IUFoST

IUFOST WORLD FOOD CONGRESS HONG KONG 2026

IUFoST 23rd World Food Congress

BOOK OF ABSTRACTS



IUFoST 2026 World Food Congress
25–29 October in Hong Kong
Where Food Science meets the Future

Welcome Letter

Distinguished guests, scientists, policymakers, industry leaders, and global partners in food science and technology,

On behalf of the International Union of Food Science and Technology (IUFoST), it is my distinct honor and pleasure to welcome you all to the **IUFoST World Congress 2026** at AsiaWorld-Expo, Hong Kong.

Our gathering here from October 25 to 29, 2026, comes at a pivotal moment for our planet. The complex challenges we face - ranging from climate change and supply chain resilience to global population nutrition - demonstrate clearly that scientific research alone is not enough. It must be supported by progressive and targeted policy, alongside real-world execution and scaling by industry. Building and strengthening global linkages among these three vital pillars is essential to translating knowledge into tangible benefits for society.

This Congress offers a valuable platform to exchange innovations, build cross-sector partnerships, and shape the future of food globally. I encourage you to share your insights, engage in scientific dialogue, and foster meaningful collaborations.

I wish you all a productive and impactful conference.
Thank you

Pavinee Chinachoti,
Acting President, IUFoST

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Dr. Pavinee Chinachoti (Thailand) Acting President
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Dr. Fereidoon Shahidi, Academy President; Dr. Lilia Ahrne, Scientific Council Chair
Secretary-General: Judith Meech

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PHOTO	NAME	COUNTRY	ROLE
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PHOTO	NAME	COUNTRY	ROLE
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	Cesarettin Alasalvar	Türkiye	Member
	Cristina Silva	Portugal	Member

Congress Advisory Committee

PHOTO	NAME	INSTITUTION / AFFILIATION
	Ryszard Amarowicz	Polish Academy of Sciences, Poland
	Sun Baoguo	Chinese Academy of Engineering, Professor, Beijing Technology and Business University, CIFST President
	V.M. Balasubramaniam	Koehler-Ayres Professor of Food Processing: Sustainable Food Manufacturing Systems, University of Georgia, USA
	Zhen-You Chen	Chinese University of Hong Kong
	Marco Dalla Rosa	Department of Agricultural and Food Sciences, Alma Mater Studiorum Università di Bologna, Italy
	Ferruh Erdogdu	Professor of Food Process Engineering, Computational Food Processing Group, Department of Food Engineering, Ankara University, Turkey
	Lotis Francisco	Department of Food Science and Nutrition, College of Home Economics, University of the Philippines Diliman; President, Philippine Association of Food Technologists, Inc. (PAFT), Philippines
	Shi Hanping	Founding Chair, Department of Clinical Nutrition, Capital Medical University, China
	Purwiyatno Hariyadi	Professor, Dept of Food Science & Technology, Faculty of Agricultural Engineering & Technology, IPB University (Bogor Agricultural University); Senior Scientist, SEAFAST Center, IPB University, Bogor, Indonesia
	Jeya Henry	Senior Advisor, Global Centre for Asian Women's Health, Singapore
	Anne-Marie Hermansson	Chalmers University of Technology, Sweden
	Milan Houska	Senior Researcher, Czech Agro-food Centre (CARC), Department of Food Science, Prague, Czech Republic

	**Amin Ismail**	University Putra Malaysia, Malaysia
	**Bo Jiang**	Jiangnan University, China
	**Mukund V Karwe**	Distinguished Professor Food Engineering, Rutgers, State University of New Jersey, USA
	**John Kinyuru**	College of Agriculture and Natural Resources, Jomo Kenyatta University of Agriculture & Technology, Kenya
	**Suzana Caetano da Silva Lannes**	School of Pharmaceutical Sciences, University of São Paulo, Brazil
	**Jiang Lianzhou**	Chief Professor, Northeast Agricultural University, China
	**Keshun Liu**	U.S. Department of Agriculture, Agricultural Research Service, USA
	**Xie Mingyong**	Chinese Academy of Engineering, Director of State Key Laboratory of Food Science and Resources, Nanchang University, China
	**Kazuo Miyashita**	Hokkaido Bunkyo University, Japan
	**John Muyonga**	Professor of Food Science, Makerere University, Uganda
	**Keshavan Niranjan**	Prof. of Bioprocessing, University of Reading, UK
	**Li Ning**	Chief expert of China National Center for Food Safety Risk Assessment, China
	**Obadina Adewale Olusegun**	Association of African Universities (AAU), Accra, Ghana

	**Jamuna Prakash**	Professor, Dept. of Food Science and Nutrition, University of Mysore, India
	**George Ooko Abong**	Department of Food Science, Nutrition and Technology; Director (Ag) Advancement & Institutional Development, University of Nairobi, Kenya
	**Bolanle Otegbayo**	Department of Food Science and Technology, Bowen University, Nigeria
	**Jairo Romero**	IAFoST Fellow, Colombia
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	**Petras Rimantas Venkutonis**	Kaunas University Technology, Lithuania
	**Erich Windhab**	Swiss Federal Institute of Technology Zurich (ETH); Chair, Food Technology Platform @ Swiss Academy of Technical Sciences (SATW), Switzerland
	**Yuan Li**	College of Food Science and Nutritional Engineering, China Agricultural University, Beijing; Section Chief Precision Nutrition, Frontier Technology Research Institute of China Agricultural University Shenzhen, China
	**Koh Yew Ming**	Malaysian Institute of Food Technology, Malaysia
	**Ding Gangqiang**	Senior Scientist, Chinese Center for Disease Control and Prevention (Chinese Academy of Preventive Medicine); Former Director of National Institute for Nutrition and Health, China CDC
	**Terence Lau**	Professor Terence Lau, Interim Chief Innovation Officer, Hong Kong Baptist University

New Fellows 2026

PHOTO	NAME	AFFILIATION	EXPERTISE
	**Joseph Oneh Abu**	University of Agriculture, P.M.B. 2373, Makurdi, Nigeria (UAM) or C/O Nigerian Institute of Food Science and Technology, Cappa Bus Stop, Oshodi, Lagos, Nigeria	Food Chemistry, Food and Nutrition, Food Processing, Food Safety, Functional Foods, Food Science and Nutrition Education Curriculum Development and Promotion
	**Hafiz Abubakar**	Department of Biochemistry, Bayero University, Kano, P.M.B. 3011, Kano, Nigeria	Food Biotechnology, Food Chemistry, Food and Nutrition, Food Processing, Food Safety, Functional Foods, Cereal Biochemistry, Nutritional Biochemistry, Public Health Nutrition, Food Quality Assurance and Standards, Food Systems and Nutrition Policy, Household Food Security and Nutrition Interventions, Capacity Development in Food Science and Nutrition
	**Marleny D. Aranda Saldaña**	University of Alberta	Food Engineering, Food Processing, Food Technology, Functional Foods
	**Janet E. Collins**	JEC Regulatory Strategies Consultants	Food Biotechnology, Food Chemistry, Food and Nutrition, Food Processing, Food Technology, Food Ingredients
	**Sakamon Devahastin**	King Mongkut's University of Technology Thonburi	Food Engineering, Food Processing, Food Technology, Novel food processing technologies
	**Asgar Farahnaky**	RMIT University, Melbourne, Australia	Food Engineering, Food Processing, Food Technology, Functional Foods
	**Vural Gokmen**	Hacettepe University	Food Chemistry, Food Engineering, Food Processing, Food Technology
	**Chen Gong**	N/A	N/A
—	**Lihan Huang**	USDA Agricultural Research Service	Food Microbiology, Food Engineering, Food Processing, Food Safety, Food Technology
	**Hiroko Isoda**	University of Tsukuba	Functional Foods

	**Anet Rezek Jambrak**	University of Zagreb, Faculty of Food Technology and Biotechnology	Food Chemistry, Food Engineering, Food Processing, Food Technology
—	**Yujun Jiang**	N/A	N/A
—	**Vijay K. Juneja**	N/A	N/A
	**Zwe-Ling Kong**	Department of Food Science, National Taiwan Ocean University	Food Safety and Functional Foods
	**Marianne Nissen Lund**	Department of Food Science, University of Copenhagen	Food Chemistry
	**Haile Ma**	Jiangsu University	Food Engineering and Functional Foods
	**Mercy Mmari**	Aa Centre for Food Innovation, The Open University of Tanzania, Tanzania Association of Food Science and Technology	Food and Nutrition, Food Processing, Food Safety
	**Nitin Nitin**	University of California, Davis	Food Microbiology, Food Engineering, Food Processing, Food Safety, Functional Foods
	**Ronald B. Pegg**	Department of Food Science & Technology, University of Georgia, Athens, GA, USA	Food Chemistry, Food Engineering, Food and Nutrition, Functional Foods
	**Siew Yong Quek**	University of Auckland, New Zealand	Food Biotechnology, Food Chemistry, Food Microbiology, Food Engineering, Food and Nutrition, Food Processing, Food Safety, Food Technology, Functional Foods
	**Upali Samarajeewa**	Emeritus Professor in Food Science and Technology	Food Chemistry, Food Microbiology, Food Safety, Laboratory accreditation
—	**Jiwan Singh Sidhu**	College of Dairy and Food Sciences, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana-141004, Punjab, India / Department of Food Science and Technology, Punjab Agricultural University, Ludhiana-141004, India	Food Chemistry, Food Microbiology, Food Processing, Food Safety, Food Technology, Functional Foods

	**Narpinder Singh**	Vice Chancellor, Graphic Era deemed to be University	Food Chemistry and Food Technology
—	**Shaoyun Wang**	N/A	N/A
	**Xuebing Xu**	College of Food Science and Technology, Henan University of Technology	Food Biotechnology, Food Chemistry, Food and Nutrition, Food Safety, Food Technology, Functional Foods
—	**Kazutaka Yamamoto**	N/A	N/A
	**Howard Q Zhang**	US Department of Agriculture, Agricultural Research Service	Food Engineering, Food Processing, Food Safety, Food Technology

Young Scientist Awards 2026

PHOTO	NAME	COUNTRY	RESEARCH / CONTRIBUTION
	Yaqi Zhao	China	Advanced food allergen detection through highly specific immunochemical methods and monoclonal antibodies. Improved understanding of how food processing affects protein allergenicity and food safety. Contributed to accurate analysis of plant-based proteins, supporting sustainable food innovation and consumer protection. Research: Quantitative Western Blot Detection of Chicken Serum Albumin
	Tyler Barzee	USA	Pioneer in fungal and microbial biomanufacturing for sustainable food production. Developed technologies for 3D bioprinting, alternative proteins, probiotic encapsulation, and circular bio-processing. Successfully translated research into industry applications, startups, patents, and sustainable resource management. Research: Utilization of filamentous fungi in 3D-bioprinted structured food products
	Xuan Dong	New Zealand	Established AI-driven and proteomics-based approaches for evaluating bioactive food proteins. Advanced sustainable protein research through predictive analysis of hempseed proteins. Bridged food science, industry innovation, and clinical proteomics applications in New Zealand. Research: Translating bulk protein into bioactive potential: A multi-scale exploration based on hempseed
	Rahel Suchintita Das	Ireland	Developed green extraction technologies for alternative proteins and bioactive compounds. Advanced circular bioeconomy approaches using seaweed, legumes, and grass biomass. Leads international research collaborations focused on sustainable ingredients and zero-waste value chains. Research: Eco-Innovative Zero-Waste Seaweed Biorefinery
	Shubham Mahendra Nimbkar	India	Developed innovative food engineering solutions for micronutrient delivery and food fortification. Applied emerging technologies to improve processing, stability, and value addition of agricultural products. Successfully translated research into industrial applications and patented innovations. Research: Impact of spray and freeze drying on physicochemical and functional characteristics of encapsulated custard apple peel extract: A waste valorization study
	Byron Perez	Switzerland	Established engineering foundations for scalable microbial food production. Advanced predictive models for pulsed electric field (PEF) processing and downstream protein recovery. Integrated circular bioprocessing, digital optimization, and sustainable protein manufacturing. Research: Microalgae biorefineries for sustainable food systems: circular cultivation, energy-efficient processing, and scalable downstream integration
	Su Lingshan	Singapore	Pioneered the use of cereal prolamins as functional structural biomaterials for future foods. Developed innovative fabrication methods for cultivated meat scaffolds and structured protein products. Advanced sustainable food design through upcycling of climate-resilient cereals and processing by-products. Research: Novel Engineering Approaches to Scaffolding Prolamins for Cultivated Meat Production
	Ka Yi MAN	Hong Kong SAR, China	Her research applies untargeted metabolomics and lipidomics to identify cultivation- and origin-dependent chemical signatures in foods, contributing to food integrity, food fraud prevention, and consumer protection, and leads research projects on hydroponic vegetable biofortification, food 3D printing, and food waste upcycling, with a focus on translating scientific discoveries into practical applications through collaborations with academia, industry, and government.

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Congress Programme at a Glance

Sunday, 25 October 2026

08:30 – 09:00	
Main programme	REGISTRATIONS OPEN STARTING FROM 16.00

15:00-17:00	
Hall 5 / Exhibition Area	Special Session: For Early Career Scientists, Young Scientists, pre-registration (your congress registration number and name) needed to join - (science.comms@iufost.org) Breakout Rooms 9 and 10, Hall 5 Asia/World Expo Centre

18:00 – 20:00	
Main programme	WELCOME RECEPTION

Monday, 26 October 2026

08:30 – 09:00	
Congress-wide	EXHIBITION & POSTER PRESENTATIONS OPEN

09:00 – 10:30	
Hall 5 / Plenary	OPENING CEREMONY & OPENING PLENARY

10:30 – 11:00	
Congress-wide	COFFEE BREAK — EXHIBITION & POSTER PRESENTATIONS OPEN

11:00 – 12:30	
Hall 5 / Plenary	From Misinformation to Perception: The Role of Media in Shaping Consumer Attitudes Toward Food
Hall 5 / Breakout 1	Malaysian Palm Oil Council Shaping Future Food Systems: The Role of Lipids in Next-Generation Food Innovation
Hall 5 / Breakout 2	Food Processing and Engineering 1
Hall 5 / Breakout 3	Food Packaging Innovations and Environmental Impact 2 /Biodegradable and sustainable packaging materials 1
Hall 5 / Breakout 4	ISOPOW Food Processing and the Hidden Role of Water
Hall 5 / Breakout 5	AI, Data Science and Digital Transformation in Food Systems -2
Hall 5 / Breakout 6	Rethinking Ultra-Processed Food, Scientific Foundations of Processing in Food Classification
Breakout 7	Functional Foods, Bioactive and Health Promotion 1

Breakout 8	Food Processing and Engineering 2
Breakout 9	Functional Foods, Bioactive and Health Promotion 2
Breakout 10	Wiley Advancing the Future of Food

12:30 – 14:00	
Congress-wide	LUNCH BREAK — EXHIBITION & POSTER PRESENTATIONS OPEN

14:00 – 15:30	
Hall 5 / Plenary	Innovative Ingredients and Processing: Showcasing next-generation food manufacturing technologies
Hall 5 / Breakout 1	Food Safety, Quality and Risk Communication 1
Hall 5 / Breakout 2	Food Processing and Engineering 4
Hall 5 / Breakout 3	Food Attributes: Chemistry and Sensory 1
Hall 5 / Breakout 4	Functional Foods, Bioactive and Health Promotion 4
Hall 5 / Breakout 5	Food Processing and Engineering 5
Hall 5 / Breakout 6	Rethinking Ultra-Processed Food - When Classification Blocks Progress: UPF in Implementation
Breakout 7	Food Attributes: Chemistry and Sensory 2
Breakout 8	Food Packaging Innovations and Environmental Impact 1 / Intelligent and Smart Packaging
Breakout 9	3rd China Europe International Food Innovation Forum Safety, Sustainability, market and Human health
Breakout 10	Food Processing and Engineering 6

15:30 – 16:00	
Congress-wide	COFFEE BREAK — EXHIBITION & POSTER PRESENTATIONS OPEN

16:00 – 17:30	
Hall 5 / Plenary	ILSI SEA Region / ALSIN Rethinking Food Environment, Dietary Quality and Health Guidance Beyond 'UPF' - An Asian Perspective
Hall 5 / Breakout 1	Food Attributes: Chemistry and Sensory 3
Hall 5 / Breakout 2	Functional Foods, Bioactive and Health Promotion 3
Hall 5 / Breakout 3	Food Processing and Engineering 7
Hall 5 / Breakout 4	Food Processing and Engineering 8
Hall 5 / Breakout 5	Sustainable Food Systems and Global Food Security 1
Hall 5 / Breakout 6	Food Safety, Quality and Risk Communication 2
Breakout 7	Education, Capacity Building and Workforce Transformation 1

Breakout 8	Food Attributes: Chemistry and Sensory 4
Breakout 9	ISNFF From Waste to Upcycled Valorized Ingredients
Breakout 10	Food Processing and Engineering 3

Tuesday, 27 October 2026

08:30 – 09:00	
Congress-wide	EXHIBITION & POSTER PRESENTATIONS OPEN

09:00 – 10:30	
Hall 5 / Plenary	Distinguished Lecture Dr Junshi Chen and Lifetime Achievement Award Winnner Dr. Aman Wirakartakusumah Fellows Induction Ceremony
Hall 5 / Breakout 1	Food Attributes: Chemistry and Sensory 5
Hall 5 / Breakout 2	Food Attributes: Chemistry and Sensory 7
Hall 5 / Breakout 3	Food Processing and Engineering 10
Hall 5 / Breakout 4	Functional Foods, Bioactives and Health Promotion 5
Hall 5 / Breakout 5	Food Attributes: Chemistry and Sensory 8
Hall 5 / Breakout 6	Nutrition Policy Classification and Public Health 3
Breakout 7	FIFSTA - Science, Safety and Claims: ASEAN Harmonisation for the Future of Food
Breakout 8	Food Processing and Engineering 11
Breakout 9	Food Safety, Quality and Risk Communication 3
Breakout 10	Sustainable Food Systems and Global Food Security 3

10:30 – 11:00	
Congress-wide	COFFEE BREAK — EXHIBITION & POSTER PRESENTATIONS OPEN

11:00 – 12:30	
Hall 5 / Plenary	IUFoST / IAFoST / Interdisciplinary Partners Global Policy Directions in Future Foods - where are we and where do we go?
Hall 5 / Breakout 1	Food Attributes: Chemistry and Sensory 9
Hall 5 / Breakout 2	ILSI - The Protein Landscape and Sustainable Solution - Dietary Supply, Health and Innovations in Southeast Asia
Hall 5 / Breakout 3	Artificial Intelligence (AI) for Food Systems
Hall 5 / Breakout 4	IUFoST Japan 1 Challenges of Promoting Food Globalization and Sustainability
Hall 5 / Breakout 5	Food Processing and Engineering 12
Hall 5 / Breakout 6	Sustainable Food Systems and Global Food Security 2
Breakout 7	Functional Foods, Bioactives and Health Promotion 6
Breakout 8	Food Processing and Engineering 13
Breakout 9	ALACCTA Food Innovation under Regulation: Pathways to Health and Sustainability
Breakout 10	Food Processing and Engineering 14

12:30 – 14:00	
Congress-wide	LUNCH BREAK — EXHIBITION & POSTER PRESENTATIONS OPEN

14:00 – 15:30	
Hall 5 / Plenary	Food Safety, Quality and Risk Communication 4
Hall 5 / Breakout 1	Functional Foods, Bioactives and Health Promotion 7
Hall 5 / Breakout 2	Educating the Future Food Workforce: Competencies, Curriculum and Innovation for Sustainable Food Systems, IUFoST Education WG
Hall 5 / Breakout 3	Food Attributes: Chemistry and Sensory 10
Hall 5 / Breakout 4	IUFoST Japan 2 Glycoscience and Glycotechnologies - Starch, Starch Sugars, and Key Enzymes
Hall 5 / Breakout 5	Food Processing and Engineering 15
Hall 5 / Breakout 6	Rethinking Ultra-Processed Food UNIDO: Processing for Nutrition, Food security and Circular Resource Use
Breakout 7	Functional Foods, Bioactives and Health Promotion 8
Breakout 8	Food Attributes: Chemistry and Sensory 11
Breakout 9	AI, Data Science and Digital Transformation in Food Systems 3
Breakout 10	Food Processing and Engineering 16

15:30 – 16:00	
Congress-wide	COFFEE BREAK — EXHIBITION & POSTER PRESENTATIONS OPEN

16:00 – 17:30	
Hall 5 / Plenary	ISNFF Functional Foods and Nutraceuticals - Where Food and Medicine Merge
Hall 5 / Breakout 1	AJINOMOTO - Bridging Scientific Evidence and Public Understanding in Food Ingredients: Lessons from Amino Acid Science and Communication
Hall 5 / Breakout 2	Functional Foods, Bioactives and Health Promotion 9
Hall 5 / Breakout 3	Food Processing and Engineering 17
Hall 5 / Breakout 4	Food Attributes: Chemistry and Sensory 12
Hall 5 / Breakout 5	AI, Data Science and Digital Transformation in Food Systems 3
Hall 5 / Breakout 6	Rethinking Ultra-Processed Food Towards Measurable, Evidence-based Food Classification - panel discussion
Breakout 7	Food Processing and Engineering 18
Breakout 8	AI, Data Science and Digital Transformation in Food Systems 1 / Foodomics and Multi-omics approaches 1
Breakout 9	Food Attributes: Chemistry and Sensory 13
Breakout 10	IUFoST Working Group

18:45 – 22:30	
Hall 5 / Exhibition Area	FELLOWS DINNER (by invitation) NUVA, Expo Centre restaurant
Breakout 7	FELLOWS DINNER Expo Centre restaurant

Wednesday, 28 October 2026

08:30 – 09:00	
Congress-wide	EXHIBITION & POSTER PRESENTATIONS OPEN

09:00 – 10:30	
Hall 5 / Plenary	Traditional Foods and Their Role in Sustainable Nutrition
Hall 5 / Breakout 1	Food Attributes: Chemistry and Sensory 14
Hall 5 / Breakout 2	Food Attributes: Chemistry and Sensory 15
Hall 5 / Breakout 3	Food Industry Asia - From Evidence to Claim: Advancing Science-based Health and Functional Claims
Hall 5 / Breakout 4	Food Processing and Engineering 19
Hall 5 / Breakout 5	ISFANS Nanotechnology in Food applications
Hall 5 / Breakout 6	Food Attributes: Chemistry and Sensory 16
Breakout 7	Food Processing and Engineering 20
Breakou 9	Sustainable Food Systems and Global Food Security 4
Breakot 10	Food Packaging Innovations and Environmental Impact 1 /Intelligent and Smart Packaging 1

10:30 – 11:00	
Congress-wide	COFFEE BREAK — EXHIBITION & POSTER PRESENTATIONS OPEN

11:00 – 12:30	
Hall 5 / Plenary	Academy (IAFoST) Emergency Disaster Relief Food Processing: Industry models enabling international interventions
Hall 5 / Breakout 1	Food Safety, Quality and Risk Communication 5
Hall 5 / Breakout 2	Science of Food - Advancing Food Science Frontiers
Hall 5 / Breakout 3	Food Attributes: Chemistry and Sensory 17
Hall 5 / Breakout 4	Food Processing and Engineering 21
Hall 5 / Breakout 5	Sustainable Food Systems and Global Food Security 5

Hall 5 / Breakout 6	Nutrition Policy, Classification, Public Health 1, Nutrition Policy, Public Health 1
Breakout 7	Food Processing and Engineering 22
Breakou 9	Food Processing and Engineering 23
Breakot 10	Food Attributes: Chemistry and Sensory 18

12:30 – 14:00	
Congress-wide	LUNCH BREAK — EXHIBITION & POSTER PRESENTATIONS OPEN

14:00 – 15:30	
Hall 5 / Plenary	Food Processing and Engineering 24
Hall 5 / Breakout 1	Food Attributes: Chemistry and Sensory 19
Hall 5 / Breakout 2	Functional Foods, Bioactives and Health Promotion 10 / Synthetic Biology
Hall 5 / Breakout 3	ONFOODS Foundation Science, Innovation and Communication for Healthy and Sustainable Diets
Hall 5 / Breakout 4	Food Safety, Quality and Risk Communication 6
Hall 5 / Breakout 5	Functional Foods, Bioactives and Health Promotion 11
Hall 5 / Breakout 6	AI, Data Science, and Digital Transformation in Food Systems 4
Breakout 7	Rethinking Ultra-Processed Food Evidence-based Food Classication Future - Work Session with audience
Breakou 9	Food Processing and Engineering 25
Breakot 10	Food Processing and Engineering-9

15:30 – 16:00	
Congress-wide	COFFEE BREAK — EXHIBITION & POSTER PRESENTATIONS OPEN

16:00 – 17:30	
Hall 5 / Plenary	Functional Foods, Bioactives and Health Promotion 12
Hall 5 / Breakout 1	Functional Foods, Bioactives and Health Promotion 13
Hall 5 / Breakout 2	Food Safety, Quality and Risk Communication 7
Hall 5 / Breakout 3	Food Processing and Engineering 26
Hall 5 / Breakout 4	Food Attributes: Chemistry and Sensory 20
Hall 5 / Breakout 5	Nutrition Policy Classification and Public Health 2
Hall 5 / Breakout 6	Food Processing and Engineering 27
Breakout 7	Food Processing and Engineering 28
Breakou 9	Food Packaging Innovations and Environmental Impact 3 / Biodegradable and sustainable packaging materials 2

18:45 – 22:30	
Hall 5 / Exhibition Area	GALA DINNER (Paid event) Marriott Hotel Ballroom AB & C
Breakout 7	GALA DINNER Marriott Hotel Ballroom AB & C

Thursday, 29 October 2026

08:30 – 09:00	
Congress-wide	EXHIBITION & POSTER PRESENTATIONS OPEN

09:00 – 10:30	
Hall 5 / Plenary	Food Industry Asia - Navigating the Future of Food Systems Through Food Processing and Science
Hall 5 / Breakout 1	Swiss Academy of Sciences Empowering the future of novel protein sources: Processing Innovation for nutrition, taste, sustainability and resilience
Hall 5 / Breakout 2	Food Processing and Engineering 29
Hall 5 / Breakout 3	International Society of Medical Nutrition and Lumoscience - From Functional Foods to Clinical Nutrition: Advances for Healthy Aging
Hall 5 / Breakout 4	Food Attributes: Chemistry and Sensory 21
Hall 5 / Breakout 5	Sustainable Food Systems and Global Food Security 6
Hall 5 / Breakout 6	Food Packaging Innovations and Environmental Impact 4 / Biodegradable and sustainable packaging materials 3
Breakout 7	Functional Foods, Bioactive and Health Promotion 15
Breakout 8	Food Processing and Engineering 30

10:30 – 11:00	
Congress-wide	COFFEE BREAK — EXHIBITION & POSTER PRESENTATIONS OPEN

11:00 – 12:30	
Hall 5 / Plenary	Rethinking Ultra-Processed Food Science, Practice and Policy - Roundtable
Hall 5 / Breakout 1	Swiss Academy of Sciences Empowering the future of novel protein sources: Processing Innovation for nutrition, taste, sustainability and resilience
Hall 5 / Breakout 2	Functional Foods, Bioactives and Health Promotion 14
Hall 5 / Breakout 3	Food Attributes: Chemistry and Sensory 22
Hall 5 / Breakout 4	Food Processing and Engineering 31
Hall 5 / Breakout 5	Nutrition Policy Classification and Public Health 4

Hall 5 / Breakout 6	Food Processing and Engineering 32
Breakout 7	Education, Capacity Building and Work Force Transformation 2

12:30 – 13:00	
Congress-wide	AWARDS CEREMONY & CLOSING CEREMONIES

13:15 – 14:15	
Hall 5 / Exhibition Area	IUFoST General Assembly Location: tbc
Breakout 7	IUFoST General Assembly (by invitation) Location: Breakout Rooms 9 and 10

Invited Sessions

Sunday, 25 October

Special session – Workshop Early Career Scientists and Young Scientists
Communicating Food Science for Impact: Engaging Journals, Media, and Society

Congress registration number and name needed to join workshop– send to science.comms@iufost.org

Chairs: Elizabeth Arenas and Dominic Agyei

3:00-3:20 pm
Why Science Communication Matters in Food Science

- Communicating evidence in an era of misinformation
- The role of food scientists in public discourse

3:20-3:40 pm
Communicating with Media, Industry and the Public

- Working effectively with journalists
- Engaging policymakers, industry, and consumers

3:40-4:05 pm
Publishing, Visibility and Research Impact Panel

- Journal editors and publishers discussing publishing, peer review, editorial opportunities, and strategies for increasing research visibility and impact

4:05-4:20 pm
From Research Paper to Public Story

- An interactive discussion on translating research findings for different audiences and communicating science in accessible ways

4:20-4:35 pm
Tea Break

4:35-5:00 pm
Networking Roundtables

Monday, 26 October

09.00 – 10.30 Opening Ceremonies and Scientific Plenary

Session Chairs: Pavinee Chinachoti, Acting President, IUFoST and Jiachi Amber Chiou, Congress Co-chair, The Hong Kong Polytechnic University

Scientific Plenary:
Introduction and Innovation - Pavinee Chinachoti
Emergency Relief - Aman Wirakartakusumah
Re-thinking ultra-processed foods - Erich Windhab
Scientific Communications - Sebastiano Porretta
Circular Economy - Brijesh Tiwari (1565)

11.00 – 12.30 (Plenary Room)

From Misinformation to Perception: The Role of Media in Shaping Consumer Attitudes Toward Food

Chair: S. Porretta, President AITA

Speakers:

1. **Aklanta Kalita,** Senior Vice President, Public Affairs, Issues & Crisis Management, Edelman, Haryana, India
   From Misinformation to Perception: The Role of Media in Shaping Consumer Attitudes
2. **Vish Prakash,** Former Director, CFTRI, Distinguished Scientist, India
   Choice of Food by Media Push rather than Quality Nutrition Compels Customer
3. **Charice Grace**, Manager, trade marketing and stewardship**,** Almond Board of California, USA
   From Food Science to Market Success: How Innovation Becomes Adoption in a Global Food System (1493)
4. **Bei Wang,** School of Food and Health, Beijing Technology and Business University, China
   From Molecular perception to Formulation Redesign: A Data-Knowledge Dual-driven Flavor Foundation Model and distributed Agent Paradigm (965)
5. **Francesca Pompei,** School of Biosciences & Veterinary Medicine, University of Camerino, Italy
   Exploring consumer perception across Italy and Japan: a cross-cultural study on functional pasta (660)

11.00-12.30 Breakout 1

Malaysian Palm Oil Council - Shaping Future Food Systems: The Role of Lipids in Next-Generation Food Innovation

Chair: Roger Clemens, University of Southern California, USA

Speakers:

1. **Roger Clemens**, Adjunct Professor, Mann School of Pharmacy and Pharmaceutical Sciences, University of Southern California, USA and **Peter Pressman**, Professor, University of Maine, USA.
   *The Fat Paradox: Essential, Misunderstood, and Evolving (*1496)
2. **Goh Bey Hing,** Head of Sunway Biofunctional Molecules Discovery Centre, Faculty of Medical and Life Sciences, Sunway University, Malaysia
   *Functional lipids and bioactive components in emerging food applications (*1494)
3. **Robert Basker**, Chief Executive Officer, Global Specialty Ingredients Malaysia Sdn Bhd, Malaysia
   Advanced lipid delivery systems for functional and health-oriented food innovation (1495)

11.00 – 12.30 Breakout 4

Food Processing and the Hidden Role of Water (ISOPOW)

Chairs: Yrjö H. Roos, University College Cork, Ireland and Weibiao Zhou, National University of Singapore

Speakers:

1. **Yrjö H. Roos,** School of Food and Nutritional Sciences, University College Cork, Ireland.
   *Water in food and food processing classification*s (1331)
2. **Sakamon Devahastin**, Department of Food Engineering, King Mongkut's University of Technology, Bangkok, Thailand.
   The combined role of superheated steam drying and water on dried food quality (
3. **Weibiao Zhou**, Department of Food Science and Technology, National University of Singapore.
   The role of water in high protein bread making (1333)
4. **Fanghui Fan**, School of Chemistry and Environmental Engineering, Shenzhen University, Guangdong, China
   Water mobility in solid foods and its impact on quality

11.00 – 12.30 Breakout 6

Rethinking Ultra-Processed Food, Scientific Foundations of Processing in Food Classification

Chairs: Erich Windhab, Swiss Federal Institute of Technology Zurich (ETH), Switzerland

Speakers:

1. **Barbara Schneeman**, University of California, Davis, USA
   The NOURISH Scheme – Separating Formulation and Processing Impact on Nutrition
2. **Hongda Chen**, Independent Consultant, USA
   The PRISM Framework – Multi-Characteristics determining Food Quality
3. **Erich Windhab**, Swiss Federal Institute of Technology Zürich (ETH), Switzerland
   The SLIM Approach - From Formulation and Processing to Food Intake and Digestion

14.00 – 15.30 Plenary Room

Innovative Ingredients and Processing: Showcasing next-generation food manufacturing technologies

Chair: Pavinee Chinachoti, FIRN Network, Thailand

Speakers:

1. **Min Zhang,** School of Food Science and Technology, Jiangnan University, Wuxi, China
   Food Additive Manufacturing: Current Status, Progress, and Reflections (1497)
2. **Antonio Derossi**, Dept. Science of Agriculture, Food and Environment, University of Foggia, Italy
   Digitalizing the Food Matrix: 3D and 4D Printing as Catalysts for Sustainable Novel Food Innovation
3. **Lingyun Chen**, Canada Research Chair in Plant Protein Structure Function and Nutraceutical Delivery, Department of Agricultural, Food & Nutritional Science, University of Alberta, Edmonton, Canada
   Transformation of Upcycled Food Proteins into Functional Emulsifiers and Nutraceutical Delivery Systems (1498)
4. **Sakamon Devahastin,** Department of Food Engineering, King Mongkut's University of Technology, Bangkok, Thailand.
   Game-Changing Food Processing: From Theory to Industrial Reality (1470)

14.00-15.30 Breakout 6

Rethinking Ultra-Processed Foods – When Classification Blocks Progress: UPF in Implementation

Chair: Aman Wirakartakusumah, IPMI Institute, Indonesia

Speakers:

1. **Susana Socolovsky**, University of Buenos Aires, Argentina
   Food Regulation Reality in South America
2. **Aman Wirakartakusumah**, IPMI Institute, Indonesia
   Global Food Fortification needs
3. **Alexander Mathys**, ETH Zurich, Switzerland
   Plant-based food alternatives

14.00- 15.30, Breakout 9

3rd China Europe International Food Innovation Forum

Chairs: Sebastiano Porretta, Senior Advisor, Sino-Europe International Joint Food Research Institute, Qiao Shiyan and Fuyu Yang, China Agricultural University

Speakers:

1. **Sebastiano Porretta,** Italian Association of Food Technology, Italy
   The Apparent Paradox of European Food Markets
2. **Yuan Li,** China Agricultural University, China
   Geometry-engineered microgels for intestinal region-specific probiotics delivery in future food systems (571
3. **Shuo Wang**, Nankai University, China
   Interplay of Human milk oligosaccharides with Immunosenescence (669)
4. **Guoliang Li,** Shaanxi University of Science & Technology, China
   Novel Nanopore Detection Methods for Food Risk Analysis (471)
5. **Zhaoxiang Ma**, China Agricultural University, China
   From bulk averaging to single-droplet precision: an AI-driven microfluidic platform for decoding digestion dynamic kinetics (525)

6. **Xiangyu Liu,** China Agricultural University, China
   Microfluidization and TEMPO-Oxidation Modified Chickpea Husk Fiber: Structure, Function and Prospect for Elderly Food Development (483)
7. **Yiyang Wu,** University of Macau, China
   Enhancing lipid NPs prediction and design for food bioactive delivery using the AI language model and multi-task learning (782)

16.00 – 17.30 Plenary

Asian Life Sciences Institutes Network – Rethinking Food Environment, Dietary Quality and Health Guidance beyond 'UPF' – an Asian Perspective

Chair: A. Wirakartakusumah, IPMI Institute, Indonesia

Speakers:

1. **Boon Yee Yeong**, Coordinator, ALSIN, Singapore
   Welcome and Introduction to ALSIN
2. **Aman Wirakartakusumah**, IPMI Institute, Indonesia
   Rethinking Food Environment, Dietary Quality and Health Guidance beyond 'UPF' – an Asian Perspective (1571)
3. **Purwiyatno Hariyadi**, Southeast Asian Food and Agricultural Science and Technology (SEAFAST) Centre, Bogor Agricultural University, Indonesia
   Understanding Food Processing and Processed Foods in Asia - Dietary Context (1572)
4. **E Siong Tee**, Nutrition Society of Malaysia (NSM), Malaysia
   The Real Food Environment in Asian Countries: Rethinking Dietary and Policy Guidance (1573)
5. **Yuko Tousen**, National Institute of Health and Nutrition, National Institutes of Biomedical Innovation, Health and Nutrition, Japan
   Nutrient Profiles Based on Meals/Dishes: Practical Applications for Food Environment in Asia (1574)

16.00 – 17.30 Breakout 9

From Waste to Upcycled Valorized Ingredients (ISNFF)

Chairs: Fereidoon Shahidi, Memorial University, Canada, Cesarettin Alasalvar, Tubitak, Turkiye, and Ronald Pegg, University of Georgia, USA

Speakers:

1. **Fereidoon Shahidi,** Memorial University, St. John's Newfoundland, Canada
   From Waste to Wealth and Health (1519)
2. **Ronald B. Pegg,** Department of Food Science & Technology, University of Georgia, Athens, GA, USA
   Upcycling of Tree Nut Co-products (1486)
3. **Cesarettin Alasalvar,** TÜBİTAK MAM, Food Research Group, Gebze-Kocaeli, Türkiye
   Valorisation of nut processing coproducts: opportunities and challenges (902)
4. **Guangwei Huang**, Associate Director of Food Research and Technology, Almond Board of California, USA
   Transforming almond hulls into functional food ingredients (1535)

16.00 – 17.30 Breakout 10
Wiley Advancing the Future of Food

Chair: Lionel Zhu, Wiley

Speakers:

1. **Brijesh Tiwari, Teagasc** - Irish Agricultural and Food Research Authority, Ireland
   Transforming Food Systems through Circular Biorefinery
2. **Gangqiang Ding,** National Institute for Nutrition and Health, China CDC
   Food Nutrition and Chronic disease: from evidence to population
3. **Narpinder Singh,** Graphic Era Deemed to be University, India
   Reimagining Plant-Based Foods: From Molecular Structure to Next-Generation Functionality
4. **NNitin,** UC Davis, California, USA
   AI-enabled food safety and quality research
5. **Lionel Zhu**, Wiley
   How Wiley is advancing the Future of Food

Tuesday, October 27

09.00 – 10.30 Plenary Room

Chairs: Fereidoon Shahidi, IAFoST President and Charles Aworh, IAFoST Past President

Lifetime Achievement Award Winner Dr. Aman Wirakartakusumah
Distinguished Lecture Dr Junshi Chen

IAFoST Fellows Induction Ceremony
Moderators: Fereidoon Shahidi, IAFoST President,Canada; Pingfan Rao, IAFoST President elect, China; Charles Aworh IAFoST IPP, Nigeria; Cesarettin Alasalvar Academy Councillor, Turkey; Cristina Silva, Academy Councillor, Portugal.

09.00 – 10.30 Breakout 7

FIFSTA - Science, Safety and Claims: ASEAN Harmonisation for the Future of Food

Chair: Richard Khaw, President FIFSTA

Speakers:

1. **Lotis Francisco**, President, Philippines Association of Food Technologists, Inc. (PAFT), Philippines
   Strengthening Regulatory Science for Responsible Food Innovation in ASEAN: The Role of Food Science Associations (1552)
2. **Siree Chaiseri**, Kasetsart University, Thailand
   Current Development on Thailand's Positive List: First Step Towards ASEAN Harmonisation (1556)
3. **Dwi S Larasatie Nur Fibri**, Indonesian Association of Food Technologists (PATPI), Indonesia
   Ensuring Food Safety at Scale: Regulatory Framework for Indonesia's Free Nutritious Meals Program (MBG) (1553)
4. **Adi Md Sikin,** President, Malaysia Institute of Food Technology (MIFT), Malaysia
   Food Analyst Competency in Malaysia: Challenges and Opportunities
5. **Richard Khaw**, President FIFSTA, Singapore
   Singapore Food Toxicology Network: Advancing Precision Health Through New Approach Methodologies (1555)

11.00 – 12.30 Plenary

IUFoST / IAFoST / Interdisciplinary Partners - Global Policy Directions in Future Foods - where are we and where do we go?

Chair: Fereidoon Shahidi, IAFoST President, Canada

Speakers:

1. **HRH Muhammadu Sanusi II,** Emir of Kano, Nigeria
2. **Hyun-Sook Kim**, IUNS President, Korea
3. **Gangqiang Ding**, Chief Nutritionist, China CDC, former Director, Institute of Nutrition and Health, China

4. **Ali Badarneh,** Chief, Food Systems and Sustainability Unit, UNIDO, Austria

11.00 – 12.30 Breakout 2

ILSI SEA

ILSI: The Protein Landscape and Sustainable Solution – Dietary Supply, Health and Innovations in Southeast Asia

Chair: Geoffry Smith, ILSI SEA Region, Singapore

Speakers:

1. **Stephane Vidry**, ILSI Global, USA
   Welcome Remarks and Introduction to ILSI
2. **Geoffry Smith,** ILSI SEA Region President, Singapore
   The Protein Landscape and Sustainable Solution – Dietary Supply, Health and Innovation in Southeast Asia(1567)
3. **Cecilia Christina Santos-Acuin**, University of the Philippines Los Baños, Philippines
   Protein Consumption and Health Status in Southeast Asia (1568)
4. **Weibiao Zhou,** Department of Food Science and Technology, National University of Singapore (NUS), Singapore
   Advances in Novel Protein Technologies, Safety and Regulatory Aspects (1569)
5. **Zhenxing Li,** College of Food Science and Engineering, Ocean University of China
   Allergenicity of Novel Proteins

11.00 – 12.30 Breakout 3

Artificial Intelligence for Food Systems

Chairs: Nitin Nitin, University of California, Davis, USA and Donghong Liu, Zhejiang University, China

Speakers:

1. **Yang Tao**, University of Maryland, USA
   Active Laser Precision 3D Imaging Robotics for Accurate Packaging and Operations (1196)
2. **Peter Pressman**, University of Maine, USA, and **Roger Clemens,** University of Southern California, USA (1340)
   Artificial Intelligence (AI) in Nutrition Assessment and Clinical Support
3. **Nitin Nitin**, University of California, Davis, USA
   AI-enabled microbial detection (1339)
4. **Dachuan Zhang**, Department of Food Science and Technology, National University of Singapore. Singapore
   Domain knowledge, just evaluation, and robust data standards are required to advance AI in food science (58)
5. **Aberham Hailu Feyissa,** National Food Institute, Technical University of Denmark, Denmark
   Hybrid Multiphysics Modelling for Smart Baking Systems (1109)

11.00 – 12.30 Breakout 4

IUFoST Japan 1: Challenges of Promoting Food Globalization and Sustainability

Speakers:

1. **Ken-ichi Honjoh,** Faculty of Agriculture, Kyusyu University, Japan
   Antibiotic Use in Crop Production and Dynamics of Antibiotic Resistant Bacteria in Soils (1356)
2. **Eriko Yasunaga**, Tokyo University of Agriculture and Technology, Japan
   Visualizing and Predicting Quality Changes in Fresh Produce to Support Postharvest Loss Reduction in Global Supply Chains (1358)
3. **Jin-Kyu Rhee**, Department of Food Science and Biotechnology, Ewha Womans University, Korea
   Voxel-Level Multi-Dimensional Food Fabrication: Structural Reverse Engineering and Bio-Orchestration of Biomaterial Scaffolds for Next-Generation Alternative and Cultivated Proteins (1379)
4. **Lijing Ke,** School of Food Science and Nutrition, University of Leeds, UK
   Translate Herbal Tradition to Sustainable Solution: An expedition on the interface of food (1393)

11.00 – 12.30 Breakout 9

Asociación Latinoamericana y del Caribe de Ciencia y Tecnología de Alimentos (ALACCTA)
Food Innovation under Regulation: Pathways to Health and Sustainability

Chair: Susana Socolovsky, ALACCTA President

Speakers:

1. **Sara Valdez Martinez, Universidad Nacional Autonoma de Mexico,** Mexico
   Front-of-Package Food Labeling: Impact and Understanding in Mexico (1500)
2. **Suzana Caetano da Silva Lannes,** University of Sao Paulo, Brazil
   Integrating Regulation and Upcycling in Food Science for a Sustainable Tomorrow (1385)
3. **Alejandra Medrano,** Department of Food Science and Technology, Facultad de Química/ Faculty of Chemistry. UdelaR. Uruguay
   Functional Ingredients and Novel Foods is the Future of Food in Latin America (1384)
4. **Carlos Wanderlei Piler Carvalho,** Embrapa Food Technology, Brazil
   Balancing Technological Innovation with Regulatory Compliance in Cereal and Pulse Milling Products (1386)
5. **Susana Socolovsky**, ALACCTA, President-Elect, Argentina
   "Ultra-processed foods" in LATAM: *The Erroneous Regulatory Consequences of Using an Unvalidated Concept (1490)*

14.00 - 15.30 Breakout 2

Educating the Future Food Workforce:
Competencies, Curriculum and Innovation for Sustainable Food Systems, IUFoST Education WG

Chairs: Cristina Silva, Faculty of Biotechnology; Universiade Católica Portuguesa and O. Adewale, Project Officer, Quality Assurance and Accreditation, Association of African Universities (AAU)

Speakers:

1. **Maria Leonora Lotis dL. Francisco**, Professor, Department of Food Science and Nutrition, College of Home Economics, University of the Philippines Diliman, Philippines.
   Reframing Food Science Education for Sustainable Food Futures: Curriculum, Mindset and Professional Formation (843)

2. **Adewale Olusegun Obadina**, Project Officer, Quality Assurance and Accreditation, Association of African Universities (AAU), Accra, Ghana, (Professor of Food Safety and Biotechnology), Department of Food Science and Technology, Federal University of Agriculture, Nigeria.
   Pedagogy of Food Science and Engineering in Africa: Challenges and Future Directions Project Officer, Quality Assurance and Accreditation (1522)
3. **Phil Bremer,** Department of Food Science, University of Otago, Dunedin, New Zealand; Chief Scientist, New Zealand Food Safety Science & Research Centre, Palmerston North, New Zealand
   What Knowledge and Skills Will Future Food Science Graduates Need? (1521)
4. **Cristina L.M. Silva,** Faculty of Biotechnology; Universiade Católica Portuguesa | Porto
   Transforming Food Engineering Education through International Challenge-Based Learning: The SHIFT Experience (841)
5. **Jason Wan**, Associate Director - Institute for Food Safety and Health (IFSH) Director – Food Safety Preventive Controls Alliance (FSPCA) Professor of Food Science, Illinois Institute of Technology, USA
   Training the Future Food Workforce: Global Perspectives on Food Traceability and Standardized Food Safety Education (1501)

14.00 – 15.30 Breakout 4

IUFoST Japan 2

Glycoscience and Glycotechnologies – Starch, Starch Sugars, and Key Enzymes

Speakers:

1. **Cheng Li,** School of Life Sciences, The Chinese University of Hong Kong, Hong Kong
   Starch-polyphenol Complexes as Low-glycemic Functional Food Ingredients for Type 2 Diabetes management (1388)
2. **Qunyu Gao**, School of Food Science and Engineering, South China University of Technology, China
   Factors and Mechanisms Affecting the Structure and Digestibility of Jackfruit Seed Starch (1397)
3. **Seon-Min Oh**, Korean Food Research Institute, Korea
   Engineered Starch-based Supramolecular Assemblies through Enzymatic Debranching (1394)
4. **Takashi Kuriki**, President, Glico Nutrition Co., Ltd., Japan
   From Enzyme Insight to Industry Impact: Our Strategy Built on the α-Amylase Family (1390)

14.00 – 15.30 Breakout 6

Rethinking Ultra-Processed Food
UNIDO: Processing for Nutrition, Food Security and Circular Resource Use

Chair: Hongda Chen, Independent Consultant, USA

Speakers:

1. **Ali Badarneh**, Chief, Food Security and Food Systems Unit, United Nations Industrial Development Organization (UNIDO), Austria
   Role and Importance of Food Processing in UNIDO's Industrial Development Approach
2. **Erich Windhab**, Swiss Federal Institute of Technology Zürich (ETH), Switzerland
   Circular economy enhancement and food fortification in the cocoa value chain

16.00 – 17.30 Plenary

Functional Foods and Nutraceuticals – Where Food and Medicine Merge (ISNFF)

Chairs: Fereidoon Shahidi, Memorial University, Canada and Jianping Wu, University of Alberta, Canada

Speakers:

1. **Jianping Wu,** Department of Agricultural, Food and Nutritional Sciences, University of Alberta, Edmonton, Alberta, Canada
   Food-derived Bioactive peptides for Human Health: Research Progresses and Challenges (1499)
2. **Rotimi Aluko,** Department of Food and Human Nutritional Sciences, University of Manitoba, Winnipeg, Manitoba, Canada
   Structure *and Function of Multifunctional Fava Bean Protein Hydrolysates and Peptides* (224)
3. **Zhen-Yu Chen,** Guangdong Pharmaceutical University
   Branch side chain and Esterification theory – why cholesterol is well absorbed, and phytosterols are not absorbed (1317)
4. **Dongxiao Sun-Waterhouse**, The University of Auckland; South China University of Technology, New Zealand
   The design and development of wellness/functional foods (1520)
5. **Fereidoon Shahidi,** ISNFF President, Canada
   Functional Foods: Growth and Challenges (1518)

16.00 – 17.30 Breakout 1

Ajinomoto: Bridging Scientific Evidence and Public Understanding in Food Ingredients: Lessons from Amino Acid Science and Communication

Speakers:

1. **Shirley Ho,** Nanyang Technological University, China
   Part 1: From Evidence to Public Understanding: How Communication Shapes Perception of Food Ingredients (1502)
2. **Mahenderan Appukutty**, University Teknologi Mara, Malaysia
   Part 2: Interpreting Emerging Evidence on Branched-Chain Amino Acids: Scientific Insights and Communication Challenges (The Case of BCAA/LEAA)(1503)
3. **Miro Smriga,** Director/Representative of the Board, The International Council on Amino Acid Science, ICAAS (NGO), Japan
   Part 3: Global regulatory and communication challenges for amino acids used in foods and supplements

16:00-17:30 Breakout 6

Rethinking Ultra-Processed Food
Towards Measurable, Evidence-based Food Classification: Panel Discussion

Chair/Moderator: Erich Windhab, Swiss Federal Institute of Technology Zurich (ETH), Switzerland

Speakers:

1. **Barbara Schneeman,** University of California, Davis, USA
2. **Alexander Mathys,** ETH Zurich, Switzerland
3. **Ludovica Verzegnassi**, VP Global Head Regulatory and Scientific Affairs, Nestlé SA, Switzerland
4. **Ali Badarneh,** Chief, Feed Security and Food Systems Unit, UNIDO, Austria
5. **Susana Socolovsky**, University of Buenos Aires, Argentina

Wednesday, October 28

09.00 – 10.30 Plenary

Traditional Foods and its Role in Sustainable Nutrition - Panel Discussion

Chair and Moderator: V. Prakash, Past President of IUFoST and Vice -President of IUNS, Distinguished Scientist of CSIR - INDIA

Panelists:

1. Hyun-Sook Kim, President of IUNS, Korea
2. Mercy Mmari, The Open University of Tanzania, Tanzania
3. Charles Aworh, Immediate Past President, IAFoST, University of Ibadan, Nigeria
4. Francesca Pompei, School of Biosciences & Veterinary Medicine, University of Camerino, Italy
5. Lijing Ke, School of Food Science and Nutrition, University of Leeds, UK
6. Katsuyoshi Nishinari, Hubei University of Technology, SHARPS, Japan

9.00 – 10.30 Breakout 3

Food Industry Asia – from Evidence to Claim: Advancing Science-Based Health and Functional Claims

Chair: Shahrila Ishak, FIA, Singapore

Speakers:

1. **Han Yin,** Head of Nutrition Science and Policy. FIA, Singapore
2. **Shahrila Ishak,** Head of Scientific and Regulatory Affairs, FIA, Singapore
3. **Matt Kovac,** Executive Director, FIA, Singapore
   From Evidence to Claim: Advancing Science-Based Health & Functional Claims
   One Evidence Base, Multiple Markets: The Scientific Challenge of Claim Substantiation
   From Evidence to Regulatory Decision: Assessing Scientific Evidence Across Populations and Jurisdictions – Panel Discussion

09.00 – 10.30 Breakout 5

Nanotechnology in Food Applications (ISFANS)

Chairs: Hongda Chen, Independent Consultant, USA and Lijing Ke, University of Leeds, UK

Speakers:

1. **Karin Schroen,** Wageningen University, Netherlands
   From large scale to small scale and back again: designing food from first principles (871)
2. **Hyun Jin Park**, Korea University, Korea
   Nano-encapsulation technology for oral musical adhesive film using by 3-D printer (307)
3. **Henry Chinonso Nwogba ,**Graduate School of Science & Technology, University of Tsukuba, Japan
   Surface-modified halloysite nanotubes: impact on the performance of chitosan nanocomposite films for sustainable food packaging (647)

4. **Yasmeen Mamu**, Advanced Food Processing Research Laboratory, Department of Food Engineering, Faculty of Engineering, King Mongkut's University of Technology Thonburi, Thailand
   Enhancement of betalains retention in spray-dried colorant powder from dragon fruit peels via the use of carbon-dioxide nanobubbles pretreatment (249)

11.00 – 12.30 Plenary

Academy: Emergency Disaster Relief Food Processing: Industry models enabling international interventions

Chairs: Fereidoon Shahidi IAFoST President and Charles Aworth, IPP, IAFoST

Speakers:

1. **Vish Prakash**, Immediate Past-President IUFoST, India
2. **Pavinee Chinachoti**, Chair, Food Innovation and Regulation Network (FIRN); Acting President, IUFoST, Thailand
3. **Ding Gangqiang,** Senior Scientist, Chinese Center for Disease Control and Prevention (Chinese Academy of Preventive Medicine); Former Director of National Institute for Nutrition and Health, China CDC
4. **Charles Aworh,** University of Ibadan, Nigeria

11.00-12.30 Breakout 2

Sponsored - Science of Food - Advancing Food Science Frontiers

Chair: Viki Hurst, Executive Publisher, npi series, United Kingdom

Speakers:

1. **Viki Hurst,** Executive Publisher, npi series, United Kingdom
   Welcome and Introduction
2. **Pingfan Rao,** Distinguished Scientist, Fuzhou University, China
   Is there really a problem with ultra-processed foods? (1525)
3. **Dr. Pavinee Chinachoti**, IUFoST President-Elect and Academic Fellow; Chair of FIRN (Food Innovation-Regulation Network), Thailand
   A Second Thought on Complex, Generation-Defining Challenge on Food
4. **Hongda Chen,** Independent Consultant, USA
   Engineering Food Systems to Enhance Sustainability, Safety, Health and Quality of Life (1524)
5. **Jianshe Chen,** Singapore Institute of Food and Biotechnology Innovation (SIFBI), A*STAR, Singapore
   Rethinking food design: From materials to human functions
6. **Zhaoshou Yu,** University College Dublin, Ireland
   Sustainable nano-nutrients for precision nutrition (183)

14.00 – 15.00 Breakout 3

ONFOODS Foundation

Science, Innovation and communication for healthy and sustainable diets

Speakers:

1. **Patrizia Riso,** University of Milan, Italy
   Public-private partnerships for food system innovation: Lessons learnt from ONFOODS (1237)
2. **Paola Vitaglione,** University of Naples Federico II, Department of Agricultural Sciences, Portici, Italy
   Personalized nutrition and gut health as drivers of healthy, sustainable and targeted diet and food innovation (1239)
3. **Daniela Martini,** University of Milan, Department of Food, Environmental and Nutritional Sciences, Italy
   Plant-based alternatives in the UPF era: separating evidence from myths (1238)

14.00 – 15.30 Breakout 7 & 8

Rethinking Ultra-Processed Food - Evidence-based Food Classification Future
WORK SESSION with audience

Guiding experts: Barbara Schneeman~~n~~; Roger Clemens; Hongda Chen; Erich Windhab

Detailed descriptions on how to work with the suggested IUFoST Task Force Framework (PRISM - NOURISH - SLIM),

Addressing three perspectives: P1: Factory, P2: Consumer, P3 : Food Intake / Digestion

For each (P1-P3): Guiding INTROS and Q & A (audience

Thursday, 29 October

09.00 – 10.30 Plenary

Food Industry Asia - Navigating the Future of Food Systems Through Food Processing and Science"

Chair: Leong Han Yin, FIA

Speakers:

1. **Pavinee Chinachoti**, Chair, Food Innovation and Regulation Network (FIRN, Thailand
   Navigating Food Systems for Nutrition and Health Security and Emerging Debates
2. **Dominic Agyei**, Associate Professor of Food Chemistry, Monash University, Malaysia
   The Spectrum of Food Processing: Function, Structure and Health
3. **Richard Khaw**, President, FIFSTA, Singapore
   Food Processing and Health: Evidence and Scientific Considerations
4. **Purwiyatno Hariyadi**, Professor of Food Process Engineering, Faculty of Agricultural Technology, IPB University, Indonesia
   Food Additives in Context: Function, Safety and Risk-Based Food Evaluation

09.00 - 10.30 and 11 – 12.30 Breakout 1

Swiss Academy of Sciences (sessions 1 and 2)
Empowering the future of novel protein sources: Processing Innovation for nutrition, taste, sustainability and resilience

Moderators: Shao Quan Liu – National University of Singapore and Byron Perez - ETH Zurich, Singapore ETH Center

Speakers:

1. **Alexander Mathys,** ETH Zürich, Singapore ETH Center, Bezos Centre for Sustainable Protein, National University of Singapore, Singapore
   Sustainable Design of Food Processing Platforms for Improved Nutritional Metrics and Product Functionality (1487)
2. **Lu Yuyun,** Department of Food Science and Technology, National University of Singapore, Bezos Centre for Sustainable Protein. University of Singapore
   Microalgae as Protein-Rich Food Biomass – Challenges and Opportunities
3. **Jack Yang,** Wageningen University, Netherlands
   Designing protein ingredients: from extraction to functionality (343)
4. **Byron Perez,** ETH Zürich, Singapore ETH Center, Bezos Centre for Sustainable Protein at the National University of Singapore, Singapore
   Microalgae protein production and extraction: pulsed electric fields for efficient and scalable processing (1488)
5. **Amy McMackin,** ETH Zürich, Switzerland
   Green refining of protein sources using natural deep eutectic solvents: opportunities for novel protein ingredients (1489)

09.00 – 10.30 Breakout 3

Sponsored by the International Society of Medical Nutrition (ISMN) and LumoScience

From Functional Foods to Clinical Nutrition: Advances for Healthy Aging

Chairs: Roger Clemens, USC, USA and Peter Pressman, U. of Maine, USA

Speakers:

1. **Janet Collins**, JEC Consulting, USA
   Dietetic Dynamics of Dietary Choices in Healthy Aging
2. **Roger Clemens**, University of Southern California, USA
   Biological and Metabolic Perspectives on Healthy Aging
3. **Peter Pressman**, University of Maine, USA
   Clinical Perspectives on Healthy Aging

11.00 – 12.30 Plenary

Rethinking Ultra-processed Food - Science, Practice and Policy Roundtable

Moderator: Pavinee Chinachoti, Acting President, IUFoST

1. **Barbara Schneeman,** University of California, Davis, USA
2. **Ludovica Verzegnassi**, VP, Global Head Regulatory and Scientific Affairs, Nestlé, Switzerland
3. **Ali Badarneh**, Chief, Feed Security and Food Systems Unit, UNIDO, Austria
4. **Purwiyatno Hariyadi**, IPB University and Senior Scientist, SEAFAST Center, Indonesia
5. **Erich Windhab**, Swiss Federal Institute of Technology Zürich (ETH), Switzerland

IUFOST WORLD FOOD CONGRESS HONG KONG 2026



Oral Presentation
• Plenary Hall
• Breakout 1
• Breakout 2
• Breakout 3
• Breakout 4
• Breakout 5
• Breakout 6
• Breakout 7
• Breakout 8
• Breakout 9
• Breakout 10

Poster Presentation
P1 P001-P020
P2 P021-P040
P3 P041-P060
P4 P061-P080
P5 P081-P100
P6 P101-P120
P7 P121-P140
P8 P141-P160
P9 P161-P180

Exhibitor	
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D13	ROYAL SOCIETY OF CHEMISTRY
E11	MALAYSIA PALM OIL COUNCIL
E13	ANTON PAAR CHINA
H1	INNOLAB GLOBAL CONNECT

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ORAL PRESENTATION SESSIONS

Monday, 26 October 2026

11.00 - 12.30 hrs Breakout 2

FOOD PROCESS AND ENGINEERING-01 -Advanced Food Preservation and Processing Technologies - Separation Process-01

Speakers & Titles

1. **Meena Nagarajan**, Agricultural and Food Engineering Department, Indian Institute of Technology Kharagpur, Kharagpur, West Bengal 721302, India; School of Molecular and Life Sciences, Faculty of Science and Engineering, Curtin University, Bentley, Western Australia 6102, Au
   EFFECT OF EXTRACTION TECHNOLOGIES ON THE COMPOSITIONAL AND MICROSTRUCTURE OF SORGHUM-MILLET BLENDED MILK (40)
2. **Nandika Bandara**, University of Manitoba
   SUSTAINABLE EXTRACTION AND PROCESSING TECHNOLOGIES FOR TAILORING HEMP PROTEIN STRUCTURE-FUNCTION ACTIVITIES (160)
3. **Modupeola Oguntoye**, Department of Food Technology, Faculty of Technology, University of Ibadan, Ibadan, Nigeria
   EXTRACTION, ENCAPSULATION, AND VALORISATION OF BITTER ORANGE (CITRUS AURANTIUM) JUICE AND POMACE AS NATURAL PRESERVATIVES FOR SWEET ORANGE JUICE (824)
4. **Petras Rimantas Venskutonis**, Kaunas University of Technology, Department of Food Science and Technology, Kaunas, Lithuania
   MODERN EXTRACTION AND FRACTIONATION TECHNIQUES FOR THE RECOVERY OF FUNCTIONAL NUTRIENTS FROM AGRI-FOOD PROCESSING SIDE-STREAMS AND WASTE: PROS AND CONS (909)
5. **Yangyi Zheng,** School of Food Science and Nutrition, University of Leeds, Leeds, UK
   PRETREATMENT ROUTE GOVERNS SUBCRITICAL WATER EXTRACTION OF CHICKPEA PROTEIN: RECOVERY, STRUCTURE, AND SURFACE PROPERTIES (923)
6. **Okba Guedri**, LUT School of Engineering Sciences, LUT University, Kouvola, Finland
   PROCESS OPTIMIZATION AND LIFE CYCLE ASSESSMENT OF ADVANCED EXTRACTION PROCESSING TECHNOLOGIES FOR ARGEMONE OCHROLEUCA SEED OIL (1042)

11.00 - 12.30 hrs Breakout 3

Food Packaging Innovations and Environmental Impact-02 - Biodegradable and Sustainable Packaging Materials

Speakers & Titles

1. **Rakesh Kumar Gupta**, Indian Institute of Technology Kharagpur, India
   COLD PLASMA MODIFIED TARO (COLOCASIA ESCULENTA) STARCH-BASED ACTIVE PACKAGING FILM FUNCTIONALIZED WITH BETEL LEAF (PIPER BETLE L.) ESSENTIAL OIL FOR SHELF-LIFE EXTENSION OF GRAPES (93)
2. **Preetam Sarkar**, Department of Food Process Engineering, National Institute of Technology Rourkela
   VALORIZATION OF TAMARIND SEED BY-PRODUCTS: CARBON DOT–REINFORCED XYLOGLUCAN NANOCOMPOSITE FILMS (107)
3. **Nandika Bandara**, University of Manitoba
   SCALABLE EXTRUSION PROCESSING OF CANOLA PROTEIN-BASED NANOCOMPOSITE FILMS WITH IMPROVED MECHANICAL AND BARRIER PROPERTIES (161)
4. **Joinul Islam**, University of Georgia - Department of Food Science and Technology, Griffin, GA, USA
   DEVELOPING INNOVATIVE JELLYFISH COLLAGEN-BASED BIOPLASTIC FILMS FOR FOOD PACKAGING APPLICATIONS (213)
5. **Wanxiang Guo**, China-Hungary Belt and Road Joint Laboratory on Food Science, College of Food Science, Southwest University, Chongqing, China
   VALORIZATION OF BREAD WASTE INTO BIODEGRADABLE, GREEN, AND SUSTAINABLE PACKAGING MATERIALS (447)

11.00 - 12.30 hrs Breakout 5

AI, Data Science, and Digital Transformation in Food Systems-02 - Artificial Intelligence for Sensory and Quality Prediction-01

Speakers & Titles

1. **Jingzhi Zhang**, Collaborative Innovation Center of Fragrance Flavour and Cosmetics, School of Perfume and Aroma Technology, Shanghai Institute of Technology, Shanghai 201418, China
   MOLECULAR ATLAS OF KEY FOOD ODORANTS REVEALS STRUCTURED AROMA ORGANIZATION AND ENABLES GENERATIVE AROMA DESIGN (57)
2. **Thi Bao Chau Bui**, University of Tsukuba
   ILLUMINATING FOOD: MOVING BEYOND OPTICAL INTERFERENCE IN FLUORESCENCE SPECTROSCOPY (154)
3. **Xiaoning Zhu**, College of Biosystems Engineering and Food Science, Zhejiang University, Hangzhou 310058, China
   EXPLAINABLE MACHINE LEARNING-BASED PREDICTION OF SHELF-LIFE AND ANTHOCYANIN ACCUMULATION IN TABLE GRAPES (233)

4. **Li Zhenghong,** Aura Health International Limited
   ARTIFICIAL INTELLIGENCE GUIDED SYNTHETIC BIOLOGY FOR SCALABLE BIOSYNTHESIS OF NATURAL INGREDIENTS (261)
5. **Yonghui LI**, Department of Grain and Food Science, Kansas State University, Manhattan, KS, USA
   AI-POWERED DISCOVERY OF BIOACTIVE PEPTIDES FROM FOOD PROTEINS (281)

11.00 - 12.30 hrs Breakout 7

Functional Foods, Bioactives and Health promotion-01 -Functional foods and Supplements: Safety & Health Outcomes-Protein Technology

Chairs:

Speakers & Titles

1. **XINYUE QI**, Nanyang Technological University
   PEPTIDOMICS-GUIDED DISCOVERY OF CRICKET HYDROLYSATE PEPTIDES THAT SUPPRESS MICROGLIAL INFLAMMATORY RESPONSES (857)
2. **Jiaoyan Ren**, School of Food Science and Engineering, South China University of Technology, Guangzhou-China
   PREPARATION AND CHARACTERIZATION OF MILK PROTEIN-DERIVED PEPTIDES WITH ANTI-SARCOPENIC ACTIVITY (719)
3. **Wei Han Foo**, School of Chemistry, Chemical Engineering and Biotechnology, Nanyang Technological University, Singapore 637459, Singapore
   IMPACT OF THERMAL PROCESSING AND SIMULATED GASTROINTESTINAL DIGESTION ON THE NUTRITIONAL, STRUCTURAL AND METABOLOMIC FATE OF MICROALGAE PROTEIN CONCENTRATES (538)
4. **Zi Ning Leong**, Department of Food Science and Technology, Faculty of Science, National University of Singapore, Singapore
   PROTEIN COMPOSITION AND POSTPRANDIAL AMINO ACID BIOAVAILABILITY OF BISCUITS FORTIFIED WITH AUTOCLAVED AND FERMENTED BREWERS' SPENT GRAIN IN INDIVIDUALS WITH METABOLIC SYNDROME (963)
5. **Salome Martinez-Morales**, Institute of Food Science Research (CIAL), CSIC-UAM, Madrid, Spain
   ENCAPSULATION OF IRON WITH PECTIN FROM SUGAR BEET PULP: A SUSTAINABLE STRATEGY FOR FUNCTIONAL FOODS (773)

11.00 - 12.30 hrs Breakout 8

FOOD PROCESS AND ENGINEERING-02 -Advanced Food Preservation and Processing Technologies - Separation Process-01

Speakers & Titles

1. **Anet Režek Jambrak**, University of Zagreb, Faculty of Food Technology and Biotechnology, Zagreb, Croatia
   INTERNET OF THINGS (IOT) ULTRASOUND EXTRACTION OF PROTEINS FROM SUGAR BEET LEAVES (54)
2. **Zhiwei Li**, College of Food Science, Sichuan Agricultural University
   INITIAL ENCAPSULATION CONCENTRATION REGULATES MICROCOLONY FORMATION, STRESS RESISTANCE, AND TRANSCRIPTOMIC RESPONSES OF LACTIPLANTIBACILLUS PLANTARUM LP124 (114)
3. **Alexander Mathys**, ETH Zurich, Institute of Food, Nutrition and Health, Sustainable Food Processing, 8092 Zurich, Switzerland / ETH Zurich, Institute of Food, Nutrition and Health, Food Process Engineering, 8092 Zurich, Switzerland
   THE POTENTIAL OF MICROALGAL LIPID DROPLETS AS NATURAL EMULSIONS (119)
4. **Fangzhou He**, University of Leeds
   SUSTAINABLE DES EXTRACTION OF COCONUT GLOBULIN: PHYSICOCHEMICAL AND INTERFACIAL PROPERTIES (256)
5. **Kinjal Anil Furia**, RMIT University
   SUSTAINABLE LEAF PROTEIN CONCENTRATE FROM CAULIFLOWER LEAVES VIA ULTRASONICATION-ASSISTED EXTRACTION AND SIEVE FILTRATION (386)
6. **Nitin Nitin**, University of California, Davis
   INTERFACIAL ENGINEERING OF ASPERGILLUS ORYZAE BIOFILM–OLEOGEL HYBRID COMPOSITES VIA PLANT PROTEIN–BASED ADHESION FOR STRUCTURED FOOD SYSTEMS (537)

11.00 - 12.30 hrs Breakout 9

Functional Foods, Bioactives and Health Promotion-02 - Functional Foods and Supplements: Safety & Health Outcomes-Protein Technology

Speakers & Titles

1. **Rotimi Aluko**, Department of Food and Human Nutritional Sciences, University of Manitoba, Winnipeg, Manitoba, Canada
   STRUCTURE AND FUNCTION OF MULTIFUNCTIONAL FAVA BEAN PROTEIN HYDROLYSATES AND PEPTIDES (224)
2. **HUI YE**, Nanyang Technological University
   CRICKET PROTEIN HYDROLYSATE-DERIVED PEPTIDES ATTENUATE MICROGLIAL INFLAMMATORY ACTIVATION VIA IL-6–ASSOCIATED STAT3 SIGNALING (872)

3. **Muizat Bukola Olatunde**, Department of Food Science and Technology, Federal University of Technology, Minna, Nigeria
   EFFECT OF FERMENTATION METHODS ON THE ESSENTIAL AMINO ACID PROFILE OF PROTEIN CONCENTRATES FROM TIGERNUT, PIGEON PEA, AND AFRICAN YAM BEAN: IMPLICATIONS FOR MILK AND COMPLEMENTARY FOOD FORTIFICATION (55)
4. **Subhangi Panigrahi**, National Institute of Food Technology, Entrepreneurship and Management
   BEYOND GELATIN: PLANT-BASED PROTEIN GUMMIES (759)
5. **Jhong-Huei Huang,** Department of Food Science & Technology, University of Georgia, Athens, GA, USA
   ANTI-INFLAMMATORY EFFECTS OF PECAN-DERIVED PHENOLICS AND THEIR POTENTIAL AS FUNCTIONAL FOOD INGREDIENTS (558)
6. **Hui Li,** College of Biosystems Engineering and Food Science, Zhejiang University, Hangzhou 310058, China
   BIOFILM-LIKE PROBIOTIC PATCHES ENABLE TARGETED MANAGEMENT OF INFLAMMATORY BOWEL DISEASE (207)

11.00 - 12.30 hrs Breakout 10

FOOD PROCESS AND ENGINEERING-03 -Scaling Up Traditional Technologies-01

Speakers & Titles

1. **Monjurul Hoque**, Food Chemistry and Technology Department, Teagasc Food Research Centre, Ashtown, D15 DY05 Dublin, Ireland
   NEXT-GENERATION SCALABLE NANOCELLULOSE PRODUCTION FROM UNDERUTILISED AQUATIC BIOMASS (212)
2. **Myrna Benita Luna**, Department of Food Science and Nutrition, College of Home Economics, University of the Philippines Diliman, Quezon City, Philippines
   BANANA LEAF AS A FOOD CONTACT MATERIAL: FROM TACIT KNOWLEDGE TO MEASURABLE CRITERIA (680)
3. **Rosalba Lanciotti**, Department of Agricultural and Food Sciences, Alma Mater Studiorum University of Bologna, Cesena, Italy
   TAILORED MICROBIAL CONSORTIA FOR THE VALORISATION OF LEGUME-BASED INGREDIENTS: FROM STRAIN SELECTION TO FUNCTIONAL FOOD APPLICATIONS (504)

14.00 - 15.30 hrs Breakout 1

Food Safety, Quality and Risk Communication -01 Foodborne Pathogens and Prevention Strategies

Speakers & Titles

1. **Qianrui Wang**, China National Center for Food Safety Risk Assessment, NHC Key Laboratory of Food Safety Risk Assessment, No.37, Guangqu Road, Chaoyang District, Beijing 100022, People's Republic of China
   OCCURRENCE OF PFOS AND PFOA IN FISH FROM TYPICAL COASTAL AREAS OF CHINA AND ASSOCIATED DIETARY EXPOSURE ASSESSMENT (227)
2. **Fangbin Xiao**, College of Biosystems Engineering and Food Science, Zhejiang University, Hangzhou 310058, China
   A HYDROGEL-BASED "NUCLEIC ACID PLATE CULTURE" TECHNOLOGY FOR RAPID DETECTION OF FOODBORNE PATHOGENS IN FRUITS AND VEGETABLES (163)
3. **Liu-Yean Goh**, Institute of Environmental and Occupational Health Sciences, College of Public Health, National Taiwan University, Taipei 100, Taiwan
   MODELING THE GROWTH AND DYNAMICS OF THE UROPATHOGENIC ESCHERICHIA COLI IN WATERMELON JUICE (295)
4. **Pierangeli Vital**, Natural Sciences Research Institute, University of the Philippines Diliman, Quezon City, Philippines
   LOOP-MEDIATED ISOTHERMAL AMPLIFICATION (LAMP) ASSAY TO DETECT VIBRIO INFECTIONS IN FISH (900)

14.00 - 15.30 hrs Breakout 2

FOOD PROCESS AND ENGINEERING-04 -Biotransformation-01

Speakers & Titles

1. **Abiodun Adebayo-Oyetoro**, Yaba College of Technology, Department of Food Science and Technology, Yaba, Lagos, Nigeria
   PROXIMATE AND MICROBIAL ASSESSMENTS OF YOGHURT PRODUCED USING CHILLI PEPPER (CAPSICUM ANNUUM) WITH ITS STALK AS STARTER CULTURE (10)
2. **Magdalena Zielinska**, University of Warmia and Mazury in Olsztyn, Poland
   CARBON-SOURCE DRIVEN BIOTRANSFORMATION AND STRUCTURAL ORGANIZATION OF CELLULOSE-RICH SCOBY PELLICLES DURING KOMBUCHA FERMENTATION (79)
3. **Jie Zhang**, Jiangnan University
   STUDY ON THE EFFICACY AND MECHANISM OF BOVINE LACTOPONTIN IN PROMOTING BONE GROWTH AND DEVELOPMENT (116)

4. **Dupe Otolowo**, Department of Food Science and Technology, Mountain Top University, Ogun State, Nigeria
   PHYSICOCHEMICAL, NUTRITIONAL, AND POTENTIAL HEALTH BENEFITS OF WHOLE ORANGE FRUIT IN A CUBE PRODUCT (151)
5. **Fidel Toldra**, Instituto de Agroquímica y Tecnología de Alimentos (CSIC)
   ENZYMATIC HYDROLYSIS OF COLLAGEN OBTAINED FROM PORK BONES BY-PRODUCTS FOR THE GENERATION OF BIOACTIVE PEPTIDES (173)

14.00-15.30 hrs Breakout 3

Food Quality Attributes : Chemistry and Sensory-01 Food and Analytical Chemistry—Advanced Analytical Technologies—01

Speakers & Titles

1. **KA YI MAN**, Department of Food Science and Nutrition, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong, China
   TOWARDS ORGANIC FOOD AUTHENTICATION: FOODOMICS REVEALS CULTIVATION-DEPENDENT METABOLIC AND LIPID SIGNATURES IN LEAFY VEGETABLES (1410) YS
2. **Nada Zamzam**, Department of Food Science, College of Agriculture and Veterinary Medicine, United Arab Emirates University, Al-Ain 15551, United Arab Emirates, Pharmaceutical Analytical Chemistry Department, Faculty of Pharmacy, Ain Shams University, 11566, A'bbasiyya, UAE
   HYBRID CAMEL-PLANT PROTEINS MODULATE INFANT DIGESTION AND BIOACTIVITY: INTEGRATED PEPTIDOMIC AND FUNCTIONAL ANALYSIS (206)
3. **Nicholas Horlacher**, University of Guelph, Food Science Department, Ontario, Canada
   RAPID FLUORESCENT DETECTION OF FUNGAL BIOMASS DURING SOLID-STATE FERMENTATION OF INDUSTRY BYPRODUCTS (241)
4. **ZHUOFEI LIU**, Faculty of Agriculture Graduate School of Kyushu University Fukuoka, Japan
   MASS SPECTROMETRIC DETECTION OF DIVERSE FOOD COMPOUNDS BY GRAPHITE SHEET-ASSISTED LASER DESORPTION IONIZATION AND ITS APPLICATION TO BEER CHEMICAL PROFILING (246)
5. **Ricco Tindjau**, Illinois Advanced Research Center at Singapore
   ADVANCES IN VITAMIN B12 ANALYSIS AND B12 BIOFORTICATION OF PLANT-BASED FOODS (419)
6. **Atsushi Hashimoto**, Mie University
   CHARACTERIZATION OF KOMBU DASHI EXTRACTED UNDER DIFFERENT TEMPERATURE PROFILES USING MULTIBAND SPECTROSCOPY (437)
7. **Shahriar Islam**, Sichuan Agricultural University

NON-INVASIVE MEASUREMENT OF ISOTHERMAL WATER ACTIVITY BASED ON RAMAN SPECTROSCOPY: A CASE STUDY OF EGG POWDERS (470)

14.00 - 15.30 hrs Breakout 4

Functional Foods, Bioactives, and Health Promotion-04 -Functional foods and Supplements: Safety & Health Outcomes-Prebiotics/Probiotics

Speakers & Titles

1. **Nutthapohn Majai**, Department of Agro-Industry, Faculty of Agriculture, Natural Resources and Environment, Naresuan University, Phitsanulok 65000, Thailand
   DEVELOPING FUNCTIONAL NON-DAIRY CREAMER FROM COCOA OIL: REPLACING GLUCOSE WITH PREBIOTICS (1198)
2. **Thaiza Serrano Pinheiro de Souza**, School of Agriculture and Food Sustainability (AGFS), The University of Queensland, St Lucia, 4072, Queensland, Australia; Food and Beverage Accelerator (FaBA), The University of Queensland, St Lucia, 4072, Brisbane, Queensland, Australia
   BARLEY AND OAT B-GLUCANS: STRUCTURE, DIGESTIBILITY AND FERMENTABILITY FOR HEALTH (463)
3. **Wanilada Rungrassamee**, National Center for Genetic Engineering and Biotechnology
   ASTAXANTHIN-PRODUCING PROBIOTIC (BREVUNDIMONAS SP.) AS A FUNCTIONAL FEED ADDITIVE FOR NUTRITIONAL BIOFORTIFICATION OF PACIFIC WHITE SHRIMP (LITOPENAEUS VANNAMEI) (1273)
4. **Xin Wang**, Key Laboratory of Environmental Medicine and Engineering, Ministry of Education, and Department of Nutrition and Food Hygiene, School of Public Health, Southeast University, Nanjing 210009, China
   CARRIER-FREE NANOPARTICLES CO-ASSEMBLED FROM BIOACTIVE OLEANOLIC ACID AND FLAVONOIDS: INTERACTION MECHANISMS, IMPROVED BIOACTIVITY, AND SAFETY EVALUATION (934)
5. **Qile ZHANG**, The Chinese University of Hong Kong
   PPARΓ/P21 SIGNALING MEDIATES BUTYRATE-DRIVEN PROTECTION AGAINST AGING-RELATED ENDOTHELIAL DISFUNCTION : A NOVEL EFFECT OF SOYBEAN POLYSACCHARIDE
   VIA THE GUT-VASCULAR (618)

14.00 - 15.30 hrs Breakout 5

FOOD PROCESS AND ENGINEERING-05 -Miscellaneous -01

Speakers & Titles

1. **Lisa PAPA**, Univ Montpellier, CIRAD, Institut Agro, Avignon Université, Univ de La Réunion, F-34398 Montpellier, France / PURPAN Engineering School, 75 Voie du Toec, 31076 Toulouse, France
   EFFECTS OF OZONE TREATMENT ON GERMINATED (VIGNA UNGUICULATA (L.) WALP.) FLOUR. (47)

2. **Andres Abea**, Department of Food Science and Technology, Tokyo University of Marine Science and Technology, 4-5-7 Konan, Minato-ku, Tokyo, 108-8477, Japan.
PREDICTIVE MODELING OF SELECTIVE REHEATING IN A MULTI MAGNETRON MICROWAVE SYSTEM OF MULTI-COMPONENT MEAL TRAYS (67)
3. **Yvan Llave**, Department of Food Science and Technology, Tokyo University of Marine Science and Technology, Tokyo, Japan
BAKING OF RICE CAKE (MOCHI) USING AN INFRARED RADIATION OVEN - EXPERIMENTAL AND COMPUTER SIMULATION ANALYSIS (68)
4. **Foong Yong**, RMIT University, Australia
EFFECTS OF STATIC RETORT PROCESSING ON COLOUR, VISCOSITY, AND TEXTURE OF READY-TO-EAT BEEF STEW (444)
5. **Amy McMackin**, Sustainable Food Processing Laboratory, ETH Zurich
NADES-BASED REFINING OF RAPESEED PROTEINS: CONTROLLING POLYPHENOL–PROTEIN INTERACTIONS FOR IMPROVED FLAVOUR AND FUNCTIONALITY (382)
6. **Amy McMackin**, Sustainable Food Processing Laboratory, ETH Zurich
FROM OFF-FLAVOUR TO FUNCTION: NADES-BASED ENGINEERING OF PROTEIN–POLYPHENOL INTERACTIONS IN PEA PROTEIN ISOLATES (384)

14.00-15.30 hrs Breakout 7

Food Attributes: Chemistry and Sensory-02 —Food and Analytical Chemistry— Advanced Analytical Technologies-02

Speakers & Titles

1. **Runa Iwaki**, Department of Food Science and Technology, Tokyo University of Marine Science and Technology, Tokyo, Japan
DEVELOPMENT OF A NOVEL METHOD FOR CORTISOL QUANTIFICATION IN POSTMORTEM FISH MUSCLE (736)
2. **Solomon Yao-Say Selorm Adade**, Jimei University
VIS–NIR SPECTROSCOPY COUPLED WITH MULTIMODEL MACHINE LEARNING FOR DETECTING MILLET AND CHILI ADULTERATION IN BLACK PEPPER (1125)
3. **Doralyn Dalisay**, Center for Chemical Biology and Biotechnology (C2B2), University of San Agustin, Iloilo City
SPATIAL METABOLOMICS OF FUNCTIONAL FOODS: MALDI-HDMS IMAGING OF NUTRACEUTICALS IN GINGER, PINEAPPLE, AND CACAO
4. **Yuanyuan Ye**, School of Agricultural and Food Sustainability, The University of Queensland, Brisbane, Australia
SEPARATION AND IDENTIFICATION OF MAJOR PROTEINS IN CAMEL MILK (364)

5. **Divya Aggarwal**, Department of Food Chemistry and Technology, Teagasc Food Research Centre, Ashtown, D15 DY05, Dublin, Ireland

   ULTRASOUND-ASSISTED EXTRACTION OF LIPIDS FROM OAT FLAKES USING GREEN SOLVENTS: A SUSTAINABLE APPROACH FOR REPLACING N-HEXANE (556)

6. **Silpa Vellasseri,** Department of Food Technology & Nutrition, School of Science, RMIT University, Melbourne, Australia

   CHEMICAL CROSSLINKING OF PEA LEGUMIN AND K-CASEIN WITH GENIPIN (901)

7. **Keshun Liu,** Department of Agriculture, Agricultural Research Service, Aberdeen, Idaho, USA

   COMPARISON OF ISO AND AOCS OFFICIAL METHODS FOR MEASURING TRYPSIN INHIBITOR ACTIVITY IN OILSEEDS, PULSES AND CEREALS AND JUSTIFICATIONS FOR ALIGNING ISO 14902 WITH AOCS BA 12A-2020 (548) - ONLY VIDEO

14.00 - 15.30 hrs Breakout 10

FOOD PROCESS AND ENGINEERING-06 -Traditional Foods for Future-01

Speakers & Titles

1. **AGNES ADEBOLA OGUNYEMI**, Food and Industrial Microbiology, Department of Microbiology, College of Biological Sciences (Colbios), Federal University of Agriculture, Abeokuta, Ogun State, Nigeria

   MICROBIOLOGICAL QUALITY AND SAFETY ASSESSMENT OF KULI-KULI PRODUCED IN SELECTED LOCATIONS IN OGUN STATE, NIGERIA. (22)

2. **Fatima Abdulkadir**

   AMINO ACID PROFILE OF OPTIMIZED AND LACTIC ACID FERMENTED COMPOSITE FLOURS FOR MASA PRODUCTION (31)

3. **Mary Adesola**, Ladoke Akintola University of Technology, Ogbomoso. Oyo State, Nigeria

   DEVELOPMENT OF A FUNCTIONAL MEAL FROM GERMINATED PEARL MILLET, SORGHUM, AND BAMBARA GROUNDNUT FORTIFIED WITH CARROTS (34)

4. **Hao Cheng**, State Key Laboratory of Food Science and Resources, School of Food Science and Technology, Jiangnan University, Wuxi 214122, China

   A UNIVERSAL “KCL/GDL” DUAL CROSS-LINKING STRATEGY FOR CONSTRUCTING ROBUST PROTEIN-POLYSACCHARIDE COMPOSITE GELS AS ADVANCED DELIVERY CARRIERS (311)

5. **Zhongli Pan**, Department of Biological and Agricultural Engineering, University of California, Davis, Davis, USA

   EFFICACY OF FOOD-GRADE SILICA NANOPARTICLES FOR

CONTROLLING STORED-PRODUCT INSECTS IN GRAINS AND TREE NUTS (546)

16.00 - 17.30 hrs Breakout 1

Food Quality Attributes: Chemistry and Sensory-03 -Food and Analytical Chemistry-Food Chemistry

Speakers & Titles

1. **Anne-Sofie Gottschalck Rehlund**, Department of Food Science, University of Copenhagen, Copenhagen, Denmark
   EFFECT OF SOLID-STATE FERMENTATION OF YELLOW PEAS ON FORMATION OF MAILLARD REACTION PRODUCTS (408)
2. **Wei Liao**, Michigan State University
   A FOOD-ENERGY-WATER NEXUS SOLUTION TOWARDS A SUSTAINABLE AND RESILIENT EUROPE (554)
3. **Ting-Jang Lu**, Institute of Food Science and Technology, National Taiwan University
   SHORT-CHAIN CARBOHYDRATES PRODUCED FROM BROWN SEAWEED THROUGH ACID AND FENTON DEPOLYMERIZATION (1078)
4. **Ruoxin Liu,** Center for Nutrition and Food Sciences, The University of Queensland, Australia
   VALORIZATION OF CO-PRODUCTS FROM LEGUME PROTEIN DRY FRACTIONATION FOR APPLICATION IN TORTILLAS (257)
5. **Julieta Americano,** Department of Crop Protection, Faculty of Agronomy and Forestry Engeneering, Center of Excellence in Agri-Food Systems and Nutrition Eduardo Mondlane University, Maputo, Mozambique
   INFLUENCE OF BOILING AND FRYING ON STARCH DIGESTIBILITY, SUGAR PROFILE AND ACRYLAMIDE FORMATION IN MOZAMBICAN SWEET POTATO VARIETIES (1024)

16.00 - 17.30 hrs Breakout 2

Functional Foods, Bioactives and Health Promotion-03 -Functional foods and Supplements: Safety & Health Outcomes-Clinical Outcomes

Speakers & Titles

1. **Jerrell Felim**, National Taiwan Ocean University
   STURGEON COLLAGEN PEPTIDES PROTECT MALE REPRODUCTIVE FUNCTION AND TESTICULAR INTEGRITY IN OBESITY-INDUCED RODENT MODELS (737)
2. **Saya Nakamura**, Department of Bioscience and Biotechnology, Faculty of Agriculture, Graduate School of Kyushu University, Japan
   ANTI-DIABETIC EFFECT OF ADIPOR1 AGONISTIC DIPEPTIDE TYR-PRO IN SPONTANEOUSLY DIABETIC TORII RATS (320)

3. **Alweera Ashfaq**, United Arab Emirates University, Al Ain, UAE
PREPARATION OF COLOSTRUM FORTIFIED CAMEL MILK-BASED INFANT FORMULA: ITS CHARACTERIZATION, BIOACTIVE PROPERTIES, AND PEPTIDOMICS AFTER IN-VITRO SIMULATED INFANT GASTROINTESTINAL DIGESTION (253)
4. **Thanutchaporn Kumrungsee**, Program of Food and AgriLife Science, Graduate School of Integrated Sciences for Life, Hiroshima University, Hiroshima, Japan
CIRCULATING GABA: A POTENT AND UNEXPECTED PERIPHERAL SIGNAL THAT SUPPRESSES APPETITE AND INDUCES WEIGHT LOSS (1219)
5. **Laxmikant Shivnath Badwaik**, Department of Food Engineering and Technology, School of Engineering, Tezpur University, Napaam, Assam 784028, India
ALGINATE-BASED ENCAPSULATION OF NONGMANGKHA (PHLOGACANTHUS THYRSIFLORUS) FLOWER EXTRACT FOR ENHANCED STABILITY, BIOACCESSIBILITY, AND FUNCTIONAL FOOD APPLICATIONS (1179)

16.00 - 17.30 hrs Breakout 3

FOOD PROCESS AND ENGINEERING-07 Advanced Food Preservation and Processing Technologies - Separation Process-02

Speakers & Titles

1. **Mathéo Desmenez**, Food Science Department, Université Laval, Quebec City, Canada
IDENTIFICATION AND CHARACTERIZATION OF NEW ANTIMICROBIAL PEPTIDES DERIVED FROM CHICKEN, CALF, AND TURKEY BLOOD CRUORS FOLLOWING THEIR ENZYMATIC HYDROLYSIS AND SEPARATION BY EDUF USING STATISTICAL APPROACHES AND IN VITRO TESTS (1097)
2. **Brajesh Kumar Panda**, Assistant Professor, Department of Agricultural and Food Engineering, IIT Kharagpur, India
MICROCLIMATE DYNAMICS IN BULK GRAIN STORAGE: CHARACTERIZATION OF TEMPERATURE AND MOISTURE GRADIENTS IN GODOWN SYSTEMS (1162)
3. **Wei Han Foo**, School of Chemistry, Chemical Engineering and Biotechnology, Nanyang Technological University, Singapore 637459, Singapore
MACHINE-LEARNING-GUIDED EXTRACTION OPTIMIZATION AND PHYSICOCHEMICAL CHARACTERISTICS OF GRAS MICROALGAE PROTEINS FOR SUSTAINABLE FOOD APPLICATIONS (540)
4. **Ardra Chandra Babu**, Agricultural and Food Engineering Department, Indian Institute of Technology Kharagpur, Kharagpur, West Bengal, India, and School of Molecular and Life Sciences, Curtin University, Perth, Western Australia, Australia
DESIGN OF AN OZONE TREATMENT SYSTEM FOR FRESH PRODUCE USING COMPUTATIONAL FLUID DYNAMICS (686)

5. **Kazutaka Yamamoto**, Grad School Agric Life Sci/U Tokyo, Japan
SYNERESIS AND COLOR CHANGE OF EGG WHITE SOLIDIFIED BY HIGH HYDROSTATIC PRESSURE (365)

16.00 - 17.30 hrs Breakout 4

FOOD PROCESS AND ENGINEERING-08 -Food Processing and Engineering Process Innovation -02

Speakers & Titles

1. **Tyler Barzee**, University of Kentucky, USA
UTILIZATION OF FILAMENTOUS FUNGI IN 3D-BIOPRINTED STRUCTURED FOOD PRODUCTS (195) YS
2. **Haijie Wang**, Department of Food Science and Technology, National University of Singapore
COMPUTATIONAL FLUID DYNAMICS AS A RATIONAL DESIGN TOOL FOR SCALING UP CULTIVATED MEAT BIOPROCESSING: A MECHANISTIC REVIEW WITH SYSTEMATIC SPINNER FLASK SIMULATIONS (614)
3 **Jørgen Lerfall**, Department of Biotechnology and Food Science, Norwegian University of Science and Technology.
EFFECTS OF SUB-CHILLING ON THE BIOCHEMICAL STABILITY AND HYDROLYSIS PERFORMANCE OF SALMON REST RAW MATERIAL (729)
4. **Rossella Caporizzi**, Department of Agriculture, Food, Natural resources and Engineering, University of Foggia, Via Napoli 25, 71122, Foggia, Italy
THREE-DIMENSIONAL PRINTED MODEL FOODS AS DIGITAL PLATFORMS FOR TAILORED RELEASE OF BIOACTIVES AND MICRONUTRIENTS (700)

16.00 - 17.30 hrs Breakout 5

Sustainable Food Systems and Global Food Security-01 -Food Systems and Climate Change-01

Speakers & Titles

1. **Hsin Yi Liu**, Institute of Aquatic Science and Technology, National Kaohsiung University of Science and Technology, Kaohsiung, Taiwan
ASSESSING THE NET CARBON BALANCE OF COMMERCIAL GROUPER AQUACULTURE INTEGRATED WITH SOLAR PHOTOVOLTAIC SYSTEMS: A COMPARATIVE LIFE CYCLE ASSESSMENT IN TAIWAN (53)
2. **Yoga Pratama**, Department of Food Technology, Faculty of Animal and Agricultural Science Faculty, Universitas Diponegoro, Semarang, 50275, Indonesia
IMPROVING THE QUALITY OF A NOVEL AND SUSTAINABLE EDIBLE LIPID BLACK SOLDIER FLY LARVAE OIL (BSFLO) THROUGH BLEACHING WITH SELECTED ADSORBENTS (62)

3. **Avinash Sinha**, Food, Chemical and Biotechnology Cluster, Singapore Institute of Technology (SIT), Singapore
   TECHNO-ECONOMIC ANALYSIS AND LIFE-CYCLE ASSESSMENT OF DAIRY, NON-DAIRY, AND VEGAN WHIPPING CREAMS (484)
4. **Sujosh Nandi**, Department of Molecular Sciences, Swedish University of Agricultural Sciences, Uppsala, Sweden
   A GENOTYPE-BASED ASSESSMENT OF PHYSICOCHEMICAL PROPERTIES, COOKING QUALITY, AND STARCH DIGESTIBILITY OF RICE UNDER SOIL SALINITY STRESS (799)
5. **Bate Li**, Technological University Dublin, Teagasc Ashtown Food Research Centre
   LIFE CYCLE ASSESSMENT OF DRYING AND PROTEIN EXTRACTION FROM DUCKWEED BIOMASS ASSISTED WITH ULTRASONIC TECHNOLOGY (816)
6. **Upali Samarajeewa**, Department of Food Science and Technology, University of Peradeniya, Peradeniya, Sri Lanka
   CLIMATE CHANGE EFFECTS ON MARINE FOOD RESOURCES: OPPRTUNITIES AND CHALLENGES (853)

16.00 - 17.30 hrs Breakout 6

Food Safety, Quality, and Risk Communication -02 —Foodborne Pathogens and Prevention Strategies

Speakers & Titles

1. **Arianna Dick**, School of Science, RMIT University, Melbourne, Australia
   IMPLEMENTING A FOOD SAFETY FRAMEWORK FOR 3D-PRINTED BEEF PUREE INTENDED FOR DYSPHAGIA DIETS (318)
2. **BHANU PRAKASH**, Department of Botany, Institute of Science, Banaras Hindu University, Varanasi, Pin code- 221005, Uttar Pradesh, India
   DEVELOPMENT OF NOVEL GREEN ANTIFUNGAL FORMULATION AGAINST AFLATOXIN B1 PRODUCING ASPERGILLUS FLAVUS AND DECIPHERING MECHANISM OF ACTION USING MATHEMATICAL MODELING AND TRANSCRIPTOMIC APPROACHES (375)
3. **Liling Hao**, University of Shanghai for Science and Technology
   RESEARCH ON HIGHLY SENSITIVE APTASENSORS FOR RAPID DETECTION OF FOODBORNE PATHOGENS (462)
4. **Yada Nolvachai**, ARC Training Centre for Hyphenated Analytical Separation Technologies (HyTECH), Deakin Centre for Advanced Food Sciences, School of Exercise and Nutrition Sciences, Deakin University 221 Burwood Highway, Burwood VIC 3125 Australia
   A UNIFIED ANALYTICAL PLATFORM FOR FOOD SAFETY, QUALITY, AND AUTHENTICITY: CASE STUDIES USING COMPREHENSIVE TWO-DIMENSIONAL GAS CHROMATOGRAPHY (482)

16.00 - 17.30 hrs Breakout 7

Education, Capacity Building, and Workforce Transformation-01 - Global Frameworks for Food Education

Speakers & Titles

1. **Adewale Olusegun Obadina**, Association of African Universities (AAU), Accra, Ghana
   HARMONIZING FOOD SCIENCE EDUCATION IN AFRICA: THE AAU-IUFOST COLLABORATION WITHIN A GLOBAL FRAMEWORK FOR EDUCATION (76)
2. **Anthony Sales**, Professional Regulatory Board of Food Technology, Professional Regulation Commission, Delegation Bldg., Philippine International Convention Center, Vicente Sotto St., Pasay, Metro Manila, 1307, Philippines; Department of Science and Technology Davao Regio
   PROFESSIONALIZING FOOD TECHNOLOGISTS IN THE PHILIPPINES: UPDATES ON THE IMPLEMENTATION OF THE PHILIPPINE FOOD TECHNOLOGY ACT (238)
3. **Myrna Benita Luna**, Department of Food Science and Nutrition, College of Home Economics, University of the Philippines Diliman, Quezon City, Philippines
   STAKEHOLDER-INFORMED CURRICULUM REVISION IN GRADUATE FOOD SCIENCE: A CONTINUOUS QUALITY IMPROVEMENT APPROACH (314)
4. **Joseph Abu**, Department of Food Science and Technology, University of Agriculture, P.M.B. 2373, Makurdi, Nigeria
   ASSESSING FOOD SCIENCE AND TECHNOLOGY CURRICULA FOR

1600–1730 hrs Breakout 8

Food Quality Attributes: Chemistry and Sensory-04 -Food and Analytical Chemistry-Property Based Techniques

Speakers & Titles

1. **Yaqi Zhao**, South China University of Technology, China
   CHARACTERIZATION OF SOLA L 7, A NONSPECIFIC LIPID TRANSFER PROTEIN IN TOMATO SEED (753) YS
2. **Yasutaka Shigemura**, Tokyo Kasei University, JapanIDENTIFICATION OF ACRYLOYL-HISTIDINE AS A HEAT-INDUCED DERIVATIVE OF AN IMIDAZOLE PEPTIDE IN FOODS (495)
3. **Beril Bayrak**, Munster Technological University, Ireland
   BEYOND PROTEIN QUANTITY: COMPREHENSIVE CHARACTERISATION OF FISH PROTEINS USING CHEMICAL AND SPECTROSCOPIC TECHNIQUES (684)
4. **Sihao Chen**, Department of Food Science & Technology, National University of Singapore, 2 Science Drive 2, Singapore 117542, Singapore
   SYNERGISTIC GELATION BEHAVIOR OF XANTHAN GUM AND POLYSACCHARIDES ISOLATED FROM SEA COCONUT (775)
5. **Ma. Krischen Austria**, Institute of Food Science and Technology, College of Agriculture and Food Science, University of the Philippines Los Baños, College, Laguna, Philippines

ANNEALING-INDUCED CHANGES IN THE PASTING, THERMAL, STRUCTURAL, AND DIGESTIBILITY PROPERTIES OF GREEN SABA BANANA FLOUR WITH PEEL (1051)

6. **Siyu Yao**, Southeast University, China

CROSS-SCALE SPATIOTEMPORAL MAPPING AND METABOLIC DYNAMICS OF AFLATOXIN ACCUMULATION IN ASPERGILLUS FLAVUS-INFECTED PEANUTS (1432)

Tuesday, 27 October 2026

09.00 - 10.30 hrs Breakout 1

Food Attributes: Chemistry and Sensory-05 -Food and Analytical Chemistry-Food Safety and Monitoring

Speakers & Titles

1. **Xinxue Zhang**, Key Laboratory of Environmental Medicine and Engineering, Ministry of Education, and Department of Nutrition and Food Hygiene, School of Public Health, Southeast University, Nanjing, China
   HIGHLY SENSITIVE DETECTION OF WHEAT ALLERGEN GLIADIN USING AN ELECTROCHEMICAL BIOSENSOR FOR FOOD SAFETY MONITORING (933)
2. **Khalid Al Zuhaibi**, Ministry of Agriculture, Fisheries, and Water Resources_ Food Safety and Quality Center
   FOOD SAFETY AND AGRICULTURAL PRACTICES: A STUDY OF FRESH LOCAL PRODUCE IN THE SULTANATE OF OMAN (947)
3. **Yuying Feng**, Deakin University
   SUITABILITY OF POST-CONSUMER RECYCLED PLASTIC AS A FOOD CONTACT MATERIAL (966)
4. **Jonah Bondoc**, Research and Analytical Services Laboratory, Natural Sciences Research Institute, University of the Philippines, Diliman, Quezon City, 1101 Philippines
   HIDDEN RISKS ON THE PLATE: HEALTH RISK ASSESSMENT OF HEAVY METALS IN URBAN- AND RURAL-FARMED VEGETABLES IN THE PHILIPPINES (874)
5. **Yada Nolvachai**, ARC Training Centre for Hyphenated Analytical Separation Technologies (HyTECH), Deakin Centre for Advanced Food Sciences, School of Exercise and Nutrition Sciences, Deakin University 221 Burwood Highway, Burwood VIC 3125 Australia
   SOLVENT-ASSISTED FLAVOUR EVAPORATION (SAFE) OPTIMISATION FOR EXTRA VIRGIN OLIVE OIL: A DESIGN OF EXPERIMENT APPROACH ENHANCED BY MULTIDIMENSIONAL GAS CHROMATOGRAPHY (479)

0900–1030 hrs Breakout 2

Food Quality Attributes: Chemistry and Sensory-07 -Flavor Chemistry and Sensory Science-Flavour Chemistry-01

Speakers & Titles

1. **Blessing Offia-Olua**, Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria
   AMINO ACID PROFILING OF SELECTED INDIGENOUS NIGERIAN SPICES FOR TRADITIONAL, INNOVATIVE AND GLOBAL FOOD APPLICATIONS (123)

2. **Yifeng Dai**, Guizhou University
LEFTY OR RIGHTY: CHIRALITY OF ETHYL LACTATE MATTERS IN BAIJIU AROMA (125)

3. **Peerapong Wongthahan**, Department of Food Technology, Faculty of Technology, Khon Kaen University, Khon Kaen 40002, Thailand.
DEVELOPMENT OF A ROASTED WOLFFIA LATTE ENRICHED WITH PLANT PROTEIN FOR FUNCTIONAL BEVERAGE APPLICATIONS (157)

4. **Laura Castaneda**, Department of Molecular Sciences, Swedish University of Agricultural Sciences, 750 07 Uppsala, Sweden.
REPLACING IMPORTED SOY WITH LOCAL PULSES: CONSUMER ACCEPTANCE AND WILLINGNESS TO PAY FOR TOFU-LIKE PRODUCTS IN SWEDEN (170)

5. **Wenmeng HE**, Beijing Normal-Hong Kong Baptist University
MOLECULAR MECHANISM OF BITTERNESS AND FUNCTIONAL EVALUATION OF WHEAT GLUTEN-DERIVED PEPTIDES (191)

6. **Zihan Wang**, University of Alberta
ENHANCING TASTE AND ANTI-INFLAMMATORY ACTIVITY OF CANOLA PROTEIN HYDROLYSATES VIA GAMMA-GLUTAMYLATION (304)

09.00 - 10.30 hrs Breakout 3

FOOD PROCESS AND ENGINEERING-10 -Process Innovation -03

Speakers & Titles

1. **Ishara De Silva**, School of Science, STEM College, RMIT University, Bundoora, VIC 3083, Australia
EFFECT OF MAILLARD REACTION PRODUCTS FORMATION AND IRON COMPLEXATION ON PHYSICOCHEMICAL AND STRUCTURAL PROPERTIES OF CASEINATE-GLUCOSE AND CASEINATE-LACTOSE SYSTEMS. (836)

2. **Pei Leng TAN**, Nanyang Technological University, Singapore
LOW-COST AND VERSATILE SCAFFOLD TECHNOLOGY FOR SUSTAINABLE CULTIVATED MEAT PRODUCTION (967)

3. **Abdur Rehman**, Food Chemistry and Technology Department, Teagasc Food Research Centre, Moorepark, Fermoy, Co. Cork P61 C996, Ireland
ULTRASOUND-ASSISTED SOY PROTEIN ISOLATE/PURITY GUM ULTRA-COMPLEX NANOPARTICLES FOR CONTROLLED DELIVERY OF BORAGE SEED OIL AND PEPPERMINT OIL BLENDS (1022)

4. **Guanqiu Huang**, Department of Chemical Engineering, University of Melbourne, Melbourne, Australia
MILD FRACTIONATION OF PEA GLOBULINS AND THEIR CONCENTRATION USING ULTRAFILTRATION (1034)

5. **Alexander Mathys**, ETH Zurich, Institute of Food, Nutrition and Health, Sustainable Food Processing Laboratory, Schmelzbergstrasse 9, Zurich 8092, Switzerland; Singapore-ETH Centre,

1 Create Way, 138602 Singapore; Bezos Centre for Sustainable Protein at the National University of Singapore
EMERGING FOOD PRODUCTION VIA EXTREMOPHILIC MICROALGAE: ADVANCING SUSTAINABILITY, AFFORDABILITY, AND NUTRITION (205)

09.00 - 10.30 hrs Breakout 4

Functional Foods, Bioactives, and Health Promotion-05 -Functional foods and Supplements: Safety & Health Outcomes-Clinical Applications

Speakers & Titles

1. **Huijin Jeong**, Department of Food Science and Biotechnology, Gachon University, Seongnam 13120, Republic of Korea
   NEUROPROTECTIVE EFFECTS OF PEDIOCOCCUS PENTOSACEUS TAP041 AGAINST METHYLGLYOXAL-INDUCED COGNITIVE IMPAIRMENT IN AN ALZHEIMER'S DISEASE MOUSE MODEL (445)
2. **Restituto Tocmo**, Department of Food and Nutritional Sciences, University of Reading, Whiteknights, Reading, United Kingdom
   REDOX-ACTIVE CONJUGATED FATTY ACIDS AS FUNCTIONAL FOOD BIOACTIVES FOR REGULATING HUMAN T HELPER 17 (TH17)-MEDIATED INFLAMMATION (95)
3. **Agnieszka Orkusz**, Wrocław University of Economics and Business, Department of Biotechnology and Food Analysis, Wrocław, Poland
   BREAKING BELOW 55 - HOW ALTERNATIVE PROTEIN SOURCES RESHAPE THE GLYCAEMIC INDEX OF DRY WAFERS (342)
4. **Nur Syakilla**, Faculty of Food Science and Nutrition, Universiti Malaysia Sabah, Jalan UMS, Kota Kinabalu 88400, Sabah, Malaysia
   IN SILICO GUIDED PRODUCTION OF ACE-INHIBITORY PEPTIDES FROM GRACILARIA CHANGII USING ENZYME-ASSISTED EXTRACTION (1176)
5. **Kanjana Singh**, Division of Cannabis and Medicinal Plants for Local Development, Graduate School, Payap University, Chiang Mai 50000, Thailand
   SYNERGISTIC ENCAPSULATED GREEN TEA-TURMERIC POLYPHENOLS: A TRANSLATIONAL FUNCTIONAL BEVERAGE STRATEGY FOR COLORECTAL CANCER PREVENTION (452)

0900–1030 hrs Breakout 5

Food Quality Attributes: Chemistry and Sensory-08 -Flavor Chemistry and Sensory Science-Flavour Chemistry-02

Speakers & Titles

1. **Yuzhu MAO**, Singapore Institute of Technology
   EFFECTS OF HYDROCOLLOID TYPES AND CONCENTRATIONS ON THE

TEXTURAL PROPERTIES AND DIGESTIBILITY OF PLANT-BASED NUGGETS (329)

2. **Peeraporn Pakakaew**, Cluster of high-value products from Thai rice and plants for health, Faculty of Agro-Industry, Chiang Mai University, Chiang Mai 50100, Thailand
ACCELERATED PROCESSING OF BLACK GARLIC AND A NEWLY DEVELOPED "GOLDEN GARLIC": EFFECTS ON BIOACTIVE COMPOUNDS, VOLATILE PROFILES, SENSORY PROPERTIES, AND CONSUMER ACCEPTANCE IN FOOD APPLICATIONS (361)
3. **Christine Hui Qin Goh**, Singapore Institute of Technology
FROM PLAIN TO PALATABLE: INNOVATION IN TEXTURE-MODIFIED FOODS FOR SINGAPORE'S SENIORS (374)
4. **Xuebing Xu**, Wilmar (Shanghai) Biotechnology Research and Development Center Co. Ltd.
SUSTAINABLE PRODUCTION OF ROASTED OILS: RATIONAL MODULATION OF PRECURSOR FORMATION TO AVOID OVER-ROASTING OPERATIONS (862)
5. **Kawindhya Thathsarani**, Department of Food Science, University of Otago, Dunedin, New Zealand
IMPACT OF PULSED ELECTRIC FIELD PROCESSING ON CONSUMER PERCEPTION OF BEEF EATING QUALITY (922)
6. **Zhibin Liu**, Fuzhou University
DECODING THE SMOKY FLAVOR OF SMOKED LAPSANG SOUCHONG TEA (929)

09.00 - 10.30 hrs Breakout 6

Nutrition, Policy, Classification, and Public Health-03 —Global Nutrition, Food Security, and Policy

Speakers & Titles

1. **Jian He**, National Technology Innovation Center for Dairy, Yili Global Innovation Center, International Dairy Federation (IDF), Journal of China Dairy Industry
MICRO-EMULSIFIED ENCAPSULATED CALCIUM TECHNOLOGY FOR OPTIMIZED CALCIUM SUPPLEMENTATION (1539)
2. **Vishweshwaraiah Prakash,** Council of Scientific and Industrial Research, INDIA; Former President of IUFoST, Former Vice-President of IUNS
EMERGENCE OF NEW GENERIC FOOD REGULATIONS FROM THE VAST POTENTIAL OF PERSONALIZED FOOD (1096)
3. **Pui Yee Tan**, School of Food Science and Nutrition, Faculty of Environment and Social Sciences, University of Leeds, Leeds LS2 9JT, United Kingdom
TRANSFORMING DIGITAL FOOD ENVIRONMENTS IN MALAYSIA: SYSTEMS INSIGHTS AND CO-CREATED PATHWAYS FOR HEALTHIER AND MORE SUSTAINABLE FUTURES (563)

4. **Zhiyi Yin, Zhaoshuo Yu, Patrick G Wall, Pingfan Rao, Imeida Maher.** Sutherland School of Law, University College Dublin, Ireland and College of Biological Science and Engineering, Fuzhou University, China

   BROADER DEVELOPING-COUNTRY ENGAGEMENT IN RESHAPING CODEX ALIMENTARIUS COMMISSION STANDARDS FOR ULTRA-PROCESSED FOODS COULD ADVANCE DIETARY EQUITY (182)

09.00 - 10.30 hrs Breakout 8

FOOD PROCESS AND ENGINEERING-11 -Scaling Up Traditional Technologies-02

Speakers & Titles

1. **Chenxue Su**, Northwest A&F University, China
   NON-DESTRUCTIVE ASSESSMENT OF WINE GRAPE MATURITY USING AN OVERALL QUALITY INDEX (OQI) AND VISIBLE–NEAR-INFRARED SPECTROSCOPY (355)
2. **Elisabeth Prabawati**, School of Agriculture and Food Sustainability, The University of Queensland, Australia
   RAPID PRODUCTION OF AUSTRALIAN-GROWN CHICKPEA TEMPEH: INFLUENCE OF ACIDIFICATION ON KEY PHYSICOCHEMICAL PROPERTIES (441)
3. **Professor Dr Anil Kumar Anal**, Faculty of Food Agriculture and Natural Resources, Asian Institute of Technology, Thailand
   SCALING TRADITIONAL TOHU AND PE POKE: APPROPRIATE-TECHNOLOGY UPGRADING OF WET AND DRIED MYANMAR LEGUME FOODS FOR FUTURE PROTEIN APPLICATIONS (481)
4. **Guru Raj Pejavara Narayana**, Department of Food Process Technology, National Institute of Food Technology, Entrepreneurship and Management – Thanjavur – 613005, (NIFTEM-T) Tamil Nadu, India
   DEVELOPMENT AND CHARACTERISATION OF RADIOFREQUENCY-TREATED FOXTAIL MILLET AND BROWN SEAWEED PROTEIN COMPOSITES AND ITS APPLICATION IN A READY-TO-SERVE BEVERAGE (550)

09.00 - 10.30 hrs Breakout 9

Food Safety, Quality, and Risk Communication -03 —Foodborne Pathogens and Prevention Strategies

Speakers & Titles

1. **Okon Johnson Esua**, Department of Food Science and Technology, National University of Singapore, Science Drive 2, 117542, Singapore; Singapore-HUJ Alliance for Research and Enterprise (SHARE), Innovation Wing, 1 CREATE Way, 138620, Singapore; Department of Agricultural and F
   ANTIMICROBIAL PEPTIDE COCKTAIL FORMULATION AS NON-

ANTIBIOTIC MITIGANTS TO CONTROL BACTERIA CONTAMINATION IN CULTURED MEAT PRODUCTION (724)

2. **Minkawat Thanopajai**, Department of Food technology, Faculty of Technology, Khon Kaen University, Khon Kaen, Thailand
SYNERGISTIC ANTIFUNGAL ACTIVITY OF GREEN-SYNTHESIZED ZINC OXIDE NANOPARTICLES AND LIMNOPHILA AROMATICA ESSENTIAL OIL AGAINST ASPERGILLUS NIGER (944)

3. **Shanshan Liu**, School of Chemistry, Chemical Engineering and Biotechnology, Nanyang Technological University, Singapore
A FOOD-GRADE HYDROGEL FOR TARGET-TRIGGERED BACTERIOPHAGE DELIVERY IN FOOD BIOCONTROL (968)

5. **Hui Liu**, School of Public Health, Southeast University, Nanjing, China
THE KEY HAZARDOUS CHARACTERISTICS OF PERACETIC ACID-INDUCED VIABLE BUT NON-CULTURABLE LISTERIA MONOCYTOGENES (1374)

09.00 - 10.30 hrs Breakout 10

Sustainable Food Systems and Global Food Security-03 -Circular Economy and Zero waste Approaches-01

Speakers & Titles

1. **Byron Perez**, ETH Zurich
MICROALGAE BIOREFINERIES FOR SUSTAINABLE FOOD SYSTEMS: CIRCULAR CULTIVATION, ENERGY-EFFICIENT PROCESSING, AND SCALABLE DOWNSTREAM INTEGRATION (111) YS

2. **Rahel Suchintita Das**, Food Chemistry and Technology Department, Teagasc Food Research Centre, Ashtown, Dublin, D15 DY05, Ireland
ECO-INNOVATIVE ZERO-WASTE SEAWEED BASED BIOREFINERY (210) YS

3. **Francesca Pompei**, University of Camerino
RECOVER, EXTRACT AND EAT: BIOSAFETY ASSESSMENT OF WATER-BASED DES EXTRACTS FROM SPENT COFFEE GROUNDS (5)

4. **Erwin Descallar**, University of the Philippines
ASSESSMENT OF THE IMPACT OF PASTEURIZATION ON THE PHYSICOCHEMICAL PROPERTIES AND MICROBIAL SAFETY OF COCONUT SKIM MILK (CSM) (14)

5. **Asgar Farahnaky**, Department of Food Technology and Nutrition, School of Science, RMIT University, Melbourne, Australia
EMERGING LEAF PROTEINS: BRIDGING SUSTAINABILITY, FUNCTIONALITY, AND INDUSTRIAL SCALE (80)

6. **Christian Hermansen**, Singapore Institute of Food and Biotechnology Innovation (SIFBI), Agency for Science, Technology, and Research (A*STAR), Singapore
FERMENTATION OF FOOD PROCESSING BY-PRODUCTS FOR IMPROVED NUTRITIONAL VALUE IN SUSTAINABLE AQUAFEED (248)

7. **N Sai Prasanna**, Indian Institute of Technology Tirupati
DEEP EUTECTIC SOLVENT-MEDIATED EXTRACTION OF COCONUT PROTEINS FROM SPENT COCONUT RESIDUE: STRUCTURE AND FUNCTIONALITY INSIGHTS (272)

1100–1230 hrs Breakout 1

Food Attributes: Chemistry and Sensory-09 -Flavor Chemistry and Sensory Science-Flavour Chemistry-03

Speakers & Titles

1. **Molan Zhang**, South China University of Technology
MECHANISTIC INSIGHTS INTO THE CONVERSION OF NEPHROTOXIC DJENKOLIC ACID INTO MEATY AROMA COMPOUNDS IN DJENKOL BEAN: MODULATION BY ASCORBIC ACID AND PH (1089)
2. **Malinda Madhusankha**, Department of Food Science and Technology, Faculty of Livestock, Fisheries and Nutrition, Wayamba University of Sri Lanka
THERMAL AND EMULSIFICATION PROCESSING OF SPICE OLEORESIN: PHYSICOCHEMICAL BEHAVIOR, FLAVOR RELEASE, AND ENCAPSULATION IN OIL-IN-WATER SYSTEMS (1140)
3. **Katsuyoshi Nishinari**, Hubei University of Technology, SHARPS
MOLECULAR MECHANISM OF ASTRINGENCY CASED BY POLYPHENOLS (1350)
4. **Yanlei Li**, Hubei University of Technology
SALTINESS ENHANCEMENT BY DEPOLYMERIZED GUM ARABIC (1351)
5. **Yi Kai**, Department of Food Science and Technology, National University of Singapore, Singapore 117542, Singapore
SACCHAROMYCES CEREVISIAE FERMENTATION-ASSISTED EXTRACTION IMPROVES FLAVOR AND FUNCTIONAL PROPERTIES OF PEA PROTEIN ISOLATE (324)
6. **Shubham Chandraker, Mahendran Radhakrishnan.** Centre of Excellence in Non-Thermal Processing, National Institute of Food Technology, Entrepreneurship and Management, India
COLD PLASMA-ASSISTED ULTRASOUND EXTRACTION OF BIOACTIVE COMPOUNDS FROM BLACK PEPPER HUSK USING FOOD-GRADE ETHANOL AND DEEP EUTECTIC SOLVENTS: SENSORY CHARACTERIZATION USING AN ELECTRONIC NOSE (607)
7. **Yeoeun Kim,** Department of Human Ecology, Korea University, Korea,
EFFECT OF MAILLARD REACTION AND LIQUID SMOKING ON THE AROMA OF TENEBRIO MOLITOR AND PROTAETAI BREVITARSIS SEULENSIS LARVAE (363)

11.00 - 12.30 hrs Breakout 5

FOOD PROCESS AND ENGINEERING-15 : Process Innovation -04

Speakers & Titles

1. **Srishti Upadhyay**, Indian Institute of Technology, Delhi, India
   ENGINEERING STABLE PLANT-BASED PICKERING EMULSIONS USING MUNG BEAN PROTEIN NANOPARTICLES AND EDIBLE OILS (1127)
2. **Paola Pittia**, University of Teramo, Dep.t Biosciences and Technology for Food Agriculture and Environment
   INNOVATIVE EXTRACTION PROCESS OF PLANT-DERIVED EXTRACELLULAR VESICLES—TECHNOLOGICAL AND SCALABILITY ASPECTS (1150)
3. **Scasia Fortunata Halim**, School of Science, Monash University Malaysia, Jalan Lagoon Selatan, 47500 Bandar Sunway, Selangor.
   INCLUSION COMPLEXES OF TOCOTRIENOL RICH FRACTION: PRODUCTION AND CHARACTERIZATION OF THE PHYSICOCHEMICAL PROPERTIES (1168)
4. **Nitin Nitin**, University of California, Davis
   BACTERIA-MATRIX INTERACTIONS INFLUENCE THE VIABILITY AND INTESTINAL SURVIVAL OF LACTICASEIBACILLUS RHAMNOSUS GG ENCAPSULATED IN WHEY PROTEIN AND STARCH HYDROGELS (539)
5. **Hosahalli Ramaswamy**, Professor, McGill University, Montreal, Canada (IUFoST Science Council Member)
   END-OVER-END (EOE) ROTATIONAL VS. EOE INTERMITTENT OSCILLATION AGITATION THERMAL PROCESSING: EFFECT ON HEAT TRANSFER AND QUALITY OF PRODUCTS IN GLASS JARS (1392)

11.00 - 12.30 hrs Breakout 6

Sustainable Food Systems and Global Food Security-02 -Food Systems and Climate Change-02

Speakers & Titles

1. **Shen Ching Hao**, Food Science Department, Taiwan Ocean University, Keelung
   EFFECT OF LED LIGHT SOURCES ON THE GROWTH RATE AND LIPID COMPOSITION OF CHLORELLA SOROKINIAN AT LOW-TEMPERATURE STRESS (1032)
2. **Masagus Haidir Tamimi**, Department of Food Technology, Universitas Diponegoro
   FROM FOOD NEOPHOBIA TO ACCEPTANCE: EFFECTS OF EDUCATIONAL AND SENSORY INTERVENTIONS IN PROMOTING EDIBLE INSECTS AS SUSTAINABLE FOOD IN INDONESIA (1191)
3. **Okba Guedri**, Lappeenranta–Lahti University of Technology LUT
   LIFE CYCLE ASSESSMENT IN SUSTAINABLE FOOD PROCESSING AND

CIRCULAR FOOD SYSTEMS: A SCOPING REVIEW OF METHODS, IMPACT CATEGORIES AND DIGITAL TOOLS (1235)

4. **Alicja Krzeminska**, Faculty of Earth Sciences and Environmental Management, Institute of Geography and Regional Development, University of Wroclaw, Pl. Uniwersytecki 1, 50-137 Wrocław, Poland
REDESIGNING FOOD SYSTEMS FOR CLIMATE RESILIENCE AND FOOD SECURITY (1241)

11.00 - 12.30 hrs Breakout 7

Functional Foods, Bioactives, and Health Promotion-06 -Functional foods and Supplements: Safety & Health Outcomes-Food Waste Management

Speakers & Titles

1. **Jyotsna Waghmare,** Institute of Chemical Technology, Mumbai, India
INTEGRATED CASCADING BIOREFINERY: TRANSFORMING MULTI-STREAM AGRI-FOOD AND HORTICULTURE WASTE INTO FUNCTIONAL INGREDIENTS AND HIGH-PERFORMANCE SUPERCAPACITOR CARBON ELECTRODES (1429)
2. **Ana M. Vilas-Boas**, Catholic University of Portugal, CBQF – Centre for Biotechnology and Fine Chemistry – Associate Laboratory, Faculty of Biotechnology, Rua Arquiteto Lobão Vital, 172, 4200-374 Porto, Portugal
FROM PINEAPPLE WASTE TO THERAPY: CHITOSAN-ENCAPSULATED BROMELAIN AND POLYSACCHARIDES FOR INTESTINAL ANTI-INFLAMMATORY DELIVERY (1115)
3. **Ma. Krischen Austria**, Institute of Food Science and Technology, College of Agriculture and Food Science, University of the Philippines Los Baños, College, Laguna, Philippines, Cagayan State University-Andrews Campus, Tuguegarao City, Cagayan, Philippines
FULL UTILIZATION OF SABA BANANA (MUSA ACUMINATA × BALBISIANA COLLA) PEEL AND PULP FOR FUNCTIONAL FOOD PRODUCT DEVELOPMENT (1091)
4. **Nicola Sunderland**, Technological University Dublin, School of Food Science & Environmental Health, Dublin, Ireland
FUNGAL SOLID-STATE FERMENTATION OF FOOD WASTE FOR THE DEVELOPMENT OF FUNCTIONAL INGREDIENTS (796)
5. **Nicola Sunderland**, Technological University Dublin, School of Food Science & Environmental Health, Dublin, Ireland
AN INVESTIGATION OF THE EFFECT OF FOOD WASTE DIETS ON THE BIOACTIVITY OF HERMETIA ILLUCENS AND TENEBRIO MOLITOR LARVAE FOR FUNCTIONAL FOOD APPLICATIONS (795)
6. **Subhanshu Bezbaruah**, Food Science and Technology Section, School of Allied Health Sciences, Manav Rachna International Institute of Research and Studies, Faridabad, Haryana, India, 121003.
CIRCULAR ECONOMY APPROACH IN FOOD SYSTEM: CONVERTING KOKUM PROCESSING WASTE INTO SAFE FUNCTIONAL INGREDIENTS. (204)

11.00 - 12.30 hrs Breakout 8

FOOD PROCESS AND ENGINEERING-13 -Traditional Foods for Future-02

1. **Laura Castaneda**, Swedish University of Agricultural Sciences
   INFOGEST IN VITRO DIGESTION OF NORDIC FABA BEAN–OAT TEMPEH: ROLES OF MICROSTRUCTURE AND COMPOSITION IN DIGESTIVE BEHAVIOR (167)
2. **Janusz Kapusniak**, Department of Dietetics and Food Studies, Faculty of Science and Technology, Jan Dlugosz University in Czestochowa, Armii Krajowej 13/15, 42-200 Czestochowa, Poland
   PLANT PROTEINS AS ALTERNATIVE NATURAL EMULSIFIERS IN FOOD EMULSIONS (193)
3. **Ji Hae Lee**, National Institute of Agricultural Sciences, RDA
   EFFECTS OF A SILKWORM-BASED COMPLEX IN A VCD-INDUCED MENOPAUSAL MOUSE MODEL (228)
4. **Oluchukwu Nwadi**, University of Nigeria, Nsukka
   CHEMICAL COMPOSITION AND SENSORY PROPERTIES OF OKPA PUDDING AND READY-TO-EAT OKPA GRITS FROM BAMBARA GROUNDNUT FLOUR SPICED WITH GARLIC (292)
5. **Chinelo Ezeocha**, Department of Food Science and Technology, Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria.
   EVALUATION OF THE FUNCTIONAL AND PASTING PROPERTIES OF AERIAL YAM (DIOSCOREA BULBIFERA), GERMINATED BLACK TURTLE BEAN (PHASEOLUS VULGARIS), AND TIGERNUT (CYPERUS ESCULENTUS) COMPOSITE FLOURS. (402)

11.00 - 12.30 hrs Breakout 10

FOOD PROCESS AND ENGINEERING-14 Track Theme: Advanced Food Preservation and Processing Technologies

Speakers & Titles

1. **Dequan Zhang**, PhD, Professor, Doctoral Supervisor, Director of Institute of Urban Agriculture, Chinese Academy of Agricultural Sciences, China
   ADVANCES AND FUTURE PROSPECTS IN MEAT PROCESSING SCIENCE AND TECHNOLOGY (1540)
2. **Yu Xuan Lim**, School of Chemistry, Chemical Engineering and Biotechnology, Nanyang Technological University, Singapore 637459, Singapore
   MICROBIAL PROFILING OF SEAFOOD SPOILAGE BACTERIA AND PHAGE COCKTAIL DEVELOPMENT AGAINST PREDOMINANT PSEUDOMONAS BUBULAE (574)
3. **Zhuorui Han**, College of Biosystems Engineering and Food Science, Zhejiang University, Hangzhou, 310058, China
   PREPARATION OF SELF-POWERED STERILIZATION PACKAGING FILM

AND RESEARCH ON SUSTAINABLE ANTIBACTERIAL PRESERVATION (924)

4. **MONALISA SAHOO**, Swedish University of Agricultural Sciences
EFFECTS OF GENOTYPE AND GERMINATION ON FODMAP COMPOSITION IN WHEAT CULTIVARS (1095)

5. **Yusa Nakamura**, Department of Food Science and Technology, Tokyo University of Marine Science and Technology, Tokyo, Japan
DIFFERENCES IN PHYSICAL PROPERTY CHANGES BETWEEN FATTY AND LEAN MUSCLES OF ATLANTIC BLUEFIN TUNA DURING LONG-TERM COLD-AGING (722)

14.00 - 15.30 hrs Plenary

Food Safety, Quality, and Risk Communication -04 —Foodborne Pathogens and Prevention Strategies

Speakers & Titles

1. **Yaqi Zhao**, Florida State University
QUANTITATIVE WESTERN BLOT ASSAY FOR THE DETECTION OF CHICKEN SERUM ALBUMIN (709) YS

2. **Nan Zhong**, School of Agriculture and Biology, Shanghai Jiao Tong University, Shanghai, China
A CRISPR-CAS12A-BASED METHOD FOR SCARLESS DELETION OF PLASMID-BORNE ANTIMICROBIAL RESISTANCE GENES IN STAPHYLOCOCCUS AUREUS (1252)

3. **Wanwan Hou**, School of Agriculture and Biology, Shanghai Jiao Tong University, Shanghai
DISRUPTION OF WALL TEICHOIC ACID GLYCOSYLATION INCREASES MEROPENEM SUSCEPTIBILITY IN STAPHYLOCOCCUS AUREUS (1253)

4. **Chunlei Shi**, School of Agriculture and Biology, Shanghai Jiao Tong University, Shanghai, China
PROTEOMICS-GUIDED INSIGHTS INTO THE ANTIBIOFILM AND ANTIVIRULENCE ACTION OF HMB AGAINST LISTERIA MONOCYTOGENES (1265)

5. **Shoukui He**, MOST-USDA Joint Research Center for Food Safety, School of Agriculture & Biology, Shanghai Jiao Tong University, Shanghai, China
DISRUPTION OF FUR-MEDIATED IRON HOMEOSTASIS UNDERLIES THE ANTIBACTERIAL ACTIVITY OF CINNAMON ESSENTIAL OIL AGAINST SALMONELLA ENTERITIDIS (1287)

6. **Letian Li**, College of Biosystems Engineering and Food Science, Zhejiang University, Hangzhou 310058, Zhejiang, China
MULTIPLEXED AND ULTRASENSITIVE FOODBORNE PATHOGENS DETECTION WITH AN ORTHOGONAL ARGONAUTE CIRCUIT BASED ON ENCODED MICROSPHERE MICROSCOPIC IMAGING (1342)

14.00 - 15.30 hrs Breakout 1

Functional Foods, Bioactives, and Health Promotion-07 -Functional foods and Supplements: Safety & Health Outcomes-Food Technology

Speakers & Titles

1. **Vaishali Saraswat**, Indian Institute of Technology Tirupati
   SUSTAINABLE EXTRACTION OF R-PHYCOERYTHRIN FROM DRY BIOMASS OF GRACILARIA CORTICATA EMPLOYING ULTRASOUND-ASSISTED EXTRACTION WITH NADES (636)
2. **Justice Okwechime**, Rivers State University Port Harcourt Nigeria
   DEVELOPMENT AND QUALITY EVALUATION OF AN INSTANT SOUP THICKENER FROM OKRA (ABELMOSCHUS ESCULENTUS) AND JUTE LEAF ((CORCHORUS OLITORIUS) BLEND (215)
3. **Nguyen-Phuc Le**, Food and Health Group, School of Chemical Engineering, University of New South Wales, Sydney, Australia
   FREEZE-DRYING MICROENCAPSULATION OF FINGER LIME EXTRACTS WITH CANOLA MEAL PROTEIN AND INULIN IMPROVES BIOACTIVE STABILITY DURING IN VITRO DIGESTION (1002)
4. **Anqi Li**, Centre for Nutrition and Food Sciences, Queensland Alliance for Agriculture and Food Innovation (QAAFI), The University of Queensland, Brisbane, Australia
   PECTIN AND ALGINATE PHYSICAL FORMS MODULATE IN VITRO GUT FERMENTATION, METABOLITE PROFILES AND MICROBIOTA COMPOSITION (659)
5. **Trisha Balili**, Institute of Food Science and Technology, University of the Philippines Los Baños, College, Laguna 4030, Philippines
   EFFECT OF MALTODEXTRIN CONCENTRATION ON THE PHYSICOCHEMICAL AND FUNCTIONAL PROPERTIES OF FREEZE-DRIED EXTRACT FROM SALUYOT (CORCHORUS OLITORIUS) (643)

14.00–15.30 hrs Breakout 3

Food Attributes: Chemistry and Sensory-10 -Flavor Chemistry and Sensory Science-Sensory Science-01

Speakers & Titles

1. **Verena Ming Hui Tan**, Singapore Institute of Technology, Health and Social Science cluster, Dietetics and Nutrition
   RE SHAPING PUREED FOODS: SENSORY ACCEPTABILITY OF ASIAN SOFTER MEALS FOR OLDER ADULTS (104)
2. **Jiaqiang Luo**, La Trobe Institute of Sustainable Agriculture and Food, School of Agriculture, Biomedicine and Environment, La Trobe University, Bundoora, Victoria, 3083, Australia
   A DATA-DRIVEN APPROACH TO DEVELOPING STRUCTURALLY AND SENSORIALLY COMPLEX PLANT-BASED OYSTER ANALOGUES (140)
3. **Lyket Chuon**, Department of Food Technology, Faculty of Technology, Khon Kaen University, Khon Kaen 40002, Thailand

UNDERSTANDING AMINO ACID PROFILES AND TASTE DETECTION OF MUSHROOM AND ALGAE EXTRACTS USING AN ELECTRONIC TONGUE (142)

4. **Nor Qhairul Izzreen Mohd Noor**, Food security Research Group, Faculty of Food Science and Nutrition, University Malaysia Sabah
THE OPTIMIZATION OF 5'-MONONUCLEOTIDES FROM NATIVE HERICIUM ERINACEUS PROTEIN HYDROLYSATE USING RESPONSE SURFACE METHODOLOGY (158)

5. **Yue Wang**, College of Enology, Northwest A&F University, Yangling, China
UNVEILING SUB-REGIONAL AROMA DIFFERENCES IN CHINA'S NINGXIA REGION: CHARACTERIZATION OF KEY AROMA PROFILES AND CHEMICAL FOUNDATIONS (234)

6. **Yue Wang**, College of Enology, Northwest A&F University, Yangling, China
ANALYSIS OF SENSORY CHARACTERISTICS FROM THE PERSPECTIVE OF RAW MATERIALS AND ESTABLISHMENT OF A SENSORY WHEEL FOR 'MSALAIS', A TRADITIONAL ALCOHOLIC BEVERAGE FROM SOUTHERN XINJIANG, CHINA. (235)

14.00 - 15.30 hrs Breakout 5

FOOD PROCESS AND ENGINEERING-12 -Biotransformation-02

Speakers & Titles

1. **Jae-Young Choi**, Department of Food and Biotechnology, Korea University, Sejong, 30019, Korea
ENGINEERING OF AMYLOSUCRASE TO IMPROVE TURANOSE PRODUCTION (617)

2. **Samadhan Dahikar**, Department of Microbiology, School of Sciences, Sanjivani University, Kopargaon, India
PROBIOTIC BIOTRANSFORMATION OF BEETROOT (BETA VULGARIS L.) FOR THE DEVELOPMENT OF NEXT-GENERATION FUNCTIONAL FOODS (1020)

3. **Zhuoran Zhang**, Department of Food Science & Technology, National University of Singapore, Science Drive 2, Singapore 117542, Singapore
MICROBIAL FERMENTATION OF DRIED NONI FRUIT SLURRY: IMPROVING AROMA WHILE PRESERVING BIOACTIVE COMPOUNDS (289)

4. **Joseph Jeffrey Garcia**, Department of Food Science and Nutrition, College of Home Economics, University of the Philippines Diliman, Quezon City, 1101
ISOLATION OF POTENTIAL PROBIOTIC LACTIC ACID BACTERIA FROM VIRGIN COCONUT OIL PROCESSING WASTE (673)

5. **Raghavarao KSMS,** Department of Chemical Engineering, Indian Institute of Technology Tirupati, Tirupati 517619, Andhra Pradesh, India.

EXTRACTION AND PURIFICATION OF BIOACTIVE COMPOUNDS FROM MICRO/MACROALGAE AND HAIRY ROOT CULTURES FOR FUNCTIONAL FOODS (914)

14.00 - 15.30 hrs Breakout 7

Functional Foods, Bioactives, and Health Promotion-08 -Functional Foods and Supplements: Safety & Health Outcomes-Food Technology

Speakers & Titles:

1. **Hameeda Banu Itagi**, Scientist I-Product Development and Sensory
   DEVELOPMENT OF NUTRIENT DENSE MULTI MILLET AND RICE FLAKES NUTRI BARS ENRICHED WITH STABILIZED RICE BRAN (863)
2. **Joanna Harasym**, Department of Biotechnology and Food Analysis Wrocław University of Economics and Business, Adaptive Food Systems Accelerator (AFSA) - Research Centre Wrocław University of Economics and Business, 53-345 Wroclaw, Poland
   FROM RECIPE TO PRODUCTION LINE: HIGH-FIBRE AND HIGH-PROTEIN DRY WAFERS DEVELOPED IN THE VIVAFER PROJECT (1100)
3. **Yanlin Sun**, ARC Industrial Transformation Training Centre for Uniquely Australian Foods, Queensland Alliance for Agriculture and Food Innovation, The University of Queensland, Indooroopilly, QLD 4068, Australia
   SEASONAL DYNAMICS OF THE NUTRITIONAL AND METABOLOMIC PROFILE IN ATRIPLEX NUMMULARIA: IMPLICATIONS FOR FUNCTIONAL FOOD OPTIMISATION (69)
4. **Anika Singh**, British Columbia Institute of Technology
   SYNERGISTIC EFFECTS OF CHIA MUCILAGE AND KONJAC GLUCOMANNAN ON STARCH DIGESTION AND GLUCOSE DIFFUSION (226)
5. **Ahtisham Ali**, Auckland University of Technology
   VALORISATION OF SNAPPER (PAGRUS AURATUS) BYPRODUCTS: ENZYMATIC HYDROLYSIS FOR PROTEIN HYDROLYSATE PRODUCTION (1325)
6. **Patricia Matanjun,** Food Security Research Laboratory, Faculty of Food Science and Nutrition, Universiti Malaysia Sabah, Kota Kinabalu, Sabah, Malaysia.
   DEVELOPMENT OF GLUTEN-FREE DRIED RICE NOODLES INCORPORATED WITH RED SEAWEED, KAPPAPHYCUS ALVAREZII (541)

1400–1530 hrs Breakout 8

Food Attributes: Chemistry and Sensory-11 -Flavor Chemistry and Sensory Science-Sensory Science-02

Speakers & Titles

1. **Mayushi Malshika Jayakody**, ARC Training Centre for Hyphenated Analytical Separation Technologies (HyTECH), Deakin Centre for Advanced Food Sciences (DeCAF), School of Exercise and Nutrition Sciences, Deakin University, 221 Burwood Highway, Burwood, Victoria 3125 Australia
   EFFECT OF ADVANCED THERMAL STERILISATION AND STORAGE TEMPERATURE ON SENSORY AND AROMA QUALITY OF SHELF-STABLE RED LENTIL DHAL. (491)
2. **Jieqi Mao**, Department of Food Science and Technology, National University of Singapore, Science Drive 2, Singapore, 117546, Singapore
   ENHANCING THE SENSORY ACCEPTABILITY OF PLANT-BASED FOODS: MICROBIAL MODULATION OF A FERMENTED SOY-BASED CHEESE (522)
3. **Shubham Chandrakar**, Centre of Excellence in Non-Thermal Processing, Department of Food Process Technology, National Institute of Food Technology, Entrepreneurship and Management-Thanjavur, (NIFTEM-T), Thanjavur, Tamil Nadu, India
   COLD PLASMA-ASSISTED ULTRASOUND EXTRACTION OF BIOACTIVE COMPOUNDS FROM BLACK PEPPER HUSK USING FOOD-GRADE ETHANOL AND DEEP EUTECTIC SOLVENTS: SENSORY CHARACTERIZATION USING AN ELECTRONIC NOSE (607)
4. **Ma. Carisse Compendio**, Department of Food Science, University of Otago, Dunedin, New Zealand 9016 and School of Technology, University of the Philippines Visayas, Miagao, Iloilo, Philippines 5023
   MAPPING VOLATILE CHANGES DURING FERMENTATION OF RICE BEAN AND PIGEON PEA USING CHEMOMETRIC AND MACHINE LEARNING APPROACHES (629)
5. **Mariana F. Cardoso**, Department of Food Science and Technology, Federal University of Santa Catarina (UFSC), Florianópolis, Brazil
   FROM DRYING TO DEODORIZATION: MODULATING ODOR-ACTIVE VOLATILES IN TETRASELMIS CHUII FOR CLEAN-LABEL FOODS (738)

1400 - 15.30 hrs Breakout 9

AI, Data Science, and Digital Transformation in Food Systems-03 - Artificial Intelligence for Sensory and Quality Prediction-02

Speakers & Titles

1. **Prakyath Shetty**, Department of Food Process Engineering, National Institute of Food Technology, Entrepreneurship and Management, Thanjavur (NIFTEM-T), INDIA
   RAPID DETECTION AND QUANTIFICATION OF MULTI-SOURCE STARCH ADULTERATION IN TAPIOCA STARCH AND TAPIOCA SAGO USING FOURIER TRANSFORM MID-INFRARED AND FOURIER

TRANSFORM NEAR-INFRARED SPECTROSCOPY USING CHEMOMETRICS AND AI INTEGRATION (460)

2. **Antonio Derossi**, Department of Agriculture, Food, Natural resources and Engineering, University of Foggia, Via Napoli 25, 71122, Foggia, Italy
DIGITAL AND CHAOTIC TRAJECTORY DESIGN FOR DELTA-ROBOT MIXING OF LIQUID FOOD SYSTEMS (706)
3. **Mengshi Lin**, University of Missouri
LEVERAGING MACHINE LEARNING MODELS AND SERS TECHNOLOGY FOR THE DETECTION OF PESTICIDES IN FRESH PRODUCE (866)
4. **Jie Hong Chiang**, Food & Sensory Science Division, Singapore Institute of Food and Biotechnology Innovation (SIFBI), Agency for Science, Technology and Research (A*STAR)
NOT ALL PLANT PROTEINS EXTRUDE ALIKE: MACHINE LEARNING-GUIDED PREDICTION AND OPTIMISATION OF TEXTURE IN CHICKEN BREAST ANALOGUES (930)
5. **Xie Yunfei**, School of Food Science and Technology, Jiangnan University
APPLICATION OF ARTIFICIAL INTELLIGENCE IN FOOD SAFETY AND QUALITY CONTROL (1000)
6. **Dayuan Wang**, Jiangnan University
HIGHLIGHTING AND DETECTING MOLD AND MECHANICAL DAMAGE DEFECTS IN CITRUS FRUITS USING UV-FLUORESCENCE IMAGING AND YOLO11 (1056)
7. **Simon Lee**
REVOLUTIONIZING NOVEL FOOD INGREDIENT DISCOVERY FOR BRAIN HEALTH : HOW AI AND NEW TECHNOLOGY ACCELERATE INNOVATION (1188)

14.00 - 15.30 hrs Breakout 10

FOOD PROCESS AND ENGINEERING-16 : epearation process -03 (Drying Technology)

Speakers & Titles

1. **Traiphop Phahom**, Suranaree University of Technology, School of Food Technology, Nakhon Ratchasima, Thailand
IMPACT OF DRYING TECHNOLOGIES ON MOISTURE SORPTION, FUNCTIONAL PROPERTIES, ANTIOXIDANT ACTIVITY, AND PROTEIN DIGESTIBILITY OF DUCKWEED (WOLFFIA GLOBOSA) (24)
2. **Nikita S. Bhatkar**, Department of Chemical and Materials Engineering, Faculty of Engineering, The University of Auckland, Auckland, 1010, New Zealand
HOW FOAMING AFFECTS THE FREEZE-DRYING BEHAVIOR OF MUSSEL PUREE (352)
3. **Eleonora Di Palma**, University of Bari Aldo Moro
PULSED ELECTRIC FIELD AS A NON-THERMAL STRATEGY TO IMPROVE OLIVE OIL EXTRACTABILITY AND QUALITY (1114)

4. **Antonia Tamborrino**, University of Bari Aldo Moro
ENHANCING OLIVE OIL RECOVERY THROUGH VACUUM-ASSISTED MALAXATION (1116)

16.00 - 17.30 hrs Breakout 2

Functional Foods, Bioactives, and Health Promotion-09 -Functional foods and Supplements: Safety & Health Outcomes-Antioxidant Applications

Speakers & Titles

1. **Preeyabhorn Detarun**, Center of Excellence in Functional Foods and Gastronomy, Faculty of Agro-Industry, Prince of Songkla University, Hat Yai, Songkhla, 90110, Thailand
DEVELOPMENT AND CHARACTERIZATION OF A FUNCTIONAL GNETUM GNEMON MOUSSE FOR ELDERLY INDIVIDUALS: ANTIOXIDANT, ANTI-INFLAMMATORY, AND NUTRITIONAL EVALUATION (1057)
2. **Nga Ngoc Quynh Nguyen**, RMIT University
PHYSICOCHEMICAL, STRUCTURAL AND NUTRITIONAL PROPERTIES OF TERMITE MUSHROOM-FORTIFIED TOFU AND ITS ANTIOXIDANT ACTIVITY DURING IN VITRO DIGESTION (1048)
3. **Shaobo Zhou**, School of Science, Faculty of Engineering and Science, University of Greenwich, Central Avenue, Chatham ME4 4TB, UK
SYNERGISTIC NEUROPROTECTIVE EFFECTS OF VITAMIN D AND GANODERMA LUCIDUM POLYSACCHARIDES IN EPILEPSY: EVIDENCE FROM IN VIVO AND IN VITRO MODELS (1026)
4. **Sanotharan Nadanasabapathy**, School of Molecular and Life Sciences, Faculty of Science and Engineering, Curtin University, Kent Street, Bentley, WA 6102, Australia
ULTRASOUND-ASSISTED EXTRACTION OF BIOACTIVE ANTIOXIDANT COMPOUNDS FROM CHAETOMORPHA LINUM (O.F. MÜLLER) KÜTZING (1845) (884)
5. **Onyemechi Chinedu Ogbuele**, PhD Researcher, Department of Food Science And Technology, College of Applied Food Sciences and Tourism, Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria
EFFECT OF FORTIFICATION WITH SOYBEAN CONCENTRATE ON HEMATOLOGICAL AND SERUM ANTIOXIDANTS ACTIVITIES OF EXPERIMENTAL RATS FED WITH A DOUGH MEAL PRODUCED FROM ACHA (DIGITARIA EXILIS). (890)

16.00 - 17.30 hrs Breakout 3

FOOD PROCESS AND ENGINEERING-17 -Delivery systems-01

Speakers & Titles

1. **Synne Røsten**, School of Agriculture and Food Sustainability, The University of Queensland
   COMPARATIVE EFFECTS OF DAIRY AND PLANT PROTEINS IN PROTEIN–ALGINATE MATRICES FOR SPRAY DRYING ENCAPSULATION (388)
2. **Alyanna Meryll Patulot**, Institute of Food Science and Technology, College of Agriculture and Food Science, University of the Philippines Los Baños, Los Baños, Laguna, Philippines
   BACE-ON: A VEGAN BACON ALTERNATIVE FROM NATA DE COCO (1277)

1600–1730 hrs Breakout 4

Food Attributes: Chemistry and Sensory-12 -Flavor Chemistry and Sensory Science-Sensory Science-03

Speakers & Titles

1. **Rona Camille Lizardo-Agustin**, Institute of Food Science and Technology, College of Agriculture and Food Science, University of the Philippines Los Baños, College, Laguna, Philippines 4031
   SENSORY AND VOLATILE FLAVOR PROFILE OF PHILIPPINE WILD RASPBERRY [RUBUS ROSIFOLIUS (SM.)] PUREE AS INFLUENCED BY LACTIC ACID FERMENTATION (913)
2. **Merly Panganiban**, University of the Philippines Los Banos
   CONSUMER ACCEPTABILITY AND SENSORY DRIVERS OF 'RAJAH 4' AND 'LAKAN 1' CASSAVA FLOUR-BASED PRODUCTS: A COMPARATIVE SENSORY AND TEXTURAL STUDY FROM TRADITIONAL CASSAVA CAKE TO MODERN FLATBREADS (961)
3. **Pey Sze Teo**, Singapore Institute of Food and Biotechnology Innovation (SIFBI), Agency for Science, Technology and Research (A*STAR), Singapore
   SENSORY FATIGUE IN FOOD CONSUMPTION: MECHANISMS, MEASUREMENT CHALLENGES AND IMPLICATIONS FOR EATING BEHAVIOUR (1264)
4. **Yeung ML**, Faculty of Dentistry, The University of Hong Kong, Pokfulam, Hong Kong Special Administrative Region, China
   A TASTE BUD ORGANOID PLATFORM FOR TASTE EVALUATION: ADVANCING FOOD INNOVATION, NUTRITION, AND HEALTH (1267)

16.00 - 17.30 hrs Breakout 7

FOOD PROCESS AND ENGINEERING-18 : Functional Fermentation-01

Speakers & Titles

1. **Xin Wang**, College of Food Science, Sichuan Agricultural University, Ya'an 625014, China
   GENOMIC AND PHENOTYPIC ANALYSIS OF STRESS-TOLERANT, AROMA-PRODUCING YEAST SCREENED UNDER LOW-WATER ACTIVITY, LOW-MOISTURE CONTENT FOR LOW-SALT CHILI FERMENTATION (129)
2. **Minh Son Le**, Singapore Institute of Food and Biotechnology Innovation (SIFBI), Agency for Science, Technology, and Research (A*STAR), 31 Biopolis Way, Nanos, Singapore 138669, Singapore
   FUNGAL-FERMENTED OAT OKARA AS A FUNCTIONAL FOOD INGREDIENT: NUTRITIONAL, PHENOLIC, AND FUNCTIONAL IMPROVEMENTS (202)
3. **Claudia Lazarte**, Lund University, Sweden
   MICROBIAL FERMENTATION AS A STRATEGY TO ENHANCE BIOACTIVE COMPOUND BIOACCESSIBILITY AND INTESTINAL BARRIER FUNCTION IN YELLOW PEAS (239)
4. **Alejandra Hurtado-Romero**, Tecnologico de Monterrey, School of Engineering and Sciences
   FUNGAL FERMENTATION OF BLUEBERRY BAGASSE: EFFECTS OF SOLID-STATE AND SUBMERGED PROCESSES ON PHENOLIC RECOVERY AND BIOACTIVITY (360)
5. **Chenhan Geng**, Department of Food Science and Technology, National University of Singapore, Singapore, Singapore
   SYNERGISTIC ENZYMATIC HYDROLYSIS AND LACTIC ACID BACTERIA–YEAST CO-FERMENTATION ENHANCE NUTRITIONAL QUALITY, PROBIOTIC VIABILITY, AND FLAVOR ATTRIBUTES OF KOMBU (SACCHARINA JAPONICA) (442)
6. **MI KYEONG LEE**, Chungbuk National University
   FUNCTIONAL ENHANCEMENT OF ABALONE THROUGH MUSHROOM FERMENTATION (485)

16.00 - 17.30 hrs Breakout 8

AI, Data Science, and Digital Transformation in Food Systems-01 - Foodomics and Multi-Omics Approaches

Speakers & Titles

1 **Xuan Dong**, Food Science, School of Chemical Sciences, The University of Auckland, Auckland, 1010, New Zealand
TRANSLATING BULK PROTEIN INTO BIOACTIVE POTENTIAL: A MULTI-SCALE EXPLORATION BASED ON HEMPSEED (1228) YS

2 **Yuxing Ge**, Department of Food Science and Technology, National University of Singapore, 2 Science Drive 2, Singapore 117542, Singapore
BEYOND THE FIRST CUP: UNTARGETED METABOLOMICS REVEALS METABOLITE DEPLETION AND PERSISTENCE ACROSS MULTIPLE COFFEE BREWING CYCLES (144)

3. **Hang-kin Kong**, Research Institute for Future Food, The Hong Kong Polytechnic University
TOP-DOWN PROTEOMICS FOR PROTEOFORM CHARACTERIZATION IN FOOD PRODUCTS: APPLICATIONS IN ALLERGENICITY AND AUTHENTICATION (168)

4. **Qi Lu**, College of Biosystems Engineering and Food Science, Zhejiang University, Hangzhou, China
TEA POLYPHENOLS PRETREATMENT BALANCES SAFETY, NUTRITIONAL VALUE, AND FLAVOR OF POTATO CHIPS BY REGULATING MAILLARD REACTION: A FOODOMICS STUDY (503)

5. **Sonal Aggarwal**, DEPARTMENT OF FOOD SCIENCE & TECHNOLOGY, GRAPHIC ERA (DEEMED TO BE) UNIVERSITY, DEHRADUN-248002, UTTARAKHAND, INDIA
IMPACT OF DIFFERENT ROASTING TECHNIQUES ON NUTRIENT RETENTION AND METABOLOMIC PROFILING OF INDIAN PIGMENTED AND NON-PIGMENTED RICE LANDRACES (526)

6. **Jonel Saludes**, Kasanggang NICER in Functional Food Excellence (KNIF2E) Laboratory, Center for Natural Drug Discovery and Development (CND3), and Department of Chemistry, University of San Agustin, Iloilo City, Philippines
BEYOND SWEET FLAVOR: METABOLOMIC PROFILING OF THE FUNCTIONAL COMPONENTS OF PHILIPPINE MUSCOVADO SUGAR (1175)

7. **Diane Monique Baladjay**, Kasanggang NICER in Functional Food Excellence (KNIF2E) Laboratory and Center for Natural Drug Discovery and Development (CND3), University of San Agustin, Iloilo City, Philippines
PROFILING OF WATER-SOLUBLE COMPONENTS OF EUPHORBIA HIRTA: INSIGHTS TOWARD NUTRACEUTICAL DEVELOPMENT (1197)

1600–1730 hrs Breakout 9

Food Quality Attributes: Chemistry and Sensory-13 -Color and Pigments in Food Systems

Speakers & Titles

1. **Zhou Lu**, National University of Singapore
PHOTOTHERMAL AND LUMINESCENT CHARACTERISTIC PIGMENT IN WUFAN FORMED FROM REACTION OF RICE AND VACCINIUM BRACTEATUM THUNB. LEAVES (633)

2. **Bjørn Tore Rotabakk**, Nofima AS – Norwegian Institute of Food Fisheries and Aquaculture Research, Muninbakken 9-13, Breivika, P.O. Box 6122, NO-9291, Tromsø, Norway
AN IMAGE-BASED CHROMATIC MELANOSIS VALUE FOR OBJECTIVE QUANTIFICATION OF BLUING IN SNOW CRAB (CHIONOECETES OPILIO) (742)

3. **Marie Bless Galang,** Department of Agri-Industries and Economics, College of Agriculture and Agri-Industries, Caraga State University, Ampayon, Butuan City, Agusan del Norte, Philippines
SHELF-LIFE PREDICTION AND DEGRADATION KINETICS OF ANTHOCYANINS IN OPTIMIZED PURPLE-FLESHED SWEET POTATO FLOUR (964)

4. **Sruthy G Nair**, PhD Scholar, Department of Food Packaging and Storage Technology, National Institute of Food Technology, Entrepreneurship, and Management -Thanjavur (NIFTEM-T), Thanjavur, India

SUSTAINABLE BIOPROCESSING OF NATURAL PIGMENTS VIA PULSED ELECTRIC FIELDS AND THEIR APPLICATION IN GREEN NANOTECHNOLOGY (1039)

Wednesday, 28 October 2026

0900–1030 hrs Breakout 1

Food Quality Attributes: Chemistry and Sensory-14 -Texture, Rheology and Material Properties of Foods-Texture of Foods-01

Speakers & Titles

1. **Felicia Z.W. Peh**, School of Food Technology and Natural Sciences, Massey University, Palmerston North, New Zealand
   INTERACTION BETWEEN NOVEL HYDROCOLLOIDS FROM INDIGENOUS NEW ZEALAND FERNS WITH K-CARRAGEENAN AND LOW-ACYL GELLAN GUM (120)
2. **Afsaneh Taheri**, Food, Chemical and Biotechnology Cluster, Singapore Institute of Technology, 1 Punggol Coast Road, Singapore, 828608
   FORMATION OF POROUS CHICKPEA PROTEIN GELS USING DIRECTIONAL FREEZING: EXPLORING THE GOVERNING PRINCIPLES FROM STRUCTURE-FUNCTION PERSPECTIVES (330)
3. **Jack Yang**, Wageningen University & Research
   A ROADMAP TO TECHNO-FUNCTIONALITY PREDICTION (343)
4. **Sze Ying Leong**, School of Biosciences, Faculty of Health and Medical Sciences, Taylor's University, Subang Jaya, Selangor, Malaysia
   ENZYMATIC STABILISATION OF FIBER-ENRICHED WHEAT BREAD SYSTEMS USING CARBOHYDRATE DEGRADING ENZYMES ON STRUCTURAL INTEGRITY (376)
5. **Jiaqi Mi**, Department of Food Science and Technology, National University of Singapore
   OPTIMISATION OF TEXTURE PROFILE ANALYSIS CONDITIONS FOR EARLY-STAGE CULTIVATED AND ALTERNATIVE MEAT PROTOTYPES (768)
6. **Swasti Mudgal**, Trans disciplinary University of Health Science and Technology
   DEVELOPMENT OF HIGH MOISTURE MEAT ANALOGUES FROM THE BLENDS OF LEGUME & CEREAL PROTEINS FOR IMPROVED TEXTURAL & NUTRITIONAL PROPERTIES (1318)

0900–1030 hrs Breakout 2

Food Quality Attributes: Chemistry and Sensory-15 -Texture, Rheology and Material Properties of Foods-Texture of Foods-02

Speakers & Titles

1. **Siavash Soltanahmadi**, School of Food Science and Nutrition, University of Leeds, Leeds, UK
   DECODING CHOCOLATE TEXTURE ACROSS SCALES VIA IN SITU TRIBOLOGY-MICROSCOPIC TECHNIQUES USING A BIOMIMETIC TONGUE (487)

2. **Siavash Soltanahmadi**, School of Food Science and Nutrition, University of Leeds, Leeds, UK
   A NOVEL SETUP MIMICKING ORAL PROCESSING AND THE HUMAN TONGUE FOR THE OBJECTIVE ASSESSMENT OF FOOD TEXTURE AND MOUTHFEEL: A PATHWAY TOWARDS SUSTAINABLE FOOD DEVELOPMENT (499)
3. **Erich Windhab**, CHoNova, ETH Zürich
   ULTRASOUND ATTENUATION SPECTROSCOPY FOR SMART INDUSTRIAL IN-LINE MONITORING AND CONTROL OF FOOD STRUCTURE FORMATION DYNAMICS (565)
4. **Thoithoi Tongbram**, Department of Food Engineering and Technology, School of Engineering, Tezpur University, Napaam, 784028, India
   SOLUBLE AMYLOSE CHAINS INHIBIT GELATINISATION AND RETROGRADATION IN WAXY CORN STARCH (685)
5. **Chan Xin Hui**, Singapore Institute of Technology, Health and Social Sciences Cluster, Singapore, Singapore
   INFLUENCE OF TEXTURE-MODIFIED CHICKEN ATTRIBUTES ON ELDERLY SENSORY PERCEPTION (691)
6. **Siyong You**, Department of Food Science and Technology, National University of Singapore, 2 Science Drive 2, 117542, Singapore
   TUNABLE RHEOLOGICAL PROPERTIES AND STABILITY OF PLANT PROTEIN–PERILLA OIL BIGELS AS BUTTER SUBSTITUTES FOR BREAD BAKING (480)

09.00 - 10.30 hrs Breakout 4

FOOD PROCESS AND ENGINEERING-19 -Traditional Foods for Future-03

Speakers & Titles

1. **Supuni Aluthge**, Department of Food Technology and Nutrition, School of Science, RMIT University, Bundoora West Campus, Plenty Road, Melbourne, VIC, 3083, Australia.
   GREEN WHEAT FREEKEH: FROM TRADITIONAL CEREAL TO SUSTAINABLE FUTURE FOOD - A COMPARATIVE EVALUATION OF NUTRITIONAL, FUNCTIONAL, AND PHYSICAL PROPERTIES ACROSS MULTIPLE CULTIVARS (422)
2. **Asif Ali Bhat**, Department of Seafood Science, College of Hydrosphere, National Kaohsiung. University of Science and Technology, Kaohsiung 81157, Taiwan
   ENHANCING THE PHYSICOCHEMICAL AND SENSORY PROPERTIES OF MERETRIX LUSORIA CLAM ESSENCE USING MICROBUBBLE-ASSISTED EXTRACTION: A NOVEL APPROACH TOWARD SUSTAINABLE NUTRACEUTICAL DEVELOPMENT (423)
3. **Qiaozhi Song**, Institute of Food Science and Technology CAAS
   METAGENOMICS AND VOLATILE METABOLOMICS REVEAL MICROBIAL SUCCESSION AND ITS CORRELATIONS WITH FRUITY FLAVOR VOLATILE COMPOUNDS DURING MIANHUA INDUSTRIAL PROCESSING (455)

4. **Shengliang Zhang**, Future Food Laboratory, Innovation Center of Yangtze River Delta, Zhejiang University, Jiaxing, China, Department of Food Science and Nutrition, Zhejiang University, Hangzhou, China
   A SCAFFOLD BASED ON UNCOATED RICE GRAINS INTEGRATED WITH PISCINE CELLS SUPPORTING THE PRODUCTION OF A SUSTAINABLE FOOD (505)

0900–1030 hrs Breakout 6

Food Quality Attributes: Chemistry and Sensory-16 -Texture, Rheology and Material Properties of Foods-Texture of Foods-03

Speakers & Titles

1. **Wen Wang**, Singapore Institute of Technology
   FROM SHAPE-CHANGING FOODS TO RESPONSIVE FOOD MATERIALS: TOWARDS PROGRAMMABLE TEXTURE EVOLUTION (920)
2. **Rohit Srivastava**, Université Bourgogne Europe, Institut Agro, CNRS, INRAE, UMR CSGA, 21000 Dijon, France
   UNDERSTANDING THE CONTROLLED ORAL BREAK-DOWN OF MEAT AND THEIR VEGETARIAN ANALOGUES- AN IN-VITRO APPROACH (935)
3. **Tzu Ling Tseng**, Food Science Department, Taiwan Ocean University, Keelung
   EFFECT OF CITRUS FIBER ON EMULSION STABILITY OF BATTER AND QUALITY OF DEEP-FRIED BREADED SHRIMP (1060)
4. **Adma Melo**, Universidade Católica Portuguesa, CBQF- Centro de Biotecnologia e Química Fina - Laboratório Associado, Escola Superior de Biotecnologia, Rua Diogo Botelho 1327, 4169-005 Porto, Portugal.
   TEXTURE, RHEOLOGY AND MICROBIOLOGICAL STABILITY OF A CLEAN-LABEL REDUCED-FAT DAIRY SPREAD (1275)

5 **Suzana Lannes**, School of Pharmaceutical Sciences / University of Sao Paulo
   FOOD MATRIX AND HYDRATION TIME MODULATE TEXTURE AND RHEOLOGY OF LIQUIDS THICKENED WITH XANTHAN GUM AND GUAR GUM (1302)

09.00 - 10.30 hrs Breakout 7 & 8

FOOD PROCESS AND ENGINEERING-20 -Advanced Food Preservation and Processing Technologies

Speakers & Titles

1. **Lisa Gotzmann**, University of Copenhagen
   TARGETED PHENOLICS REMOVAL FROM RAPESEED MODEL SOLUTIONS USING ELECTRODIALYSIS (488)
2. **Mario Pérez-Won**, University of Bío-Bío
   ULTRASONIC AGGLOMERATION IN A DRY FOOD MATRIX BASED ON

DURVILLAEA ANTARCTICA AND ARTHROSPIRA PLATENSIS: KINETIC STUDY, SUSTAINABILITY,

3. **Filiz Koksel**, University of Manitoba
STRUCTURE–FUNCTION RELATIONSHIPS IN EXTRUDED FABA BEAN PROTEINS FOR MEAT ALTERNATIVE APPLICATIONS (105)

4. **Eiselle Joyce Hidalgo** The Graduate School, University of Santo Tomas

ELECTRON BEAM IRRADIATION INDUCES DOSE-DEPENDENT STRUCTURAL AND BIOFUNCTIONAL CHANGES IN ADLAY (COIX LACHRYMA JOBI L.) BRAN: EVIDENCE FOR A 7.5 KGY THRESHOLD(649)

09.00 - 10.30 hrs Breakout 9

Sustainable Food Systems and Global Food Security-04 -Circular Economy and Zero Waste Approaches-02

Speakers & Titles

1. **Soudabeh Ghalamara**, Food Chemistry and Technology Department, Teagasc Food Research Centre, Ashtown, Dublin, D15 DY05, Ireland
SUSTAINABLE ZERO-WASTE BIOREFINERY FOR BOARFISH VALORISATION (282)
2. **Gayatri Mishra**, Indian Institute of Technology Kharagpur
PROCESS OPTIMIZATION OF SUPRAMOLECULAR SOLVENT–ASSISTED PHENOLIC COMPOUNDS EXTRACTION FROM ONION PEEL (326)
3. **Xiaofang Xie**, National University of Singapore
VALORIZATION OF FOOD SIDE STREAMS AS SUSTAINABLE SERUM REPLACEMENTS FOR CULTIVATED MEAT CULTURE MEDIA (435)
4. **Wei Liao**, Michigan State University
A FOOD-ENERGY-WATER NEXUS SOLUTION TOWARDS A SUSTAINABLE AND RESILIENT EUROPE (554)
5. **Nora Alhulaimi**, University of Alberta, Edmonton, AB, Canada.
BETALAIN EXTRACTION FROM RED BEET POMACE: ULTRASOUND VS PRESSURIZED FLUIDS (593)
6. **Willis Owino**, Jomo Kenyatta University of Agriculture and Technology, Kenya Advanced Institute of Science and Technology
INFLUENCE OF PHYSICAL MODIFICATION ON THE FUNCTIONAL PROPERTIES OF MANGO KERNEL STARCH (681)
7. **Fatma Laili Khoirunnida**, Department of Food Science, National Chiayi University, Chiayi City, Chinese Taipei

VALORIZATION OF IMMATURE CITRUS BYPRODUCTS: COMPARATIVE ANALYSIS OF PHYTOCHEMICAL PROFILES AND ANTIOXIDANT CAPACITIES OF TANKAN, MURCOTT, AND KOTOKAN DURING FRUIT MATURATION (765)

09.00 - 10.30 hrs Breakout 10

Food Packaging Innovations and Environmental Impact-01 - Intelligent and Smart Packaging

Speakers & Titles

1. **Xiaoxue Jia**, Institute of Food Science and Technology, Chinese Academy of Agricultural Sciences
   AI-ENABLED DYNAMIC CATECHOL–BORONATE POLYSACCHARIDE FILMS FOR ADAPTIVE FRUIT PRESERVATION (176)
2. **Guo Li**, College of Biosystems Engineering and Food Science, Zhejiang University
   A BISTABLE PHASE-CHANGE ACTUATED CUSHIONING PACKAGING SYSTEM ENABLING SELF-ADAPTIVE WRAPPING OF FRESH PRODUCE (475)
3. **Xiaoyu Luo**, Beijing Normal-Hong Kong Baptist University
   DEVELOPMENT OF COMPOSITE COLORIMETRIC INDICATORS BY PIEZOELECTRIC INKJET PRINTING FOR MONITORING PRODUCT FRESHNESS DURING PROLONGED STORAGE (569)
4. **Bo Pang**, National University of Singapore
   ACTIVE CHITIN EUTECTOGELS FROM SOLVENT-DIRECTED RECONSTRUCTION FOR SUSTAINABLE FOOD PACKAGING (1070)
5. **Yuyang Zhang**, School of Food Science and Engineering, South China University of Technology; Academy of Contemporary Food Engineering, SCUT; Guangdong Engineering and Technological Research Centre for Intelligent Sensing and Process Control of Cold Chain Foods, China
   MECHANISM OF COLD PLASMA-INDUCED CELLULOSE-BASED HYDROGEL COUPLED WITH GRAPHENE OXIDE FOR INTELLIGENT REGULATION OF FRUIT AND VEGETABLE PACKAGING HUMIDITY (1082)

11.00 - 12.30 hrs Breakout 1

Food Safety , Quality, and Risk Communication -05 —Safety Regulations & Global Harmonization

Speakers & Titles

1. **Adewale Olusegun Obadina**, Federal University of Agriculture, Abeokuta,
   BRIDGING REGULATORY GAPS IN INFORMAL FOOD SYSTEMS: FOOD SAFETY AND ANTIMICROBIAL RESISTANCE CHALLENGES TO GLOBAL HARMONIZATION IN AFRICA (75)
2. **Christelle Bou Mitri**, Notre-Dame University Louaize, Lebanon
   OCCURRENCE AND EXPOSURE ASSESSMENT OF GLYPHOSATE RESIDUES IN CORNFLAKES FROM LEBANON AND THE UNITED ARAB EMIRATES (127)
3. **Hussein Hassan**, Lebanese American University, Lebanon
   DIETARY EXPOSURE TO GLYPHOSATE FROM BREAKFAST CEREALS

AND SNACKS AMONG LEBANESE CHILDREN AND ADOLESCENTS (128)

4. **Liu WANG**, State Key Laboratory for Quality and Safety of Agro-products; Institute of Agro-product Safety and Nutrition, Zhejiang Academy of Agricultural Sciences, Hangzhou 310021, China
PERFORMANCE EVALUATION AND QUALITY MANAGEMENT OF COMMERCIALLY AVAILABLE COLLOIDAL GOLD TEST STRIPS FOR THE DETECTION OF PESTICIDE AND VETERINARY DRUG RESIDUES IN AGRICULTURAL PRODUCTS (181)

5. **Hang Yu**, Jiangnan University
MECHANOSENSITIVE CHANNEL (MS) PROTEINS AS POTENTIAL TARGETS FOR FOODBORNE PSEUDOMONAS FLUORESCENS CONTROL: ULTRASOUND ACTIVE MS PROTEINS AND TRANSPORT VANILLIN CROSS MEMBRANE (136)

11.00–12.30 hrs Breakout 3

Food Attributes: Chemistry and Sensory-17 -Texture, Rheology and Material Properties of Foods-Rheology of Foods

Speakers & Titles

1. **Muneeba Zubair Alam**, UNITED ARAB EMIRATES UNIVERSITY
HYDROCOLLOID-STABILISED CAMEL MILK ACID GELS (137)

2 **Maria Garofalo**, Department of Food and Human Nutritional Sciences. University of Manitoba. Winnipeg. Canada
IMPACT OF SALIVARY A-AMYLASE, BOTANICAL ORIGIN, AND RETROGRADATION IN STARCH GEL BREAKDOWN DURING ORAL SIMULATION (347)

3. **Fengwei Xie**, College of Food Science, Southwest University, Chongqing 400715, China
FROM WASTE TO PRINT: UNLOCKING THE MULTI-SCALE STRUCTURAL SECRETS OF NON-CONVENTIONAL STARCHES FOR HIGH-PRECISION, HEALTH-FOCUSED 3D FOOD PRINTING (456)

4 **Wenqing Yang**, Department of Food Science and Technology, National University of Singapore, 2 Science Drive 2, Singapore 117542
CHARACTERIZATIONS OF B-GLUCAN FROM BLACK GLUTINOUS HIGHLAND BARLEY AND ITS USE IN HIGH INTERNAL PHASE EMULSION SYSTEMS (513)

5. **Swasti Mudgal**, trans disciplinary university of health science and technology
ENHANCING JUICINESS AND MEAT-LIKE TEXTURE IN HIGH-MOISTURE MEAT ANALOGUES: EFFECTS OF EDIBLE OIL TYPE AND INCLUSION LEVEL (1185)

11.00 - 10.30 hrs Breakout 4

FOOD PROCESS AND ENGINEERING-21: Delivery Systems 02

Speakers & Titles

1. **Derossi Antonio**, Department of Agriculture, Food, Natural resources and Engineering, University of Foggia, Via Napoli 25, 71122, Foggia, Italy
   COOKING-TRIGGERED MORPHING OF CEREAL-BASED FOODS AS A DIGITAL STRATEGY FOR FUTURE SUSTAINABLE FOOD DESIGN (697)
2. **Jose Martin Ramos Diaz**, Natural Resources Institute Finland
   REVALORIZING CATTLE INDUSTRY BY-PRODUCTS: DEVELOPING HYBRID MEAT ANALOGUES VIA MULTI-SCREW EXTRUSION (749)
3. **Shingo Matsukawa**, Tokyo University of Marine Science and Technology
   ENCAPSULATION OF WATER-SOLUBLE COMPONENTS BY OIL FILMS (792)
4. **Yue Zhang**, School of Food Science and Biotechnology, Zhejiang Gongshang University.
   TRANSFORMING SPENT COFFEE GROUNDS INTO MULTIFUNCTIONAL INGREDIENTS: INTEGRATED DEVELOPMENT OF POLYSACCHARIDE–PROTEIN COMPOSITE CARRIERS AND PHENOLIC-BASED BIOACTIVES (1047)
5. **Talita Souza Carmo**, Institute of Biological Sciences, University of Brasilia
   IMPROVING VANILLA CURING PROCESSES TO SUPPORT QUALITY, SUSTAINABILITY, AND ENTRY INTO HIGH VALUE INGREDIENT MARKETS (1113)

11.00 - 12.30 hrs Breakout 5

Sustainable Food Systems and Global Food Security-05 Track Theme: Sustainable Food Systems and Global Food Security-Circular Economy and Zero waste Approaches-03

Speakers & Titles

1. **Shubham Nimbkar**, Department of Food Process Engineering, National Institute of Technology Rourkela, Odisha, India
   Impact of spray and freeze drying on physicochemical and functional characteristics of encapsulated custard apple peel extract: A waste valorization study (429) YS
2. **Byron Perez**, Sustainable Food Processing, ETH Zurich
   Microalgae biorefineries for sustainable food systems: circular cultivation, energy-efficient processing, and scalable downstream integration (1212) YS
3. **Mary Angela Janelle Cancio**, Department of Food Science and Nutrition, College of Home Economics, University of the Philippines Diliman
   MICROBIAL SAFETY AND QUALITY OF SELECTED FOODS FROM PACKAGE-FREE STORES (756)

4. **Erich Windhab**, CHoNova AG, ETH-Zürich
VALORISATION OF COCOA POD SIDE STREAMS TO IMPROVE NUTRITIONAL, SUSTAINABILITY AND ECONOMIC ASPECTS OF CHOCOLATE CONFECTIONERY (813)
5. **Petras Rimantas Venskutonis**, Kaunas University of Technology, Department of Food Science and Technology, Kaunas, Lithuania
INCREASING THE SUSTAINABILITY OF THE SMALL FRUIT SECTOR: INNOVATIVE PROCESSING USING A ZERO-WASTE APPROACH (908)
6. **Casiana Blanca Villarino**, Food Application and Sensory Laboratory, Department of Food Science and Nutrition, College of Home Economics, University of the Philippines-Diliman
EFFECTS OF COCONUT-CHICKPEA PROTEIN RATIO ON THE PHYSICO-CHEMICAL PROPERTIES OF A NOVEL HYBRID PLANT-BASED MILK ALTERNATIVE (949)
7. **Casiana Blanca Villarino**, Food Application and Sensory Laboratory, Department of Food Science and Nutrition, College of Home Economics, University of the Philippines-Diliman
ZERO WASTE VIRGIN COCONUT OIL PROCESSING THROUGH UPCYCLING (VC0-UP): A BIOCIRCULAR ECONOMY FRAMEWORK (980)

11.00 - 12.30 hrs Breakout 6

Nutrition, Policy, Classification, and Public Health-01 —Dietary Guidelines and Public Health Nutrition

Speakers & Titles

1. **Alia Shareef**, Griffith University
QUANTIFYING THE MAGNITUDE OF TAS2R38-MEDIATED BITTER SENSITIVITY IN SHAPING ADULT DIET QUALITY AND EATING BEHAVIOUR: EVIDENCE FROM A 407-PARTICIPANT AUSTRALIAN COHORT (17)
2. **Pengkun Song**, National Institute for Nutrition and Health, Chinese Center for Disease Control and Prevention & Chinese Academy of Preventive Medicine, Beijing, China
FORTY-YEAR TRANSITION OF ELDERLY NUTRITIONAL HEALTH AND ADVANCEMENT OF ELDERLY-FRIENDLY FOOD INDUSTRY IN CHINA (981)
3. **Elina Muhomba**, School of Biological and Environmental Sciences, University of Nottingham Malaysia, Jalan Broga, 43500, Semenyih, Selangor, Malaysia
ASSOCIATION OF FOOD ENVIRONMENT AND HYPERTENSION RISK FACTORS IN DAR ES SALAAM, TANZANIA (1134)

11.00 - 12.30 hrs Breakout 7 & 8

FOOD PROCESS AND ENGINEERING-22 -Functional Fermentation-02

Speakers & Titles

1. **Zhaoxiang Ma**, Research Center of Food Colloids and Delivery of Functionality, College of Food Science and Nutritional Engineering, China Agricultural University, Beijing, 100083, China.
   INSIGHTS FROM PULSED ELECTRIC FIELD-INDUCED RECONSTRUCTION AND SINGLE-DROPLET MICROFLUIDIC ANALYSIS. (534)
2. **Shubham Mandliya**, Department of Food and Nutritional Sciences, University of Reading, Reading, United Kingdom
   SOLID-STATE FERMENTATION OF PLANT-BASED INGREDIENTS AS SUBSTRATES USING LACTIPLANTIBACILLUS PLANTARUM: GROWTH KINETICS AND TECHNO-FUNCTIONAL PROPERTIES (785)
3. **Larry Ekundayo**, Department of Food Engineering, University of Ilorin, Ilorin, Nigeria
   PRO-ALM OGI: DEVELOPMENT OF AN INSTANT FERMENTED MAIZE–MILLET–ALMOND BREAKFAST MIX FOR IMPROVED NUTRITION, CONVENIENCE, AND SHELF STABILITY (1112)
4. **Stella Green**, University of Otago, Department of Food Science, Dunedin, New Zealand
   METABOLIC EVOLUTION IN OAT SOLID-STATE FERMENTATION: INSIGHTS FROM PROTON NUCLEAR MAGNETIC RESONANCE AND MACHINE LEARNING (1259)

11.00 - 12.30 hrs Breakout 9

FOOD PROCESS AND ENGINEERING-23

Speakers & Titles

1. **MERCY MMARI**, The Open University of Tanzania
   INDIGENOUS KNOWLEDGE, PROCESSING PRACTICES, AND FOOD SAFETY OF EDIBLE INSECTS IN TANZANIA (918)
2. **Kézia dos Santos Menezes**, Institute of Biological Sciences, University of Brasilia
   INNOVATIVE EXTRACTION AND MICROENCAPSULATION STRATEGIES FOR HIGH-QUALITY SOLUBLE COFFEE PRODUCTION (1107)
3. **Yan Kong**, National University of Singapore (Suzhou) Research Institute
   MOLECULAR DESIGN AND MULTI-DIMENSIONAL VALORIZATION OF PUMPKIN SEED PROTEIN: A VERSATILE PLATFORM FOR NEXT-GENERATION ALTERNATIVE PROTEIN SYSTEMS (1174)

1100–1230 hrs Breakout 10

Food Attributes: Chemistry and Sensory-18 -Texture, Rheology and Material Properties of Foods-Rheology of Foods

Speakers & Titles

1. **Rossella Caporizzi**, Department of Agriculture, Food, Natural resources and Engineering, University of Foggia, Via Napoli 25, 71122, Foggia, Italy
   DECODING AND PROGRAMMING CRUNCHINESS THROUGH FORCE–SOUND ANALYSIS AND 3D PRINTED FOOD ARCHITECTURES (699)
2. **Manon Serval**, Qualisud, Université de Montpellier, Avignon Université, CIRAD, Institut Agro, IRD, Université de La Réunion, Montpellier, France
   REVEALING STARCH FUNCTIONALITY THROUGH PECTIN DECONSTRUCTION: TOWARD RHEOPHYSICAL CONTROL AND VALORIZATION OF GREEN MANGO PURÉES (717)
3. **Md Abid Hasan Sarker**, School of Science, STEM College, RMIT University, Melbourne, VIC 3083, Australia
   PLANT-DAIRY HYBRID CHEDDAR TYPE CHEESE GELS: INFLUENCE OF PROTEIN SOURCE AND HEAT-TREATMENT AND MICROBIAL TRANSGLUTAMINASE CROSSLINKING (720)
4. **Chenxi Wang**, Food Colloids and Bioprocessing Group, School of Food Science and Nutrition, University of Leeds, UK
   MICROSTRUCTURE-DEPENDENT MIXED-LUBRICATION BEHAVIOUR OF WHEY PROTEIN-STABILISED WATER-IN-WATER EMULSIONS UNDER SOFT CONTACTS (855)
5. **Xinran Liu**, Singapore Institute of Technology, Health and Social Sciences cluster, Singapore, Singapore
   FROM FLUID TO SPOONABLE GEL: SHEAR-INDUCED STRUCTURING OF HIGH-ACYL GELLAN FOR ADAPTIVE FOOD TEXTURES (907)
6. **K Sandhya**, Department of Food Process Engineering National Institute of Food Technology, Entrepreneurship and Management – Thanjavur Ministry of Food Processing Industries, Government of India Thanjavur – 613005, Tamil Nadu, India
   A COMPARATIVE STUDY ON THE INFLUENCE OF DIFFERENT POST-PROCESS THERMAL TREATMENTS ON THE STABILITY OF SUNFLOWER WAX-BASED OLEOGELS (1063)

14.00 - 15.30 hrs Plenary

FOOD PROCESS AND ENGINEERING-24 : Application of Ultrasound, Electromagnetic etc-02

Speakers & Titles

1. **Rahul Biswas**, Department of Separation Science, LUT School of Engineering Sciences, Lappeenranta-Lahti University of Technology LUT, Kauppalankatu 13, FI-45100 Kouvola, Finland
   IDENTIFYING A PHYSICOCHEMICAL WINDOW FOR SUSTAINABLE

PROTEIN RECOVERY FROM BARLEY AND DEFATTED OAT USING ULTRASOUND-ASSISTED DEEP EUTECTIC SOLVENTS (992)

2. **Marina Stramarkou**, Teagasc Food Research Centre, Ashtown, Dublin, D15 DY05, Ireland
ULTRASOUND-ASSISTED FISH OIL EMULSIONS LINKING FORMULATION, STABILITY, AND IN VITRO DIGESTION (1011)

3. **ESAULOVA OLGA**, Federal Scientific Center of Hygiene named after F.F. Erisman of Rospotrebnadzor
RADURIZATION: A DIGITAL SYSTEM FOR REMOTE MONITORING AND TRACEABILITY IN FOOD IRRADIATION (956)

4. **Pranav Deevi**, United Graduate School of Agricultural Sciences, Gifu University, 1-1 Yanagido, Gifu, 501-1193, Japan
QUANTITATIVE CHARACTERIZATION OF MICROSTRUCTURAL CHANGES ASSOCIATED WITH MICROWAVE VACUUM DEHYDROFREEZING THROUGH ELECTRICAL IMPEDANCE SPECTROSCOPY AND X-RAY MICROTOMOGRAPHY (1250)

5. **Vinutha B N**, Ph.D. (Food Technology) in Food Process Engineering, National Institute of Food Technology, Entrepreneurship and Management (NIFTEM-T), Thanjavur, Tamil Nadu, India- 613005
RADIO FREQUENCY TREATMENT AS A POTENTIAL ALTERNATIVE TO ETHYLENE OXIDE STERILIZATION FOR ENHANCING THE MICROBIAL SAFETY AND QUALITY OF WHITE PEPPER AND TURMERIC POWDER (1278)

6. **Teppei Imaizumi**, Gifu University
VACUUM-MICROWAVE DRYING ENHANCES PORE FORMATION AND REDUCES OFF-FLAVOR COMPOUNDS IN EDIBLE CRICKETS. (893)

1400–1530 hrs Breakout 1

Food Attributes: Chemistry and Sensory-19 -Texture, Rheology and Material Properties of Foods-Rheology of Foods

Chairs:

Speakers & Titles

1. **Song Miao**, Joint Research Centre for Food Materials Science and Structure Design, Fujian Agriculture and Forestry University, Fuzhou, China
ENGINEERING HYBRID PLANT–DAIRY PROTEIN GELS FOR SUSTAINABLE FOOD SYSTEMS: INSIGHTS INTO STRUCTURE–FUNCTION RELATIONSHIPS AND PROTEIN REPLACEMENT STRATEGIES (1001)

2. **Riane Yeo**, Singapore Institute of Technology
SHEAR-INDUCED STRUCTURING OF GELLAN GUM: INFLUENCE OF MOLECULAR STRUCTURE AND CONDITIONS (1003)

3. **Ruojun Mu**, College of Food Science, Fujian Agriculture and Forestry University, Fuzhou 350002, China.
MECHANISMS OF POLYSACCHARIDE-DRIVEN LUBRICATION: A

RHEOLOGICAL AND TRIBOLOGICAL EVALUATION IN SIMULATED ORAL ENVIRONMENTS (1043)

4. **Afif Aziz Daffa Alauddin**, Department of Smart Green Technology Engineering, Pukyong National University.
ENHANCING 3D PRINTING PERFORMANCE VIA CONJUGATION OF SOY PROTEIN ISOLATE AND HIGH-METHOXYL PECTIN (1076)

5. **Chamodini Thilakarathna**, Department of Food Science and Technology, Faculty of Applied Sciences, Sabaragamuwa University of Sri Lanka
FROM FOREST SEED TO CHOCOLATE BAR: EXTRACTION AND MODIFICATION OF MAHUA OIL AS A SUSTAINABLE COCOA BUTTER EQUIVALENT (1137)

14.00 - 15.30 hrs Breakout 2

Functional Foods, Bioactives, and Health Promotion-10 -Functional foods and Supplements: Safety & Health Outcomes-Microbiome

Speakers & Titles

1. **Jingru Zhuang**, the Chinese University of Hong Kong
COMPARING STRUCTURALLY DIFFERENT DIETARY FIBERS IN REVERSING SUCRALOSE-INDUCED MICROBIOTA DYSBIOSIS (599)

2. **Yan Qin Tan**, Beijing Normal-Hong Kong Baptist University, Zhuhai, China
NICOTINATE–NAD^+ AXIS MEDIATES THE ANTI-STEATOTIC ACTION OF LACTOBACILLUS GASSERI (299)

3. **Wonpyo Lee**, Department of Food and Biotechnology, Korea University, Sejong 30019, Republic of Korea
PREVENTIVE EFFECTS OF PARA-PROBIOTIC LACTIPLANTIBACILLUS PLANTARUM HY7714 IN AN ULTRAVIOLET B-INDUCED SKIN PHOTOAGING MOUSE MODEL (1052)

4. **Seong Hun Ju**, Department of Integrated Biomedical & Life Sciences, Korea University
MICROBIOME METABOLITES, TAURINE- AND GLYCINE-CONJUGATED DEOXYCHOLIC ACIDS, MITIGATES OBESITY (1345)

5. **Zengfeng Zhang**, School of Agriculture and Biology, State Key Lab of Microbial Metabolism, Shanghai Jiao Tong University, Shanghai, China
P1-LIKE PHAGE-PLASMIDS DRIVE BLACTX-M-27 TRANSMISSION THROUGH LYSOGENIC CONVERSION AND TRANSPOSITION (1202)

6. **Lin Chen**, Nanyang Technological University
HOST-PHAGE CO-EVOLUTION AND RESISTANCE TRADE-OFFS: INSIGHTS FOR SUSTAINABLE FOOD BIOCONTROL APPLICATIONS (529)

7. **Bijie Wang**, Department of Food Science and Nutrition, Zhejiang University, Hangzhou, Zhejiang, 310058, P. R. China
SPORE-EMBEDDED SCAFFOLDS FOR ENHANCED MASS TRANSPORT AND PROGRAMMABLE BIOMANUFACTURING (500)

14.00 - 15.30 hrs Breakout 4

Food Safety , Quality, and Risk Communication -06 —Safety Regulations & Global Harmonization

Chairs:

Speakers & Titles

1. **Xiangyu Sun**, College of Enology, Northwest A&F University, Yangling, China
   IMPACT OF COPPER ION CONCENTRATIONS ON FLAVOR QUALITY FROM GRAPES TO WINE (297)
2. **Denghui Meng**, College of Biosystems Engineering and Food Science, Zhejiang University, Hangzhou, Zhejiang, China.
   ASSOCIATION OF EXPOSURE TO SELECTED CHEMICAL CONTAMINANTS WITH DIABETES MELLITUS IN CHINESE ADULTS: MIXTURE ASSOCIATIONS AND METABOLIC MEDIATION IN THE PRECISION NUTRITION AND FOOD SAFETY STUDY (527)
3. **M. Loganathan**, Department of Food Packaging and Storage Technology, National Institute of Food Technology, Entrepreneurship and Management, Thanjavur (NIFTEM-T), Tamil Nadu, India
   STUDY ON THE THERMO-OXIDATION COMPOUNDS FORMED DURING CONTINUOUS DEEP FRYING OF PALM OLEIN: AN EMERGING FOOD SAFETY CONCERN (1062)

14.00 - 15.30 hrs Breakout 5

Functional Foods, Bioactives, and Health Promotion-11 -Functional foods and Supplements: Safety & Health Outcomes-Integration of Food Science, Nutrition, Pharmacology, Biotechnology, and Toxicology

Speakers & Titles

1. **Simon Lee,** Department of Food Science and Nutrition, The Hong Kong Polytechnic University, Hung Hom, Hong Kong, China
   HARNESSING NATURAL BIOACTIVE MOLECULES FOR BRAIN HEALTH, (1188)
2. **Nicole Min Yee Wong**, National University of Singapore, Department of Food Science and Technology, Singapore
   PLASMA METABOLOMICS IDENTIFIES METABOLITE MEDIATORS LINKING PROTEIN INTAKE TO CARDIOMETABOLIC RISK FACTORS IN SINGAPORE ADULTS (970)
3. **Yidan He,** School of Agriculture, Food and Ecosystem Sciences, Faculty of Science, the University of Melbourne, Melbourne, Victoria, Australia
   ANTI-INFLAMMATORY AND ANTIOXIDANT EFFECTS OF KAKADU PLUM (TERMINALIA FERDINANDIANA) EXTRACT ON CANINE INTESTINAL EPITHELIAL CELLS (478)
4. **YOU-YOUNG JO**, Industrial Entomology Division, Department of Agricultural Biology
   PHYSIOLOGICAL ACTIVITIES OF SIX TYPES OF INSECT-DERIVED OILS (260)

5. **Yuxing Ge**, Department of Food Science and Technology, National University of Singapore, 2 Science Drive 2, Singapore 117542, Singapore
DIGESTIVE ENZYME INHIBITORY POTENCY AND GASTROINTESTINAL FATE OF SPENT COFFEE GROUND-DERIVED CHLOROGENIC ACIDS AS MODULATED BY MANNOOLIGOSACCHARIDES (146)
6. **Jiang Yu Li,** Department of Food and Biotechnology, Korea University, Korea,
ANTI-PHOTOAGING EFFECTS AND STRUCTURAL FEATURES OF AN EXOPOLYSACCHARIDE FROM LIMOSILACTOBACILLUS FERMENTUM FB10(1268)

14.00 - 15.30 hrs Breakout 6

AI, Data Science, and Digital Transformation in Food Systems-04 - AI-driven analysis of food consumption and innovation

Speakers & Titles

1. **Peihua Ma**, Institute of Food Science and Technology, China Academy of Agricultural Sciences, Beijing, China.
VIBE RESEARCHING: AI-BASED ONE PERSON FOOD LAB (229)
2. **Yushan Xie**, College of Food Science, Shenyang Agricultural University
LLM-ASSISTED FORMULATION DESIGN OF INSTANT RICE: A KNOWLEDGE-GROUNDED APPROACH FOR HIGH-REHYDRATION PRODUCT DEVELOPMENT (379)
3. **Mei Yen Chan**, School of Medicine, Nazarbayev University
A NEURO-SYMBOLIC HYBRID MODEL FOR PERSONALIZED NUTRITION (1293)
4. **Zhuldyz Omarova**, Nazarbayev University, School of Medicine, Department of Biomedical Sciences, Astana, Kazakhstan
THE CENTRAL ASIAN FOOD DATASET: A DIGITAL ATLAS FOR AUTOMATED NUTRITIONAL SURVEILLANCE (1297)

14.00 - 15.30 hrs Breakout 9

FOOD PROCESS AND ENGINEERING-25 - Nano Delivery Systems

Speakers & Titles

1. **Michael Oke**, Michael Adedotun Oke Foundation / Federal Capital Territory Agricultural Development Program
POTATO PARTNERSHIPS AND PRIVATE SECTOR INVESTMENT IN ENHANCED BAGGING AND DISTRIBUTION SYSTEMS: A CASE STUDY OF ABUJA, NIGERIA (849)
2. **Jiangtao Zhou**, Department of Food Science and Technology, National University of Singapore, 2 Science Drive 2, 117542, Singapore
FOOD PROTEIN NANOFIBRILS FOR THE DESIGN OF SUSTAINABLE FOOD SYSTEMS, NUTRITION AND DRUG DELIVERY (9)

3. **Yanan Wu**, School of Food Science and Engineering, South China University of Technology, Guangzhou, Guangdong, China.
NANOLIPOSOME ENCAPSULATION OF SARGASSUM FUSIFORME POLYSACCHARIDES FOR ENHANCED BIOAVAILABILITY AND FUNCTIONAL SKIN PROTECTION (1120)
4. **Abdur Rehman**, Food Chemistry and Technology Department, Teagasc Food Research Centre, Moorepark, Fermoy, Co. Cork P61 C996, Ireland
ULTRASOUND-ASSISTED SOY PROTEIN ISOLATE/PURITY GUM ULTRA COMPLEX NANOPARTICLES FOR CONTROLLED DELIVERY OF BORAGE SEED OIL AND PEPPERMINT OIL BLENDS (1022)
5. **Kishanthini Kailaivasan**, Department of Food Science and Technology, Faculty of Livestock, Fisheries and Nutrition, Wayamba University of Sri Lanka, Makandura, Sri Lanka.
PRODUCTION AND CHARACTERIZATION OF LIQUID SMOKE FROM LIGNOCELLULOSIC BIOMASS USING A COMPACT FOOD-GRADE PYROLYSIS REACTOR (544)

14.00 - 15.30 hrs Breakout 10 (28)

FOOD PROCESS AND ENGINEERING-09 -Advanced Food Preservation and Processing Technologies - Food Preservation-01

Speakers & Titles

1. **Ivy Chiu**, University of British Columbia
SELF-ASSEMBLED METAL–PHENOLIC–AGAR MICROPARTICLE COATING FOR FRESH PRODUCE PRESERVATION (41)
2. **Layal Karam**, Qatar University
SUSTAINABLE CAMEL MEAT PRESERVATION USING INDIVIDUAL AND SYNERGISTIC ESSENTIAL OIL BIOACTIVE COMPOUNDS AGAINST LISTERIA MONOCYTOGENES (78)
3. **Hang-kin Kong**, Research Institute for Future Food, The Hong Kong Polytechnic University
TOP-DOWN PROTEOMICS FOR PROTEOFORM CHARACTERIZATION IN FOOD PRODUCTS: APPLICATIONS IN ALLERGENICITY AND AUTHENTICATION (168)
4. **Yuni Kartika**, The United Graduate School of Agricultural Science, Gifu University, 1-1, Yanagido, Gifu-city, Gifu, 501-1193, Japan
OZONE PRESERVES POSTHARVEST QUALITY OF STRAWBERRY FRUIT BY STABILIZING MEMBRANE INTEGRITY AND MODULATING OXIDATIVE STRESS (169)
5. **Solène Morin**, Oniris UMR GEPEA CNRS 6144 44322 Nantes France, Sill Entreprises Raden 29860 Plouvien France
STERILISATION OF A LOW-ACID VEGETABLE SOUP: IMPACT OF STERILISING VALUE ON SENSORY AND NUTRITIONAL ATTRIBUTES (276)

16.00 - 17.30 hrs Plenary

Functional Foods, Bioactives, and Health Promotion-12 -Functional foods and Supplements: Safety & Health Outcomes-Integration of Food Science, Nutrition, Pharmacology, Biotechnology, and Toxicology

Speakers & Titles

1. **Yves José Souza-Santos**, Universidade de São Paulo
   BEYOND NUTRIENT LOSS: HOW PROCESSING MODULATES THE DIGESTIBILITY AND CITOTOCITY PROPERTIES IN A MODEL FOOD SYSTEM (1009)
2. **Ji-Sun Kim**, Department of Biotechnology, Graduate school of Biotechnology, Korea University, Seoul 02841, South Korea
   TARGETING OLFACTORY RECEPTOR 51E2 FOR COLORECTAL CANCER PREVENTION AND THERAPY (1348)
3. **Jiangtao Zhou**, Department of Food Science and Technology, National University of Singapore, 2 Science Drive 2, 117542, Singapore
   FOOD PROTEIN NANOFIBRILS FOR THE DESIGN OF SUSTAINABLE FOOD SYSTEMS, NUTRITION AND DRUG DELIVERY (9)
4. **Mei Yin Wang**, Singapore Institute of Technology
   DEVELOPMENT OF ENERGY DENSE, IDDSI COMPLIANT RICE PORRIDGE (237)

16.00 - 17.30 hrs Breakout 1

Functional Foods, Bioactives, and Health Promotion-13 -Functional Foods and Supplements: Safety & Health Outcomes-Synthetic Biology

Speakers & Titles

1. **LINGSHAN SU**, National University of Singapore
   NOVEL ENGINEERING APPROACHES TO SCAFFOLDING PROLAMINS FOR CULTIVATED MEAT PRODUCTION (177) YS
2. **Jiaqi Mi**, Department of Food Science and Technology, National University of Singapore
   BIOPROCESS OPTIMISATION OF SEEDING DENSITY AND MEDIA EXCHANGE FOR PORCINE SATELLITE CELL EXPANSION (757)
3. **Dimitris Charalampopoulos**, University of Reading
   PRODUCTION OF MICROBIAL ASTAXANTHIN FOR FOOD APPLICATIONS (112)
4. **Ji-Sum Kim**, A*STAR's Singapore Institute of Food and Biotechnology Innovation (SIFBI)
   DEVELOPMENT OF CHITOSAN–WHEAT PROTEIN SCAFFOLDS FOR BOVINE SATELLITE CELL CULTURE (1248)
5. **LINZHI JING**, Department of Food Science and Technology, NUS
   CEREAL PROLAMIN-BASED EDIBLE BIOMATERIALS FOR FUTURE FOOD APPLICATIONS (592)

16.00 - 17.30 hrs Breakout 2

Food Safety , Quality, and Risk Communication -07 —Risk Perception and Communication in Education and Microplastics & Nanomaterials in Food Systems

Speakers & Titles

1. **Bince Russo Crieta**, Global Health Program, College of Public Health, National Taiwan University
   GLOBAL OCHRATOXIN A OCCURRENCE IN FOODS: A PROBABILISTIC DIETARY RISK ASSESSMENT FOR RISK-BASED FOOD SAFETY MANAGEMENT (88)
2. **Jingo Hembram**, School of Oceanographic Studies, Jadavpur University, Kolkata, India
   HEAVY-METAL CONTAMINATION AND HUMAN HEALTH RISKS ASSOCIATED WITH CONSUMPTION OF MILK SHARK (RHIZOPRIONODON ACUTUS) FROM DIGHA, WEST BENGAL, INDIA Theme :Food Packaging Innovations and Environmental Impact Theme :Food Packaging Innovations and Environmental Impact (1065)

16.00 - 17.30 hrs Breakout 3

FOOD PROCESS AND ENGINEERING-26 Track Theme: Advanced Food Preservation and Processing Technologies

Speakers & Titles

1. **Lili Zhang**, Key Laboratory of Environmental Medicine and Engineering, Ministry of Education, and Department of Nutrition and Food Hygiene, School of Public Health, Southeast University, Nanjing, 210009, China
   DIELECTRIC BARRIER DISCHARGE COLD PLASMA ALLEVIATED THE IMMUNOREACTIVITY OF EGG WHITE PROTEINS WITH IMPROVED DIGESTIBILITY AND FUNCTIONAL PROPERTIES (910)
2. **Zhuorui Han**, Zhejiang University
   COLD PLASMA-INITIATED PREPARATION OF BAGASSE CELLULOSE POROUS HYDROGEL AND ITS APPLICATION IN FRUIT PRESERVATION (990)
3. **Ainifa Rehemanjiang**, Key Laboratory of Environmental Medicine and Engineering, Ministry of Education, and Department of Nutrition and Food Hygiene, School of Public Health, Southeast University, Nanjing, 210009, China
   EFFECTS OF COLD PLASMA PROCESSING ON THE IMMUNOREACTIVITY, STRUCTURE AND FUNCTIONAL PROPERTIES OF SILKWORM PUPA PROTEIN (1262)
4. **Heeba Shakeela**, Agro and Food Processing Technology Division, National Institute for Interdisciplinary Science and Technology (CSIR-NIIST), Thiruvananthapuram, Kerala, India; Academy of Scientific and Innovative Research (AcSIR), Ghaziabad- 201002, India.
   DESIGN AND DEVELOPMENT OF CUSTOMIZED LIPID POWDER FROM VIRGIN VEGETABLE OIL INDUSTRY BY-PRODUCTS FOR FUNCTIONAL FOOD APPLICATIONS (1312)

5. **Steffi Thomas,** Department of Food Science, University of Otago, Dunedin, New Zealand and New Zealand's Institute of Bioeconomy of science, Auckland, New Zealand
COLD ATMOSPHERIC PLASMA- UNLOCKING NEW APPROACHES FOR CONTAMINATION CONTROL IN CELLULAR AGRICULTURE (1086)

1600–1730 hrs Breakout 4

Food Attributes: Chemistry and Sensory-20 -Texture, Rheology and Material Properties of Foods-Rheology of Foods

Speakers & Titles

1. **Xue Dong**, School of Chemical Engineering, UNSW, Sydney, Australia
SALT-INDUCED MICROSTRUCTURING EFFECTS ON PLANT PROTEIN GEL PROPERTIES (110)
2. **Sajid Maqsood**, Department of Food Science, UAE University, Al Ain, UAE.
MECHANISTIC INSIGHTS AND NOVEL FORMULATION STRATEGIES FOR PEA-, CHICKPEA-, AND SOY PROTEIN-BASED HIGH-MOISTURE MEAT ANALOGUES (225)
3. **Takao NAGANO**, Department of Food Science, Faculty of Bioresources and Environmental Sciences, Ishikawa Prefectural University, Suematsu, Nonoichi, Ishikawa, Japan
UPCYCLING INSOLUBLE FIBER-RICH RESOURCES VIA WET-TYPE GRINDER: IMPROVEMENTS IN PHYSICOCHEMICAL PROPERTIES AND HEALTH FUNCTIONS IN FOOD SYSTEMS (242)
4. **Cheryl Kwoek Zhen Ng**, Food, Chemical and Biotechnology Cluster, Singapore Institute of Technology, 1 Punggol Coast Road, Singapore, 828608, Singapore
PHYSICOCHEMICAL PROPERTY CHARACTERIZATION AND FOODOMIC PROFILING OF CUPCAKES FORMULATED WITH OKARA (247)

16.00 - 17.30 hrs Breakout 5

Nutrition, Policy, Classification, and Public Health-02 —R&D Support for Nutrition and Function-Related Labelling and Claims, and Food Classification Systems for Health and Safety Communication

Speakers & Titles

1. **Alexander Mathys**, Sustainable Food Processing Laboratory, Institute of Food Nutrition and Health, Department of Health Sciences and Technology, ETH Zurich, Schmelzbergstrasse 9, Zurich, 8092, Switzerland
MICROALGAE AS MORE SUSTAINABLE AND AFFORDABLE MINERAL SOURCES FOR HUMAN NUTRITION AND HEALTH: BIOACCESSIBILITY AND BIOAVAILABILITY ASSESSMENT (284)
2. **Wieslaw Kopec**, Cedrob S.A. Poland
TECHNOLOGICAL DESIGN OF A CONVENIENCE FOOD PRODUCT WITH MEAT AND VEGETABLES TO MEET NUTRITIONAL CLAIMS REQUIREMENTS (1128)

3. **Lu Ying Khoo**, Department of Nutrition, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Serdang, Selangor, Malaysia
   NUTRITIONAL QUALITY AND MARKETING INDICATORS OF FOOD BARS IN MALAYSIA: CLASSIFICATION OF FOOD BAR CREDIBILITY USING THE WORLD HEALTH ORGANIZATION SOUTH EAST ASIA REGION NUTRIENT PROFILE MODEL (180)
4. **Yrjö H. Roos**, School of Food and Nutritional Sciences, University College Cork, Cork, Ireland
   FOOD PROCESSING LEVELS AND EXPOSURE-TO-FOOD-PROCESSING DESCRIPTORS IN THE NEW FOOD INTAKE CLASSIFICATION (889)
5. **Yuyang Yao**, School of Food and Health, Beijing Technology and Business University, 100048 Beijing, China
   FROM ULTRA-PROCESSED CONCEPT TO HEALTH-ORIENTED FOOD EVALUATION: A MATRIX–NUTRIENT INTERACTION FRAMEWORK (921)
6. **Mei Yen Chan**, School of Medicine, Nazarbayev University
   DEVELOPMENT OF FOOD-BASED DIETARY GUIDELINES FOR CENTRAL ASIA: A FRAMEWORK FOR REGIONAL NUTRITION RESILIENCE (1294)

16.00 - 17.30 hrs Breakout 6

FOOD PROCESS AND ENGINEERING-27 -Advanced Food Preservation and Processing Technologies

Speakers & Titles

1. **Rita Tay**, Singapore Institute of Technology
   PROCESS INTENSIFICATION OF CARROT SOFTENING USING PULSED ELECTRIC FIELD PRETREATMENT COMBINED WITH STEAMING FOR TEXTURE-MODIFIED FOODS (313)
2. **Arisa Thamsuaidee**, Elea Technology GmbH, National and Kapodistrian University of Athens
   ADVANCING THE QUALITY OF PLANT-BASED MILK ALTERNATIVES THROUGH PULSED ELECTRIC FIELD (PEF) PROCESSING (939)
3. **Mylene Ross Arcena**, Department of Food Science, University of Otago, Dunedin, New Zealand; Department of Science and Technology, Davao Region, Davao City, Philippines
   DO PEF-INDUCED COMPOSITIONAL DIFFERENCES PERSIST DURING STORAGE? INTEGRATED METABOLOMICS AND CHEMOMETRIC PROFILING OF BOTTLED MERLOT WINES FROM PEF-TREATED GRAPES (1081)
4. **Renjie Zhao**, Institute of Food Science and Technology, Chinese Academy of Agricultural Sciences, Integrated Laboratory of Potato Staple Food Processing Technology, Beijing 100193, P.R. China
   PULSED ELECTRIC FIELD ENABLES DUAL REGULATION OF FLAVOR FORMATION AND HAZARDOUS COMPOUND MITIGATION IN FRIED POTATO (1299)

5. **Habiba Shah**, Food Science laboratory, School of Public Health, Dow University of Health Sciences, Karachi-75270, Pakistan
EVALUATION OF WICKERHAMOMYCES ONYCHIS AS A POTENTIAL BIOCONTROL AGENT AGAINST POSTHARVEST LOSSES IN TOMATO (LYCOPERSICUM ESCULENTUM) FRUIT (122)

16.00 - 17.30 hrs Breakout 7 & 8

FOOD PROCESS AND ENGINEERING-28

Speakers & Titles

1. **Rishika Batra**, Technical University of Munich, Chair of Brewing and Beverage Technology, Research Group Cereal Technology and Process Engineering, Weihenstephaner Steig 20, 85micr, Freising, Germany; TUMCREATE, 1 Create Way, 10-02 CREATE Tower, 138602, Singapore
UNDERSTANDING GELATION BEHAVIOR OF DIFFERENT SOY PROTEIN MODEL SYSTEMS AS A STRUCTURIZATION TOOL FOR 3D PRINTING (524)
2. **Abdulla Al Faruq**, Department of Food Technology and Nutrition, School of Science, RMIT University, Melbourne, VIC 3083, Australia.
SUSTAINABLE MODIFICATION OF HIGH-FIBRE CASSAVA STARCH: REACTION OPTIMIZATION, PREDICTIVE MODELING, AND EXPLAINABLE ARTIFICIAL INTELLIGENCE (728)
3. **Ronit Mandal**, Agricultural and Food Engineering Department, Indian Institute of Technology Kharagpur, Kharagpur, WB, 721302, India
IMPACT OF PROCESS PARAMETERS ON THE 3D PRINTABILITY OF HEAT-ACID COAGULATED MILK PROTEIN GELS (810)
4 **Vladimir Rusakov**, Federal Scientific Center of Hygiene named after F.F. ERISMAN of ROSPOTREBNADZOR
CURRENT ASPECTS OF QUALITY AND SAFETY ASSURANCE IN RADIATION PROCESSING OF LOW-MOISTURE FOODS (1181)

16.00 - 17.30 hrs Breakout 9 & 10

Food Packaging Innovations and Environmental Impact-03 - Biodegradable and Sustainable packaging materials

Speakers & Titles

1. **Paulin Patricia P**, NATIONAL INSTITUTE OF FOOD TECHNOLOGY, ENTREPRENEURSHIP & MANAGEMENT, THANJAVUR (NIFTEM-T)
CHARACTERIZATION OF THERMAL, STRUCTURAL AND FUNCTIONAL PROPERTIES OF CORN OIL WAX AND ITS COMPARISON WITH OTHER WAXES (512)
2. **Anubhav Pratap-Singh**, Faculty of Land & Food Systems, The University of British Columbia, Vancouver, BC, V6T 1Z4, Canada
COLD PLASMA INDUCED SURFACE ENGINEERING FOR WATER RESISTANCE AND BARRIER FOR NEXT-GENERATION BIOBASED PACKAGING (786)

3. **Hongwei Wu**, School of chemistry and chemical engineering, Southeast University
   PROGRAMMING THE LIFE CYCLE OF BIODEGRADABLE FOOD PACKAGING THROUGH A PECTIN/POLY(LACTIC ACID) MULTILAYER ARCHITECTURE (952)
4. **Madara Jayanetti**, School of Molecular and Life Sciences, Curtin University, Bentley, Western Australia 6102, Australia
   AI ENABLED OPTIMISATION OF FRUIT WASTE DERIVED NANOCELLULOSE: KINETIC MODELLING OF BIOSYNTHESIS FOR CIRCULAR FOOD PACKAGING (960)
5. **Gabriel Escobar,** Food Packaging and Shelf Life Laboratory, Instituto de Ciencia y Tecnología de Alimentos, Universidad Nacional de Colombia, Bogotá, Colombia
   EFFECT OF BUTYLENE ADIPATE CO TEREPHTHALATE – PBAT ON THE PROPERTIES OF MULTICOMPONENT ACTIVE BIODEGRADABLE FILMS FOR THE ACTIVE PRESERVATION OF FRESH CHICKEN UNDER REFRIGERATION CONDITIONS (1118)

Thursday, 29 October 2026

09.00 - 10.30 hrs Breakout 2

FOOD PROCESS AND ENGINEERING-29 Physico Chemical Properties and Composition

Speakers & Titles

1. **Nneoma Elechi Obasi**, Department of Food Science and Technology, Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria.
   PHYTOCHEMICAL PROFILE AND SENSORY EVALUATION OF FUFU ANALOGUE FROM COCONUT-MILK RESIDUE. (46)
2. **Lisa PAPA**, QualiSud, Univ Montpellier, CIRAD, Institut Agro, Avignon Université, Univ de La Réunion, F-34398 Montpellier, France
   EVALUATION OF NUTRITIONAL QUALITIES, SORPTION PROPERTIES, AND DRYING KINETICS OF GERMINATED COWPEA SEEDS (VIGNA UNGUICULATA (L.) WALP.) (48)
3. **Christian Amor Tuso**, Department of Food Science and Nutrition, College of Home Economics, UP Diliman, Quezon City, Philippines
   OPTIMIZATION OF THE UVB IRRADIATION CONDITIONS FOR THE VITAMIN D2 BIOFORTIFICATION OF OYSTER MUSHROOM (PLEUROTUS OSTREATUS) USING RESPONSE SURFACE METHODOLOGY (66)
4. **Anubhav Pratap-Singh**, Faculty of Land & Food Systems, The University of British Columbia, Vancouver, BC, Canada, V6T 1Z4
   COLD PLASMA-ACTIVATED WATER AS A GREEN ALTERNATIVE FOR PESTICIDE DEGRADATION AND FOOD SAFETY (532)

09.00–10.30 hrs Breakout 4

Food Attributes: Chemistry and Sensory-21 -Texture, Rheology and Material Properties of Foods-Rheology of Foods

Speakers & Titles

1. **Chek-Chuan Tan**, Food, Chemical and Biotechnology Cluster, Singapore Institute of Technology, 1 Punggol Coast Road, Singapore 828608, Singapore
   EFFECTS OF PULSED ELECTRIC FIELD TREATMENT ON THE PHYSICOCHEMICAL AND GELLING PROPERTIES OF PEA PROTEIN ISOLATE (316)
2. **Kerstin Risse**, Wageningen University and Research, Biobased Chemistry and Technology, The Netherlands; Eindhoven University of Technology, Mechanical Engineering, The Netherlands
   DECODING INTERFACIAL DYNAMICS IN PROTEIN-PHOSPHOLIPID SYSTEMS ACROSS TIME AND TEMPERATURE (368)
3. **Antonio J. Vela**, Bioeconomy Research Institute - BioEcoUVa, PROCEREALtech Group, University of Valladolid, Valladolid 47005, Spain
   STRUCTURAL DETERMINATION AND PHYSICOCHEMICAL

CHARACTERIZATION OF ULTRASOUND-INDUCED COMPLEXES BETWEEN HIGH-AMYLOSE CORN STARCH AND PROTOCATECHUIC ACID (383)

4. **Monica Velusamy**, Research Student, Centre of Excellence in Nonthermal Processing, Department of Food Process Technology, National Institute of Food Technology, Entrepreneurship and Management-Thanjavur (NIFTEM-T), Thanjavur, India ORCID: https://orcid.org/0000-0002-4576-1
IMPROVING THE FUNCTIONALITY OF THE RICE BRAN PROTEIN BY COMBINING THE COLD PLASMA AND HIGH-PRESSURE -ASSISTED COVALENT CONJUGATION WITH CARRAGEENAN (776)

09.00 - 10.30 hrs Breakout 5

Sustainable Food Systems and Global Food Security-06 -Circular Economy and Zero waste Approaches-04

Speakers & Titles

1. **Rahel Suchintita Das**, Food Chemistry and Technology Department, Teagasc Food Research Centre, Ashtown, Dublin, D15 DY05, Ireland
ECO-INNOVATIVE ZERO-WASTE SEAWEED BASED BIOREFINERY (1213) YS
2. **Wenwen Wei**, Shenyang Agricultural University
SUBCRITICAL EXTRACTION OPTIMIZES THE MILK THISTLE VALUE CHAIN: BALANCING DISPROPORTIONATE ECONOMIC-HEALTH GAINS WITH MARGINAL ENVIRONMENTAL TRADE-OFFS (378)
3. **Tomas Lafarga**, CIESOL-Solar Energy Research Centre, University of Almeria, Almeria, Spain
SUSTAINABLE SEAWATER PRODUCTION OF CHLORELLA SOROKINIANA: FROM ADAPTIVE LABORATORY EVOLUTION TO AI-MONITORED PILOT-SCALE VALIDATION (1016)
4. **Tomas Lafarga**, CIESOL-Solar Energy Research Centre, University of Almeria, Almeria, Spain
A ZERO-WASTE BIOREFINERY FRAMEWORK FOR EDIBLE SPIRULINA: FROM PILOT-SCALE CULTIVATION TO HIGH-VALUE FUNCTIONAL INGREDIENTS (1018)
5. **KKMG Kavindya**, Department of Food Science and Technology, Faculty of Applied Sciences, Sabaragamuwa University of Sri Lanka, Belihuloya, Sri Lanka
QUALITATIVE PHYTOCHEMICAL SCREENING OF SELECTED SRI LANKAN FRUIT BIOWASTES: A PRELIMINARY ASSESSMENT OF VALORIZATION POTENTIAL (1041)
6. **Florencia Belén Cáceres-Ferroni**, CIESOL-Solar Energy Research Centre, University of Almeria, Almeria, Spain
BIOREFINERY VALORISATION OF PORPHYRIDIUM PURPUREUM BIOMASS (1045)
7. **Sook Wah Chan**, School of Biosciences, Faculty of Health and Medical Sciences, Taylor's University, 47500 Subang Jaya, Selangor, Malaysia, Centre for Active Living, Taylor's

University, 47500 Subang Jaya, Malaysia
SUBSTRATE-DRIVEN BIOCONVERSION OF PALM KERNEL CAKE AND COCONUT DREGS BY BLACK SOLDIER FLY (HERMETIA ILLUCENS) LARVAE FOR NUTRIENT-RICH BIOMASS AND FUNCTIONAL OIL PRODUCTION (514)

09.00 - 10.30 hrs Breakout 6

Food Packaging Innovations and Environmental Impact-04 - Biodegradable and Sustainable packaging materials

Speakers & Titles

1. **Ruojun Mu**, College of Food Science, Fujian Agriculture and Forestry University, Fuzhou 350002, China.
   ADVANCED HYDROPHOBIC MODIFICATION STRATEGIES FOR BIOPOLYMER FILMS: EXPERIMENTAL INSIGHTS INTO MECHANICAL AND BARRIER PROPERTIES (1058)
2. **Laxmikant Shivnath Badwaik**, Department of Food Engineering and Technology, School of Engineering, Tezpur University, Napaam, Assam 784028, India
   NANOCELLULOSE FROM PASSION FRUIT PEEL FOR STARCH–XANTHAN GUM FILMS AND CHERRY TOMATO COATINGS (1178)
3. **Anirudh Madavankandy**, Food Industry Development Department, Teagasc Food Research Centre, Ashtown, D15DY05, Dublin, Ireland
   SUSTAINABLE FOOD PACKAGING FILMS DERIVED FROM OAT AND WHEAT STRAW CELLULOSE: STRUCTURAL, BARRIER, AND THERMAL PERFORMANCE EVALUATION (1190)
4. **Guo Li**, College of Biosystems Engineering and Food Science, Zhejiang University
   BREATHABLE EDIBLE WAX COATINGS INCORPORATED WITH BIO-DERIVED POROUS CELLULOSE CRYOGEL MICROPARTICLES FOR JUJUBE PRESERVATION (1246)
5. **Sruthy G,** PhD Scholar, Department of Food Packaging and Storage Technology, National Institute of Food Technology, Entrepreneurship, and Management -Thanjavur (NIFTEM-T), Thanjavur, India
   CIRCULAR APPROACH FOR TRANSFORMING TAPIOCA BIOMASS INTO SUSTAINABLE FOOD PACKAGING MATERIALS (1040)
6. **Henry Chinonso Nwogba,** Graduate School of Science & Technology, University of Tsukuba, Tsukuba 305-8577, Japan
   SURFACE-MODIFIED HALLOYSITE NANOTUBES: IMPACT ON THE PERFORMANCE OF CHITOSAN NANOCOMPOSITE FILMS FOR SUSTAINABLE FOOD PACKAGING (647)

09.00 - 10.30 hrs Breakout 7 & 8

Functional Foods, Bioactives, and Health Promotion-15 -Microbiome interactions and Physiological Impacts-Precision and personalized nutrition

Speakers & Titles

1. **Pasindu Perera**, Monash Centre for Additive Manufacturing (MCAM) 15-17 Normanby Rd Notting Hill VIC 3168 Australia, Department of Material Science and Engineering Monash University Wellington Rd Clayton VIC 3800 Australia
   BICONTINUOUS BIGELS FROM CELLULOSE DERIVATIVES FOR DIW 3D PRINTING AND BIOACTIVE CO-DELIVERY (615)
2. **Fangchao Hu**, Shanghai Jiao Tong University
   A HIGH-FIBER DIET MIMICS AGING-RELATED SIGNATURES OF CALORIC RESTRICTION IN MAMMALS (1261)
3. **JingJing Qian**, School of Food Science and Engineering, South China University of Technology, Guangzhou 510640, China
   MULTI-OMICS ANALYSIS REVEALS THE POTENTIAL SLEEP-ENHANCING PEPTIDE FROM MILK CASEIN HYDROLYSATE AND ITS SYNERGIC MECHANISM VIA REGULATING THE KEY HUB CAMKII PATHWAY IN CHRONIC STRESSED MICE (873)
4. **Cheng Li**, Food & Nutritional Sciences Programme, School of Life Sciences, The Chinese University of Hong Kong, Shatin 999077, Hong Kong, China
   RESISTANT STARCH TYPE 5, GUT MICROBIOTA, AND METABOLIC-ASSOCIATED LIVER DISEASE (354)

09.00 - 10.30 hrs Breakout 10

FOOD PROCESS AND ENGINEERING-30

Speakers & Titles

1. **Monica Manalo**, Department of Science and Technology - Industrial Technology Development Institute (DOST-ITDI)
   CANNED MANGO IN SYRUP PROCESSING USING AGITATED-TYPE RETORT (1077)
2. **Erdi Eren**, Alanya University / Ankara Hacı Bayram Veli University
   COMPARATIVE EVALUATION OF TRADITIONAL AND MODERN COOKING METHODS ON THE MICROBIOLOGICAL QUALITY AND SHELF-LIFE OF EUROPEAN SEA BASS (DICENTRARCHUS LABRAX) (1167)
3. **Juan Antonio Almoradie**, Institute of Food Science and Technology, University of the Philippines Los Baños, 4031 Los Baños, Philippines
   THERMAL IMAGING-BASED ASSESSMENT OF COOKING AND HOLDING OF BATCH FRIED CHICKEN (GALLUS DOMESTICUS L.) (1260)
4. **Heeba Shakeela**, Agro and Food Processing Technology Division, National Institute for Interdisciplinary Science and Technology (CSIR-NIIST), Thiruvananthapuram, Kerala, India;

Academy of Scientific and Innovative Research (AcSIR), Ghaziabad- 201002, India.
DESIGN AND DEVELOPMENT OF CUSTOMIZED LIPID POWDER FROM VIRGIN VEGETABLE OIL INDUSTRY BY-PRODUCTS FOR FUNCTIONAL FOOD APPLICATIONS (1312)

5. **Jiaqi Shao**, Oil Crops Research Institute, Chinese Academy of Agricultural Sciences, Wuhan, Hubei, P.R. China
WEAK-BASE SYNCHRONOUS MEMBRANE SEPARATION: A GREEN STRATEGY FOR ENHANCING EMULSIFICATION STABILITY OF SOY PROTEIN ISOLATE BY REGULATING INTERFACIAL FLEXIBILITY (727)

6. **Ruojun Mu**, College of Food Science, Fujian Agriculture and Forestry University, Fuzhou 350002, China. / State Key Laboratory of Meat Quality Control and Cultured Meat Development (MOST), College of Food Science and Technology, Nanjing Agricultural University, Nanjing, 211800, China.
ADVANCED HYDROPHOBIC MODIFICATION STRATEGIES FOR BIOPOLYMER FILMS: EXPERIMENTAL INSIGHTS INTO MECHANICAL AND BARRIER PROPERTIES (1058)

11.00 - 12.30 hrs Breakout 2

Functional Foods, Bioactives, and Health Promotion-14 Track Theme: Functional Foods, Bioactives and Health Promotion-Microbiome interactions and Physiological Impacts-Precision and personalized nutrition

Speakers & Titles

1. **Shaobo Zhou**, School of Science, Faculty of Engineering and Science, University of Greenwich, Central Avenue, Chatham ME4 4TB, UK
DOCOSAHEXAENOIC ACID REVERSES APOLIPOPROTEIN E4-ASSOCIATED LIPID RAFT DYSFUNCTION AND RESTORES MITOCHONDRIAL HOMEOSTASIS IN THE AGING BRAIN (1025)

2. **Rong Huang**, Shanghai Jiaotong University
ADEQUATE DIETARY POTASSIUM INTAKE SUPPORTS LONGEVITY THROUGH A CONSERVED CROSS-TISSUE HOMEOSTATIC PATHWAY (1279)

3. **Yuyu Zhang**, Northwest A&F University
DIETARY METHIONINE RESTRICTION ALLEVIATES DIABETIC METABOLIC-ASSOCIATED STEATOTIC LIVER DISEASE BY ACTIVATING HEPATIC AUTOPHAGY AND REMODELING METABOLIC PATHWAYS (438)

1100–1230 hrs Breakout 3

Food Attributes: Chemistry and Sensory-22 -Texture, Rheology and Material Properties of Foods-Rheology of Foods

Speakers & Titles

1. **Hexiang Xie**, University of Massachusetts Amherst, USA
   ENGINEERED POROSITY FACILITATES DIFFUSION-DRIVEN ENZYMATIC TENDERIZATION OF HIGH-MOISTURE PLANT-BASED MEAT ANALOGS (904)
2. **HANNAH OLALEYE**, Department of Food Science and Technology, Yaba College of Technology, Yaba, Lagos, Nigeria
   PHYSICOCHEMICAL, PASTING AND THERMAL PROPERTIES OF ENZYMATICALLY MODIFIED RICE STARCH (917)
3. **Bhashika Senevirathne**, School of Food and Nutritional Sciences, University College Cork, T12 Y337 Cork, Ireland., Co-Centre for Sustainable Food Systems, Ireland.
   COLLOIDAL AND FUNCTIONAL PROPERTIES OF SKIM MILK AND FABA BEAN PROTEIN HYBRID EMULSION SYSTEMS (936)
4. **CHUXIN KE**, Department of Food Science and Technology, Faculty of Science, National University of Singapore, 117543, Singapore
   EFFECT OF PH-INDUCED TREATMENT ON THE STRUCTURAL AND FUNCTIONAL PROPERTIES OF CORN SILK PROTEIN AND CHARACTERIZATION OF EMULSION-TEMPLATED OLEOGELS (943)
5. **Naushad Emmambux**, University of Pretoria, South Africa
   MODIFIED MARAMA BEAN CONCENTRATE AS AN ALTERNATIVE TO GLUTEN PROTEIN (1010)

11.00 - 12.30 hrs Breakout 4

FOOD PROCESS AND ENGINEERING-31

Speakers & Titles

1. **Juan Antonio Almoradie**, Institute of Food Science and Technology, University of the Philippines Los Baños, 4031 Los Baños, Philippines
   THERMAL IMAGING-BASED ASSESSMENT OF COOKING AND HOLDING OF BATCH-FRIED CHICKEN (GALLUS GALLUS DOMESTICUS L.) (1260)

2 **Aimi Zafirah Binti Kamaruddin**, Department of Food Technology, School of Industrial Technology, Universiti Sains Malaysia, USM, 11800 Penang, Malaysia
BAROHYDRATION-DRIVEN PROTEIN CONFORMATIONAL CHANGES REGULATE PROTEOLYSIS AND BIOACTIVE RELEASE DURING HIGH-PRESSURE PROCESSING OF STICHOPUS HORRENS BODY WALL 5.

11.00 - 12.30 hrs Breakout 5

Nutrition, Policy, Classification, and Public Health-04 —Clean Label Initiatives and Supply Chain Regulation, and Regulatory Adaptation Under the One Health Framework

Speakers & Titles

1. **VISHWESHWARAIAH PRAKASH**, Council of Scientific and Industrial Research, INDIA; Former President of IUFoST; Former Vice-President of IUNS
   SCIENCE BASED AND EVIDENCE BASED SCIENCE OF NEWER FOOD SAFETY REGULATIONS (1099)
2. **ANAND MOHAN**, University of Georgia / Dept. of Food Science & Technology
   MARIGOLD FLOWER COLOR EXTRACT AS A CLEAN-LABEL MODIFIER TO ENHANCE TECHNO-FUNCTIONAL PROPERTIES OF BROCCOLI FLOWER PROTEINS (916)
3. **William Kwame Amakye**, School of Food Science and Engineering, South China University of Technology
   TRANSLATIONAL EVALUATION OF SOY PEPTIDES TOWARDS ALTERNATIVE THERAPEUTIC MANAGEMENT OF MALNUTRITION (1216)
4. **Chunlei Shi**, School of Agriculture and Biology, Shanghai Jiao Tong University, Shanghai, China
   PLASMIDOMIC LANDSCAPE OF STAPHYLOCOCCUS AUREUS AND THE EMERGENCE OF A CC5 SUBCLADE HARBORING THE CONJUGATIVE PLASMID PSK41: IMPLICATIONS FOR FOOD SAFETY AND ANTIMICROBIAL RESISTANCE (1266)

11.00 - 12.30 hrs Breakout 6

FOOD PROCESS AND ENGINEERING-32

Speakers & Titles

1. **Ishita Mondal**, Research Scholar, Department of Food Technology and Biochemical Engineering, Jadavpur University, Kolkata-700032, India
   PROCESS OPTIMIZATION OF UV-C ASSISTED ATMOSPHERIC COLD PLASMA FOR AFLATOXIN B1 MITIGATION IN CAPSICUM ANNUUM (124)
2. **Xiao Yang**, School of Food Science and Engineering, South China University of Technology, Guangzhou 510641, China
   MOLECULAR MECHANISM OF BACTERIAL OUTER MEMBRANE LYSIS THROUGH COLD PLASMA REACTIVE SPECIES EVOLUTION (188)
3. **Sanstuti Prasad**, School of Agriculture and Food Sustainability at The University of Queensland, Brisbane, Australia.
   EFFECT OF COLD PLASMA AND UV ON PHYSICOCHEMICAL PROPERTIES OF NUT-BASED MILK (287)

4. **Lili Zhang**, Key Laboratory of Environmental Medicine and Engineering, Ministry of Education, and Department of Nutrition and Food Hygiene, School of Public Health, Southeast University, Nanjing, 210009, China
   COLD PLASMA-INDUCED OXIDATIVE MODIFICATION REDUCES EGG WHITE PROTEIN ALLERGENICITY AND PROMOTES ORAL TOLERANCE (433)

11.00 - 12.30 hrs Breakout 7 & 8

Education, Capacity Building, and Workforce Transformation-02 - Global Frameworks for Food Education

Speakers & Titles

1. **Sze Ying Leong**, School of Biosciences, Faculty of Health and Medical Sciences, Taylor's University, Subang Jaya, Selangor, Malaysia
   REIMAGINING FOOD SCIENCE EDUCATION THROUGH THE IMPLEMENTATION OF HYFLEX (HYBRID-FLEXIBLE) MODALITIES (494)
2. **Foong Yong**, RMIT University, Australia
   FROM THEORY TO PRACTICE: EMBEDDING INDUSTRY SYSTEMS IN FOOD SCIENCE EDUCATION (622)
3. **Yit Siew Chin**, Department of Nutrition, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 Selangor, Malaysia; School of Food Science and Nutrition, Faculty of Environment, University of Leeds, Leeds LS2 9JT, United Kingdom
   TRANSFORMING FOOD CHOICES IN DIGITAL FOOD ENVIRONMENT: YOUTH EMPOWERMENT AND CO-CREATION AMONG NUTRITION STUDENTS IN MALAYSIA (648)
4. **Deirdre Mikkelsen**, School of Agriculture and Food Sustainability, The University of Queensland, Brisbane, Australia
   INNOVATING STUDENT ENGAGEMENT THROUGH AUTHENTIC ASSESSMENT IN FOOD SCIENCE EDUCATION (661)
5. **Mariero Gawat,** Department of Science and Technology- Caraga
   LEVERAGING NATIONAL GOVERNMENT-LED PUBLIC-PRIVATE PARTNERSHIPS TO ACCELERATE MSME FOOD INNOVATION: EVIDENCE FROM CARAGA, PHILIPPINES. (1276)
6. **Anand Mohan**, University of Georgia, Department of Food Science and Technology, 100 Cedar Street, Athens, GA 30602, USA
   INTEGRATION OF DIGITAL TOOLS IN NEW AND NOVEL FOOD PRODUCT DEVELOPMENT EDUCATION (915)

IUFoST WORLD FOOD CONGRESS 2026: HONG KONG

POSTER PRESENTATION SESSIONS

POSTER PRESENTATIONS

Theme : FOOD PROCESS AND ENGINEERING

Date 26.10.2026 Time : 0830 - 1600 hrs Venue : Hall 5

(Please note : Installation: 17:00-1800hrs (5:00 p.m.–6:00 p.m.) on 25 Oct 2026
Removal: 16:00-17:00hrs (4.00pm-5.00pm) on 26 Oct 2026)

Advanced Food Preservation and Processing Technologies

1. **#7 EFFECTS OF PROCESS CONDITIONS ON THE PHYSICOCHEMICAL AND SENSORY PROPERTIES OF AN HEIRLOOM RICE (ORYZA SATIVA L.) SOYBEAN (GLYCINE MAX) BLEND BEVERAGE**

   Abbie Padrones * , Maricar Albao, Gyle Tampil, Jordan Vincent Tiama, Junimer Lala

   Food and Nutrition Research Institute-Department of Science and Technology, Bicutan, Taguig City, Metro Manila, Philippines

2. **#49 HIGH HUMIDITY THERMAL STRESS FOR STORABILITY ENHANCEMENT OF SWEETPOTATO**

   Yong Hoon Kim * , Bal Geum Kim, Chun Wan Park

   Department of Agricultural Engineering, National institute of Agricultural sciences

3. **#56 EVALUATION OF TERMINALIA ARJUNA LEAF MUCILAGE AS A NATURAL GELATIN SUBSTITUTE IN SET YOGURT FORMULATION**

   Hasitha Senarathna, Thilini Kananke *

   Department of Food Science and Technology, Faculty of Applied Sciences, Sabaragamuwa University of Sri Lanka, Belihuloya, Sri Lanka

4. **#82 SYNERGISTIC EFFECTS OF PULSED LIGHT TREATMENT IN CONTROLLING AFLATOXIN B1 CONTAMINATION IN RICE**

   Gaurav Meena * , JATINDRA K SAHU INDIAN INSTITITUTE OF TECHNOLOGY DELHI, CENTRE FOR RURAL DEVELOPMENT AND TECHNOLOGY, NEW DELHI , INDIA

5. **#150 MICROBIAL SAFETY OF ULTRA-SHEAR TECHNOLOGY FOR LIQUID FOOD PROCESSING**

   Hetian Hu * , V. M. Balasubramaniam

   University of Georgia, Department of Food Science and Technology, Griffin GA, USA

6. **#187 EFFECT OF TECHNOLOGICAL PROCESSES ON OROTIC ACID CONTENT IN MILK AND DAIRY PRODUCTS**

   Tomasz Sawicki * [1], Monika Jabłońska[1], Marika Bielecka[2], Katarzyna Przybyłowicz[1] [1]

   Department of Human Nutrition, Faculty of Food Sciences, University of Warmia and Mazury in Olsztyn,Poland [2] Department of Dairy Science and Quality Management, Faculty of Food Science, University of Warmia and Mazury in Olsztyn, Poland

7. **#198 CHALLENGES IN ISOCHORIC FREEZING: EXPERIMENTAL INSIGHTS INTO THE ICE FORMATION MECHANISMS AND APPLICATION TO SEAFOOD PRESERVATION**

Yijun Yang * [1], Nicholas P.L. Tuckey[2], Sravani Gupta[3], Siew-Young Quek[4], Meng Wai Woo[1] [1]

Department of Chemical & Materials Engineering, Faculty of Engineering, The University of Auckland, Auckland, New Zealand [2] New Zealand Institute for Bioeconomy Science Limited, Nelson, New Zealand [3] New Zealand Institute for Bioeconomy Science Limited, Auckland, New Zealand [4] Food Science Programme, School of Chemistry, Faculty of Science, The University of Auckland, Auckland, New Zealand

8. **#199 MECHANISMS UNDERLYING THE ENHANCED PHYSICAL STABILITY OF ALMOND MILK BY PROTEIN-GLUTAMINASE**

Toya Ishii * [1], Yasuki Matsumura[2], Kiyota Sakai[3], Keita Okuda[3], Shotaro Yamaguchi[3] [1] Faculty of Agriculture, Kagawa

University, Kagawa, Japan [2] Research Institute for Sustainable Humanosphere, Kyoto University, Kyoto, Japan [3] Innovation Center, Amano Enzyme Inc., Gifu, Japan

9. **#220 CELL WALL REMODELING AND SOFTENING SUPPRESSION IN FROZEN BROCCOLI VIA POSTHARVEST WATER CURING**

Chotika VIRIYARATTANASAK * [1], Tomoko Hashimoto[2], Yuji Takemura[1], Yu Horiuchi[1] [1] Central Research Laboratory, Tokyo Innovation Center, Nissui Corporation, [1]-[32]-[3] Nanakuni, Hachioji, Tokyo 192-0991, Japan [2] Food Safety Research

Department, Tokyo Innovation Center, Nissui Corporation, [1]-[32]-[3] Nanakuni, Hachioji, Tokyo 192-0991, Japan

10. **#258 ATMOSPHERIC COLD PLASMA PRETREATMENT ENHANCES PLANT-BASED PROTEIN PRODUCTION FROM PEANUT MEAL THROUGH IMPROVED EXTRACTION, FUNCTIONALITY, AND REDUCED ALLERGENICITY**

Kuan-Chen Hsieh * , Yuwen Ting

Institute of Food science and Technology, National Taiwan University

11. **#274 POST-HARVEST PROCESSING UNDER EXTREME CONSTRAINTS: REQUIREMENTS AND CONCEPTUAL DESIGN FOR CEREAL-BASED FOOD PRODUCTION IN CLOSED HABITATS**

Cecilia Ricci *

Department of Mechanical and Aerospace Engineering, Politecnico di Torino, Turin, Italy

12. **#296 PHYSICOCHEMICAL CHARACTERIZATION OF A LOW-ABSORPTION STRUCTURED LIPID OBTAINED BY INTERESTERIFICATION FOR APPLICATION IN BISCUIT FILLINGS**

Valdecir Luccas * [1], Carla Lea de Camargo Vianna[1], Gabriela Alves Macedo[2], Vanessa Alves[2], Lara Lima Cornejo[1] [1] Food Technology

Institute – Ital, Cereal and Chocolate Technology Center – Cereal Chocotec [2] State University of Campinas – UNICAMP, School of Food Engineering – FEA

13. **#309 OPTIMIZATION AND CHARACTERIZATION OF READY-TO-COOK RICE-SHAPED KERNELS MADE FROM WHITE CORN GRITS**

Charlie Adona, Jayson Tagaroma, Francesca Louise Garcia * , Herlyn Villamento

Food and Nutrition Research Institute, Department of Science and Technology, Taguig City, Philippines

14. **#325 IMPACT OF ADDITIVE INCORPORATION ON THE FRYING PERFORMANCE AND STABILITY OF PALM OLEIN**

Yih Phing Khor * , Huey Fang Teh, Nur Azwani Ab Karim, Norliza Saparin Downstream Research, SD Guthrie Technology Centre, Ground Floor, Block A, UPM-MTDC III Technology Centre, Lebuh Silikon, 43400 Serdang, Selangor, Malaysia.

15. **#344 STEAM AGGLOMERATION OF BEAN PROTEIN FLOUR ENRICHED WITH FREEZE-DRIED MANGO POWDER**

Kaciane Andreola[1], Edson Ribeiro Junior[1], Fernanda Vissotto[2], Mitie Sadahira[3], Maria Teresa Bertoldo-Pacheco * [1] [1] Food Technology

Institute, Food Science and Quality Center, São Paulo, Brazil [2] Food Technology Institute, Cereal and Chocolate Technology Center, São Paulo, Brazil [3] Food Technology Institute, Fruit and Vegetable Technology Center, São Paulo, Brazil

16. **#345 EXTRUSION PROCESSING OF DIRECT-EXPANDED SNACKS FROM PROTEIN RICH BEAN STARCH ENRICHED WITH DRUM-DRIED MANGO PULP**

Edson Ribeiro Junior[1], Kaciane Andreola[1], Bruno Costa[2], Roseli Aparecida Ferrari[1], Maria Teresa Bertoldo-Pacheco * [1] [1] Food Technology

Institute, Food Science and Quality Center, São Paulo, Brazil [2] Food Technology Institute, Fruit and Vegetable Technology Center , São Paulo, Brazil

17. **#357 DATA-DRIVEN DOUGH MATURATION CONTROL, FOR TRADITIONAL FRIED SNACKS UNDER WHEAT FLOUR VARIABILITY: A CASE STUDY AT SAEHAN GRAIN**

Hyorim Seo * [1], Minju Son[2], Chunggil Lee[3], Junkyu Park[3], Sanghyun Lee[2] [1]

Department of Smart Food and Drug, Inje University, Korea [2] Department of Food technology and Nutrition, Inje University, Korea [3] Saehangrain Co., Ltd.

18. **#366 IMPROVED STORAGE STABILITY AND LONG-TERM VIABILITY OF LEUCONOSTOC MESENTEROIDES VIA STARCH-BASED W1/O/W2 DOUBLE EMULSIONS**

Ye won Kim * [1], Sung Hee Park[2], Yun-Jeong Choi[2], Mi-Jung Choi[3], Mi-Ai Lee[2] [1] Sustainable Distribution Research Group World

Institute of Kimchi, Gwangju, South Korea , Department of Food Science and Biotechnology of Animal Resources, Konkuk University, Seoul, South Korea [2] Sustainable Distribution Research Group World Institute of Kimchi, Gwangju, South Korea [3] Major of Food Engineering, School of Animal & Food Sciences and Marketing, Konkuk University, Seoul, South Korea

19. **#401 COMPARATIVE CHARACTERISATION OF ULTRASOUND-EXTRACTED PROTEINS FROM RED SEAWEED AND SUNFLOWER MEAL**

Yuchen Ban * [1], Gaoya Dong[1], Da-Wen Sun[2], Brijesh Tiwari[1] [1]

Department of Food Chemistry and Technology, Teagasc Food Research Centre, Ashtown, Dublin, Ireland [2] Food Refrigeration and Computerized Food Technology (FRCFT), Agriculture and Food Science Centre, University College Dublin, National University of Ireland, Belfield, Dublin [4], Ireland

20. **#448 PRESERVING FRESH EGGS VIA A RECYCLABLE AND IMPACT-RESISTANT GELATIN HYDROGEL**

Xin Wang * , Shahriar Islam, Shuxiang Liu Sichuan Agricultural

University

21. #517 ENGINEERING OLEIC ACID-LOADED SPRAY-DRIED POWDERS: EFFECTS OF PROTEIN SOURCE, DENATURATION, AND SURFACTANT TYPE ON MICROSTRUCTURE AND REHYDRATION STABILITY

Heeyeon Choi * , Han-Gyeol Gwon, Yeon-Ji Jo

Department of Food Processing and Distribution, Kangwon National University, Korea

22. #531 TAILORING THE STRUCTURE AND FOOD FUNCTIONALITY OF MICROALGAE AUXENOCHLORELLA PROTOTHECOIDES PROTEIN BY SUPERCRITICAL CARBON DIOXIDE AND SUBCRITICAL WATER TREATMENT

Dingsong Lin * [1], Jingyuan Wang[1], Jiewen Fu[1], Sreenivasa Reddy Puniredd[2], Dejian Huang[1] [1]

*Department of Food Science and Technology, National Unversity of Singapore [2] Singapore Institute of Food and Biotechnology Innovation (SIFBI), Agency for Science, Technology and Research (A*STAR)*

23. #564 THERMAL PROCESSING OF READY-TO-EAT CHOCOLATE RICE PORRIDGE: ADVANCING SHELF STABILITY, SAFETY, AND SENSORY EVALUATION

Donnalyn Imbas * [1], Maria Christina Ramos[2], Jadess Lorraine Vista[2], Mark Winston Ladrillo[2], Anthony Sales[1] [1]

Department of Science and Technology Davao Region, corner Dumanlas and Friendship Roads, Bajada, Davao City, Davao del Sur, 8000, Philippines; Food Processing Innovation Center-Davao, Philippine Women's College of Davao, University Avenue, Matina, Davao C [2] Food Processing Innovation Center-Davao, Philippine Women's College of Davao, University Avenue, Matina, Davao City, Davao del Sur, 8000, Philippines

24. #583 EFFECT OF 4-A-GLUCANOTRANSFERASE ADDITION ON THE STORAGE STABILITY OF RICE FLOUR BREAD

Chihiro Tagami * [1], Nakako Katsuno[2] [1] Gifu

University, Graduate School of Natural Science and Technology, Gifu, Japan [2] Gifu University, Faculty of Applied Biological Sciences, Gifu, Japan

25. #584 CHANGES IN LIGNAN CONTENT DURING THE PROCESSING OF SESAME PRODUCTS

Miku Terazawa * [1], Makoto Fujimura[2], Nakako Katsuno[3] [1] Gifu

University, Graduate School of Natural Science and Technology, Gifu , Japan [2] SHINSEI Co., Ltd., Kita-Nagoya, Japan [3] Gifu University, Faculty of Applied Biological Sciences, Gifu, Japan

26. #600 ADVANCED ULTRASOUND PROCESSING FOR SUSTAINABLE INSECT PROTEIN ISOLATION: YIELD, FUNCTIONALITY, AND BIOACTIVITY

Lamia L'Hocine * , Allaoua Achouri, Delphine Martineau-Côté, Mélanie Pitre, Stéphane Sirois

Agriculture and Agri-Food Canada, Saint-Hyacinthe Research and Development Centre, Saint-Hyacinthe, QC, Canada

27. **#608 OPTICAL PROPERTIES OF CARBON QUANTUM DOTS SYNTHESIZED FROM COMMON BUCKWHEAT HULLS USING HYDROTHERMAL AND MICROWAVE-ASSISTED METHODS**

Jimin Kim * , Seong-Ae Lee, Jaecheol Kim

Department of Food and Nutrition, Sungshin Women's University, Seoul, Republic of Korea

28. **#609 OPTIMIZATION OF HYDROTHERMAL SYNTHESIS CONDITIONS FOR MAXIMIZING THE QUANTUM YIELD OF CARBON QUANTUM DOTS DERIVED FROM COMMON BUCKWHEAT HULLS USING RESPONSE SURFACE METHODOLOGY**

Seong-Ae Lee * , Jimin Kim, Jaecheol Kim

Department of Food and Nutrition, Sungshin Women's University, Seoul, Republic of Korea

29. **#610 OPTIMIZATION OF MICROWAVE-ASSISTED PROCESSING CONDITIONS AFFECTING SULFORAPHANE CONTENT IN BROCCOLI SPROUTS USING RESPONSE SURFACE METHODOLOGY AND AN ARTIFICIAL NEURAL NETWORK COUPLED WITH A GENETIC ALGORITHM**

Minjung Park * , Jaecheol Kim

Department of Food and Nutrition, Sungshin Women's University, Seoul, Republic of Korea

30. **#611 DUAL MODELING FOR OPTIMIZATION OF COROSOLIC ACID EXTRACTION CONDITIONS FROM LAGERSTROEMIA SPECIOSA LEAVES USING RESPONSE SURFACE METHODOLORY AND AN ARTIFICIAL NEURAL NETWORK COUPLED WITH A GENETIC ALGORITHM**

Seoyeon Yu * , Jaecheol Kim

Department of Food and Nutrition, Sungshin Women's University, Seoul, Republic of Korea

31. **#640 REAL-TIME REPLENISHING EMBEDDING SYSTEM FOR STRUCTURAL REPLICATION OF SEVEN-BAND GROUPER VIA 3D FOOD PRINTING**

Su Hyun Lee * [1], Jiyoung Yu[2], Hyun Woo Kim[1] [1] Korea

University [2] Jeonju University

32. **#655 EFFECT OF ANTICAKING AGENT ADDITION ON THE PHYSICOCHEMICAL AND FUNCTIONAL PROPERTIES OF PARTIALLY SUBSTITUTED SPRAY DRIED SALT**

Vidushi Kapoor * [1], Raja Vijayakumar[2], Mahalakshmi Lakshmanan[2], Mahsa Majzoobi[3], Benu Adhikari[3], Anandharamakrishnan Chinnaswamy[4] [1]

Agro-Processing and Technology Division, CSIR-National Institute for Interdisciplinary Science and Technology (CSIR-NIIST), Thiruvananthapuram, 695019, Kerala, India, Academy of Scientific and Innovative Research (AcSIR), Ghaziabad, 201002, India, School [2] Agro-Processing and Technology Division, CSIR-National Institute for Interdisciplinary Science and Technology (CSIR-NIIST), Thiruvananthapuram, 695019, Kerala, India [3] School of Science, STEM College, RMIT University, Bundoora, VIC 3083, Australia [4] Agro-Processing and Technology Division, CSIR-National Institute for Interdisciplinary Science and Technology (CSIR-NIIST),

Thiruvananthapuram, 695019, Kerala, India, Academy of Scientific and Innovative Research (AcSIR), Ghaziabad, 201002, India

33. #739 MILLING AS A PRE-TREATMENT STRATEGY FOR IMPROVING PROTEIN ENRICHMENT EFFICIENCY DURING DRY FRACTIONATION OF CHICKPEA

Prashant Kumar * , P. Srinivasa Rao Indian

Institute of Technology Kharagpur, India

34. #750 HORDEIN MICROBEADS DERIVED FROM BREWER'S SPENT GRAIN FOR CULTIVATED MEAT CULTURING

Xianjian Zeng * [1], Linzhi Jing[2], Dejian Huang[1] [1]

Department of Food Science and Technology, National University of Singapore, [2] Science Drive [2], 117542, Singapore, Bezos Centre for Sustainable Protein, Faculty of Science, National University of Singapore, [2] Science Drive [2], 117542, Singapore, National U [2] Department of Food Science and Technology, National University of Singapore, [2] Science Drive [2], 117542, Singapore, Bezos Centre for Sustainable Protein, Faculty of Science, National University of Singapore, [2] Science Drive [2], 117542, Singapore

35. #781 PRODUCTION AND NUTRITIONAL ASSESSMENT OF COCOA (THEOBROMA CACAO) POWDER BEVERAGE USING DATE PALM FRUIT (PHOENIX DACTYLIFERA) AS SWEETENER

IJEOMA PRINCEWILL-OGBONNA * , Ginika Akubuobi, Obinna Agwo

Department of Food Science nd Technology, Michael Okpara University of Agriculture, Umudike, Umuahia, Abia State, Nigeria

36. #783 INFLUENCE OF ATMOSPHERIC PRESSURE PLASMA JET PROCESSING PARAMETERS ON TOTAL PLASMA-GENERATED REACTIVE OXYGEN SPECIES IN AQUEOUS PHASE AND ITS QUANTIFICATION USING IODINE AND STARCH

Josephine Shu Fen Phang * , Weibiao Zhou

Department of Food Science and Technology, National University of Singapore, [2] Science Drive [2], 117542, Singapore

37. #867 EFFECT OF BLEEDING METHODS ON MICROBIOLOGICAL QUALITY, TEXTURAL PROPERTY AND OXIDATIVE STABILITY OF REFRIGERATED ASIAN SEABASS SLICES

Balamanikandan Vijayakumar * [1], Soottawat Benjakul[1], Kigen Takahashi[2] [1] International Center of Excellence in Seafood Science and Innovation (ICE-SSI), Faculty of Agro-Industry, Prince of Songkla

University, Hat Yai, Songkhla 90110, Thailand [2] Department of Food Science and Technology, Tokyo University of Marine Science and Technology, Konan [4-5-7], Minato-Ku, Tokyo, Japan

38. #875 SPRAY DRYING AND EVALUATION OF PHYSICOCHEMICAL AND RECONSTITUTION PROPERTIES OF PINEAPPLE (ANANAS COMOSUS VAR. SMOOTH CAYENNE) JUICE POWDER

Wendell Lee * , Adeliza Dorado

University of the Philippines Los Banos (UPLB), Institute of Food Science and Technology (IFST)

39. #877 THE PROPERTIES OF PROTEIN HYDROLYSATE FROM NORTH PACIFIC KRILL (EUPHAUSIA PACIFICA) AS INFLUENCED BY MAIILARD REACTION

Thom Van Nguyen * [1], Jie-Ting Geng[1], Thuy Thi Minh Le[2], Ha Thi Nhu Nguyen[2], Kazufumi Osako[1] [1]

Department of Food Science and Technology, Tokyo University of Marine Science and Technology, [4-5-7] Konan, Minato-ku, Tokyo, 108-8477, Japan [2] Faculty of Seafood Science and Technology, College of Aquaculture and Fisheries, Can Tho University, [3/2] street, Ninh Kieu ward, Can Tho city, 94000, Viet Nam

40. #880 INTERNET OF THINGS (IOT) ULTRASOUND EXTRACTION OF PROTEINS FROM SUGAR BEET LEAVES

Anet Režek Jambrak * [1], Anita Slavica[1], Mojca Čakić Semenčić[1], Josipa Dukić[1], Filip Jukić[2] [1] Faculty of Food Technology and Biotechnology,

University of Zagreb [2] University of Zagreb, Faculty of Electrical Engineering and Computing, Zagreb, Croatia

41. #940 MICROWAVE-ASSISTED ENZYMATIC HYDROLYSIS PROCESSING MODULATED ALLERGENIC POTENTIAL AND FUNCTIONAL PROPERTIES OF COW MILK CASEIN

Tao Wang * [1], Vijaya Raghavan[2], Jin Wang[1] [1]

Department of Nutrition and Food Hygiene, School of Public Health, Southeast University, Nanjing 210009, China [2] Department of Bioresource Engineering, Faculty of Agricultural and Environmental Sciences, McGill University, 21111 Lakeshore Rd, Sainte-Anne-de-Bellevue, $H^9X^3V^9$, QC, Canada

42. #959 CURRENT ASPECTS OF QUALITY AND SAFETY ASSURANCE IN RADIATION PROCESSING OF LOW-MOISTURE FOODS

VLADIMIR RUSAKOV * , ESAULOVA OLGA

Federal Scientific Center of Hygiene named after F.F Erisman of Rospotrebnadzor

43. #974 ULTRASONICATION-ASSISTED OSMOTIC MEMBRANE DISTILLATION OF ORANGE JUICE: FLUX BEHAVIOR AND ITS QUALITY EVALUATION

Yumnam Nandan * , Akula Deepchander, Sairam Sandeep, Nilesh Choudhary, KSMS Raghavarao Indian

Institute of Technology Tirupati

44. #979 ULTRASOUND-ASSISTED SALT EXTRACTION OF FUNCTIONAL PROTEINS FROM OILSEED PRESS CAKES FOR SUSTAINABLE FOOD INGREDIENT DEVELOPMENT

Savindi Wanninayake * , Joonas Koskinen, Marjo Pöysä, Samuel Perez-Vega

Department of Separation Science, LUT School of Engineering Sciences, Lappeenranta-Lahti University of Technology LUT, Kauppalankatu [13], FI-45100 Kouvola, Finland

45. #983 EFFECT OF ULTRASOUND PROCESSING ON GERMINATION, NUTRITIONAL QUALITY AND ENZYME ACTIVITY IN MUNG BEAN SPROUTS

Taniya M. Nanayakkara * , Marleny D. A. Saldaña

Department of Agricultural, Food and Nutritional Science, University of Alberta, Edmonton, AB, Canada

46. #985 DIELECTRIC BARRIER DISCHARGE COLD PLASMA-INDUCED STRUCTURAL MODIFICATION OF HAZELNUT PROTEINS TO REDUCE IMMUNOREACTIVITY AND ENHANCE DIGESTIBILITY AND FUNCTIONAL PROPERTIES

Xin Wang * , Mukeshimana Camus-Ela, Jin Wang Key Laboratory of Environmental Medicine and Engineering, Ministry of Education, and

Department of Nutrition and Food Hygiene, School of Public Health, Southeast University, Nanjing, China

47. #987 APPLICATION OF DIELECTRIC BARRIER DISCHARGE PLASMA: A TECHNIQUE FOR REDUCING MICROORGANISMS, IMPROVING ANTIOXIDANT CAPACITY, AND INHIBITING SOFTENING OF WINTER JUJUBE

Xinxue Zhang * , Jing Qian, Jin Wang Key Laboratory of Environmental Medicine and Engineering, Ministry of Education, and

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48. #989 SEQUENTIAL APPLICATION OF COLD PLASMA IN CHICKEN BREAST: IMPROVEMENT OF MEAT TENDERNESS AND BACTERICIDAL MECHANISM AGAINST HISTAMINE-PRODUCING RAOULTELLA SP.

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49. #994 OPTIMIZATION OF MIXING RATIO FOR TEXTURED VEGETABLE PROTEIN USING SOYBEAN AND SESAME PROTEIN ISOLATES ENRICHED WITH METHIONINE AND ARGININE

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50. #996 EVALUATION OF UV ENERGY TRANSFER AND ENERGY EFFICIENCY IN FLOW-THROUGH SYSTEMS FOR LIQUID FOOD TREATMENT

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51. #997 RESEARCH PROGRESS ON THE APPLICATION OF EMERGING FOOD TECHNOLOGIES IN THE FIELD OF FOOD ALLERGY

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52. #998 ICE-BINDING PROTEINS FROM WHEATGRASS FOR THE APPLICATION IN YEAST DOUGH

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53. #1005 CHARACTERIZATION OF THE PHYSICOCHEMICAL PROPERTIES OF THE CARRIER AGENT-OPTIMIZED MICROENCAPSULATED SAPINIT POWDER

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54. #1054 INTEGRATED SURVEILLANCE AND COLD PLASMA CONTROL OF MAIZE-BORNE FUNGI AND MYCOTOXINS

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55. #1085 COMPARATIVE EFFECTS OF ADVANCED MICROWAVE AND SOUS VIDE PROCESSING ON MEAT IN-VITRO PROTEIN DIGESTIBILITY: INSIGHTS FROM MOLECULAR STRUCTURE ANALYSIS AND PEPTIDOMICS

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56. #1087 OPTIMISING COLD PLASMA-ACTIVATED MEDIA FOR MICROBIAL CONTROL

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57. #1111 BIOPRESERVATIVE ACTIVITY OF EXOPOLYSACCHARIDES PRODUCED BY LACTIC ACID BACTERIA FROM INDIGENEOUS FERMENTED FOODS ON THE SHELF LIFE OF CHERRY TOMATOES

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58. #1123 EXTENDING THE SHELF LIFE OF UNCURED FRESH SAUSAGE USING HERBAL EXTRACTS AND COLD PLASMA

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59. #1136 DEVELOPMENT OF A MICROWAVE-ASSISTED CONTINUOUS VIBRO-FLUIDIZED BED DRYING SYSTEM FOR HIGH-VALUE SPICES

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60. #1156 CONSUMER ACCEPTANCE AND SAFETY OF 3DPRINTED CONFECTIONERY: INSIGHTS INTO MICROBIAL RISKS AND FUNCTIONAL–NUTRITIONAL QUALITY

Elohor O. Oisaemi * [1], Taiwo Esther Adewole[1], Tonna Ashim Anyasi[2], Kelechi Ojini[3], Oluwafemi Aina[3] [1] London Metropolitan

University, England, United Kingdom [2] University of Greenwich, United Kingdom [3] Trinity University Yaba, Lagos, Nigeria

61. #1173 COMPARATIVE ANALYSIS OF CLASSICAL VS. CELL PELLETING INOCULATION ON PHYSICOCHEMICAL STABILITY AND MICROBIAL GROWTH IN KUMQUAT FERMENTATION

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University [2] Adana Alparslan Türkeş Science and Technology University

62. #1270 COMPARISON OF TWO PRETREATMENT STRATEGIES FOR MANNITOL FRACTIONATION FROM HIGH-ASH SEAWEED EXTRACTS USING SEQUENTIAL ION-EXCHANGE PURIFICATION

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63. #1288 APPLICATION OF ULTRASONIC-ASSISTED DEEP FRYING AS AN ALTERNATIVE TO TRADITIONAL DEEP FRYING IN THE PRODUCTION OF STRAW MUSHROOM (VOLVARIELLA VOLVACEA) CHIPS

Colleen Fuyoc * , Dennis Cantre

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64. #1298 ESTABLISHING A PROCESSING WINDOW FOR HIGHIRRADIANCE 405NM LIGHT TREATMENT IN PAPRIKA POWDER USING ENTEROCOCCUS FAECIUM AS A SALMONELLA SURROGATE

Luis Sabillon * , Minor Minor, Sergio Martínez-Monteagudo New Mexico State

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65. #1308 COMPARATIVE EVALUATION OF HYBRID DRYING TECHNIQUES FOR ORANGE FLESHED SWEET POTATO: DRYING KINETICS, QUALITY, THERMODYNAMIC ANALYSIS, AND COMPUTATIONAL FLUID DYNAMICS

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University of KwaZulu-Natal [2] University of Pretoria [3] Agricultural Research Council

66. #1310 HIGH-HYDROSTATIC PRESSURE FOR MICROBIAL INACTIVATION AND SHELF-LIFE EXTENSION OF SOUS-VIDE BARRAMUNDI MEATS

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67. #1311 ENHANCEMENT OF SHELF LIFE AND MICROBIAL SAFETY IN READY-TO-EAT SOY-SAUCE-MARINATED RAW CRAB THROUGH HIGH-PRESSURE PROCESSING

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68. **#1327 EFFECTS OF ULTRASONIC-ASSISTED AND CONVENTIONAL SOAKING ON HYDRATION KINETICS, NUTRITIONAL QUALITY, METABOLOMIC PROFILE, AND DEVELOPMENT OF GLUTEN FREE MUFFINS FROM SOYBEAN FLOUR**

Narpinder Singh *, Akanksha Negi, Deepika Kathuria Graphic Era Deemed to be

University

69. **#1354 VIABILITY EVALUATION OF LYOPHILIZED PURE CULTURES OF ACETIC ACID BACTERIA PRODUCING PHILIPPINE NATA DE COCO**

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70. **#1375 INNOVATION IN THE METHOD OF HIGH-EFFICIENCY AND LOW-DAMAGE PHYSICAL MUTAGENESIS OF ACTIVE BIOMATERIAL MICROBIAL STRAINS**

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71. **#1380 ANTIMICROBIAL SCREENING OF NEPHROLEPIS EXALTATA EXTRACT AND ALGINATE FORMULATION FOR NATURAL FOOD PRESERVATION**

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72. **#1398 DEVELOPMENT OF INNOVATIVE PRODUCTS FOR THE PRODUCTION PROCESS OF FRUIT FILLINGS AND GELS**

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73. **#1400 APPLICATION OF GOLDEN CHLORELLA–STARCH INKS FOR 3D PRINTED DYSPHAGIA FOODS**

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74. **#1412 MICROWAVE ASSISTED EXTRACTION OF SESAME MEAL PROTEIN: INFLUENCE OF CONVENTIONAL AND GREEN EXTRACTION METHODS ON STRUCTURAL AND TECHNO-FUNCTIONAL PROPERTIES.**

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75. **#1479 COMPARATIVE EFFECTS OF THERMAL AND NON-THERMAL PROCESSING ON THE QUALITY, ANTHOCYANINS, AND VOLATILE PROFILE OF BLACK MULBERRY JUICE**

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76. #1485 FUNCTIONAL NUTRITIONAL INTERVENTIONS DIFFERENTIALLY MODULATE ADIPOSE REMODELING AND METABOLIC HEALT

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77. #1510 ALTERNATIVE PROTEIN SOURCE: OPTIMIZATION OF PIGEON PEA (CAJANUS CAJAN) PROTEIN EXTRACTION USING RESPONSE SURFACE METHODOLOGY

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78. #1512 EXTRACTION, CHARACTERIZATION, AND ANTIOXIDANT EVALUATION OF PROTEIN FROM CHENOPODIUM ALBUM L. LEAVES USING ULTRASOUND-ASSISTED TRI-PHASIC PARTITIONING TECHNIQUE

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79. #1513 TITLE: ADVANCEMENTS IN FOOD PROCESSING AND TECHNOLOGY: ENSURING SAFETY, QUALITY, AND SUSTAINABILITY IN MODERN FOOD SYSTEMS

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80. #831 INTEGRATED PRESSURIZED FLUID PROCESSING WITH ULTRASOUND FOR VALUE-ADDED PRODUCTS OF AGRI/FOOD BY-PRODUCTS

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81. #1541 INNOVATING THE FUTURE OF FOOD SCIENCE

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Process Innovation and Delivery Systems

82. #145 ENHANCED STABILITY AND BIOACCESSIBILITY OF MINOR GINSENOSIDES VIA NANOEMULSION AND MICROENCAPSULATION

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83. #152 NUTRITIONAL AND POTENTIAL HEALTH BENEFITS OF LACTOSE-FREE AND CITRUS-WASTE DIETARY FIBRE FORTIFIED ICE CREAM

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84. #156 ELECTROSPINNING OF PROTEINS FROM FABA BEAN LEAVES (VICIA FABA L.) AND RED BETROOT LEAVES (BETA VULGARIS L.) AFTER INTERNET OF THINGS (IOT) ULTRASOUND EXTRACTION

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85. #240 PALM OIL-FREE STRUCTURED LIPID BASES ANALOGOUS TO PALM SHORTENING FOR MARGARINE FORMULATIONS

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86. #362 EFFECT OF AUXENOCHLORELLA PROTOTHECOIDES INCORPORATION ON COOKING BEHAVIOUR, TEXTURE, AND COLOUR OF WHEAT NOODLES

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87. #516 STRUCTURE–FUNCTION RELATIONSHIPS IN LACTOSE–PROTEIN POWDERS: EFFECTS OF PROTEIN SOURCE AND MOISTURE-INDUCED PHYSICAL STATE ON INTERFACIAL FUNCTIONALITY

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88. #551 ENHANCING DIFFUSION-ASSISTED FORTIFICATION IN RICE THROUGH MICRO-PERFORATION: A KINETIC AND MASS TRANSFER STUDY

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89. #658 ENGINEERING POROUS STARCH FROM CASSAVA AND FABA BEAN TO ENHANCE ENCAPSULATION CAPACITY: CURCUMIN AS A MODEL BIOACTIVE COMPOUND

Mayang Pawitra * , Peter J. Torley, Asgar Farahnaky, Mahsa Majzoobi RMIT

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90. #762 ULTRASOUND-MODIFIED TARWI (LUPINUS MUTABILIS) PROTEIN AS A SUSTAINABLE WALL MATERIAL FOR IRON MICROENCAPSULATION

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91. #814 INFLUENCE OF OAK AGING ON THE SENSORY PROFILE AND TEMPORAL PERCEPTION OF 80% COCOA BEAN-TO-BAR CHOCOLATE

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92. #828 MICROENCAPSULATION OF PHENOLIC-RICH EXTRACT FROM DEFECTIVE COFFEE BEANS BY IONIC GELATION

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93. #851 ENHANCING AGRO-ECOLOGICAL RESILIENCE THROUGH ORGANIC PESTICIDE TRAINING AND DIGITAL INTEGRATION: A CASE STUDY OF WOMEN FARMERS IN GWAGWALADA, NIGERIA

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94. #864 RHEOLOGICAL, TRIBOLOGICAL, AND SPREADABILITY PROPERTIES OF CAROTENOID-ENRICHED BIGELS

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95. #986 FABRICATION OF AN INNOVATIVE GELATIN/POLYVINYL ALCOHOL/VANILLIN AEROGEL CONTAINING D-LIMONENE NANOSTRUCTURED LIPID CARRIERS AND ITS PRESERVATION EFFECTS ON STRAWBERRIES

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96. #1031 BIPHASIC CO-ENCAPSULATION OF PIPERINE AND CURCUMIN IN O/W EMULSIONS STABILIZED BY 4-A-GLUCANOTRANSFERASE-MODIFIED POTATO STARCH FOR ENHANCED BIOACCESSIBILITY AND DYSPHAGIA-ORIENTED DELIVERY

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97. #1092 CORE-SHELL GEL STRATEGIES USING CELLULOSES AS A PROBIOTIC DELIVERY SYSTEM FOR ENHANCED GASTROINTESTINAL STABILITY

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98. #1121 EFFECTS OF PRE-PROCESSING ON THE DRY MILLING FRACTIONATION OF PEARL MILLET AND COWPEA: CHALLENGES IN PROTEIN SEPARATION

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99. #1211 MICROWAVE TREATMENT AND PHENOLIC COMPOUND INCORPORATION AS COMPLEMENTARY STRATEGIES TO TAILOR THE FUNCTIONALITY OF MAIZE STARCH

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100. #1281 pH-RESPONSIVE ALGINATE HYDROGELS DERIVED FROM FERMENTED UNDARIA PINNATIFIDA BY-PRODUCTS FOR CONTROLLED INTESTINAL DELIVERY OF BIOACTIVE COMPOUNDS

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101. #1370 IMPROVING PROCESS FOR EXTRACTING OLEOSOMES FROM PUMPKIN SEEDS: PHYSICAL STABILITY THROUGH HIGH-PRESSURE HOMOGENIZATION

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102. #1371 DRY FRACTIONATION AS A SUSTAINABLE ALTERNATIVE FOR PROTEIN CONCENTRATES PRODUCTION

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103. #1421 REDISPERSIBLE CASEIN-ZEIN NANOCARRIERS ENABLE SELECTIVE LOADING OF SAPONIN RD FROM CRUDE EXTRACTS FOR *IMPROVED* THERAPY OF ACUTE ALCOHOLIC LIVER INJURY

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104. #1548 A POROUS HYDROGEL-BIOFILM DELIVERY SYSTEM FOR ENHANCED INTESTINAL COLONIZATION OF PROBIOTICS AND TARGETED AMELIORATION OF AFLATOXIN B1-INDUCED ENTEROHEPATIC INJURY

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105. MUSHROOM β-GLUCAN-RESVERATROL NANOCARRIERS TARGET MICROGLIAL MITOCHONDRIA TO ATTENUATE NEUROINFLAMMATION VIA IMMUNOMETABOLIC REPROGRAMMING.

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106. #421 PRINT PARAMETERS SHAPE TEXTURE AND QUALITY IN 3D PRINTED CHICKPEA PROTEIN DYSPHAGIA FOODS

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Scaling Up Traditional Technologies

107. #74 SCALING UP TRADITIONAL FISH SALTING AND DRYING: A COMMUNITY-BASED PROCESS CONTROL FRAMEWORK FOR ARTISANAL SYSTEMS

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108. #428 DEVELOPMENT OF LOW-COST PROCESSING TECHNOLOGIES FOR THE PRODUCTION OF NUTRIENT-DENSE PUPURU WITH IMPROVED SAFETY AND QUALITY

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109. #566 LIQUID-LIQUID PHASE SEPARATION FOR FOOD SYSTEM

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110. #845 REFORMULATING TRADITIONAL PHUTU PAP BY PARTIALLY REPLACING NORMAL MAIZE WITH NIXTAMALIZED MAIZE.

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111. #887 SCALING UP TRADITIONAL DETARIUM SENEGALENSE FRUIT PROCESSING THROUGH THE LICKA'S PULPER-REFINER TECHNOLOGY

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Bio transformation and Functional Fermentation for Health

112. #50 FERMENTATION-DERIVED DIHYDROFERULIC ACID FROM RICE BRAN ATTENUATES DEXAMETHASONE-INDUCED MUSCLE DYSFUNCTION AND EXHIBITS DOSE-DEPENDENT NEURONAL DIFFERENTIATION RESPONSES

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113. #231 BEYOND TRADITIONAL TEMPEH: SYNERGISTIC EFFECTS OF R. ORYZAE AND R. BABJEVAE ON BIOACTIVE COMPOUNDS

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114. #312 RICE BRAN HYDROLYSATES AS A LOW-COST, BY-PRODUCT DERIVED SUBSTRATE FOR SINGLE-CELL PROTEIN PRODUCTION VIA MICROALGAE-YEAST CO-CULTIVATION

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115. #414 OAT SOLID-STATE FERMENTATION METABOLITE MODULATION: INSIGHTS FROM UNTARGETED 1H-NMR METABOLOMICS

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116. #420 DISCOVERY OF FOOD-RELEVANT MICROORGANISMS CAPABLE OF ACTIVE VITAMIN B12 BIOSYNTHESIS

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117. #644 EVALUATION OF S-ADENOSYLMETHIONINE (SAM) AND RELATED METABOLITES IN SAKE KASU PRODUCED BY DIFFERENT YEAST STRAINS

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118. #666 BIOCHEMICAL PROPERTIES OF BETA-GLUCOSIDASE FROM COMMERCIAL ENZYME FOR THE PRODUCTION OF PHYLLODULCIN AND HYDRANGENOL

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119. #668 ENZYMATIC SYNTHESIS OF O-METHYLATED EGCGS USING CAFFEOYL-COA O-METHYLTRANSFERASE TO ENHANCE OXIDATIVE STABILITY

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120. #676 EFFECTS OF MOISTURE AND SALT CONCENTRATION ON AMINO ACID LEVELS DURING MISO-LIKE FERMENTATION OF TRADITIONAL FLINT CORN

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121. #1126 INVESTIGATING THE EVOLUTION OF GEL NETWORK INTERACTIONS DURING RIPENING AND THEIR IMPACT ON THE PROPERTIES OF A FERMENTED FABA BEAN PROTEIN-BASED CHEESE ANALOGUE

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122. #1139 DEVELOPMENT OF PROBIOTIC MEAD USING THE MICROBIOTA OF FRIESEOMELITTA VARIA POLLEN

Clara Katharina Vaz da Silva * [1], Ana Luísa Kruschewsky da Paz[2], Grace Ferreira Ghesti[1], Talita Souza Carmo[2] [1]

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123. #1147 PRODUCTION OF VOLATILE COMPOUNDS BY SACCHAROMYCES CEREVISIAE FROM A LIPID MÉDIUM

Maria Terezinha Santos Leite Neta[1], Regina Santiago Campos Nascimento[1], Rosângela Bergamasco * [2], Hannah Caroline Santos Araujo[1], Daniel Alfonso Spudeit[1], Narendra Narain[1] [1]

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124. #1149 SUBMERGED FERMENTATION OF TROPICAL FRUIT RESIDUES AS A PLATFORM FOR BIOAROMA AND CAROTENOID PRODUCTION

Hannah Caroline Santos Araujo[1], Rosangela Bergamasco * [2], Daniel Alfonso Spudeit[1], Monica Silva de Jesus[1], Rafael Donizete Dutra Sandes[1], Maria Terezinha Santos Leite Neta[1] [1]

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125. #1183 MICROSTRUCTURAL CHANGES DURING SOLID-STATE FERMENTATION OF OATS DRIVE NUTRIENT DIGESTIBILITY AND BIOACTIVE RELEASE

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126. #1381 MICROBIOME MODULATION OF SOURDOUGH BREAD PRODUCED WITH LAVILACTOBACILLUS BREVIS ED25 AND LIMOSILACTOBACILLUS REUTERI E81 AS POTENTIAL STARTER CULTURES

Enes Dertli *[1], Mukadder Aksoy[2], Zuhal Alkay[2], Tekmile Cankurtaran-Kömürcü[2], Stephen R. Lindemann[3], Yunus Emre Tunçil[2] [1]

Istanbul Technical University [2] Food Engineering Department, Necmettin Erbakan University, Konya, Türkiye [3] Food Science Department, Purdue University, West Lafayette, IN, USA

127. #427 FERMENTATION-BASED BIOTRANSFORMATION OF NATIVE PLANT MATRICES INTO FUNCTIONAL FOOD BASES: A SCALABLE MODEL FOR SUSTAINABLE FOOD SYSTEMS

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Microbiome Interactions and Physiological Impact

128. 1537 DIETARY CHOLESTEROL IMPAIRS COGNITION VIA GUT MICROBIOTA-DERIVED DEOZYCHOLIC ACID IN OBESE MICE

Yan Liu[1], Baiyi Lu[2]

1 Southwest University, China; [2] Zhejiang University, China

129. #1536 DOREA LONGICATENA AND ITS EXTRACELLULAR VISICLES ATTENUATE OVALBUMIN-INDUCED FOOD ALLERGY IN MICE

Yiyi Wang, Wenjing Chen

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130. #21 DEVELOPMENT AND CHARACTERIZATION OF A PROTEIN-FORTIFIED PLANT-BASED BEVERAGE FROM BAMBARA GROUNDNUT (VIGNA SUBTERRANEA): IMPACT OF VARIETY AND ENZYMATIC HYDROLYSIS

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Department of Food Science and Nutrition, Faculty of Science and Technology, Prince of Songkla University, Muang, Pattani 94000, Thailand

131. #51 STARCH FUNCTIONALITY-DRIVEN STANDARDIZATION OF TRADITIONAL KOREAN BUGAK USING THERMALLY PROCESSED RICE FLOURS

SUA BAK[1], HYORIM SEO[1], WOOTAE SONG[2], BOMI YOON[2], SANGHYUN LEE * [3 1]

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132. #132 SEASONAL VARIATION AND MULTI-TARGET BIOLOGICAL ACTIVITIES OF ROSMARINUS OFFICINALIS L. EXTRACTS: PHENOLIC PROFILE, ANTIOXIDANT

khalil GUELIFET * [1], Mohammed MESSAOUDI[2], Mohamed Amine Ferhat[2], khaled kherraz[3 1]

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133. #174 MARIGOLD FLOWER PROTEIN AS A SUSTAINABLE FOOD INGREDIENT FOR FUTURE FOOD APPLICATIONS

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134. #391 NUTRITIONAL ASPECTS AND NATURAL RADIOACTIVITY IN BRAZILIAN NUTS

Mariana Del Ben Mayer * [1], Sandra Maria Chenin Seabra da Silva[1], Lucio Leonardo[1], Sandra Regina Damatto[2], Sandra Emi Kitahara[3 1]

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135. #392 DEVELOPMENT AND NUTRITIONAL EVALUATION OF GLUTEN-FREE PASTA ENRICHED WITH MUSHROOM FLOUR FOR INDIVIDUALS WITH CELIAC DISEASE

Sandra Emi Kitahara * [1], Valéria Vieira da Silva[2], Mariana Del Ben Mayer[3 1]

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136. #394 EVALUATION OF THE SENSORY DIFFERENCE BETWEEN FRESH, FROZEN AND ULTRA-FROZEN JAPANESE RICE BALLS (ONIGIRI)

Sandra Emi Kitahara * [1], Camila Akemi Karubi Yokota[2], Mariana Del Ben Mayer[3 1]

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137. #395 DEVELOPMENT AND PROXIMATE CHARACTERIZATION OF GLUTEN-FREE PASTA FORMULATED WITH ARROWROOT FLOUR AND TAIOBA RHIZOME

Mariana Del Ben Mayer * [1], Beatriz de Luca Silva[1], Heloiza de Oliveira Trindade[1], Vanessa Bernardo Uehara[1], Sandra Emi Kitahara[2] [1]

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138. #412 SUSTAINABLE UPCYCLING OF CHEESE WHEY VIA SYMBIOTIC FERMENTATION FOR FUNCTIONAL METABOLITE GENERATION

Paula Toshimi Matumoto-Pintro * [1], Jessyca Caroline Rocha Ribas[1], Leandra da Silva Florentino[1], Hélène Tormo[2] [1]

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139. #476 EFFECT OF DRYING TIME AND TEMPERATURE ON THE PHYSICO-CHEMICAL AND CONSUMER ACCEPTABILITY OF CARROT-BASED JERKY STRIPS

Kylie Frances Ty * , Jin Mark Pagulayan

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140. #547 PRODUCTION AND QUALITY EVALUATION OF AN OAT WHEAT COMPOSITE BREAD ENRICHED WITH RICE BRAN AND BANANA EXTRACTS

Ofoedum A.F. * [1], Olawuni I.A.[1], Njoku N.E.[1], Odimegu E.N.[1], Anaeke E.J.[1], Ofoedum S.L.[2] [1]

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141. #567 REPOSITIONING INDIGENOUS FOODS AND TRADITIONAL KNOWLEDGE FOR FUTURE FOOD SYSTEMS IN SUB-SAHARAN AFRICA: A SCOPING REVIEW

Sheila Kilonzi * [1], Lydiah Asiko-Omondi[2], Anselimo Makokha[1] [1]

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142. #646 COMPARATIVE EVALUATION OF MINERAL COMPOSITION, MICROBIOLOGICAL SAFETY, AND YOGURT APPLICATION OF COCONUT SAP SUGAR FROM DIFFERENT REGIONS OF THE PHILIPPINES

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143. #754 HIMALAYAN WILD BLUEBERRY (VACCINIUM GLAUCOALBUM): CHEMICAL COMPOSITION AND FUNCTIONAL POTENTIAL

Mridusmita Barman * , Dr. Poonam Mishra

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144. #1103 PROFILING OF BIOACTIVE COMPONENTS AND IN VITRO EVALUATION OF THE ANTIOXIDANT ACTIVITY OF ARATILES (MUNTINGIA CALABURA L.) FRUIT AS AFFECTED BY HEAT TREATMENT

JOANNA MARIE R. RAMOS[1], CATHERINE ANN C. ISRAEL[2]

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145. #822 FUNCTIONAL PROPERTIES OF BIOACTIVE POLYSACCHARIDES EDIBLE FLOWERS

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146. #899 CHARACTERIZATION AND SENSORY QUALITY OF AIR FRIED SNACKS FROM ORANGE FLESHED SWEET POTATO AND PALM WEEVIL LARVA COMPOSITE FLOURS

Tolulope Oresanya * [1], Hannah Olaleye[2], Oladeinde Ogundipe[2], Bolatito Sofolahan[2], Dota Odimegwu[2] [1] Food Science

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147. #903 FUNCTIONAL MODIFICATION OF TRADITIONAL WARANKASHI CHEESE: EFFECTS OF SOURSOP JUICE ON COMPOSITION AND ANTIOXIDANT ACTIVITY.

Oladeinde Olatunde Ogundipe * [1], Hannah Temitayo Olaleye[1], Femi Fidelis Akinwande[1], Olaitan Odukumoju[2], Simbiat Olaide Dawodu[2] [1]

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148. #1044 GENOTYPIC CHARACTERIZATION OF THE MICROBIOTA OF TENGBA

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149. #1072 FROM TRADITIONAL YAM TO FUNCTIONAL FLOUR: MAXIMIZING RESISTANT STARCH IN PHILIPPINE YAM FLOUR USING RESPONSE SURFACE METHODOLOGY

Arianna Denise O. Cedo * , Prince Joseph V. Gaban, Jonina Marie J. Tengco, John Andrew D. Del Mar, Florencio C. Reginio Jr. Institute of Food Science and Technology, College of Agriculture and Food Science,

University of the Philippines Los Baños, 4031 Laguna, Philippines

150. #1193 PHYSICOCHEMICAL AND MICROBIOLOGICAL CHANGES IN BREAD ENRICHED WITH FRESH, BLACK, AND ENCAPSULATED GARLIC DURING STORAGE

Hatice Kubra SASMAZ[1], Turkan UZLASIR * [2], Pınar KADİROGLU[1], Mehmet Sertaç ÖZER[3], Serkan SELLİ[3], Hasim KELEBEK[1] [1]

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151. #1233 INTEGRATED TAXONOMIC AND PREDICTIVE FUNCTIONAL PROFILING OF THE TENGBA MICROBIOME

Ryan Christopher Quiambao[1], Liezel Shine Mananquil[1], Andrew Montecillo[2], Richard Navarro * [1] [1] Institute of Food Science and Technology, College of Agriculture and Food Science,

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152. #1280 ISOLATION AND CHARACTERIZATION OF AMYLOID-LIKE PROTEIN AGGREGATES FROM WHITE BREAD FOR THEIR INTERACTION WITH PATHOGENIC AMYLOIDS

ABHISHEK SINGH YADAV * , JAY KANT YADAV

CENTRAL UNIVERSITY OF RAJASTHAN, DEPARTMENT OF BIOTECHNOLOGY, AJMER, INDIA

153. #1344 CHEMICAL COMPOSITION AND PHYTOCHEMICAL CHARACTERIZATION OF HIMALAYAN WILD BLUEBERRY (VACCINIUM GLAUCOALBUM): A TRADITIONALLY CONSUMED FRUIT OF ARUNACHAL PRADESH, INDIA

Mridusmita Barman * , Dr. Poonam Mishra

Department of Food Engineering & Technology, Tezpur University, Assam, India

154. #1355 LEVILACTOBACILLUS BREVIS ED25 AND LIMOSILACTOBACILLUS REUTERI E81 IMPROVE THE TECHNOLOGICAL AND NUTRITIONAL QUALITY OF SOURDOUGH BREAD

Mukadder Aksoy[1], Zuhal Alkay[1], Tekmile Cankurtaran-Kömürcü[1], Stephen R. Lindemann[2], Enes Dertli[3], Yunus Emre Tuncil * [1] [1] Food Engineering

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155. #1376 PROXIMATE COMPOSITION AND SENSORY ACCEPTABILITY OF PLANT-BASED YOGHURT ANALOGUES FROM MIXTURES OF SOYMILK AND PIGEON PEA MILK

Dorothy Arukwe * , Blessing Offia Olua, Ijeoma Okereke Michael Okpara

University of Agriculture, Umudike

156. #1377 FERMENTATION OF TRADITIONAL TURKISH COFFEE WITH KOMBUCHA

Ayse Muslu Aykoc * Alanya

University Art and Design Faculty Gastronomy and Culinary Arts

157. #1401 HIGH-PRESSURE PROCESSING OF HYDROLYZED SESAME PROTEIN: GELATION FOR NEXT-GENERATION PROTEIN-RICH FOODS

Beatriz Lederman Valente * [1], Giang Vu[2], Osvaldo Campanella[2], Marcelo Cristianini[1] [1]

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158. #1404 VALORISATION OF FARMED AUSTRALIAN SALTWATER CROCODILE (CROCODYLUS POROSUS) CARCASS MATERIAL AS A NOVEL SOURCE OF BIOACTIVE COLLAGEN PEPTIDES

Rina Wong[1], Padraig Strappe * [2] [1] Faculty of Health, Curtin Medical Research Institute, Curtin

University, Perth, WA 6102, Australia [2] Charles Darwin University-Menzies Medical Program, Darwin, NT 0810, Australia

159. #1413 ENRICHMENT OF GABA IN SOYBEANS THROUGH LACTOCOCCUS LACTIS AND LACTOBACILLUS PLANTARUM FERMENTATION AND ITS APPLICATION IN COOKIE PRODUCTION

Yan Liu * , Xin Chen, Zhenjia Chen, Perry Ng Michigan State

University

160. #1414 PH-DEPENDENT STRUCTURAL MODIFICATIONS OF LUPIN PROTEINS INDUCED BY HIGH-PRESSURE HOMOGENIZATION

MArcelo Cristianini * , Priscilla Barbosa André State

University of Campinas

161. #1467 NUTRITIONAL AND BIOACTIVE POTENTIAL OF CHEKA AND BORDE: TRADITIONAL ETHIOPIAN FERMENTED BEVERAGES

Endale Amare Kifle * [1], Tesfaye Legesse Bedada[1], Cristina Martínez-Villaluenga[2], Masresha Tessema[1], Elena Penas[2] [1]

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162. #1474 INTEGRATED MULTI-ANALYTICAL CHARACTERIZATION OF INDIAN HIMALAYAN SEA BUCKTHORN FOR TRADITIONAL FOOD INNOVATION AND FUTURE APPLICATIONS

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163. #1480 CHARACTERIZATION OF PHYSICOCHEMICAL PROPERTIES, FATTY ACIDS, FLAVOR VOLATILES AND PHENOLIC COMPOUNDS OF AVOCADO VARIETIES

Jiating Chen *

School of Chemical Sciences, The University of Auckland, Auckland, New Zealand

164. #349 FROM INDIGENOUS FARMS TO FUNCTIONAL FLOURS: EFFECTS OF PRETREATMENT ON THERMAL AND PASTING PROPERTIES OF PHILIPPINE PURPLE YAM (DIOSCOREA ALATA)

Edward Peter De Guzman1, Airisse Rae Basinang * 1, Emily Soriano2, Casiana Blanca Villarino1

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2Regional Field Office III, Department of Agriculture, San Fernando, Pampanga, Philippines

165. #**1227 IMPACT OF REGULAR GRAPE CONSUMPTION ON EYE HEALTH AND THE REGULATION OF ADVANCED GLYCATION END PRODUCTS**

Marcus Ting,[1] **Jessie Jya Yin Ang,**[1] **May Yoke Yeo,**[1] **Gregory Chung Tsing Chan**[2], **Jung Eun Kim**[3]

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[3]Department of Food Science & Technology, Bezos Centre for Sustainable Protein, National University of Singapore

166. **#1560** T**HE EFFECT OF MICROWAVE, OVEN, AND FREEZE DRYING ON EDIBLE INSECTS SPHENARIUM PURPURASCENS AND ATTA MEXICANA'S DRYING KINETICS, NUTRITIONAL CONTENT, AND BIOACTIVITY**

Mario Peña-Alvarado[1] **Julio E. González-Pérez**[1] **Celeste C. Ibarra-Herrera***[1]

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POSTER PRESENTATIONS

Theme : FOOD ATTRIBUTES : CHEMISTRY AND SENSORY

Date 27.10.2026 Time : 0830 - 1600 Venue : Hall 5

(Please note : Installation: 17:00-1800hrs (5.00pm-6.00pm) on 26 Oct 2026
Removal: 16:00-17:00hrs (4.00pm-5.00pm) on 27 Oct 2026)

Food and Analytical Chemistry

1. **#11 PROXIMATE, AND FUNCTIONAL PROPERTIES OF DOUGH MEAL FROM CARROT AND ORANGE-FLESHED SWEET POTATOES**
   Abiodun Adebayo-Oyetoro * , Adejumoke Salau, Mary Ayodele, Magdalene Monday, Emmanuel Alake, Izuchukwu Mbonu
   Yaba College of Technology, Department of Food Science and Technology, Yaba, Lagos, Nigeria
2. **#178 QUANTIFICATION OF TOTAL RESIN GLYCOSIDES IN SWEET POTATO AND RAPID IDENTIFICATION OF SWEET POTATO CULTIVARS WITH HIGH RG CONTENTS FROM LARGE SAMPLE POOLS**
   Qingtong Xie * [1], Yi Lin[1], Qiuyu Zhang[1], Tiange Liu[2], Dejian Huang[3]
   [1] Department of Food Science & Technology, National University of Singapore, Singapore [2] National University of Singapore (Suzhou) Research Institute, Suzhou, Jiangsu, China. [3] Department of Food Science & Technology, National University of Singapore, Singapore, National University of Singapore (Suzhou) Research Institute, Suzhou, Jiangsu, China.
3. **#189 URCHIN-SHAPED COFS EMPOWER DUAL-MODE SENSOR INTEGRATING MULTIPLE SIGNAL AMPLIFICATION FOR ULTRASENSITIVE NUCLEIC ACID DETECTION**
   Xinxue Zhang * [1], Geoffrey Waterhouse[2], Jin Wang[1]
   [1] Key Laboratory of Environmental Medicine and Engineering, Ministry of Education, and Department of Nutrition and Food Hygiene, School of Public Health, Southeast University, Nanjing, China [2] School of Chemical Sciences, The University of Auckland, Auckland 1142, New Zealand
4. **#192 GLUCOSINOLATES IN DIFFERENT ORGANS OF CHOY SUM (BRASSICA RAPA VAR. PARACHINENSIS) AND INDOOR FAR-RED LIGHT STRATEGY TO INCREASE THEIR CONTENTS**
   Jim Junhui Huang * , Yufeng Xue, Qian Zeng, Li Zou, Weibiao Zhou*
   Department of Food Science & Technology, National University of Singapore
5. **#286 EFFECT OF CONTINUOUS AND CYCLIC HYDROTHERMAL ANNEALING ON THE PASTING AND THERMAL PROPERTIES OF CASSAVA STARCH**

Tayla Danieli Lopes Dias[1], Michelle de Paula Cardozo[2], Ivo Mottin Demiate[1], Luiz Gustavo Lacerda *

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6. **#308 IMPACT OF CITRIC ACID ON THE MAILLARD REACTION IN THE PRODUCTION OF INSTANTIZED IRON-FORTIFIED RICE USING HIGH-TEMPERATURE HIGH-PRESSURE EXTRUSION**

Charlie Adona * , Jayson Tagaroma, Francesca Louise Garcia, Herlyn Villamento, Maricar Albao

Food and Nutrition Research Institute, Department of Science and Technology, Taguig City, Philippines

7. **#319 METHOD VALIDATION FOR THE DETERMINATION OF 31 PER- AND POLYFLUOROALKYL SUBSTANCES IN ANCHOVY USING LIQUID CHROMATOGRAPHY–TANDEM MASS SPECTROMETRY**

Youngbin Jang[1], Haejin Kwon[1], Yebeen Kang[1], Cho-il Kim[2], Hyun-Mee Park *

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8. **#334 FOOD GRADE SYNTHESIS OF FLAVONE DIMER LIBRARY AND SCREENING OF THEIR ANTIBACTERIAL ACTIVITY**

Chuyi Wang * , Dejian Huang, Siyu Chen

Department of Food Science and Technology, National University of Singapore

9. **#341 PHYSICOCHEMICAL AND SPECTRAL CHARACTERIZATION OF PORK AND BEEF CUTS USING HYPERSPECTRAL IMAGING AND FOOD SCANNER ANALYSIS**

Ji Yoon Cha * , Min Kyung Park, Yun-Sang Choi

Korea Food Research Institute

10. **#196 DE NOVO PEPTIDE SEQUENCING BY N-TERMINAL COUMARIN DERIVATIZATION AIDED LIQUID CHROMATOGRAPHY-TRAPPED ION MOBILITY SPECTROMETRY-QUADRUPOLE TIME-OF-FLIGHT MASS SPECTROMETRY AND ITS APPLICATION IN PEPTIDOMICS**

Hui Luan[1], Yumiko Toyama[2], Fumiya Honda[1], Ryotaro Asai[1], Risa Katagihara[1], Yizhi Xiao[1], Saya Nakamura[1], Toshiro Matsui[3], Mitsuru Tanaka[3]

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11. **#446 GREEN EXTRACTION OF BIOACTIVE COMPOUNDS FROM COFFEA ARABICA SIDESTREAMS WITH AQUEOUS DEEP EUTECTIC SOLVENT AND THEIR APPLICATION IN MAYONNAISE AS ANTIOXIDANT AGENTS**

Gaston Adoyo * [1], Willis Owino[1], Elizabeth Wafula[1], Søren Engelsen[2], George Abong[3]
[1] Jomo Kenyatta University of Agriculture and Technology [2] University of Copenhagen [3] University of Nairobi

12. **#507 LIGNAN COMPOSITION AND ANTIOXIDANT ACTIVITY OF SAFFLOWER SEEDS FROM DIFFERENT REGIONS OF KOREA**
Gajin Kim * , Jinseo Lee, Sujong Park, Seulbi Seo, Younghwa Kim
Department of Food Science and Biotechnology, BB21plus Project Team, Kyungsung University, Busan, Republic of Korea

13. **#509 CHANGES IN LIGNAN AND FLAVONOID METABOLISM AND ANTIOXIDANT ACTIVITY DURING SESAME GERMINATION AND ASSOCIATED METABOLIC PATHWAYS**
Jinseo Lee * , Yoonjeong Kim, Daeyoon Kang, Gajin Kim, Younghwa Kim
Department of Food Science and Biotechnology, BB21plus Project Team, Kyungsung University, Busan, Republic of Korea

14. **#579 NEW INSIGHTS INTO VOLATILE PHENOL–DRIVEN OFF-FLAVOR IN SOY (1) CONTRIBUTION OF STRUCTURALLY RELATED VOLATILE PHENOLS TO THE BEANY OFF-FLAVOR IN SOYMILK**
Naomichi Nakagawa * , Misato Baba, Kenichi Tomi
Fuji Oil Co., Ltd., Osaka, Japan

15. **#580 NEW INSIGHTS INTO VOLATILE PHENOL–DRIVEN OFF-FLAVOR IN SOY (2) REGULATION OF OFF-FLAVOR CONTRIBUTING VOLATILE PHENOLS IN SOYMILK USING LACCASE**
Misato Baba * , Naomichi Nakagawa, Kenichi Tomi
Fuji Oil Co., Ltd., Osaka, Japan

16. **#586 EFFECT OF ELICITORS ON LIGNAN ACCUMULATION DURING SAFFLOWER SEED GERMINATION**
Yoonjeong Kim * , Jinseo Lee, Gajin Kim, Daeyoon Kang, Younghwa Kim
Department of Food Science and Biotechnology, BB21plus Project Team, Kyungsung University, Busan, Republic of Korea

17. **#590 DETERMINATION OF TOTAL PHENOLIC AND FLAVONOID CONTENT WITH ANTIOXIDANT ACTIVITY IN VACUUM FREEZE-DRIED BREWED LIBERICA COFFEE (COFFEA LIBERICA VAR LIBERICA)**
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18. **#612 FAGOPYRIN F CONTENT IN EXTRACTS FROM COMMON AND TARTARY BUCKWHEAT HULLS UNDER DIFFERENT EXTRACTION CONDITIONS**
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Department of Food and Nutrition, College of Natural Science, Sungshin Women's University, Seoul, Republic of Korea

19. **#631 UNRAVELING IRON–STARCH COORDINATION IN FORTIFIED RICE FLOUR SYSTEMS VIA VIBRATIONAL SPECTROSCOPY**

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20. **#641 ESTABLISHMENT OF OPTIMAL EXTRACTION CONDITIONS FOR PLATYCODON GRANDIFLORUS ROOT USING BBD-RSM**

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21. **#714 CHEMICAL AND TECHNO-FUNCTIONAL CHARACTERIZATION OF AVOCADO, MAIZE, AND AGAVE BY-PRODUCTS FOR CLEAN-LABEL APPLICATIONS**

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22. **#725 TEMPERATURE-DRIVEN MOLECULAR INTERACTIONS GOVERNING STABILITY OF FUNCTIONAL MILK BEVERAGES ENRICHED WITH AUSTRALIAN NATIVE FRUIT AND HERBAL PIGMENTS**

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23. **#727 WEAK-BASE SYNCHRONOUS MEMBRANE SEPARATION: A GREEN STRATEGY FOR ENHANCING EMULSIFICATION STABILITY OF SOY PROTEIN ISOLATE BY REGULATING INTERFACIAL FLEXIBILITY**

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24. **#734 MOLECULAR MECHANISM OF TRANSMEMBRANE TRANSPORT AND HIGH-EFFICIENCY STABLE DELIVERY OF CAROTENOIDS INDUCED BY THE INTERFACE OF NATURAL FLAXSEED OIL BODIES AS A CARRIER**

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25. **#789 VARIABILITY IN THE PUN1 LOCUS IN CAPSICUM GERMPLASM**

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26. #803 IDENTIFICATION OF CONGENERS IN IRISH WHISKEY MATURING IN DIFFERENT TYPES OF CASKS

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27. #819 VOLATILE PROFILE AND SENSORY CHARACTERISATION OF MANIPUEIRA SELVAGEM, AN EMERGING BRAZILIAN WILD-FERMENTED CASSAVA BEER

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28. #842 VERIFICATION OF THE ANALYTICAL METHOD FOR 14 TYPES OF PHTHALATES IN FOOD USING GC-MS

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29. #876 EVALUATING THE FUNCTIONALITY OF A RAPID ON SITE COLORMETRIC DEVICE FOR DETECTION OF SUDAN IV DYE ADULTRATION IN PALM OIL

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30. #896 POLYCYCLIC AROMATIC HYDROCARBONS IN CACAO PRODUCTS: PROFILES AND ASSOCIATED HEALTH RISKS

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31. #931 EFFECTS OF PRETREATMENTS ON THE PHYSICOCHEMICAL PROPERTIES AND PROXIMATE COMPOSITION OF VACUUM FREEZE-DRIED MAKAPUNO COCONUT (COCOS NUCIFERA VAR. MAKAPUNO))

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32. #955 DETERMINATION OF BIOTIN CONTENT IN VEGETABLES AND MUSHROOMS COMMONLY CONSUMED IN KOREA

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33. #958 INFLUENCE OF CONTINUOUS AND CYCLIC HYDROTHERMAL ANNEALING ON THE THERMAL, PASTING, MORPHOLOGICAL, AND STRUCTURAL PROPERTIES OF BEAN STARCH

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34. #999 ANALYSIS OF PROTEINACEOUS COMPONENTS AND BIOACTIVITIES IN THE BOILED EXTRACT OF SKIPJACK TUNA SAWDUST

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35. #1037 RATIONAL DESIGN AND AI-DUIDED EVOLUTIONARY ENGINEERING OF CAS12J-8 FOR RAPID FLUORESCENCE DETECTION OF CRONOBACTER SAKAZAKII IN DAIRY PRODUCTS

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36. #1061 AN INTEGRATED AUTOMATED DISPERSIVE LIQUID-LIQUID MICROEXTRACTION WORKFLOW FOR VOLATILE ANALYSIS OF JAPANESE MANDARIN JUICES

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37. #1135 CHEMICAL DIVERSITY OF NATIVE BRAZILIAN VANILLA SPECIES AND THEIR DIFFERENTIATION FROM COMMERCIAL VANILLA VARIETIES

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38. **#1151 BOTANIC ASPECTS OF THE LEAVES AND CHEMICAL CONSTITUENTS IN THE ESSENTIAL OIL FROM TWO VARIETIES OF BASIL (OCIMUM SPP) GROWN IN BRAZIL**

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39. **#1153 QUALITY OF OLIVE OILS AND OLIVE BAGASSE OIL AND THEIR USE IN THERMAL PROCESSES**

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40. **#1180 ORANGE JUICE ENRICHED WITH DEFECTIVE COFFEE EXTRACT AND THE EFFECT OF PASTEURIZATION**

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41. **#1186 TWO-STAGE MIXED-DYE-BASED ISOTHERMAL AMPLIFICATION WITH RIBONUCLEASE-CLEAVABLE ENHANCED PROBES FOR DUAL-VISUALIZATION DETECTION OF SARS-COV-2 VARIANTS OF INTEREST**

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42. **#1187 RNASE H2-MEDIATED ISOTHERMAL AMPLIFICATION COUPLED WITH CRISPR-CAS12B FOR RAPID DETECTION OF COMMON AQUACULTURE VIRUSES**

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43. **#1200 OPTIMIZATION OF PROLINE–CITRIC ACID NATURAL DEEP EUTECTIC SOLVENT FOR ULTRASOUND-ASSISTED RECOVERY OF FLAVANONES FROM ORANGE PEEL WASTE**

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44. **#1283 DEVELOPMENT OF A NATIONAL VITAMIN B6 DATABASE THROUGH COMPREHENSIVE ANALYSIS OF PYRIDOXINE, PYRIDOXAL, AND PYRIDOXAMINE IN KOREAN FOODS**

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45. #1324 AROMA CHARACTERISTICS OF GRILLED SQUID EXTRACTS OBTAINED BY SUPERCRITICAL CARBON DIOXIDE AND SUBCRITICAL WATER EXTRACTION METHODS

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46. #1361 AN ULTRASENSITIVE STRATEGY FOR MILK ALLERGEN MONITORING BY INTEGRATING MAGNETIC ENRICHMENT AND DNAZYME-ASSISTED ELECTROCHEMICAL

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47. #1367 AN ULTRASENSITIVE STRATEGY FOR MILK ALLERGEN MONITORING BY INTEGRATING MAGNETIC ENRICHMENT AND DNAZYME-ASSISTED ELECTROCHEMICAL

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48. #1373 RATIOMETRIC SELF-CALIBRATING CONDUCTIVE HYDROGEN-BONDED ORGANIC FRAMEWORK FOR RELIABLE ARA H 1 BIOSENSING

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49. #1423 OPTIMIZATION OF EXTRACTION CONDITIONS FOR BIOACTIVE COMPOUNDS FROM PLATYCODON GRANDIFLORUS ROOT USING BBD-RSM

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50. #1437 INTEGRATED METABOLOMICS AND LIPIDOMICS ENABLE AUTHENTICATION OF ORGANIC LEAFY VEGETABLES ACROSS CULTIVATION SYSTEMS

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51. #1530 REGIONAL AND SEASONAL VARIATION IN PHYSICOCHEMICAL CHARACTERISTICS OF PHILIPPINE

CALAMANSI JUICE: AN EXPLORATORY PRINCIPAL COMPONENT ANALYSIS

Michelle Evaristo, Stanly Adams Jocson, Christian Niamey Cortado, Carmelita Umali

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52. **#1482 PHYTOCHEMICAL CHARACTERIZATION AND BIOACTIVE POTENTIAL OF THE ENDEMIC BROWN MACROALGAE FUCUS VIRSOIDES**

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53. #1562 **MILPA TORTILLAS: BIOACTIVE COMPOUNDS AND ANTIOXIDANT EFFECT IN OVARIECTOMIZED FEMALE C57BL/6 MICE**

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54. **#1221 PHYSICOCHEMICAL CHARACTERISTICS OF NANOVESICLES DERIVED FROM WHITE ROSE FLOWER ACCORDING TO PRETREATMENT CONDITIONS**

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55. **#18 SENSORY CHARACTERIZATION AND STABILITY OF IRON-FORTIFIED SPICED COCONUT (COCOS NUCIFERA) WATER VINEGAR IN DIFFERENT STORAGE TIMES AND PACKAGING MATERIALS**

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56. **#133 A METHOD TO GENERATE ANIMAL-BASED BROTH-LIKE FLAVORS FROM SOY PROTEIN VIA COMBINED PROTEASE AND MAILLARD REACTIONS**

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57. **#217 SOFTENING TRADITIONS: SENSORY PROFILING OF TEXTURED MODIFIED PULUT HITAM DESSERT**
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58. **#222 AROMA CHARACTERISTICS OF GRILLED SQUID EXTRACTS OBTAINED BY SUPERCRITICAL CARBON DIOXIDE AND SUBCRITICAL WATER EXTRACTION**
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59. **#333 CONSUMER PREFERENCES TOWARDS THE EUROPEAN FLAT OYSTER (OSTREA EDULIS) FROM INTEGRATED MULTI-TROPHIC AQUACULTURE (IMTA)**
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60. **#407 FROM CONSUMER IDEAL TO SWEET POTENCY DETERMINATION: SWEETNESS OPTIMIZATION OF NATURAL SWEETENERS IN A CHOCOLATE-FLAVORED TARWI (LUPINUS MUTABILIS) BEVERAGE**
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61. **#660 EXPLORING CONSUMER PERCEPTION ACROSS ITALY AND JAPAN: A CROSS-CULTURAL STUDY ON FUNCTIONAL PASTA**
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62. **#723 BITTERNESS AND METALLIC AFTERTASTE REDUCTION IN LOW SODIUM POTASSIUM CHLORIDE SEASONING USING YEAST EXTRACT AND PEPTIDE RICH INGREDIENTS**
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63. **#1171 CAROTENOID DEGRADATION AND DERIVED VOLATILE FORMATION DURING LONG-TERM TEA AGING**
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64. #1256 CHARACTERIZATION OF THE TEMPORAL SENSORY PERCEPTION OF FERMENTED AND UNFERMENTED RUBUS ROSIFOLIUS SM. USING TEMPORAL DOMINANCE OF SENSATIONS

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65. #1405 CONSUMER SEGMENTS, AWARENESS, AND BARRIERS TO SOY YOGURT ADOPTION IN NORTHERN VIETNAM

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66. #1406 TURN IT DOWN TO EAT MORE HEALTHILY

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67. #1419 CHEMICAL BASIS OF FLAVOR VARIATION AMONG DIFFERENT COMMERCIAL BRANDS OF TROTTER SOUP REVEALED BY INTEGRATED AROMA, TASTE, AND SENSORY ANALYSES

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68. #1427 DEVELOPMENT OF PLANT-BASED SEAFOOD ALTERNATIVES USING HIGH MOISTURE EXTRUSION AND SECOND-STAGE PROCESSING

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69. #1509 CUTTING SALT WITHOUT LOSING FLAVOR: HOW SEAWEED-DERIVED UMAMI CAN IMPROVE HEALTHIER FOODS

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Color and Pigments in Food Systems

70. #245 IDENTIFICATION OF THE BETALAIN PROFILE IN PITAYA (STENOCEREUS SP.) AND EVALUATION OF ITS STABILITY UNDER THE EFFECT OF TEMPERATURE

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71. #793 PIGMENTS FROM RHODOTORULA MUCILAGINOSA TO INCREASE QUALITY AND FUNCTIONALITY OF FERMENTED CHICKPEA-BASED HUMMUS

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72. #932 THE TOXIC GLOW: SCREENING FOR ILLEGAL COLOUR ADULTERATION IN COMMERCIAL TURMERIC POWDER WITHIN THE SRI LANKAN MARKET

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73. #1004 EVALUATION OF THE EFFECT OF DIFFERENT PROCESSING METHODS ON COLOR CHARACTERISTICS AND PHYTOCHEMICAL PROPERTIES OF SAPINIT

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74. #1143 TECHNOLOGICAL PROSPECTION OF MICROBIAL CAROTENOID PRODUCTION FROM CRUDE GLYCEROL FOR NATURAL FOOD COLORANTS

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75. #1468 CAROTENOID DIVERSITY IN ETHIOPIAN PLANT FOODS: EXPANDING FOOD COMPOSITION DATA FOR NUTRITION AND FOOD SYSTEMS

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Texture, Rheology, and Material Properties of Foods

76. #87 AQUEOUS EXTRACTION OPTIMISATION OF OKRA (ABELMOSCHUS ESCULENTUS) MUCILAGE FOR FOOD

PROCESSING APPLICATIONS: RHEOLOGICAL, FTIR, AND TGA CHARACTERISATION

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77. **#155 MODULATING STARCH RETROGRADATION IN FRESH RICE-BASED NOODLES: EFFECTS OF HYDROCOLLOIDS AND EMULSIFIERS ON TEXTURAL STABILITY DURING STORAGE**

Evelyn Goh * , Tan Yu An, Candy, Janit Thapa Magar, Timothy Lim Hong Le Temasek Polytechnic

78. **#201 LOW-ACYL GELLAN GUM FOR STRUCTURING GLUCONO-Δ-LACTONE TRIGGERED COLD-SET EMULSION GELS**

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79. **#371 THREE-DIMENSIONAL PRINTED SWEET POTATO TEETHING SNACKS: TUNING TEXTURE WITH HYDROXYPROPYL METHYLCELLULOSE**

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80. **#409 REGULATORY EFFECTS OF ULTRASONICATED POLYSACCHARIDES ON FISH PROTEIN CONFORMATION AND FUNCTIONAL PROPERTIES**

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81. **#457 EFFECT OF GELLING AGENT COMPOSITION ON RHEOLOGICAL PROPERTIES AND EXTRUDABILITY OF JELLY INKS FOR THREE-DIMENSIONAL FOOD PRINTING**

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82. **#555 3D-PRINTED CHOCOLATE FOR DYSPHAGIA: HYDROCOLLOID-ENHANCED RHEOLOGY, TEXTURE AND PRINTABILITY**

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83. #632 COMPOSITION AND THERMAL PROPERTIES OF PHILIPPINE CACAO–BASED DARK CHOCOLATE ENRICHED WITH LACTIPLANTIBACILLUS PLANTARUM

Czarina Corine Topacio * , Romeo Jamey Yaquin Jr., Florabelle Querubin, Maria Carmen Tan, Aldrin Bonto
De La Salle University

84. #653 A NOVEL GREEN AND EFFICIENT METHOD FOR CHIA SEED MUCILAGE EXTRACTION: PHYSICOCHEMICAL PROPERTIES AND FUNCTIONAL CHARACTERISTICS

ZEWEI WU *
Department of Food Science & Technology, National University of Singapore, [2] Science Drive 2, Singapore 117542, Singapore

85. #662 EFFECT OF SWEETENER TYPE AND PROTEIN COMPOSITION ON THE QUALITY CHARACTERISTICS OF HIGH-PROTEIN BAR" EMPHASIS ON PROTEIN-SWEETENER INTERACTIONS

Jihee Choo * [1], Hae Jin Park[1], Sehyun Joo[1], Wonyeong Park[1], Jieun Oh[2]
[1] Department of Nutritional Science and Food Management, Ewha Womans University, Korea [2] College of Science & Industry Convergence, Ewha Womans University, Korea

86. #708 PHYSICAL, RHEOLOGICAL AND MICROSTRUCTURAL PROPERTIES OF GRAPE POMACE-BASED EMULSION GELS FOR THE DEVELOPMENT OF REDUCED-FAT FOOD SYSTEMS

Samuel Rodríguez[1], Teresa Sanz[2], Amparo Quiles[1], Isabel Hernando *
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87. #710 OPTIMISING EMULSION STABILITY IN POTATO PROTEIN SYSTEMS: ROLES OF POLYSACCHARIDES IN INTERFACIAL AND RHEOLOGICAL BEHAVIOURS

Tianqi Shang * [1], Meng Wai Woo[2], Siew-Young Quek[1]
[1] School of Chemical Sciences, The University of Auckland, Auckland, New Zealand [2] Department of Chemical and Material Engineering, The University of Auckland, Auckland, New Zealand

88. #925 LOW METHOXYL PECTIN GELATIN SCAFFOLDS FOR ANIMAL FAT TISSUE MIMICS

Haowen Zhu * , Dejian Huang
Department of Food Science and Technology, National University of Singapore, [2] Science Drive 2, Singapore 117542, Singapore, Bezos Centre for Sustainable Protein, National University of Singapore, [2] Science Drive 2, Singapore 117542, Singapore

89. #982 INTERCONNECTED PLANT-BASED MEAT AND FAT ANALOGUES VIA DOUBLE-NETWORK EMULSION GELS

Canice Chun-Yin Yiu * , Yong Wang, Cordelia Selomulya
School of Chemical Engineering, The University of New South Wales, NSW, 2052, Australia

90. #1090 UPCYCLED INSOLUBLE FIBROUS POLLOCK SKIN POWDER AS A NOVEL REINFORCING FILLER FOR SOY PROTEIN ISOLATE-BASED THREE-DIMENSIONAL FOOD PRINTING INKS

Haran Jo * [1], Ju Young Kim[1], Sin-Won Park[1], Ji-Eun Bae[2], Sang Gil Lee[3]

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91. #1164 ENHANCING THE EMULSIFYING PROPERTIES OF MEALWORM (TENEBRIO MOLITOR) PROTEIN THROUGH ENZYMATIC HYDROLYSIS

Yu Ji Ye, Min Hyeock Lee *

Department of Biotechnology, College of Life Sciences and Biotechnology, Korea University, Republic of Korea

92. #1274 PREPARING CASSAVA STARCH–WHEY PROTEIN COMPOSITES THROUGH GENIPIN CROSSLINKING, AND THERMAL PROCESSING: STRUCTURAL AND FUNCTIONAL IMPLICATIONS

Haleh Harati * , Stefan Kasapis, Asgar Farahnaky

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93. #1290 FLUENCE-DEPENDENT EFFECTS OF PULSED LIGHT ON FUNCTIONAL PROPERTIES OF AIR-CLASSIFIED NAVY BEAN PROTEIN CONCENTRATES

Rania Marie Buenavista * , Yonghui Li, Sajid Alavi, Kaliramesh Siliveru

Department of Grain and Food Science, Kansas State University, Manhattan, Kansas, USA

94. #1291 A STUDY OF THE INCORPORATION OF FOXTAIL MILLET INTO THE BROWN-RICE PUFFED SNACKS

Qandeel Zahra, Jenshinn Lin * National Pingtung

University of Science and Technology

95. #1320 CHALLENGES OF RECOMBINANT MILK PROTEINS: THE IMPORTANCE OF CASEIN PHOSPHORYLATION

Fatemeh Mirpoor * [1], Julia Maldonado-Valderrama[2], Afroditi Chatzifragkou[1], Dimitris Charalampopoulos[1]

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96. #1473 STUDY ON THE TWIN-SCREW EXTRUSION OF EDAMAME FLOUR, SOY PROTEIN ISOLATE, AND CORN STARCH FOR A HIGH-MOISTURE MEAT ANALOG

Sri Oktavia, Jenshinn Lin * National Pingtung

University of Science and Technology

97. #232 Olive Leaf Water Extract Enhances the Physical Properties of Pea Protein Gels through Covalent Crosslinking

Lillah Zuhrotul Ukhro * 1, Toya Ishii2, Masahiro Ogawa2
University of Science and Technology

98. #1561 EFFECT OF PECTIN ON EMULSIFYING PROPERTIES OF SOY PROTEIN ISOLATE: TAILORING EMULSION GEL INKS FOR 3D-PRINTED FOOD SYSTEM

Muhammad Muntaqeem Arain* [1] **Fengxia Liu**[1]
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POSTER PRESENTATIONS

Theme : FOOD SAFETY , QUALITY, AND RISK COMMUNICATION

Date 27.10.2026 Time : 0830 - 1600 Venue : Hall 5

(Please note : Installation: 17:00-1800hrs (5.00pm-6.00pm) on 26 Oct 2026
Removal: 16:00-17:00hrs (4.00pm-5.00pm) on 27 Oct 2026)

Foodborne Pathogens and Prevention Strategies

99. #36 IMPROVE THE HYGIENE STATUS OF WASHER/WAXER BRUSH ROLLERS IN A CUSTOM-MADE PEACH PACKING LINE PROTOTYPE

Jinru Chen * , Yaxi Dai, Vondel Reyes Ortega, Kevin Mis Solval The

University of Georgia, USA

100. #37 FATE OF SALMONELLA ENTERICA IN SPROUTED PEANUT AND ALMOND BUTTER AFFECTED BY THE USE OF ELLAGITANNINS FROM AQUEOUS AND ETHANOLIC EXTRACTS OF POMEGRANATE PEELS

Jinru Chen * , Weifan Wu, Kevin Mis Solval The

University of Georgia, USA

101. #101 THE CHALLENGES OF FOOD SAFETY AND EMERGING CONTAMINANTS IN NIGERIA

Gregory Onwuka * Michael Okpara

University of Agriculture, Umudike, Abia State, Nigeria

102. #115 MULTI-OMICS INSIGHTS INTO SALMONELLA THERMAL RESISTANCE AT DIFFERENT WATER ACTIVITIES AND TEMPERATURES AND EVALUATION OF E. FAECIUM NRRL B-2354 AS A SURROGATE

Azka Batool, Xin Wang, Shuxiang Liu * College of Food Science, Sichuan Agricultural

University

103. #279 COLD PLASMA-MEDIATED INACTIVATION OF BACILLUS IN MILLET FLOUR: KINETICS, MECHANISMS, AND QUALITY IMPACTS

Jaspreet Kaur * , Dibakar Saha, Kanishka Bhunia

Agricultural and Food Engineering Department, Indian Institute of Technology Kharagpur, Kharagpur, West Bengal, India

104. #453 COMPARATIVE EVALUATION OF PHAGE COCKTAILS AGAINST A BROAD RANGE OF FOODBORNE PATHOGENS

Xi Liu * , Yuechong Liu, Song Zhang, Tian Ding, Juhee Ahn Future Food Laboratory, Innovation Center of Yangtze River Delta, Zhejiang

University, Jiaxing, Zhejiang 314100, China

105. #461 ENVIRONMENTAL STRESS ADAPTATION AND PHENOTYPIC HETEROGENEITY IN SHRIMP-BORNE VIBRIO PARAHAEMOLYTICUS

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106. #535 FOOD-GRADE SYNTHESIZED BIFLAVONOIDS AS PROMISING ANTIMICROBIALS AGAINST METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS

Siyu Chen * [1], Chuyi Wang[1], Qiao Yuan[2], Shu-Sin Chng[3], Dejian Huang[1] [1]

Department of Food Science and Technology, National University of Singapore, Singapore, Singapore [2] School of Chemistry, Chemical Engineering and Biotechnology (CCEB), Nanyang Technological University, Singapore, Singapore [3] Department of Chemistry, National University of Singapore, Singapore, Singapore

107. #543 EVALUATION OF THE BACTERICIDAL EFFECTS OF OZONE ULTRAFINE BUBBLE WATER IN MODEL SYSTEMS AND FRESH VEGETABLES FOR APPLICATION IN JAPANESE PICKLES PRODUCTION

Satomi TSUTSUURA * [1], Natsumi MITA[1], Tomoko YAMAGUCHI[2], Yutaka TERAO[3] [1] Faculty of Agriculture, Niigata

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108. #591 IDENTIFICATION AND DETECTION OF VIBRIO CHOLERAE IN GREEN MUSSELS (PERNA VIRIDIS) FROM IDENTIFIED GROWING AREAS IN LUZON (PANGASINAN AND CAVITE) USING POLYMERASE CHAIN REACTION

Patricia Mae M. Lagazon * [1], Abigail S. Rustia[1], Crisanto M. Lopez[2], Erniel B. Barrios[3], Leslie Michelle M. Dalmacio[4] [1]

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109. #595 BEYOND THE LAB: INTEGRATING ENVIRONMENTAL AND COMMUNITY DATA FOR ADAPTIVE MANAGEMENT OF VIBRIO PARAHAEMOLYTICUS AND VIBRIO CHOLERAE IN PHILIPPINE GREEN MUSSELS

Patricia Mae M. Lagazon * [1], Abigail S. Rustia[1], Crisanto M. Lopez[2], Erniel B. Barrios[3], Leslie Michelle M. Dalmacio[4] [1]

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110. #623 APPLICATION OF PLASMA CHILL SPRAY TECHNOLOGY FOR INACTIVATION OF ESCHERICHIA COLI BIOFILMS ON STAINLESS STEEL SURFACES

Roopesh Mohandas Syamaladevi * [1], Negar Ravash[1], Xianqin Yang[2] [1]

University of Alberta, Edmonton, Canada [2] Agriculture and Agri-Food Canada

111. #638 CHASING MICROBIAL FOOTPRINTS

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112. #695 GRAS BIOCONTROL FOR CULTURED MEAT: SELECTIVE ACTIVITY OF ANTIMICROBIAL FATTY ACIDS

Steven Leonardi * , Johnson Esua, Vinayak Ghate, Weibiao Zhou

Department of Food Science and Technology, National University of Singapore

113. #971 DIVERGENT COEVOLUTIONARY FATES OF ENVIRONMENTAL PHAGES AND ESCHERICHIA COLI: IMPLICATIONS FOR PHAGE-BASED BIOCONTROL IN FOOD SAFETY

Yiming Luo * , Lin Chen

Nanyang Technological University, China

114. #995 RATIONAL DESIGN AND AI-GUIDED EVOLUTIONARY ENGINEERING OF CAS12J-8 FOR RAPID FLUORESCENCE DETECTION OF CRONOBACTER SAKAZAKII IN DAIRY PRODUCTS

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115. #1332 ENVIRONMENTAL STRESS ADAPTATION AND PHENOTYPIC HETEROGENEITY IN SHRIMP-BORNE VIBRIO PARAHAEMOLYTICUS

Xiaoyu Wang * , Jiayi Zhang, Tian Ding, Xinyu Liao, Juhee Ahn

Innovation Center of Yangtze River Delta, Zhejiang University

116. #1547 INTEGRATED TRANSCRIPTOME AND REGULATORY NETWORK OF PSEUDOMONAS PLECOGLOSSICIDA REVEALS ADAPTIVE STRATEGIES AND CONSERVED VULNERABILITIES UNDER ENVIRONMENTAL CONDITIONS

Zhe Xie, Yibei Zhang, Qiyao Wang

State Key Laboratory of Bioreactor Engineering, East China University of Science and Technology, China

117. 1546 BACTERIAL ANTI-TOXIN HIGA REGULATES HOST INTESTINAL SEROTONIN HOMEOSTASIS IN A T6SS-DEPENDENT MANNER

Chunli Li

State Key Laboratory of Bioreactor Engineering, East China University of Science and Technology, China

118. #1542 MECHANISTIC INSIGHTS INTO SOLUTE-DEPENDENT SALMONELLA GROWTH KINETICS UNDER WATER ACTIVITY STRESS VIA WATER STATE CHARACTERIZATION AND TRANSCRIPTOMIC ANALYSIS

Zheneng Sun*, Mohan Li, Shuxiang Liu

College of Food Science, Sichuan Agricultural University, China

119. #1538 SOUS VIDA PROCESSING AND SAFETY VALIDATION OF CHICKEN ADOBO AND BEEF RANDANG

Monica Manalo, Maria Clarissa Manabat, Flores Bienvendio Jr.

Food Processing Division, Industrial Technology Development Institute, Department of Science and Technology, Philippines

120. #585 SUPPLY CHAIN VULNERABILITY ASSESSMENT FOR HEPATITIS A VIRUS IN PHILIPPINE OYSTERS AND MUSSELS: INFORMING RESILIENCE-BUILDING THROUGH MULTI-CRITERIA DECISION ANALYSIS

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3Department of Biology, School of Science and Engineering, Ateneo de Manila University, Quezon City, Metro Manila 1108 Philippines

121. #1559 DIRECTED SENSING OF HOST FERRIC IRON BY AN ARCHETYPE HISTIDINE KINASE MEDIATES VIRULENCE OF AN ENTRIC PATHOGEN

Yibei Zhang*[1], Qiyao Wang[1], Xiaohui Zhou[2]

[1] East China University of Science and Technology, China

[2] Southern University of Science and Technology, China

122. #1322 QUANTITATIVE FLOW-CYTOMETRIC EVIDENCE OF DIVERGENCE BETWEEN CULTURABILITY AND PHYSIOLOGICAL VIABILITY IN HIGH-PRESSURE-TREATED LISTERIA MONOCYTOGENES

Anna Zadernowska*[1], Wioleta Chajęcka-Wierzchowska[1], Patryk Wiśniewski[1], Arkadiusz Zakrzewski[1]

[1]Department of Food Microbiology, Meat Technology and Chemistry. Faculty of Food Science. University of Warmia and Mazury in Olsztyn, Poland

123. #846 BIOFILM SURVIVAL OF LISTERIA MONOCYTOGENES AFTER HIGH-PRESSURE PROCESSING: IMPLICATIONS FOR FOOD SAFETY

Anna Zadernowska*[1], Wioleta Chajęcka-Wierzchowska[1], Patryk Wiśniewski[1], Arkadiusz Zakrzewski[1]

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Safety Regulations & Global Harmonization

124. #1407 REGULATORY CONSIDERATIONS OF RECENTLY INDIVIDUALLY RECOGNIZED KOREAN HEALTH FUNCTIONAL FOOD INGREDIENTS WITH BIOAVAILABILITY-ENHANCING PROCESSING TECHNOLOGIES

Gyoung-Deuck Kim[1] Hae-yeon Lee[1] Eunju Kim[1]

[1]International Life Sciences Institute Korea, Seoul, Republic of Korea

125. #1527 ESTABLISHING CHEMICAL AND MICROBIOLOGICAL SAFETY AND QUALITY PARAMETERS FOR PHILIPPINE PEANUT BUTTER

Maria Clarissa Manabat * , Una Grace Dollete, Charles Feb Palla, Ana Rose Boqueo, Anna Katrina Loberiano

Industrial Technology Development Institute (ITDI), Department of Science and Technology (DOST), Bicutan, Taguig City 1631, Philippines

126. #557 OSMOTIC STRESS ENHANCES ANTIBIOTIC RESISTANCE AND BIOFILM FORMATION OF LISTERIA MONOCYTOGENES IN DAIRY PROCESSING ENVIRONMENTS

Wioleta Chajęcka-Wierzchowska * , Patryk Wiśniewski, Patryk Adamski, Anna Zadernowska

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127. #1148 FROM WASTE TO WELLNESS: BLACKCURRANT POMACE s A SOURCE OF BIOACTIVE INGREDIENTS FOR SKIN CARE APPLICATIONS

Milda Pukalskienė*[1,] Laura Augustinaitytė[1,] Gabriela Kowalska[2,] Joanna Oracz[2,] Susana Cardoso[3]

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128. #1328 BEYOND FOOD PRESERVATION: TECHNOLOGICAL STRESSES AS DRIVERS OF ANTIMICROBIAL RESISTANCE AND VIRULENCE IN FOODBORNE STAPHYLOCOCCI

Wioleta Chajęcka-Wierzchowska*, **Joanna Gajewska**[1], **Zuzanna Byczkowska-Roztkowska**[1], **Anna Zadernowska**[1]

[1]Department of Food Microbiology, Meat Technology and Chemistry, Faculty of Food Science, University of Warmia and Mazury in Olsztyn, Poland

Risk Perceptions and Communication in Education

129. #64 PHILIPPINE FOODBORNE DISEASE OUTBREAKS (2018-2024): EPIDEMIOLOGICAL TRENDS AND FOOD SAFETY IMPLICATIONS

Gerieka Anapi * , Dominic Panaligan

Laboratory of Food Microbiology and Hygiene, Department of Food Science and Nutrition, College of Home Economics, University of the Philippines Diliman

130. #1305 DEVELOPMENT, OPTIMIZATION, AND VALIDATION OF LATERAL FLOW APTAMER-BASED RAPID ANALYTICAL FOOD TESTING KITS FOR DETECTION OF FOLIC ACID IN FORTIFIED FOODS

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131. #1407 REGULATORY CONSIDERATIONS OF RECENTLY INDIVIDUALLY RECOGNIZED KOREAN HEALTH FUNCTIONAL FOOD INGREDIENTS WITH BIOAVAILABILITY-ENHANCING PROCESSING TECHNOLOGIES

Gyoung-Deuck Kim * , Hae-yeon Lee, Eunju Kim International Life Sciences Institute Korea, Seoul, Republic of Korea

132. #883 ASSESSMENT OF ALLERGEN CROSS-CONTACT FROM REUSED COOKING MEDIA IN RETAIL AND FOODSERVICE

Xingyi Jiang * , Ben Remington, Stefano Luccioli, Laurie Williams, Veronica Moore, Lauren Jackson

USFDA

133. #1015 BACTERIAL SAFETY OF STREET-VENDED READY-TO-EAT FRUITS AND FOOD SAFETY KNOWLEDGE, ATTITUDES, AND PRACTICES OF VENDORS IN MANILA: A CORRELATIONAL STUDY

Iliana Cashmere Cruz, A2Z B. Cada * , Gracielle Danette Delos Angeles, Elaine Marie Catoy, Lourminette Dela Cruz, Denise Kristel Cruz, Canellie Canlas-Ocsona, Clarenz Sarit Concepcion, Richmon Cuatico

Department of Medical Technology, Faculty of Pharmacy, University of Santo Tomas, Manila, Philippines

134. #511 FACTORS AFFECTING WILLINGNESS OF FILIPINOS TO CONSUME CELL-BASED FISH MEAT (PRELIMINARY ANALYSIS)

Rowena Grace Rumbaoa-Sanchez * 1, John Rinno Sanchez1, Lerrie Ann Ipulan-Colet2

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Microplastics and nanomaterials in food systems

135. #302 PROTECTIVE EFFECTS OF ERINACINE A-ENRICHED HERICIUM ERINACEUS MYCELIUM AGAINST REPRODUCTIVE DAMAGE INDUCED BY POLYSTYRENE MICROPLASTICS IN MALE RATS

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POSTER PRESENTATIONS

Theme : AI, DATA SCIENCE AND DIGITAL TRANSFORMATION IN FOOD SYSTEMS

Date 27.10.2026 Time : 0830-1600 Venue : Hall 5

(Please note : Installation: 1700-1800hrs (5:00 pm–6:00 pm) on 26 Oct 2026
Removal: 1600–1700 hrs (4:00 pm–5:00 pm) on 27 Oct 2026)

Foodomics and Multi-Omics Approaches

136. #561 TRANSLATING BULK PROTEIN INTO BIOACTIVE POTENTIAL: A MULTI-SCALE EXPLORATION BASED ON HEMPSEED

Xuan Dong * [1], Siew-Young Quek[2] [1] Food Science,

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137. #626 OVERPRODUCTION OF A TRUNCATED CYCLOISOMALTOOLIGOSACCHARIDE GLUCANOTRANSFERASE FROM THERMOANAEROBACTER THERMOCOPRIAE IN ESCHERICHIA COLI

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138. #679 COMPUTATIONAL SCREENING OF LEVAN FRUCTOTRANSFERASE BASED ON ACTIVE SITE STRUCTURE SIMILARITY

Hyeon-Seok Jeong * , Young-Wan Kim

Department of Food and Biotechnology, Korea University, Sejong, South Korea

139. #721 A GENOMIC APPROACH TO THE BIOLOGICAL MINING OF THE INDIGENOUS NEW ZEALAND MUSHROOM HERICIUM NOVAE-ZEALANDIAE

Yuan Wen[1], Xuan Dong * [1], Siew Young Quek[2] [1] Food Science,

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140. #1068 IDENTIFICATION OF DIAGNOSTIC INDICATORS USING GENOMIC TOOLS TO SUPPORT DECISION-MAKING IN CHEDDAR CHEESE RIPENING

Élisabeth Robert * [1], Marie-Hélène Lessard[1], Julien Chamberland[1], Marie-Claude Gentès[2], Steve Labrie[1] [1] Université Laval, Departement of food science, Quebec, Qc, Canada [2] Saint-Hyacinthe Research and

Development Centre, Agriculture and Agri-Food Canada, Saint-Hyacinthe, Qc, Canada

141. #1110 ANTIOXIDANT AND ANTI-INFLAMMATORY POTENTIAL OF MYAGROPSIS MYAGROIDES: AN INTEGRATED STUDY OF EXTRACTION DIVERGENCE, UNTARGETED DUAL-MODE UPLC-MS/MS, AND NETWORK PHARMACOLOGY

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142. #1549 INSIGHT INTO THE MEAT QUALITY DIFFERENCES OF TIBETAN SHEEP FROM DIFFERENT ALTITUDES BASED ON METABOLOMICS

Li Chen* 1, Ruisi Liu[1], **Jianing Fu**[1] **Dequan Zhang**[1] *[1]Institute of Food Science and Technology, CAAS, China*

Artificial Intelligence for sensory and quality prediction

143. #332 A COLORIMETRIC AND PHOTOTHERMAL DUAL-MODE NANOZYME PLATFORM: MULTIMODAL MACHINE LEARNING GUIDED REAL-TIME FRESHNESS SENSING AND PREDICTING OF AQUATIC PRODUCTS UNDER CHALLENGING LIGHTING CONDITIONS

Jingqi Shen * , Weijia Zhang, Miaolin Duan, Zunying Liu, Fei Jia

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144. #406 DECODING THE UMAMI PROFILE OF TRADITIONAL FERMENTED SUFU: A HIGH-THROUGHPUT PREDICTION STRATEGY INTEGRATING PEPTIDOMICS, MACHINE LEARNING, AND VIRTUAL SCREENING

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145. #702 MACHINE LEARNING-BASED SENSORY QUALITY PREDICTION AND FLAVOR DRIVER IDENTIFICATION IN FERMENTED EDIBLE INSECT SEASONINGS

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146. #858 ENHANCING PORK FRESHNESS PREDICTION VIA RGB-TO-HYPERSPECTRAL RECONSTRUCTION UNDER VARYING LED ILLUMINATIONS

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147. #1418 A DUAL-RESPONSE COLORIMETRIC SENSOR ARRAY INTEGRATED WITH DEEP LEARNING FOR MOBILE INTELLIGENT FRESHNESS ASSESSMENT OF AQUATIC PRODUCTS

Qi Yu * [1], Min Zhang[1], Chung Lim Law[2] [1] Jiangnan University, Wuxi, China [2] Taylor's University, Selangor, Malaysia

148. #1526 CHEMOMETRIC AND MACHINE-LEARNING APPLICATIONS FOR FOOD CHARACTERISATION AND AUTHENTICATION

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149. #269 PREDICTION OF MOISTURE CONTENT IN CUT APPLES DURING HOT-AIR DRYING USING DEEP NEURAL NETWORK WITH FINE TUNING

Yosuke Matsuo * 1, Satoshi Kawamura2, Daisuke Kurata3, Takahiro Orikasa[4], Shoji Koide[4] [1]

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AI driven analysis of food consumption and innovation

150. #59 FOOD INFORMATICS: LEVERAGING DATA AND KNOWLEDGE TO ADVANCE FOOD SYSTEMS

Mabel Zitong Leow, Dachuan Zhang *

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151. #294 MACHINE LEARNING-BASED CLASSIFICATION OF WHEAT CULTIVARS UTILIZING MULTI-INSTRUMENTAL PHYSICOCHEMICAL ANALYSIS

Chanmin Sagong, Suyong Lee * Sejong University

152. #815 DIGITAL AND SPECTROSCOPIC INNOVATIONS FOR SUSTAINABLE FOOD QUALITY CONTROL UNDER FOOD INDUSTRY 4.0

Chyngyz Erkinbaev * , Yinka Sikiru

University of Manitoba

153. #1036 DECODING CONSUMER SENTIMENT TOWARD EDIBLE INSECTS USING AI APPROACHING

Kyungmo Kang *

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154. #1511 ARTIFICIAL INTELLIGENCE-GENERATED SENSORY RESPONSES TO NON-TRADITIONAL FLAVOR INGREDIENTS IN CHOCOLATE BROWNIES

Stacie Yee Sing Tan * , Damir Torrico

University of Illinois-Urbana Champaign, Chicago, USA

POSTER PRESENTATIONS

Theme : EDUCATION, CAPACITY BUILDING AND WORK FORCE TRANSFORMATION

Date 27.10.2026 Time : 0830-1600 Venue : Hall 5

(Please note : Installation: 1700-1800hrs (5:00 pm–6:00 pm) on 26 Oct 2026
Removal: 1600–1700 hrs (4:00 pm–5:00 pm) on 27 Oct 2026)

Education, Capacity Building, and Workforce Transformation

155. #588 DEVELOPING A TRAINING COURSE ON FOOD SAFETY RISK PROFILING FOR CHEMICAL AND MICROBIOLOGICAL HAZARDS IN THE PHILIPPINES: TEACHING AND COMMUNICATING RISK TO REGULATORY AGENCIES

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POSTER PRESENTATIONS

Theme : FUNCTIONAL FOODS, BIO ACTIVES AND HEALTH PROMOTION

Date 28.10.2026 Time : 0830-1600 Venue : Hall 5

(Please note : Installation: 1700-1800hrs (5:00 pm–6:00 pm) on 27 Oct 2026
Removal: 1600–1700 hrs (4:00 pm–5:00 pm) on 28 Oct 2026)

Functional Foods and Supplements: Safety & Health Outcomes

1. **#15 COMPARATIVE STUDIES ON THE FUNCTIONAL GROUPS AND SELECTED FUNCTIONAL PROPERTIES OF PROTEIN CONCENTRATES OBTAINED FROM DIFFERENTLY DRIED SENECIO BIAFRAE LEAFY VEGETABLE**
   Akinsola Famuwagun * , Oluseye Abiona, Clement Adebooye
   Osun State University, Osogbo Nigeria
2. **#20 DEVELOPMENT OF LOW-GLYCEMIC INDEX MEAL REPLACEMENT BARS USING NATIVE AND PREGELATINIZED GREEN BANANA FLOUR**
   Thammarat Kaewmanee * [1], Acharaporn Issuriya[2], Surasak Limsuwan[3], Sasitorn Chusri[4], Damiya Semmad[1]
   Department of Food Science and Nutrition, Faculty of Science and Technology, Prince of Songkla University, Muang, Pattani 94000, Thailand [2] Division of Health and Applied Sciences, Faculty of Science, Prince of Songkla University, Hat Yai, Songkhla, 90110, Thailand [3] Traditional Thai Medical Research and Innovation Center, Faculty of Traditional Thai Medicine, Prince of Songkla University, Hat Yai 90110, Thailand [4] Biomedical Technology Research Group for Vulnerable Populations and School of Health Science, Mae Fah Luang University, Muang, Chiang Rai 57100, Thailand.
3. **#72 BIOTECHNOLOGICAL UPCYCLING OF GRAPE POMACE: ENHANCING ANTIOXIDANT POTENCY AND PHENOLIC DIVERSITY VIA SELECTIVE ENZYMATIC HYDROLYSIS**
   Rosangela Bergamasco * , Denise Silva Aquino, Marsilvio Lima de Moraes Filho, Beatriz Cervejeira Bolanho Barros, Natália Ueda Yamaguchi
   State University of Maringá, Brazil
4. **#73 EVALUATION OF THE GLYCEMIC INDEX OF COMPOSITE BREADS FORMULATED BY SUBSTITUTING 30% OF WHEAT FLOUR WITH YAM FLOUR RICH IN RESISTANT STARCH**
   Olivier Kouadio Kouadio * [1], Charlemagne Nindjin[1], Kouakou Nestor Kouassi[2], Bassirou Bonfoh[3], Georges N'guessan Amani[2]
   University Nangui Abrogoua-Department of Food Science and Technology, Centre Suisse de Recherches Scientifiques en Côte d'Ivoire-Department of Sustainable Agriculture and Nutrition [2] University Nangui Abrogoua-Department of Food Science

and Technology [3] Centre Suisse de Recherches Scientifiques en Côte d'Ivoire-Department of Sustainable Agriculture and Nutrition

5. **#92 PHYTOCHEMICAL PROFILING OF NTURUKPA (PTEROCARPUS SANTALINOIDES) LEAVES: IMPLICATIONS FOR FOOD SECURITY AND NUTRACEUTICAL DEVELOPMENT**

Nkiruka David-Chukwu * [1], Philippa Ojimelukwe[2], Fabian Ugwuona[2], Chinasa Okorie[1], Chinechendu Ubadire-Agua[2]

Abia State Polytechnic, Aba, Abia State, Nigeria [2] Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria

6. **#98 PHENOLIC PROFILING AND MECHANISTIC INSIGHTS INTO THE ANTIOXIDANT POTENTIAL OF AUSTRALIAN SORGHUM BRAN PHENOLICS**

Xuefu Zhou * [1], Pangzhen Zhang[1], Danyang Ying[2], Zhongxiang Fang[1]

School of Agriculture, Food and Ecosystem Sciences, Faculty of Sciences, University of Melbourne, Parkville, VIC 3010, Australia [2] CSIRO Agriculture & Food, Werribee, VIC 3030, Australia

7. **#103 MICROENCAPSULATION OF IRON-RICH AMARANTHUS GANGETICUS L. LEAF EXTRACT AND VITAMIN C USING SPRAY-DRYING AND FREEZE-DRYING TECHNIQUES**

Saika Vicgneswaran * [1], O.D.A.N. Perera[1], N.M. Adasooriya[2]

Department of Food Science and Technology, Faculty of Livestock, Fisheries and Nutrition, Wayamba University of Sri Lanka, Gonawila, Sri Lanka [2] Department of Chemical and Process Engineering, Faculty of Engineering, University of Peradeniya, Peradeniya, Sri Lanka

8. **#179 ENHANCED EXTRACTION OF ASHWAGANDHA ANTIOXIDANTS USING RESPONSE SURFACE METHODOLOGY AND THEIR STABILIZATION IN O/W EMULSIONS: A STUDY WITH REFERENCE TO GLUCOSE MODULATION**

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9. **#186 ANTI-INFLAMMATORY EFFECT OF LACTIC ACID BACTERIA-FERMENTED SOY MILK**

Takuya Sugahara * [1], Nanako Ishimaru[1], Momoko Ishida[2], Kosuke Nishi[3], Yasuhiro Sasuga[4]

Graduate School of Agriculture, Ehime University [2] Food and Health Function Research Center, Ehime University [3] The United Graduate School of Agricultural Sciences, Ehime University [4] B&S Corporation

10. **#190 RASPBERRY KETONE MODULATES GLIAL INFLAMMATION AND LIPID METABOLISM IN MICE**

Xinyue Qi * [1], Hui Ye[1], Vibhavari Aysha Bansal[1], Lijun Liu[1], Ting Luo[2]

School of Chemistry, Chemical Engineering, and Biotechnology, Nanyang Technological University, Singapore, 637371 [2] State Key Laboratory of Bioreactor Engineering, East China University of Science and Technology, Shanghai, China.

11. **#194 THE MAGIC OF STARCH – A SCIENTIFIC JOURNEY WITH STARCH FOR FOOD APPLICATIONS**

Janusz Kapusniak * , Kamila Kapusniak, Malwina Wojcik, Arkadiusz Zarski, Magdalena Rudlicka

Department of Dietetics and Food Studies, Innovative and Pro-Health Food (InnoFood) Research Centre, Faculty of Science and Technology, Jan Dlugosz University in Czestochowa, Armii Krajowej 13/15, 42-200 Czestochowa, Poland

12. **#211 DEVELOPMENT OF A REDUCED-FAT CAKE BAR USING JUTE (CORCHORUS OLITORIUS L.) MUCILAGE AS A FUNCTIONAL FOOD INGREDIENT**

Mayleen Joyce Villanueva * [1], Grecebio Jonathan Alejandro[2], Rosario Sagum[1]

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13. **#267 INTEGRATED EXTRACTION, PAPAIN HYDROLYSIS, AND ULTRAFILTRATION OF SOYBEAN, BLACK SOYBEAN, AND PEA FOR MULTIFUNCTIONAL BIOACTIVE PEPTIDE FRACTIONS**

Hyorim Seo * [1], Jinwoo Jeong[1], Hyunjin Lee[2], Kyunghwan Kim[3], Sanghyun Lee[2]

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14. **#270 UPCYCLING WHEAT BRAN THROUGH LACTIC ACID FERMENTATION TO ENHANCE SOLUBLE DIETARY FIBER, FREE FERULIC ACID, AND ANTIOXIDANT ACTIVITY**

Jinwoo Jeong * [1], Prasetyo Agung[1], Kyunghwan Kim[2], Jeongmin Park[2], Sanghyun Lee[3]

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15. **#271 INTEGRATED PROCESS DEVELOPMENT OF A FUNCTIONAL RICE BRAN INGREDIENT USING OPTIMIZED ALLIUM HOOKERI EXTRACT, ENZYMATIC PRETREATMENT, AND LACTIC FERMENTATION**

Suah Bak * [1], Nakyeom Lee[1], Rubab Subhani[2], Hyesook Lee[3], Hyeonjin Lee[1]

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16. **#293 SUSTAINABLE STARCH MODIFICATION FOR CLEAN-LABEL, FIBRE-ENRICHED FOOD INGREDIENTS**

Mahsa Majzoobi * , Anthony Halim, Mayang Pawitra, Asgar Farahnaky

Department of Food Technology and Nutrition, School of Science, RMIT University, Melbourne, Australia, 3083.

17. **#337 EFFECT OF MICROWAVE SEED TREATMENT ON SILYMARIN CONTENT IN MILK THISTLE (SILYBUM MARIANUM (L.) GAERTN.) SPROUTS DETERMINED BY INFRARED SPECTROSCOPY**

Paulina Ropuszyńska-Robak[1], Lucyna Dymińska[1], Agnieszka Orkusz * [2], Edyta Kucharska[1], Wojciech Sąsiadek[1]

Wrocław University of Economics and Business, Department of Bioorganic Chemistry, Wrocław, Poland [2] Wrocław University of Economics and Business, Department of Biotechnology and Food Analysis, Wrocław, Poland

18. **#346 EVALUATING CULTIVAR SPECIFIC BIOPROTECTIVE RESPONSES OF PEF ENHANCED CARROT PURÉES AGAINST OXIDATIVE STRESS USING A HUMAN CELL LINE MODEL**

Indrawati Oey * [1], David Burritt[2], Sze Ying Leong[3]

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19. **#359 MASLINIC ACID PROMOTES HAIR GROWTH AND MODULATES PIGMENTATION THROUGH ASSOCIATED SIGNALING PATHWAYS ACROSS IN VIVO, 2D, AND 3D MODELS**

Aprill Kee Oliva Mizushima * [1], Meryem Bouhoute[1], Meriem Bejaoui[1], Farhana Ferdousi[2], Hiroko Isoda[2]

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20. **#372 DEVELOPMENT OF A SCREENING FRAMEWORK FOR FUNCTIONAL EVALUATION OF CRUCIFEROUS VEGETABLE GERMPLASM**

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21. **#377 FROM BEAN TO BIOACTIVE PEPTIDES: OPTIMIZATION OF MUNG BEAN (VIGNA RADIATA L.) PROTEIN HYDROLYSATE AND EVALUATION OF SIZE-FRACTIONATED ANTIOXIDANT AND ANTI-INFLAMMATORY POTENTIAL**

Worrapob Chaisan * [1], Kanokwan Promjeen[2], Suphat Phongthai[3], Chawan Manaspon[4], Niramon Utama-ang[1]

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22. **#389 EXTRACTION, NUTRITIONAL, TECHNO-FUNCTIONAL AND SAFETY ASSESSMENT OF ALTERNATIVE PROTEINS FROM WATERWEED, ELODEA NUTTALLII.**

Gaoya Dong * [1], Monjurul Hoque[1], Shay Hannon[2], Brijesh Tiwari[1]

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23. **#466 ENZYMATIC HYDROLYSATES OF BEER BREWING BY-PRODUCTS AS POTENT AGENTS AGAINST ULTRAVIOLET B-INDUCED PHOTOAGING IN HUMAN DERMAL FIBROBLASTS**
Chanmi Jeong * , Huijoo Bae, Seonghwa Hong, Hana Lee, Junsoo Lee
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24. **#467 IDENTIFICATION OF NOVEL DPP-IV INHIBITORY PEPTIDES FROM PERILLA SEED MEAL BASED ON MACHINE LEARNING AND EXPERIMENTAL VALIDATION**
Junyoung Park * , Seoyeon Kim, Seonghwa Hong, Hana Lee, Junsoo Lee
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25. **#468 PHYSICOCHEMICAL PROPERTIES AND IN VITRO DIGESTIBILITY OF SORGHUM POLYPHENOL-POTATO STARCH COMPLEXES FOR GLYCEMIC MANAGEMENT**
Minju Kim * , Yeseul Lim, Seonghwa Hong, Hana Lee, Junsoo Lee
Department of Food Science and Biotechnology, Chungbuk National University, Cheongju, Chungbuk, Korea

26. **#469 SYNERGISTIC PROTECTIVE EFFECTS OF BLACK SOYBEAN AND BLACKBERRY EXTRACTS AGAINST DIHYDROTESTOSTERONE-INDUCED OXIDATIVE STRESS IN HUMAN DERMAL PAPILLA CELLS**
Hyeonjeong Jo * , Seonghwa Hong, Hana Lee, Junsoo Lee
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27. **#472 PROTECTIVE EFFECTS OF GARLIC SPROUT AND DIALLYL TRISULFIDE AGAINST PALMITATE-INDUCED ATROPHY IN C2C12 MYOTUBES**
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28. **#473 ENHANCEMENT OF BIOACTIVE COMPOUNDS AND BIOLOGICAL ACTIVITIES IN CENTELLA ASIATICA LEAVES BY COMBINED TREATMENT OF MELATONIN AND ULTRASOUND**
Changmin An * , Sua Park, Seonghwa Hong, Hana Lee, Junsoo Lee
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29. **#492 EFFECT OF PROCESSING ON ENDOCANNABINOIDS IN COCOA**
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30. **#501 FOOD ORIGINATED POLYAMINES AS METHYLGLYOXAL-TRAPPING AGENTS: ANTI GLYCATION ACTIVITY AND STRUCTURAL CHARACTERIZATION OF REACTION ADDUCTS**
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31. #519 DEVELOPMENT AND CHARACTERIZATION OF CINNAMON-INFUSED INSTANT BLACK TEA FOR INSTANT FUNCTIONAL BEVERAGE APPLICATION

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32. #521 ISORHAMNETIN AS A DIETARY FLAVONOID: EXPLORING ITS MULTITARGET ACTIVITY ACROSS DIVERSE BIOLOGICAL SYSTEMS

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33. #541 DEVELOPMENT OF GLUTEN-FREE DRIED RICE NOODLES INCORPORATED WITH RED SEAWEED, KAPPAPHYCUS ALVAREZII

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34. #553 CONSUMER BEHAVIOUR TOWARDS FUNCTIONAL FOODS, DIETARY SUPPLEMENTS AND NUTRIENT AWARENESS: A COMPARATIVE STUDY ACROSS FIVE EUROPEAN COUNTRIES

Olga Szulecka * [1], Tomasz Kulikowski[1], Adam Mytlewski[1], Ida-Johanne Jensen[2], Eva Falch[2], Alina Culetu[3]

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35. #559 MULTISCALE PROBING OF CHOLESTEROL-LOWERING EFFECT FROM DIETARY BIOACTIVES

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36. #582 DEVELOPMENT OF FUNCTIONAL READY-TO-DRINK BEVERAGE FROM CALABASH (CRESCENTIA CUJETE) FRUIT

Maria Christina Ramos * [1], Maribeth Hanson[1], Ludivina Porticos[2], Donnalyn Imbas[3], Jadess Lorraine Vista[1]

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37. #597 COMPARATIVE EVALUATION OF ANTIOXIDANT ACTIVITY AND ANTI-MUSCLE ATROPHY EFFECTS OF MEJU SUPPLEMENTED WITH MEALWORM AND OKARA

Seohyeon Kim * [1], Yookyung Kim[2]

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38. #606 LION'S MANE MUSHROOM AS A FUNCTIONAL INGREDIENT IN OAT-BASED DESSERTS FOR DYSPHAGIA AND HEALTHY AGEING

Samiddhi Gunathilake * [1], Supuni Aluthge[1], Asgar Farahnaky[1], Tien Huynh[2], Mahsa Majzoobi[1]

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39. #645 PILOT-SCALE EXTRUSION AND SENSORY EVALUATION OF A MULTI-NUTRIENT RICE KERNELS FOR MATERNAL HEALTH

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40. #652 PHOTOPROTECTIVE EFFECTS OF FLAVONES ARE HIGHLY SENSITIVE TO THE NUMBER AND POSITION OF PHENOLIC GROUPS

Guo Chen * , Dejian Huang

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41. #656 EFFECT OF HIGH-PRESSURE HOMOGENISATION ON THE STRUCTURE AND FUNCTIONAL PROPERTIES OF MICRO ALGAE GOLDEN CHLORELLA (AUXENOCHLORELLA PROTOTHECOIDES)

Mayang Pawitra[1], Billy Lo * [1], Asgar Farahnaky[1], Roman Buckow[2], Yakindra Timilsena[2], Mahsa Majzoobi[1]

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42. #687 EVALUATION OF AMINO ACID PROFILE OF COMMERCIALLY AVAILABLE "PLANT-BASED" OR "VEGAN" COLLAGEN PEPTIDES

Kotoko Yamada * [1], Megumi Hosokawa[1], Satoshi Miyauchi[2], Yasutaka Shigemura[2]

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43. #696 INVESTIGATION OF PHYSICOCHEMICAL, STRUCTURAL, NUTRITIONAL, BIOACTIVE, AND DIGESTIVE PROPERTIES OF

MALTED MILK POWDER ENRICHED WITH GERMINATED CEREALS AND PULSES

Chamodi Gunathunga * [1], Madhura Jayasinghe[2], Suraji Senanayake[2], Tuyen Truong[3], Charles Stephen Brennan[4], R.A.U.J. Marapana[2], Jayani Chandrapala[1]

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44. **#716 PROTEIN DIGESTIBILITY, PEPTIDOMIC PROFILES, AND PUTATIVE ALLERGENICITY OF NEW ZEALAND-SOURCED LOCUSTA MIGRATORIA: FOLLOWING SIMULATED GASTROINTESTINAL DIGESTION**

Caiyan Ye * , Duncan McGillivray, Siew-Young Quek

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45. **#751 PRODUCT DEVELOPMENT OF INSTANT ULTRA-LOW GLYCEMIC INDEX RICE PORRIDGE**

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46. **#847 NOVEL W/O/W DOUBLE EMULSION-BASED GELLED PROBIOTIC MICROCAPSULES FOR NON-DAIRY CHEESE APPLICATION**

Toshifumi Udo[1], Ethan He[2], Gopinath Mummaleti[1], Yang Jiao[3], Rakesh K. Singh * [1], Fanbin Kong[1]

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47. **#854 SUSTAINABLE UNDERUTILIZED PLANT RESOURCES FOR GUT MICROBIOTA TARGETED PREBIOTIC DEVELOPMENT**

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University of Sri Lanka

48. **#906 ANTIOXIDANT PEPTIDES FROM FERMENTED WHEY: SCREENING, PEPTIDOMICS, AND IN SILICO INSIGHTS**

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49. #969 APPLICATION OF BIOACTIVE MUNG BEAN PROTEIN HYDROLYSATE IN A HIGH-PROTEIN VEGAN SOUP

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50. #972 DIGESTIVE HEALTH AS A DRIVER OF PLANT-BASED DAIRY ALTERNATIVE CONSUMPTION: EVIDENCE FROM MULTI COUNTRIES SURVEYS

Christelle Bou-Mitri * [1], Virginia Messina[2], Klaudia Wiśniewska[3], Laëtitia Duret[4]

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51. #975 EFFECT OF GRAIN COMPOSITION ON GROWTH AND CORDYCEPIN PRODUCTION OF CORDYCEPS MILITARIS CULTIVATED ON VARIOUS FOOD CROPS

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52. #1029 APPLICATION OF HYBRID TEXTURED VEGETABLE PROTEIN WITH COCONUT DIETARY FIBER IN PLANT-BASED SAUSAGE: A PRELIMINARY STUDY

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53. #1059 DIGESTIVE STABILITY, ANTI-INFLAMMATORY ACTIVITY, AND GUT MICROBIOTA MODULATION OF SORGHUM 3-DEOXYANTHOCYANIDINS

Yanbei Wu * [1], Suhang Yao[1], Wei Ding[2], Bei Wang[1]

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54. #1102 OAT BETA-GLUCAN AS ADJUNCTIVE NUTRITIONAL THERAPY IN ACTIVE ULCERATIVE COLITIS: CLINICAL AND INFLAMMATORY OUTCOMES OF A 28-DAY INTERVENTION

Joanna Harasym * [1], Alicja Zalecińska[2], Łukasz Kopiasz[3], Katarzyna Dziendzikowska[3], Joanna Gromadzka-Ostrowska[3]

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55. **#1152 UNLOCKING THE ANTIDIABETIC POTENTIAL OF VIBURNUM OPULUS (EUROPEAN CRANBERRYBUSH) BARK: IMPACT OF EXTRACTION STRATEGIES ON ENZYME INHIBITORY ACTIVITY**
Milda Pukalskienė * [1], Beatričė Žaldokaitė[1], Audrius Pukalskas[2], Petras Rimantas Venskutonis[1]
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56. **#1201 EFFECT OF A MANGO- AND CHIA-BASED BEVERAGE ON GUT MICROBIOTA IN CHILDREN WITH EXCESS WEIGHT: STUDY DESIGN AND IMPLEMENTATION PROGRESS**
Walter Sandoval, Guiomar Viveros, Julieta Mendez, Gladys Estigarribia * , Gloria Gonzalez Universidad Nacional de Caaguazu, Facultad de Ciencias de la Salud

57. **#1223 BRIDGING THE FIBRE GAP: WHERE DID WE GO WRONG?**
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58. **#1234 QUALITY AND FUNCTIONAL CHARACTERISTICS OF DAIRY PRODUCTS SUPPLEMENTED WITH FERMENTED PHILIPPINE INDIGENOUS FRUITS: RUBUS ROSIFOLIUS AND MUNTINGIA CALABURA**
Dana Sophia Ysabel A. Fernandez, Bhea Patrice D. Aquino, John Joshua R. Javier, Dandro L. Sosa, Rona Camille Lizardo-Agustin *
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59. **#1251 BEYOND ANTIOXIDANT: UNLOCKING THE FULL POTENTIAL OF A-TOCOPHEROL FOR HUMAN HEALTH AND PLANT ADAPTATION TO ENVIRONMENTAL STRESSES**
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60. **#1284 FERMENTATION OF TRADITIONAL TURKISH COFFEE WITH SCOBY**
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61. **#1330 AVOTASTIC OAT BUNS: THE DEVELOPMENT AND SENSORY ACCEPTABILITY OF HEART-FRIENDLY SNACK BUNS INTENDED FOR ADULTS (20-59 YEARS OLD) WITH HYPERTENSION AND DYSLIPIDEMIA**
Clariza Angela Arbilo * , Adrienne Gylle Alexie S. Fernandez, Ma. Camille R. Quiapos, Claire Anne Y. Santiago, Stephanie Reign T. Villanueva
University of Santo Tomas, Philippines

62. **#1349 VALORIZATION OF SOYBEAN HULLS THROUGH THE DEVELOPMENT OF FOOD-GRADE PECTIN–ALGINATE HYDROGELS**
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63. **#1360 COMPARATIVE EFFECTIVENESS OF FERROUS SULFATE VERSUS FERROUS FUMARATE IN YINGYANGBAO FOR IMPROVING ANEMIA IN INFANTS**

Lijuan Wang * , Yifan Xu, Yanbin Tang, Mengyao Zhang, Jian Huang
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64. **#1382 HESPERETIN AMELIORATES BRAIN AGING BY RESTORING CIRCADIAN GENE EXPRESSION AND ATTENUATING NEUROINFLAMMATION IN D-GALACTOSE-INDUCED AGING MICE**

Minkyeong Lee, Suhyeon Lee, Yumin Sim, Eunju Kim *
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65. **#1387 EFFECTS OF BAICALIN ON MITOCHONDRIAL FUNCTION AND CIRCADIAN REGULATION IN DEXAMETHASONE-INDUCED SKELETAL MUSCLE ATROPHY**

Suhyeon Lee * , Yumin Sim, Minkyeong Lee, Eunju Kim
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66. **#1391 SYNTHESIS OF TRIBUTYRIN AND TRIPROPIONIN AND THEIR ALLEVIATIVE EFFECTS ON COLITIS AND GUT MICROBIOTA IN MICE**

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67. **#1408 FUCOIDAN REGULATES THE ABSORPTION AND METABOLISM OF NICOTINAMIDE RIBOSIDE WHEN SUPPLEMENTED IN A FUNCTIONAL RICE FLOUR**

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68. **#1417 FEEDING THE CLOCK: HOW CHRONONUTRITION FIGHTS JET LAG, CIRCADIAN DISRUPTION, AND NEURODEGENERATION**

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69. **#1431 DIGESTION AND FECAL FERMENTATION BEHAVIOR OF AMPELOPSIS GROSSEDENTATA POLYSACCHARIDE AND ITS MODULATION ON HUMAN GUT MICROBIOME**

Lu Xu * , Kailin Li, Tim-fat Shum, Jiachi Chiou
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70. **#1436 POMEGRANATE ELLAGITANNIN-RICH EXTRACT IMPROVES CHOLESTEROL METABOLISM THROUGH GUT MICROBIOTA-MEDIATED BILE ACID REMODELING**

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71. #1460 MOLECULAR INTERACTIONS GOVERNING THE PHYSICOCHEMICAL, NUTRITIONAL AND SENSORIAL PROPERTIES OF MILK–TEA SYSTEMS

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72. #400 EFFECTS OF CELL DISRUPTION ON THE BIOACCESSIBILITY OF FRACTIONATED AUXENOCHLORELLA PROTOTHECOIDES DURING IN VITRO DIGESTION

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73. #458 COMPARATIVE GENOMIC ANALYSIS REVEALING DISTINCT ACID TOLERANCE MECHANISMS IN LACTIPLANTIBACILLUS PLANTARUM TMA126 AND KCCP 11859

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74. #523 ENHANCING PROBIOTIC FUNCTIONALITY USING A PEACH KERNEL OIL-BASED DOUBLE EMULSION SYSTEM

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75. #1014 WHEN FOOD GOES BAD: STUDYING BIOFILM FORMATION TO REDUCE FOOD SPOILAGE AND EXTEND SHELF LIFE

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76. #1204 CHOLESTEROL-LOWERING EFFECTS OF BIFIDOBACTERIUM BREVE IDCC 4401(BBR 4401): INTEGRATED PRECLINICAL AND CLINICAL EVIDENCE

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77. #1476 HEAT-INACTIVATED BIFIDOBACTERIUM BREVE 207-1 PREVENTS GLUCOSE METABOLISM DETERIORATION IN PATIENTS WITH TYPE 2 DIABETES MELLITUS: A RANDOMIZED CONTROLLED TRIAL

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78. #1471 LUTEOLIN STABILIZES EPHX1 AND ENGAGES AN ARACHIDONIC ACID–PPARD–ACSL4 AXIS ASSOCIATED WITH LIPID PEROXIDATION AND MLKL SIGNALING IN GASTRIC CANCER

Huan Zhang * , Ke Tao, Guiju Sun, Shaokang Wang

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79. #1472 MULTI-OMICS INSIGHTS INTO THE PROTECTIVE EFFECTS OF SALIDROSIDE AGAINST HYPERURICEMIA-ASSOCIATED LIVER–KIDNEY METABOLIC DYSFUNCTION IN RATS

Wenqian Tang * , Haojing Chang, Shaokang Wang, Guiju Sun

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80. #1481 WHEN FOOD SYNERGY BREAKS: FAILURE-MODE MAPPING AND A STAGE-GATED EVIDENCE PIPELINE FOR FUNCTIONAL FOOD BIOACTIVE COMBINATIONS

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81. #1483 QUALITY AND FUNCTIONAL CHARACTERISTICS OF DAIRY PRODUCTS SUPPLEMENTED WITH FERMENTED PHILIPPINE INDIGENOUS FRUITS: RUBUS ROSIFOLIUS AND MUNTINGIA CALABURA

Rona Camille Lizardo-Agustin * , Dana Sophia Ysabel Fernandez, Bhea Patrice Aquino, John Joshua Javier, Dandro Sosa

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82. #1484 FUNCTIONAL NUTRITIONAL INTERVENTIONS ATTENUATE MUSCLE DECLINE AND MODULATE GUT MICROBIOTA DURING AGING

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83. #1485 FUNCTIONAL NUTRITIONAL INTERVENTIONS DIFFERENTIALLY MODULATE ADIPOSE REMODELING AND METABOLIC HEALTH

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84. #1504 HEAT-INACTIVATED BIFIDOBACTERIUM BREVE 207-1 IMPROVES GLUCOSE METABOLISM IN TYPE 2 DIABETES MELLITUS PATIENTS: A RANDOMIZED CONTROLLED TRIAL

Yanyan Tian * , Ligang Yang, Guiju Sun, Shaokang Wang, Wang Liao

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85. #1505 A-LINOLENIC ACID-RICH PERILLA OIL IMPROVES SARCOPENIC OBESITY IN MICE AT DIFFERENT LIFE STAGES VIA MODULATING ENERGY SUBSTRATE UTILIZATION

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86. #1506 PROTEIN CONTENT AND AMINO ACID COMPOSITION OF A HIGH-PROTEIN BEVERAGE MADE FROM DIFFERENT PROTEIN POWDERS FOR OLDER ADULTS

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Department of Science and Technology - Food and Nutrition Research Institute

87. #1507 COCONUT-BASED CEREAL MIX AS SUPPLEMENTAL FEEDING ALTERNATIVE FOR SCHOOL-AGE CHILDREN

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88. #1508 NUTRITIONAL PROFILE AND BIOLOGICAL VALUE OF A BEVERAGE POWDER MIX FOR OLDER ADULTS

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89. #1514 EFFECTS OF PHYTOSTEROLS WITH PHOSPHOLIPIDS ON BLOOD LIPIDS IN OVERWEIGHT ADULTS WITH DYSLIPIDEMIA: A RANDOMIZED CONTROLLED TRIAL

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90. #1515 PENTADECANOIC ACID REGULATES MICROBIOTA-METABOLISM AXIS AGAINST CHRONIC HEPATIC FIBROSIS

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91. #1516 GANODERMA LUCIDUM-DERIVED EXTRACELLULAR VESICLES AMELIORATE CHRONIC OBSTRUCTIVE PULMONARY DISEASE BY SUPPRESSING INFLAMMATORY RESPONSES

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92. #1517 HIGH-INTENSITY ULTRASOUND FUNCTIONALIZATION OF BROCCOLI BY-PRODUCT PROTEIN CONCENTRATE FOR DEVELOPMENT OF A PROTEIN-RICH INSTANT SOUP MIX

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93. #278 ANTI-CANCER EFFECTS OF FLAVONE DIMER ZHL10 AGAINST OVARIAN CLEAR CELL CARCINOMA

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94. #619 MICROBIAL RISK IN BLENDERIZED TUBE FEEDING: IMPLICATIONS FOR DECENTRALIZED PREPARATION

Cecile Klaudine Cabigas * [1], Myrna Benita Luna[1], Isa Terese Santos[1]

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95. #148 DIETARY CYCLIC ORGANOSULFIDES AS H2S DONORS: MODULATING NF-KB SIGNALING PATHWAY TO EXERT ANTI-INFLAMMATORY ACTIVITY IN RAW264.7 MACROPHAGE

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96. #1093 PROTECTIVE EFFECTS OF HEAT-KILLED LACTICASEIBACILLUS PARACASEI HY7017 ON GUT MICROBIOTA AND IMMUNE FUNCTION IN CYCLOPHOSPHAMIDE-INDUCED IMMUNOSUPPRESSED MICE

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97. #358 EFFECT OF A WHEY PROTEIN NUTRITIONAL COMBINATION ON MUSCLE RECOVERY

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98. #1543 STRUCTURE-DEPENDENT TRIGLYCERIDE PROTECTION OF FREEZE-DRIED LACTIPLANTIBACILLUS PLANTARUM STORAGE PROTECTION WINDOW, LIPID OXIDATION, AND STRESS ADAPTATION

Zhneug Sun, Nan Zhang, Shuxiang Liu
College of Food Science, Sichuan Agricultural University, China

99. #1532 MECHANISMS OF PROTOCATECHUIC ACID IN ALLEVIATING STREPTOZOTOXIN-INDUCED DIABETES IN MICE

Huafang Ding, Shouhe Huang, Yuting Su, Hanyue Zhu, Zhen-Yu Chen
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100. #603 SHELF-LIFE DETERMINATION OF MULBERRY (MORUS NIGRA L.), SOURSOP (ANNONA MURICATA), AND CRANBERRY (VACCINIUM MACROCARPON) JUICE BLEND USING ACCELERATED SHELF-LIFE TESTING

Jan Clarisse Credo * , Katherine Ann Castillo-Israel, Sheba Mae Duque, Romel Felismino, Jan Irish Estanislao
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101. #1550 PRODUCT DEVELOPMENT OF GUYABANO (Annona muricata), MULBERRY (Morus spp.), AND CRANBERRY (Vaccinium macrocarpon) FREEZE DRIED POWDER MIX

Thelma Lauriane Julian*[1] Katherine Ann Castillo-Israel[1], Sheba Mae Duque Duque[1] , Romel Felismino[1] , Jan Irish Estanislao[1]
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102. #1564 INVESTIGATION OF SEAWEED-DERIVED BIOCHEMICAL COMPOUNDS FOR TYPE 2 DIABETES MANAGEMENT

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POSTER PRESENTATIONS

Theme : SUSTAINABLE FOOD SYSTEMS AND GLOBAL FOOD SECURITY

Date 28.10.2026 Time : 0830-1600 Venue : Hall 5

(Please note : Installation: 1700-1800hrs (5:00 pm–6:00 pm) on 27 Oct 2026
Removal: 1600–1700 hrs (4:00 pm–5:00 pm) on 28 Oct 2026)

Food Systems and Climate Change

103. #219 CELL AND MATERIAL DESIGN FOR CELL BASED FOODS: PRINCIPLES AND PLATFORM TECHNOLOGIES

Sungkwon Park * , Bosung Kim
Department of Food Science and Biotechnology, Sejong University

104. #244 THE BITTER TRUTH: PROP TASTER STATUS, NEOPHOBIA, AND PREFERENCE IN RELATION TO ATTITUDE TOWARD ALTERNATIVE FOODS

Airisse Rae Basinang, Mary Michelle Velasquez * , Casiana Blanca Villarino
Food Application and Sensory Laboratory, Department of Food Science and Nutrition, College of Home Economics, University of the Philippines Diliman, Philippines

105. #486 PRODUCTION-SIDE VULNERABILITY AND CONSTRAINED RESILIENCE UNDER DROUGHT STRESS IN CHINA'S GRAIN SYSTEM

Jie Luo * , Tracy Bradfield, Thia Hennessy, Mary McCarthy
Cork University Business School, University College Cork, Cork, Ireland

106. #520 ENVIRONMENTAL INFLUENCE ON THE NUTRITIONAL COMPOSITION, ANTIOXIDANT ACTIVITY, AND CONSUMER ACCEPTABILITY OF HYDROPONIC SWEET BASIL (OCIMUM BASILICUM L.): A HIGHLAND-LOWLAND COMPARISON

Sook Wah Chan * [1], Yu Xin Fong Siow[2], Lye Yee Chew[1], Yen Teng Wong[2], Ziwei Cai[3]
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107. #637 NUTRITION-ORIENTED LIFE CYCLE ASSESSMENT OF MUNG BEAN AND LENTIL PROTEINS

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108. #755 LIFE CYCLE ASSESSMENT OF PLANT PROTEINS USING PROTEIN QUALITY-RELATED FUNCTIONAL UNITS

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109. #1533 HEALTH AND ENVIRONMENTAL EVIDENCE, CHALLENGES, AND SUSTAINABLE STRATEGIES OF PLANETARY HEALTH DIET: A MIXED-METHODS REVIEW

Jia Wang, Lau Jiang, Jin Wang

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110. 1046 DEVELOPMENT OF A LOW-COST CULTURE MEDIUM FOR THE COMMERCIAL PRODUCTION OF PORPHYRIDIUM CRUENTUM AS A SOURCE OF PHYCOERYTHRIN

Florencia Belén Cáceres-Ferroni * , María Salinas-García, Gabriel Acién, Emanuele Viviano, Tomás Lafarga

CIESOL-Solar Energy Research Centre, University of Almeria, Almeria, Spain

Circular Economy and Zero Waste Approaches

111. #38 ZERO-WASTE VIRGIN COCONUT OIL (VCO) PROCESSING WASTE THROUGH UPCYLING (VCØ-UP): A FRAMEWORK FOR BIOCIRCULAR FOOD SYSTEM

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112. #39 A ZERO-WASTE APPROACH TO SNACK BAR FORMULATION: UTILISING DRY-FRACTIONATED DEFATTED CAKE FROM DURUM WHEAT MILLING BY-PRODUCTS

Antonella Pasqualone * , Vittoria Latrofa, Francesca Vurro, Davide De Angelis, Francesco Caponio
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113. #45 UPCYCLING COCONUT RESIDUE VIA HOT WATER EXTRACTION: TECHNO-FUNCTIONAL DIETARY FIBER FOR FOOD APPLICATIONS

Mary Michelle Velasquez, Casiana Blanca Villarino * , Jin Mark Pagulayan
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114. #243 VALORIZATION OF PHILIPPINE SQUASH (CUCURBITA MOSCHATA DUCHESNE) BY-PRODUCTS FOR FUNCTIONAL COMPOSITE FLOUR DEVELOPMENT: A REVIEW

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115. #259 ATMOSPHERIC COLD PLASMA TREATMENTS ON AQUAPONIC WASTEWATER FOR ENHANCED MICROALGAL GROWTH

Kuan-Chen Hsieh * [1], Jen-Yi Huang[2]
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116. #264 IMPROVING FOOD WASTE RECYCLING WITH BLACK SOLDIER FLY LARVAE

Adrian Fuhrmann[1], Moritz Gold[1], Nalini Puniamoorthy[2], Alexander Mathys *
[1] ETH Zurich - Sustainable Food Processing Laboratory, Singapore-ETH Centre [2] National University of Singapore - Department of Biological Science

117. #268 VALORIZATION OF BLUE SWIMMING CRAB (PORTUNUS PELAGICUS) SHELL WASTE FOR CHITOSAN EXTRACTION

Aleeya Mari Garcia * , Jelynne Tamayo, Ara Fatima Carbonera, Anna Rina Evangelista-Albacea
Institute of Food Science and Technology, University of the Philippines Los Baños

118. #369 EVALUATING SPENT TEA AND PEANUT SKIN BLENDS AS SUSTAINABLE SUBSTRATES FOR PEARL OYSTER MUSHROOM PRODUCTION

Rui En Koh * [1], Chin Wee Heng[1], Mei Hui Liu[2]
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119. #370 AGRO-INDUSTRIAL VALORISATION OF PEANUT SKIN AND MOROMI ON PLEUROTUS OSTERATUS MYCELIAL COLONISATION

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120. #411 UPCYCLING OF SHIITAKE (LENTINULA EDODES) RESIDUES VIA KOMBUCHA-TYPE MIXED FERMENTATION: A SUSTAINABLE STRATEGY TO ENHANCE BIOACTIVE COMPOUNDS AND ANTIOXIDANT POTENTIAL

Bruna Samiri Barbosa Maciano[1], Jaqueline Ferreira Silva[2], Jessyca Caroline Rocha Ribas * [2], Fernando Antônio Anjo[3], Paula Toshimi Matumoto Pintro[2]

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121. #417 ENHANCING POLYPHENOL RECOVERY AND ANTIOXIDANT ACTIVITY FROM PILI (CANARIUM OVATUM, ENGL.) FRUIT POMACE THROUGH OPTIMIZED MICROWAVE – ASSISTED EXTRACTION

Emjay Samin * [1], Elizabeth Arenas[2]

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122. #465 CIRCULAR BIOPROCESSING: A CASE STUDY OF SPENT MEDIA AND SPENT MICROBIAL BIOMASS RECYCLING IN A ZERO-WASTE FERMENTATION PROCESSES WITH UMBELOPSIS ISABELLINA

Kah Yin Lee * , Christian Hermansen, Khanijou Jasmeet Kaur, Yoganathan Kanagasundaram, Sreenivasa Reddy Puniredd Singapore

*Institute of Food and Biotechnology Innovation, Agency for Science Technology and Research (A*STAR)*

123. #506 EFFECT OF ROASTING TEMPERATURE AND TIME ON THE PHYSICOCHEMICAL PROPERTIES AND CONSUMER ACCEPTABILITY OF CAFFEINE-FREE COFFEE SUBSTITUTE FROM COCONUT RESIDUE

Mary Antonette Cuachon * , Jin Mark Pagulayan, Mary Michelle Velasquez, Casiana Blanca Villarino

Food Application and Sensory Laboratory, Department of Food Science and Nutrition, College of Home Economics, University of the Philippines Diliman, Quezon City 1101, Philippines

124. #515 EFFECT OF COCONUT FLOUR AND WHEAT FLOUR FORMULATIONS ON THE PHYSICO-CHEMICAL AND CONSUMER ACCEPTABILITY OF KABABAYAN BREAD (FILIPINO MUFFINS)

Shekainah Natividad * , Jin Mark Pagulayan, Mary Michelle Velasquez, Casiana Blanca Villarino

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125. #761 FUNCTIONAL CHARACTERISTICS OF UPCYCLED AVOCADO SEED STARCH AND ITS EFFECTS ON PHYSICOCHEMICAL AND STORAGE PROPERTIES OF SET-TYPE YOGHURT

Winnie Nyonje * [1], Elizabeth Wafula[1], Esmanur Ilhan[2], Willis Owino[1], Mecit Oztop[2]

Jomo Kenyatta University of Agriculture and Technology [2] Middle East Technical University (METU)

126. #784 INTEGRATION OF EMERGING TECHNOLOGIES FOR THE PRODUCTION OF DEHYDRATED EDIBLE JELLYFISH IN A ZERO-WASTE BIOREFINERY FRAMEWORK

Oliver Schlueter * , Nader Marzban, Holger Kuehnhold, Luma Rossi Ribeiro, Marios Psarianos

Leibniz Institute for Agricultural Engineering and Bioeconomy (ATB)

127. #788 ADVANCING SUSTAINABLE FOOD SYSTEMS WITH MOBILE FRUIT PROCESSING: A FEASIBILITY STUDY ON UPCYCLING UNDERUTILIZED PRODUCE IN GEORGIA

Yi Li * , James P. Gratzek, Joseph G. Usack

Department of Food Science & Technology, University of Georgia

128. #805 UPCYCLING COFFEE CASCARA INTO INSTANT BEVERAGE INGREDIENTS: A SUSTAINABLE APPROACH FOR BY-PRODUCT VALORIZATION

Marileusa D. Chiarello * [1], Aryane Ribeiro Oliveira[1], Amanda Felipe Reitenback[1], Lívia de Lacerda de Oliveira[2]

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129. #839 GRAPE POMACE FLOUR AS A SOURCE OF NUTRIENTS AND PHENOLIC COMPOUNDS

Tatiane de Oliveira Xavier Machado * [1], Faezeh Fathi[2], Maria Beatriz P. P. Oliveira[2], Cláudio Dariva[3], Eliana B. Souto[4]

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130. #976 A-MAIZE-ING WASTE: A BIOCIRCULAR ECONOMY FRAMEWORK FOR THE PHILIPPINE CORN INDUSTRY

Gerieka Anapi * [1], Elaine Saniel[2], Casiana Blanca Villarino[1]

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131. #978 OPTIMIZATION OF SOLVENT-BASED OIL EXTRACTION FROM MIXTURES OF GRAPE AND MAQUI BIOWASTE PRETREATED WITH HIGH HYDROSTATIC PRESSURE

Jose Miguel Bastias Montes * [1], Monserrat Toloza Mora[2], Jaime Ortíz Viedma[3], Horacio Fraguela Meissimilly[1], Yarleicy Mercado Murillo[4]

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132. #1007 INDUSTRY MOTIVATIONS AND FUTURE PATHWAYS FOR HIGHER-VALUE UTILISATION OF PELAGIC FISH PROCESSING SIDE-STREAMS IN FRANCE, NORWAY AND POLAND

Tomasz Kulikowski * [1], Olga Szulecka[1], Ida-Johanne Jensen[2], Eva Falch[2]

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133. #1359 MICROALGAE AS PROTEIN-RICH FOOD BIOMASS – CHALLENGES AND OPPORTUNITIES

Shao Quan Liu *

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134. #1428 DEVELOPMENT OF SUSTAINABLE TREATMENT METHODS TO INCREASE RESISTANT STARCH CONTENT IN THE FABA BEAN STARCH FRACTION

Niina Kelanne * , Tuija Peltomäki, Taru Kariniemi, Martin Ramos Diaz, Sari Mäkinen

Natural Resources Institute Finland

135. #1492 BERRY POMACE AS AN UPCYCLED FUNCTIONAL INGREDIENT IN BAKERY PRODUCTS: A RAPID STRUCTURED REVIEW OF NUTRITIONAL AND TECHNOLOGICAL EFFECTS

Albina Oblitsova *

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136. #827 MICROBIAL FERMENTATION OF WHEY PERMEATE AS A CIRCULAR APPROACH FOR VALUE GENERATION AND METAL RECOVERY

Marleny D.A. Saldaña * [1], Rayelle C. Silva[1], Juliana S. Ferreira[2]

[1]University of Alberta, [2]Federal University of Uberlândia

137. #711 UTILIZATION OF SPENT COFFEE (COFFEA ARABICA) GROUNDS IN THE DEVELOPMENT OF A HIGH-PROTEIN AND HIGH-FIBER SNACK BAR

Abigail Riogelon[1] Raphael Marquez[2] Czarina Mejia[2] Maitreya Onalan[2] Nicole Anne Serafico[2] Samantha Terrado[2] Dianne Jane Sunico*[3]

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[2]University of Santo Tomas - Department of Food Technology, Manila City, Philippines

Emergency and humanitarian food systems

138. #1357 STRENGTHENING FOOD SAFETY SYSTEM IN INDONESIA'S NATIONAL FREE NUTRITION MEAL PROGRAM (MBG)

Wisnu Samuel Atmaja Triwarsita * [1], Aditya Dian Pratiwi[2]
[1]University of Auckland; [2]Yayasan Cakrawala Maju Sejahtera

POSTER PRESENTATIONS

Theme : NUTRITION, POLICY, CLASSIFICATION AND PUBLIC HEALTH

Date 28.10.2026 Time : 0830-1600 Venue : Hall 5

(Please note : Installation: 1700-1800hrs (5:00 pm–6:00 pm) on 27 Oct 2026
Removal: 1600–1700 hrs (4:00 pm–5:00 pm) on 28 Oct 2026)

Dietary Guidelines and Public Health Nutrition

139. #301 THE ROLE OF MASTICATION IN SHAPING MOOD AND COGNITIVE PERFORMANCE

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140. #743 TOWARDS SUSTAINABLE DIETS ACROSS DIVERSE POPULATION GROUPS

Claudia Lazarte * , Ellen Trolle

National Food Institute, Technical University of Denmark (DTU), Kongens Lyngby, Denmark

141. #852 TITLE: ENHANCING CHILD NUTRITION AND FOOD SAFETY IN THE CHILD AND YOUTH CARE CENTRES (CYCCS): POST-IMPLEMENTATION INSIGHTS FROM KWAZULU-NATAL, SOUTH AFRICA

Mumsy Chibe *

University of South Africa

142. #1094 THE ASSOCIATIONS OF DIETARY PATTERNS WITH MUSCLE HEALTH AND FUNCTIONAL FITNESS IN THE HONG KONG HEALTHSPAN PROJECT

Yu Nan Chen * , Lai Ling Hui

Department of Food Science and Nutrition, The Hong Kong Polytechnic University, Hong Kong SAR, China.

143. #1210 NUTRITIONAL QUALITY OF FOODS FEATURING CHILD-DIRECTED MARKETING STRATEGIES BEFORE AND AFTER THE IMPLEMENTATION OF BRAZILIAN FRONT-OF-PACKAGE LABELING REGULATIONS

Sarah Polezi, Gabriela Barreiro Bergamin, Luiza Ximenez, Veridiana de Rosso * Federal

University of São Paulo

144. #1352 PAST, PRESENT AND THE FUTURE OF LARGE-SCALE FOOD FORTIFICATION IN NIGERIA

Salisu Maiwada Abubakar *

Nutrition and Dietetics Unit, Department of Biochemistry and Africa Center of Excellence for Population Health and Policy (ACEPHAP), Bayero University, Kano - Nigeria.

145. #1399 INFLUENCE OF TIMED AND TARGETED COUNSELLING ON MATERNAL HEALTH SERVICES AND PRACTICES IN UGANDA

Faith Namayengo Muyonga * [1], Joweria Nambooze[2], Daniel Hendry Ruma[2], James Kimmula[3]

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146. #1402 ASSOCIATION BETWEEN PROTEIN INTAKE ADEQUACY AND PREDIABETIC GLYCEMIC INDICATORS AMONG KOREAN ADULTS

Yechan Lee, Meeyoung Kim, Eunju Kim * , Je-Hyuk Lee

Department of Food and Nutrition, Kongju National University, Yesan, Korea

147. #1403 CHARACTERISTICS OF DIETARY PROTEIN SOURCES AND GLYCEMIC METABOLIC RISK IN KOREAN ADULTS

Yechan Lee, Eunju Kim * , Meeyoung Kim, Je-Hyuk Lee

Department of Food and Nutrition, Kongju National University, Yesan, Korea

148. #1534 HUMAN MILK-DERIVED EXTRACELLULAR VESICLES ALLEVIATE FOOD ALLERGY BY RESTORING INTESTINAL BARRIER FUNCTION AND IMMUNE HOMEOSTASIS

Wenjing Chen, YiYi Wang

Key Laboratory of Environmental Medicine and Engineering, Ministry of Education, and Department of Nutrition and Food Hygiene, School of Public Health, Southeast University, China

149. #1424 INTAKE EVALUATION OF DIETARY SATURATED FATTY ACIDS IN CHINESE CHILDREN AND ADOLESCENTS

Fanglei Zhao[1], Feng Pan[1], Tongwei Zhang[1], Jianwen Li[1], Weifeng Mao[1]

[1]China National Center for Food Safety Risk Assessment, China

R&D Support for Nutrition and Function-related labeling and claims and Food Classification Systems for health and safety communication

150. #779 STARCH-EGCG COMPLEX ALLEVIATES GLYCOGEN FRAGILITY IN DB/DB MICE VIA GUT MICROBIOTA–MEDIATED BILE ACID METABOLISM AND THE FXR-GBE/GYS PATHWAY

Xinyi Deng * , Cheng Li

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Global Nutrition, Food Security, and Policy

151. #667 EXPLORING UNDERUTILIZED LEGUMES AS SUSTAINABLE PROTEIN SOURCES FOR STRUCTURALLY AND NUTRITIONALLY OPTIMIZED PLANT-BASED MEAT ANALOGUES

Malsha Dinali * [1], Isuru Wijesekara[2], Rumesh Liyanage[3], Benu Adhikari[1], Lisa Newman[1], Mayumi Silva[1], Jayani Chandrapala[1]

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152. #937 IMPACT OF PROP TASTER STATUS ON FOOD PREFERENCES AND NEOPHOBIA TOWARD ALTERNATIVE PROTEINS OF FILIPINO ADULTS: INITIAL FINDINGS

Airisse Rae Basinang * [1], Mary Michelle Velasquez[2], Casiana Blanca Villarino[2]

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153. #1199 KNOWLEDGE, ATTITUDES, AND PRACTICES OF FOOD INDUSTRY PROFESSIONALS TOWARD RABBIT MEAT UTILIZATION IN FILIPINO CUISINE: IMPLICATIONS FOR SUSTAINABLE PROTEIN DIVERSIFICATION

Adrian Paul Basilio * [1], Ephraimuel Jose Abellana[2]

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154. #1309 A PLACE BASED DIETARY BIOMARKERS TO INFORM THE NUTRITION POLICY

Manik Puranik * [1], Gunter Kuhnle[2], Carol Wagstaff[2]

Dr [2] Prof

155. #806 SURVEY of COMMERCIAL COCOA QUALITY USING MAILLARD REACTION PARAMETERS

Salome Martinez-Morales[1]*, Álvaro Ferreira-Lazarte[1], Guillermo Fernández[1], **Ana Muñoz-Labrador**[1], **Amalia Molina-Chaux**[1] , **María del Mar Villamiel**[1]

[1]*Institute of Food Science Research (CIAL), CSIC-UAM, Madrid, Spain*

Clean label initiatives and supply chain regulation and regulatory adaptation under the One Health framework

156. #65 ORGANIC ACID PRE-TREATMENT AS A CLEAN-LABEL ALTERNATIVE TO SULFITE IN OSMOTICALLY DEHYDRATED PHILIPPINE CARABAO MANGO (MANGIFERA INDICA L.)

Gerieka Anapi * [1], Ma. Patricia Azanza[1], Guiller Dartin Canapi[2], Ezra Gabrielle Cacayan[2], Gina Abrera[2]

Department of Food Science and Nutrition, College of Home Economics, University of the Philippines Diliman [2] Microbiological Research and Service Laboratory, Atomic Research Division, Philippine Nuclear Research Institute

157. #1154 ORGANIC ACID PRE-TREATMENT AS A CLEAN-LABEL ALTERNATIVE TO SULFITE IN OSMOTICALLY DEHYDRATED PHILIPPINE CARABAO MANGO (MANGIFERA INDICA L.)

Gerieka Anapi * [1], Ezra Gabrielle Cacayan[2], Guiller Dartin Canapi[2], Ma. Patricia Azanza[1], Gina Abrera[2]

Department of Food Science and Nutrition, College of Home Economics, University of the Philippines Diliman [2] Biomedical Research Section, Atomic Research Division, Philippine Nuclear Research Institute, Department of Science & Technology

POSTER PRESENTATIONS

Theme : FOOD PACKAGING INNOVATIONS AND ENVIRONMENTAL IMPACT

Date 28.10.2026 Time : 0830-1600 Venue : Hall 5

(Please note : Installation: 1700-1800hrs (5:00 pm–6:00 pm) on 27 Oct 2026
Removal: 1600–1700 hrs (4:00 pm–5:00 pm) on 28 Oct 2026)

Intelligent and Smart Packaging

158. #280 WIRELESS RADIO-FREQUENCY IDENTIFICATION (RFID) SYSTEM FOR SMART POST-HVEST ETHYLENE GAS DETECTION

Dibakar Saha * , Jaspreet Kaur, Kanishka Bhunia
Agricultural and Food Engineering Department, Indian Institute of Technology Kharagpur, Kharagpur, West Bengal, India

159. #1144 CAROTENOIDS IN ACTIVE AND INTELLIGENT FOOD PACKAGING: A TECHNOLOGICAL PROSPECTION OF SUSTAINABLE INNOVATIONS

Maria Lua dos Reis Bento [1], Giovanna Esperidião dos Santos Pereira [1], Talita Souza Carmo * [2]
University of Brasília, Chemistry Institute — Brasília, 70910-900, Brazil. [2] University of Brasília, Institute of Biological Sciences — Brasília, 70910-900, Brazil

Biodegradable and Sustainable Packaging Materials

160. #291 DEVELOPMENT OF ACTIVE FILM FROM CHITOSAN INCORPORATED WITH HERBAL EXTRACTS FOR EXTENDING THE SHELF LIFE OF MEAT

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Department of Food Science and Technology, Faculty of Livestock, Fisheries and Nutrition, Wayamba University of Sri Lanka, Makandura, Gonawila, 60170, Sri Lanka

161. #464 BIODEGRADABLE STARCH FILMS WITH FINGER LIME PEEL ANTIOXIDANT EXTRACTS

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Alliance for Agriculture and Food Innovation (QAAFI), The University of Queensland, St Lucia, 4072, Brisbane Queensland, 4072, Australia

162. #489 PREPARATION OF NANO-CHITOSAN LOADED WITH ELDERBERRY ANTHOCYANINS: CHARACTERIZATION OF ADSORPTION KINETICS AND PHYSICOCHEMICAL PROPERTIES FOR SUSTAINABLE PACKAGING

Haoze Ren * , Xiaoyu Luo

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163. #549 HIGH YIELD BACTERIAL CELLULOSE FROM WASTE DERIVED CULTURE MEDIA FOR SUSTAINABLE FOOD PACKAGING

Madara Jayanetti * [1], Mauro Mocerino [2], Wei Shan Cassandra Chong [2], Weeraya Karnpanit [2], Ranil Coorey [2]

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164. #562 PRODUCTION OF BIOPOLYMERS FROM FOOD WASTE: THE CASE OF ECUADOR

Carlos Jadán Piedra * [1], Francisco Demera Lucas [1], Caroline Loor Moreira [1], Felipe Jadán Piedra [2], Nathaly Giler Intriago [3]

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165. #801 SUSTAINABILITY GAPS IN INTELLIGENT AND ACTIVE FOOD PACKAGING: A GLOBAL PATENT LANDSCAPE ANALYSIS

Frederico Ramaiana Carreno Ribeiro, Fernanda Gonsalves de Andrade, Natália Lima de Oliveira, Marileusa D. Chiarello *

University of Brasília, PROFNIT, Brasília, 70910-900, Brazil

166. #991 BEYOND BIODEGRADATION: NATURAL DEEP EUTECTIC SOLVENT RECONSTITUTION OF MANDARIN PEEL PECTIN AND POLYMETHOXYFLAVONES INTO WATER-REPROCESSABLE ACTIVE PACKAGING FILMS

Hongwei Wu * , Guomin Xiao

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167. #1088 CELLULOSE BIOFILLERS FROM FRUIT PEELS FOR REINFORCING ALGINATE-BASED BIODEGRADABLE FILMS FOR FRESH-CUT VEGETABLE PACKAGING

Yeon Ju Lee * , Young Hoon Jung

School of Food Science and Biotechnology, Kyungpook National University, Daegu, 41566, Republic of Korea

168. #1177 DEVELOPMENT OF FLAT-DIE EXTRUDED POLYCAPROLACTONE (PCL)-CARRAGEENAN COMPOSITE

FILMS AS A SCALABLE APPROACH FOR MARINE BIOPOLYMER-BASED FOOD PACKAGING.

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169. #1208 DEVELOPMENT OF CARBOXYMETHYL CHITOSAN/PULLULAN COMPOSITE EDIBLE FILMS INCORPORATED WITH ERICA MANIPULIFLORA EXTRACT FOR FOOD PRESERVATION

Ümran İp [1], Dilara Baz [2], Arif Mermer * [3], Ronayi Coskun [2]

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170. #1304 DEVELOPMENT OF ACTIVE FOOD PACKAGING BASED ON A CHITOSAN MATRIX REINFORCED WITH POLYPHENOL EXTRACT FROM THE TROPICAL RED MACROALGAE

Quynh Nhu Pham * [1], Hoang Thao Linh Nguyen [2], Minh Vuong Phan [2], Tuyen Truong [1], Yunus Khatri [3]

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171. #1529 SUSTAINABLE GELLAN GUM-BASED BIOPOLYMER COATINGS REINFORCED WITH NFC AND ZEIN FOR PAPER FOOD PACKAGING

Joey Ng[1], Adeline Su Yien Ting[1], Siang Yin Lee [2], Yin Yin Thoo[1]

[1] *Monash University, Malaysia [2.] Malaysian Rubber Board, Malaysia*

172. # 1079 3-Decen-2-one Loaded Zein-Hydroxypropyl Methylcellulose Coating to Delay Sprouting and Greening in Potato Tubers

Yuyang Zhang[1], Jeannine Bonilla[2] Caihua Shi[3] Iris J. Joye[2] Loong- Tak Lim[2]

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POSTER PRESENTATIONS

Theme : FOOD PROCESS AND ENGINEERING

Date 28.10.2026 Time : 0830 - 1600 hrs Venue : Hall 5

(Please note : Installation: 17:00-1800hrs (5:00 p.m.–6:00 p.m.) on 27 Oct 2026
Removal: 16:00-17:00hrs (4.00pm-5.00pm) on 28 Oct 2026)

Biotransformation and Functional Fermentation for Health

173. #255 MONITORING CELL GROWTH AND KINETIC BEHAVIOR OF SACCHAROMYCES CEREVISIAE DURING FERMENTATION IN A BIOFLO/CELLIGEN 115 BIOREACTOR

Rosangela Bergamasco * [1], Regina Santiago Campos Nascimento[2], Juliete Pedreira Nogueira[2], Maria Terezinha Santos Leite Neta[2], Narendra Narain[2] [1]

Chemistry Engineer Department, State University of Maringá [2] Laboratory of Flavor and Chromatographic Analysis, Federal University of Sergipe

174. #1395 SYNTHESIS OF PANOSE-TYPE OLIGOSACCHARIDES DERIVED FROM FOUR DISACCHARIDES WITH DIFFERENT GLYCOSIDIC LINKAGES AND ITS APPLICATION

Bo-Hwa Kim[1], Seong-Jin Hong[2], Young-Min Kim[1]

1 Department of Integrative Food, Bioscience, and Technology, Chonnam National University, Korea; [2] Research Institute of Agricultural Science and Technology, Chonnam National University, Korea

175. #322 SHEAR-INDUCED ALIGNMENT AND PH-RESPONSIVE PHASE TRANSITIONS IN 3D-PRINTED LIPID MESOPHASES FOR PRECISION DELIVERY

Yuxuan Zheng*[1] Yuanheng Zhang[1] Yier Xu[1] Tingting Cui[2] Fanghui Fan[1]

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Integration of Food science, nutrition, pharmacology, biotechnology and toxicology

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Functional foods and supplements: safety and health outcomes

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Microplastics and nanomaterials in food systems

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Herbal food / Microbiota heal

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Herbal food / Microbiota heal

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ID: 1574

Nutrient Profiles Based on Meals/Dishes: Practical Applications for Food Environment in Asia

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Excessive sodium intake remains a major nutritional challenge in Japan, with more than 60% derived from seasonings such as soy sauce and miso. While various nutrient profile (NP) models are utilized globally to rank foods according to their nutritional composition, most existing models were primarily designed for Western processed foods and not for evaluating the complex dishes that characterize Japanese meal patterns. To address this gap, we developed the Nutrient Profile Model for Dishes in Japan (NPM-DJ). Created independently of food business operators, the model is intended to support the reformulation of dishes and products and to help consumers select healthier dishes.

In the NPM-DJ, dishes are classified into five categories based on the Japanese Food Guide Spinning Top, Japan's food-based dietary guideline, with reference to data from the National Health and Nutrition Survey. The scoring algorithm is based on the Nutrient Profiling Model for Processed Foods in Japan (NPM-PFJ), which was derived from the Health Star Rating algorithm and modified based on the Dietary Reference Intakes for Japanese and Health Japan 21 (Third Term). Each dish is scored by subtracting points for positive components (protein, dietary fiber, and the proportion of fruits, vegetables, nuts and legumes [FVNL] by weight) from points for nutrients to limit (energy, saturated fatty acids, sugars and sodium), and then rated from 0.5 to 5 within each category.

As a dish-based NP model developed by a government-affiliated institute, NPM-DJ allows for a realistic assessment of dishes as consumed, including the seasonings and oils used in cooking. Furthermore, it can reflect differences in how dishes are consumed, such as whether noodle soup broth is consumed. As many Asian countries share similar dish-based meal structures, the NPM-DJ concept may serve as a reference for each country to develop its own model using national nutrition survey data and food-based dietary guidelines. This approach may contribute to discussions on how to improve the food environment in Asia.

Keyword: -

The Real Food Environment in Asian Countries: Rethinking Dietary and Policy Guidance

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The food environment in Southeast Asia, and possibly in other Asian countries, differs from that of other regions of the world. It is closely linked to cultural and traditional practices and lifestyle, and does not comprise primarily of processed packaged foods. Eating out is a characteristic of the food culture of many population groups in SEA, driven by rapid socio-economic transition, increasing urbanisation, changing lifestyles and greater affluence. People obtain meals, as many as two to three times a day, from a variety of food outlets, including hawker stalls, kopi tiam, restaurants, workplace cafeterias and food delivery services. However, the nutritional value and safety of meals eaten out of home are areas of concern, as many meals are nutritionally imbalanced, lacking healthful ingredients such as vegetables and whole grains, and are often high in sodium, oil and sugar. This presentation will highlight the need to give due cognizance to the real food environment in SEA when developing dietary and policy guidance. It will discuss appropriate policies and interventions, including clearer messages in national FBDGs, simple guidance for consumers, and healthier dining programmes for food services, restaurants and other eating outlets.

Keyword: -

Understanding Food Processing and Processed Foods in Asia Dietary Context

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Food processing plays an important role in the food supply chain through its contribution to food safety, food security and nutrient provision. This presentation will examine the role of processed foods in the Asian dietary context, including their contribution to nutrient intake and opportunities to improve the nutritional quality of products and meals. It will distinguish processing from formulation and address concerns and misconceptions about processed foods, alongside approaches to innovation, reformulation and consumer education.

Using Indonesia as a case study, the presentation will examine dietary contributions across food sources, including home-prepared meals, commercially packaged products, and street and restaurant foods. Indonesia's archipelagic geography and exposure to natural disasters further illustrate the importance of processing, preservation and packaging for reliable distribution and emergency food provision.

While the NOVA Food Classification system and its ultra-processed food category have gained global attention, their application in Southeast Asia requires careful consideration of local dietary patterns and differences in classification and intake measures. Dietary guidance should move beyond simplified narratives of 'processed' versus 'real' food by integrating nutrition, food safety, cultural practices and local food systems. Such an approach can support recommendations that are relevant, feasible and consistent with everyday eating practices in the region.

Keyword: -

Rethinking Food Environment, Dietary Quality and Health Guidance Beyond 'UPF' - An Asian Perspective

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To improve nutrition status and health, it is imperative to improve the overall food environment as unhealthy diet has been recognised as one of the leading contributors to the high prevalence of non-communicable diseases (NCDs) and double burden of malnutrition. In recent years, there is also a tendency to attribute poor diet quality and NCDs to consumption of packaged processed foods and the newly coined term of NOVA ultra-processed foods (UPFs) category.

In SE Asia and other Asian countries, the highly diverse food environment is much more complex and rather different from that of western countries. Due to unique socio-cultural environment and economic situation in this region, data shows that large population groups rely heavily on meals-away -from-home, purchase from multitude of sources such as low-cost street vendors, food stalls, caterers to restaurants and popular meal delivery platforms for offices and homes. With frequent consumption, such meals are often found to be imbalanced and lacking in healthful ingredients while high in sugar, oil and salt, leading to poor diet quality. Process foods while convenient and widely available are not a main stay, provide varieties and may be use as a mean to deliver safe and fortified nutrients to significant segment of vulnerable communities. Understanding of why we process foods and its role in today's dietary pattern is important.

More importantly, there is a lack of guidance in the purchasing and consumption of meals-away-from home, in dietary guidance to the vendors and consuming public. Concerted efforts should be given to consider a food system approach, address the food environment, improve diet quality and lead guidance to all stakeholders, beyond focusing overtly on processed foods and UPF.

This session brings together Asian experts, highlighting scientific, public health, and food system perspectives to explore how evidence can inform balanced intervention strategies, guidance policies and programmes to effectively address the food environment in reducing double burden of malnutrition, especially in the region.

Keyword: -

Allergenicity of Novel Proteins: A New Strategy Based on a Coupled Cell Model

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With the rapid expansion of novel proteins in food development, assessing their potential allergenicity has become a critical safety priority. Traditional assessment typically begins with gene source characterization and evaluation of the protein's history of safe use, analyzing its phylogenetic relationship with known allergenic species. Bioinformatics screening then compares amino acid sequences with those of known allergens to identify shared linear epitopes or significant homology. Finally, in vitro tests using sera from allergic patients evaluate IgE-binding capacity, while digestibility and thermal stability tests assess resistance to gastrointestinal processing and heat treatment. However, these methods often fail to capture the complete sensitization process. To address this, we developed a dendritic cell–T cell coupled co-culture model using parvalbumin, the major fish allergen in China. Flow cytometry and dual-omics analyses confirmed that bone marrow-derived dendritic cells (BMDCs) possess antigen-loading and T cell-stimulating capacities, enabling establishment of a BMDC–$CD4^+$ T cell co-culture system. ELISA identified IL-2, IFN-γ, IL-4, and IL-10 as potential biomarkers. This model monitors the entire process from protein intake to T-cell polarization, offering a more comprehensive and physiologically relevant assessment of allergenicity to support the safe introduction of novel food proteins.

Keyword: -

Advances in Novel Protein Technologies, Safety and Regulatory Aspects

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For novel proteins, the assurance of their safety through government regulatory systems is essential for building up the confidence of consumers in product acceptance, preventing potential risks they may pose to human health, as well as helping the nascent industry to grow sustainably. This presentation provides an overview of the latest developments in novel protein technologies, the potential safety issues arising from novel proteins, and the regulatory frameworks in some countries, illustrated through examples.

Keyword: -

Protein Consumption and Health Status in Southeast Asia

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Background: Evaluating protein security is crucial to establishing resilience in health and nutrition across Southeast Asia (SEA).

Objective: This regional report synthesizes the findings and recommendations from seven comprehensive SEA country reports [compiled by the ILSI-SEA working group], examines the landscape of protein intake, requirements, sustainable supply chains, and health outcomes of protein intake.

Methods: A cross-country comparative review was conducted, analyzing national dietary surveillance data as well as smaller food intake studies, localized requirement metrics, macro-level food balance statistics, and researches linking protein intakes to health outcomes in specific population groups.

Results: The synthesis reveals a critical regional core insight: while aggregate national protein availability is generally sufficient across most nations, widespread disparities persist regarding equitable access to diverse, high-quality proteins, resulting in functional inadequacies. Reported country-level protein intakes ranged from 50–68 g/capita/day in Thailand, Indonesia, Lao PDR, and the Philippines, to 72 g/capita/day in Malaysia and 83.4 g/capita/day in Vietnam. In comparison, FAOSTAT data indicate national protein supplies ranging from 68.6 g/capita/day in Thailand to 102.2 g/capita/day in Vietnam, with Malaysia (93.3 g/capita/day), Lao PDR (81.7 g/capita/day), Indonesia (77.8 g/capita/day), and the Philippines (77.5 g/capita/day) also showing substantial aggregate availability. These findings indicate that, at the national level, protein supply is generally sufficient in quantity, but aggregate availability does not necessarily translate into quality or adequate intakes across population sub-groups.

Across the lifecycle, complementary-feeding infants, pregnant/lactating women, and older adults vulnerable to sarcopenia emerge as cross-country priority sub-groups. However, regional data translation is constrained by methodological limitations, including outdated datasets, reliance on single 24-hour recalls, and limited use of advanced protein quality metrics like DIAAS. Furthermore, macro-supplies remain fragile due to accelerating climate change impacts and heavy dependencies on imported strategic commodities like dairy, soy, or animal feed. Reflecting these regional patterns, ASEAN countries demonstrate a range of quantitative protein adequacy, but face crucial challenges towards a protein quality framework, considering ways to improve protein-source diversity, equitably meeting the needs of vulnerable population groups, including healthy aging initiatives, and supply resilience.

Conclusion: To bridge these gaps, a transdisciplinary, multi-sector approach spanning government, academia, and industry is needed. Standardizing food-group metrics, updating national surveillance tools, and investing in climate-resilient, diversified protein ecosystems are vital actions needed to secure nutritional protein resilience across Southeast Asia.

Keyword: -

The Protein Landscape and Sustainable Solution – Dietary Supply, Health and Innovations in Southeast Asia

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Evaluating protein security is vital to establishing health and nutritional resilience across Southeast Asia. While aggregate protein availability is generally sufficient, population growth, economic development and shifting dietary patterns highlight critical disparities in access to high-quality protein, particularly among vulnerable groups across the region. Addressing these gaps requires moving beyond a quantity-focused framework to consider protein quality, nutritional health status and the development of climate-resilient and sustainable protein supply systems. A comprehensive understanding of the protein landscape also involves considering current dietary intake and health outcomes, alongside advances in alternative and novel protein technologies and the regulatory and safety considerations associated with their development. This includes addressing key safety parameters such as allergenicity as new protein sources and technologies emerge.

This session will bring together regional experts to explore the protein landscape in Southeast Asia, covering protein consumption and health, advances in alternative and novel protein technologies, and the safety and regulatory considerations associated with emerging protein sources, including allergenicity. The discussion will highlight key considerations and opportunities for supporting a safe, diverse and sustainable protein supply in the region.

Keyword: -

A HUMIDITY-COMPENSATED FLUORESCENT SMART LABEL COUPLED WITH DEEP LEARNING FOR SIMULTANEOUS FRESHNESS AND HUMIDITY MONITORING OF FRESH PRODUCE

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Water vapor severely interferes with colorimetric/fluorescent gas sensors, undermining their accuracy in real-world applications. A universal, customizable framework for humidity compensation remains elusive. To address this challenge, a paradigm shift is proposed in which humidity responses are actively exploited for signal compensation rather than being suppressed. This study developed a fluorescent sensor array comprising 30 sensing units, establishing a hybrid composite architecture. This architecture integrates pH-indicating dyes (hemopyrrole hydrochloride, puerarin, fisetin) sensitive to spoilage-related volatile acidic/alkaline gases, combined with a dedicated riboflavin-based humidity label exhibiting highly reversible humidity response capabilities. This hybrid composite system combines organic fluorescent dyes with a PTFE microporous membrane support layer and a laminated polyethylene cover film, forming a multi-level, functionally integrated sensing module. This sensor module was affixed to the top-space inner surface of packaging for longan, button mushrooms, and snap beans. Fluorescence images captured with a smartphone were processed by a multitask deep convolutional neural network, enabling simultaneous, nondestructive tri-level classification of both freshness (fresh/sub-fresh/spoiled) and storage humidity (low/optimal/high). The model achieved 97.67% accuracy in freshness classification and 95.77% in humidity grading. Crucially, incorporating humidity compensation improved freshness prediction from 92.50% to 97.67%, substantially reducing misclassification under high-humidity conditions. This work offers a novel, lightweight, and intelligent approach for concurrent monitoring of humidity and quality in fresh produce supply chains.

Keyword: *Humidity compensation, Fluorescent sensor array, Nondestructive freshness monitoring, Agri-fresh food, Deep learning*

ID: 1565

Closing the Loop: Food Science and the Future of Global Food Systems

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The global food system stands at a critical crossroads, facing the dual challenge of feeding a growing population while operating within increasingly constrained planetary boundaries. They need to deliver food that is safe, nutritious and affordable while using fewer resources, wasting less and doing less damage to the environment. Moving from a linear "take, make, dispose" model to a circular one gives us a chance to rethink how we produce, process and use food and other biological resources.

This talk looks at how food science and engineering can help make that shift. It covers sustainable processing, biorefining, green extraction, alternative proteins and digital tools, and shows how they can turn side streams into useful ingredients and products while cutting energy and resource use.

Science can't do this alone. The transition will need new ideas at every stage of the value chain, and researchers, industry, policymakers and consumers working more closely together. If we can close resource loops and turn lab results into solutions that work at scale, food science can play a central part in building a food system that is more circular, more resilient and more sustainable.

Keyword: -

INVESTIGATION OF SEAWEED-DERIVED BIOCHEMICAL COMPOUNDS FOR TYPE 2 DIABETES MANAGEMENT

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Universitas Muhammadiyah Semarang

This study investigated the phytochemical composition and antioxidant activity of three seaweeds—Eucheuma cottonii, Ulva lactuca, and Sargassum aquifolium—and evaluated the metabolic effects of U. lactuca-formulated diets in streptozotocin-induced diabetic Wistar rats. In vitro analyses assessed total phenolic content (TPC), total flavonoid content (TFC), and DPPH radical-scavenging activity. Sargassum aquifolium showed the highest TPC (25.14 ± 0.43 mg GAE/g), while U. lactuca had the highest TFC (10.53 ± 0.13 mg QE/g). In the four-week feeding study, rats received diets containing 5%, 10%, 15%, or 20% U. lactuca. Among the treatment groups, the 15% group (P3) showed the lowest final-week blood glucose (193.67 ± 84.24 mg/dL), the lowest mean HOMA-IR (8.48 ± 3.58), and the highest mean HOMA-β (65.63 ± 41.71). The 10% group (P2) recorded the highest serum insulin concentration (671.73 ± 16.83 pg/mL), while the 15% group also had the highest mean FRAP value. These findings indicate that U. lactuca supplementation, particularly at 15%, showed promising patterns across several metabolic and antioxidant outcomes, warranting further investigation.

Keyword: *; Ulva lactuca; Sargassum aquifolium; Eucheuma cottonii; Blood glucose; Insulin resistance; HOMA-IR; HOMA-β.*

ID: 1562

Milpa tortillas: bioactive compounds and antioxidant effect in ovariectomized female C57BL/6 mice

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The milpa, a Mesoamerican polyculture of maize, beans, and squash, provides phytochemicals with antioxidant potential relevant to the oxidative stress associated with menopause. This study aimed to develop nixtamalized tortillas made with milpa ingredients and to evaluate their bioactive compounds and their effect on oxidative stress in ovariectomized female mice. Maize (Zea mays var. Elotes Occidentales), bean (Phaseolus vulgaris var. Negro), and squash (Cucurbita pepo) were nixtamalized separately. A mixture design (16 formulations) identified doughs like the control (100% maize): TM1 (90:5:5), TM2 (85:10:5), and TM3 (85:5:10) (maize:bean:squash). Total phenolics, flavonoids, anthocyanins, and antioxidant capacity were quantified in tortillas. Ovariectomized female C57BL/6 mice were fed TM1–TM3, a control tortilla (TC), and standard diet (CON) for 8 weeks (CICUAL-P05-2025). Lipid and protein oxidation, as well as catalase and superoxide dismutase activities, were determined. Compared with TC, TM1–TM3 increased ($p<0.05$) total phenolics (39–58%), flavonoids (64–78%), anthocyanins (11–63%), and antioxidant capacity (25–36%). In vivo, they reduced lipid (33–39%) and protein (49–63%) oxidation and increased catalase (33%) and superoxide dismutase (45%) activities versus TC and CON. Milpa tortillas showed potential to attenuate oxidative stress associated with estrogen deficiency, with TM3 showing the best performance.

Keyword: *Functional foods*, *Monopause*, *Nixtamalization*, *Oxidative stress*, *Polyphenols*

EFFECT OF PECTIN ON EMULSIFYING PROPERTIES OF SOY PROTEIN ISOLATE: TAILORING EMULSION GEL INKS FOR 3D-PRINTED FOOD SYSTEM

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Soy protein isolate (SPI)-pectin emulsion gels can be used as nutritious food-grade inks for extrusion-based 3D printing to produce customized foods for precision nutrition. However, pectin chain structure affects its interaction with SPI and governs its emulsifying properties and function as emulsion gel ink for 3D printing that needs to be studied. Results showed that low-methoxyl pectin (LMP) effectively stabilized the SPI emulsion through strong electrostatic repulsion, exhibited better emulsification properties and increased emulsion stability compared to high-methoxyl pectin (HMP). Subsequently, the stabilized SPI-LMP emulsion system was transformed into calcium induced viscoelastic gels with varying emulsified oil fractions (10%, 20%, 30%) in continuous phase for effective 3D printing. The rheological and micro-structure analysis of emulsion gel inks demonstrated that emulsified oil droplets embedded within interconnected calcium-pectin gel matrix synergistically reinforcing the gel network. This resulted in superior mechanical strength, minimal creep compliance, rapid thixotropic recovery and up to 99% water holding capacity. Macroscopic printing trials confirmed that 1% of LMP provided robust structural integrity without slumping while increasing dispersed phase to 20% and 30% yield smooth extrusion and high-fidelity resolution, respectively. Thus, these findings suggested SPI-LMP emulsion gel as a potential ink for 3D printing, advancing the development of clean-labelled customized, plant-based foods for sustainable food production.

Keyword: *3D printing, Clean label, Sustainable food, Plant-based, Nutrition*

THE EFFECT OF MICROWAVE, OVEN, AND FREEZE DRYING ON EDIBLE INSECTS SPHENARIUM PURPURASCENS AND ATTA MEXICANA'S DRYING KINETICS, NUTRITIONAL CONTENT, AND BIOACTIVITY

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Given the increasing interest in insects as sustainable protein sources and the limited information regarding the impact of their processing, this study compared microwave, conventional oven, and freeze-drying for preserving the nutritional composition and bioactive properties of Sphenarium purpurascens and Atta mexicana (Huang et al., 2019). Drying kinetics were described using semi-empirical models, with Henderson–Pabis and Page providing the best fits. Water activity, protein, chitin, fat, dietary fiber, ash, and antioxidant capacity (DPPH and ABTS) were assessed. In S. purpurascens, protein concentrations did not differ significantly among lyophilization (47.01 mg/mL), microwave (43.19 mg/mL), and oven drying (42.82 mg/mL; $p > 0.05$). Fat concentrations were 11.33, 8.53, and 8.78 mg/mL, respectively. In A. mexicana, protein concentrations were highest after lyophilization (28.35 mg/mL), then microwave (23.91 mg/mL) and oven drying (17.83 mg/mL). Fat concentrations were highest after microwave drying (35.79 mg/mL), followed by lyophilization (31.44 mg/mL) and oven drying (26.70 mg/mL). Overall, drying effects were species-dependent, with lyophilization generally supporting nutrient retention. These findings inform processing strategies to preserve nutritional quality and support the use of edible insects as sustainable functional food ingredients.

Keyword: *microwave, oven-drying, freeze-drying, edible insects*

Direct sensing of host ferric iron by an archetype histidine kinase mediates virulence of an enteric pathogen

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Two-component system (TCS) histidine kinases enable bacterial pathogens to sense environmental signals and regulate adaptive responses during infection. The EnvZ/OmpR TCS, known for its role in osmolarity/pH-dependent regulation of outer membrane porins across bacterial species, is also a central virulence regulator. However, the environmental cues that activate EnvZ/OmpR to trigger pathogenicity have remained unclear, limiting our understanding of host-pathogen interactions. Here, we demonstrate that in Vibrio parahaemolyticus, a major etiological agent of seafood-associated gastroenteritis, EnvZ functions as a direct ferric iron (Fe^{3+}) sensor governing virulence programs. Fe^{3+}-EnvZ interaction triggers kinase phosphorylation and activation, enabling transcriptional control of biofilm formation, swarming motility, and type 3/6 secretion systems. An iron-binding-deficient EnvZ mutant ($EnvZ^{Q103A}$) abrogated Fe^{3+} responsiveness and downstream signaling pathways. In an infant rabbit infection model, Fe^{3+} enhanced V. parahaemolyticus intestinal colonization and virulence through EnvZ/OmpR signaling. This study identifies Fe^{3+} as the physiological ligand activating the EnvZ/OmpR virulence regulon and provides insight into how enteric pathogens exploit host-derived iron cues to promote infection.

Keyword: *Vibrio parahaemolyticus, Two-component system, biofilm, Fe3+*

From Evidence to Claim: Advancing Science-Based Health and Functional Claims

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Assessing whether evidence sufficiently supports a proposed claim requires consideration of the food or ingredient, conditions of use, target population and claimed effect.

Drawing on Food Industry Asia's regional analysis and an industry case study, this session examines how scientific substantiation informs regulatory decisions across Asian markets. Academic, technical assessment and industry perspectives will explore study quality, consistency, the totality of evidence and the relevance of measured outcomes to the proposed claim.

Population relevance is a central consideration. Discussion will examine how evidence generated in one population can be assessed for applicability to another, and when additional human evidence may be needed. It will also consider how existing scientific assessments and common core dossiers could inform independent national reviews, alongside jurisdiction specific requirements.

The session aims to identify practical principles for robust claim substantiation and opportunities for regulatory cooperation. The focus is on supporting scientifically justified decisions and accurate consumer communication, while respecting local considerations and each authority's responsibility for claim assessment.

Keyword: -

Navigating the Future of Food Systems Processing and Science

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Todays food systems face increasingly complex demands—from addressing food security and malnutrition to reducing diet-related nan-communicable diseases, while ensuring food remains safe, nutritious and accessible. Food science and processing have important rotes in responding to these challenges, yet growing debate around food processing, ingredients and health is reshaping how foods are perceived and evaluated.

This plenary brings together experts to examine these issues through a scientific and food-systems lens. Food processing encompasses a spectrum Of technologies and functions, supporting food safety, nutrition, reformulation, accessibility and food-system resilience. Its influence on food composition, structure and nutritional outcomes also provides important context for understanding food and health. Current evidence on food processing and health spans epidemiological, clinical and mechanistic research, with questions remaining around confounding factors and drivers of observed health associations. Food additives add another dimension, with technological function, dietary exposure and safety evaluated through established risk-assessment frameworks, including JECFA and Codex. Robust food evaluation requires a comprehensive, evidence-based approach that considers multiple interacting factors and wider dietary context to support healthier and more resilient food systems.

Keyword: -

ID: 1556

Current Development in Thailand's Positive List: A First Step towards ASEAN Harmonisation

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Thailand is undergoing a significant transformation in the regulation of food health claims through the development of a science-based Positive List system. The Thai Food and Drug Administration, in collaboration with research funding agencies, researchers, and relevant stakeholders, has established a national flagship target of 150 Positive List health claims by 2030.

To date, Positive Lists covering 11 key food components and 15 health claims have been established. A further pipeline of claims is being developed through systematic reviews, meta-analyses, and clinical research. The Thai FDA estimates that announced Positive List components are currently utilized by approximately 1,800 food operators and are associated with more than 32,000 registered food products, representing an estimated economic value of THB 28.3 billion annually.

In parallel, the regulatory process is being strengthened through improved dossier-review mechanisms and researcher workshops designed to improve the quality, completeness, and efficiency of scientific dossier preparation.

Thailand's experience demonstrates how a coordinated regulator–researcher–funding agency model can support the development of an evidence-based regulatory infrastructure that simultaneously strengthens consumer protection, accelerates food innovation, and contributes to the economic development of the functional food sector.

Thailand's Positive List initiative may serve as an initial platform for regional dialogue and knowledge exchange. Progress toward ASEAN harmonisation would require scientific researches on common regional food components, comparative regulatory analysis, stakeholder engagement and agreement on feasible areas for cooperation, while respecting national regulatory responsibilities.

Keyword: *Positive List, Food Health Claims, ASEAN Harmonisation, Science-Based Regulation*

ID: 1555

Singapore Food Toxicology Network: Advancing Precision Health Through New Approach Methodologies

Richard Khaw Min Cheh *

President, Federation of Institutes of Food Science & Technology in ASEAN (FIFSTA) Immediate Past President, Singapore Institute of Food Science & Technology (SIFST)

The future of food safety and toxicology is being reshaped by predictive, human-relevant science that supports precision health. Singapore has taken a pioneering step with the establishment of the Singapore Food Toxicology Network (SFTN), a national initiative led by the Singapore Food Agency (SFA), the Agency for Science, Technology and Research (A*STAR), and the National University of Singapore (NUS), with the Singapore Institute of Food Science & Technology (SIFST) serving as the coordinating and secretariat body. This collaborative platform represents a national commitment to advancing New Approach Methodologies (NAMs) in food toxicology, aligning with global efforts to reduce reliance on animal testing while enhancing scientific rigor and ethical standards. NAMs encompass innovative tools such as in vitro assays, computational toxicology, high-throughput screening, and omics-based approaches. These methodologies provide mechanistic insights into toxicological endpoints, enabling faster, more cost-effective, and more human-relevant risk assessments of food ingredients, contaminants, and emerging hazards. By integrating NAMs into regulatory science, Singapore is building capacity for more predictive and harmonized food safety frameworks that directly support public health. The presentation will highlight the strategic role of SFTN in fostering collaboration among regulators, academia, and industry, while connecting NAMs to the broader mission of precision health. By generating data that reflects human biology more accurately, NAMs improve risk prediction and support personalized nutrition and health protection strategies. Through the lens of the Singapore Food Toxicology Network, this session will invite dialogue on how ASEAN collaborations can accelerate the adoption of NAMs, bridge regulatory gaps, and contribute to a global paradigm shift in food safety and health protection.

Keyword: *Food Toxicology, New Approach Methodologies (NAMs), Precision Health, Singapore Food Toxicology Network (SFTN), Regulatory Science, Risk Assessment, ASEAN Harmonisation, Consumer Safety*

Food Analyst Competency in Malaysia: Challenges and Opportunities

Adi Md Sikin *

President, Malaysia Institute of Food Technology (MIFT)

Food analysts play a pivotal role in safeguarding public health, ensuring food quality, supporting regulatory compliance, and facilitating domestic and international food trade. In Malaysia, the Food Analysts Act 2011 (Act 727) provides the legislative framework for the registration and regulation of food analysts through the Malaysian Food Analysts Council (MFAC). However, evolving food safety risks, increasingly sophisticated analytical technologies, and rising expectations for food integrity present new challenges for developing a competent and future-ready workforce.

This presentation examines the current landscape of food analyst competency in Malaysia, with particular emphasis on the alignment between graduate production, professional registration, and industry workforce requirements. Although Malaysia produces a substantial number of graduates in food science, food technology, chemistry, microbiology, biotechnology, and related disciplines, academic qualifications alone may not fully address the practical, analytical, regulatory, and professional competencies required in contemporary food testing laboratories. Key challenges include translating theoretical knowledge into analytical proficiency, keeping pace with emerging technologies, strengthening quality assurance and data integrity, and fostering continuous professional development.

It will also explore opportunities to bridge these gaps through stronger university–industry collaboration, competency-based education, structured industrial training, professional certification, and lifelong learning. It will also highlight the potential role of the Malaysian Institute of Food Technology (MIFT) in connecting academia, industry, regulators, and professional bodies to strengthen workforce readiness and professional recognition.

Ultimately, developing competent food analysts requires an integrated approach that extends beyond graduate numbers to measurable professional capability. Strengthening this ecosystem will enhance Malaysia’s food safety assurance, analytical capacity, and competitiveness in the global food system.

Keyword: *Food Analyst Competency; Food Safety; Professional Registration; Analytical Skills; Industry–Academia Collaboration; Workforce Development*

Ensuring Food Safety at Scale: Regulatory Framework for Indonesia's Free Nutritious Meals Program (MBG)

Dwi Larasatie Nur Fibri *

Immediate Past Treasurer, Indonesian Association of Food Technologists (IAFT)

Indonesia's Free Nutritious Meals Program (Makan Bergizi Gratis, MBG) aims to improve national nutritional outcomes. However, its scale and decentralized operations require food safety to be integrated throughout the food service chain. This presentation examines Indonesia's regulatory framework and proposes an action plan for the Indonesian Association of Food Technologists (IAFT/PATPI) to strengthen food safety implementation.

Key challenges include high-volume production, variable kitchen infrastructure, diverse suppliers, vulnerable beneficiaries, and time–temperature control during food preparation and distribution. Effective management requires coordinated controls from procurement to consumption, supported by trained personnel, clear procedures, and verifiable records.

PATPI proposes five action areas. First, develop case-based training for SPPG managers, food handlers, and local suppliers on hygiene, cross-contamination prevention, and food safety management. Second, mobilize food science experts to assess hazards in commonly served menus and recommend appropriate risk controls. Third, support validation of cooking, packaging, holding, and distribution procedures under local conditions. Fourth, conduct applied research on operational shelf life, local food safety risks, and processes suitable for tropical and remote settings. Fifth, establish a university expert network to facilitate technical assistance, knowledge exchange, and evidence-based recommendations for regulators and program operators.

Progress can be assessed through measurable outputs, including training coverage, menu-specific risk assessments, validated process recommendations, research findings, and documented technical collaborations. These activities should complement, not replace, the responsibilities of government agencies and food service operators.

By translating scientific knowledge into practical tools and coordinated action, PATPI can support preventive food safety management and continuous improvement. Ultimately, MBG must deliver both nutritional value and food safety to every beneficiary.

Keyword: *Food Safety, Free Nutritious Meals Program (MBG), HACCP, Risk-Based Prevention*

Strengthening Regulatory Science for Responsible Food Innovation in ASEAN: The Role of Food Science Associations

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Food innovation is advancing rapidly across ASEAN, but the capacity to evaluate emerging ingredients, processes, technologies, and claims remains uneven. This presentation examines how food science associations can strengthen regulatory-science capacity while respecting the authority of regulators. It uses the Philippine Association of Food Technologists, Inc. (PAFT), recognized as the Interim Accredited Integrated Professional Organization for food technologists in the Philippines, as an example. The Philippine Code of Professional Conduct for Professional Food Technologists provides the ethical foundation for this role. It places public welfare, food safety, scientific integrity, professional competence, accurate communication, and accountability at the center of practice. As Interim AIPO, PAFT can translate these individual duties into collective capacity by promoting ethical practice, identifying competency needs, convening multidisciplinary expertise, organizing professional learning, and providing evidence-based professional input to authorized institutions. These functions support regulatory systems without transferring regulatory authority to the association. Regulatory science offers a practical area for regional cooperation. Food science associations can help members strengthen skills in product and ingredient characterization, evidence assessment, exposure evaluation, claims substantiation, uncertainty analysis, and risk communication. They can also share adaptable training resources, regional case studies, expert networks, and evidence-mapping tools. PAFT's participation in Asian regulatory-science initiatives is presented as an opportunity for institutional learning: to understand established approaches, identify Philippine capability gaps, and bring relevant lessons back to professionals and national stakeholders. Strengthening associations in this way can support responsible food innovation and contribute to credible and consistent implementation of food safety and claims requirements across ASEAN.

Keyword: *Regulatory Science, Professional Ethics, Accredited Integrated Professional Organization, Food Science Associations, Responsible Food Innovation, ASEAN Harmonisation, Professional Competence, PAFT*

PRODUCT DEVELOPMENT OF GUYABANO (Annona muricata), MULBERRY (Morus spp.), AND CRANBERRY (Vaccinium macrocarpon) FREEZE DRIED POWDER MIX

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This study developed a fruit juice powder mix using mulberry (Morus nigra L.), cranberry (Vaccinium macrocarpon), and guyabano (Annona muricata) to produce a nutrient-rich, shelf-stable beverage. To overcome stickiness and hygroscopicity associated with the low glass-transition temperatures of fruit sugars and organic acids, maltodextrin was incorporated as a carrier agent. Three formulations were tested: a control (pure fruit blend), 15% (w/v) maltodextrin, and 20% (w/v) maltodextrin. Samples underwent enzymatic maceration, 48-hour pre-freezing, and 24-hour freeze-drying before analyses of pH, moisture content, and solubility. Maltodextrin significantly improved powder quality. The control retained high moisture (~8%) and collapsed into a sticky matrix due to pectin and sugar content. In contrast, maltodextrin reduced moisture to 6% (15% treatment) and 5% (20% treatment), enhancing powder stability. The 20% maltodextrin formulation exhibited superior reconstitution, with the highest solubility index and fastest wetting time. The control blend was unsuitable for powderization, while the 20% maltodextrin treatment optimized drying efficiency, solubility, and stability. These findings establish a baseline for producing free-flowing, highly soluble tropical-berry juice powders.

Keyword: *Morus spp., Guyabano, Cranberry, Freeze Drying, Fruit Juice Powder*

ID: 1549

Insight into the meat quality differences of Tibetan sheep from different altitudes based on metabolomics

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Tibetan sheep from different altitudes exhibit unique meat quality attributes, whereas the molecular mechanisms remain unelucidated. Such meat quality attributes are associated with underlying metabolic processes, which are influenced by high-altitude conditions. Herein, meat quality and muscle metabolism in Tibetan sheep from Oula (2900 m), Huoerba (4000 m), and Duoma (5100 m) were compared. Oula sheep showed higher moisture and lighter color, while Duoma sheep had the lowest fat content. A total of 419 differential metabolites were identified based on metabolomics. Among them, peptide contents decreased with increasing altitude of Tibetan sheep's residence, while carnitine derivatives increased. Bioinformatics analysis indicated that high altitude regulates HIF-1α signaling through hypoxic conditions and oxidative stress mediates glutathione oxidation, thus affecting meat L* value. This study reveals meat quality and the metabolic basis in Tibetan sheep at different altitudes, establishing a scientific foundation for resource utilization and development of Tibetan sheep at specific altitudes.

Keyword: *High-altitude adaptation, metabolomics, Meat color, HIF-1α signaling, Lysine degradation*

A POROUS HYDROGEL-BIOFILM DELIVERY SYSTEM FOR ENHANCED INTESTINAL COLONIZATION OF PROBIOTICS AND TARGETED AMELIORATION OF AFLATOXIN B1-INDUCED ENTEROHEPATIC INJURY

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Aflatoxin B_1 (AFB_1) is a major foodborne toxicant. Although hepatotoxicity is well recognized, oral exposure first engages the intestine, where barrier disruption and microbiota dysbiosis may amplify hepatic injury through the gut-liver axis. Conventional probiotic therapies are constrained by poor gastrointestinal viability and low intestinal colonization. To overcome this, we developed an integrated "porous hydrogel-biofilm" delivery system by encapsulating probiotic biofilm within a supramolecular hydrogel matrix. Lactobacillus rhamnosus 7469 was selected for its robust biofilm-forming phenotype and in vitro AFB_1 adsorption capacity.

The matrix, cross-linked by oxidized fucoidan, carboxymethyl chitosan, and tannic acid, offers a robust porous network protecting against thermal, freeze-drying, and gastrointestinal stresses. First-order kinetic modeling confirmed that tannic acid integration conferred superior sustained-release performance. Spectroscopic and thermal characterization supported successful network formation and favorable structural stability. By successfully coupling physical matrix shielding with biological biofilm resilience, this delivery platform presents a novel upstream mitigation strategy.

In vivo evaluations using an AFB_1-exposed murine model are currently underway to validate its targeted efficacy in enhancing biofilm adhesion and ameliorating enterohepatic injury, thereby offering a promising nutritional strategy to safeguard host metabolic homeostasis.

Keyword: *Probiotics, Biofilm, Porous hydrogel, Aflatoxin B1, Gut-liver axis*

ID: 1547

Integrated Transcriptome and Regulatory Network of Pseudomonas plecoglossicida Reveals Adaptive Strategies and Conserved Vulnerabilities under Environmental Conditions

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Marine pathogen Pseudomonas plecoglossicida causes visceral white spot disease in farmed marine fish. During early host invasion, the pathogen must rapidly coordinate stress resistance and virulence under multiple-severe environmental conditions; however, its global regulatory adaptations remain poorly understood. Here, a transcriptome of P. plecoglossicida was established across 12 environmental conditions which were classified into four conditional groups: physiological shifts, nutritional immunity, host-physicochemical stresses, and niche-specific cues. The adaptive response displays a switching strategy: systemic metabolic restraint combined with selective deployment of defensive and competitive systems. The host-targeting T3SS and T6SS-1 apparatuses were silenced under chemical stress to prevent energetic drain, while the antibacterial T6SS-2 selectively motivated at 30°C and stationary phase. Intersecting the responsive transcriptome with the essential genome identified the Rhs toxin-immunity pair (Txe4-Txi4) as a conserved vulnerability across all conditions. Operon-level network revealed the induction of the tripartite Cus/CzcA-TolC RND efflux pump against host transition-metal intoxication, alongside the shutdown of the polyamine catabolic operon to preserve protective polyamine pools, prevent toxic aldehyde accumulation, and enforce metabolic contraction. Gene-level network mapped this plasticity to a tiered transcription factor hierarchy, including AlgR/AmrZ-mediated lifestyle switching, PurR/ArgR/σ^{54}-NtrC metabolic repression, and a zinc-redox interaction where zinc overload disrupts SoxR iron-sulfur sensing. These findings establish a systems-level framework for P. plecoglossicida adaptation, providing anti-virulence targets for disease prevention and management.

Keyword: *Transcriptome, Environmental adaptation, Pseudomonas, Type VI secretion system, Transcriptional factor*

ID: 1546

Bacterial anti-toxin HigA dysregulates host intestinal serotonin homeostasis in a T6SS-dependent manner

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Intestinal serotonin not only plays crucial roles in the gut-brain axis but also participates in host-microbial interactions. However, the underlying mechanism of serotonin-level fluctuations remains elusive. Here, we demonstrate that host intestinal serotonin levels are elevated during the early stage of Edwardsiella piscicida infection. Upon perceiving serotonin, HigA, an anti-toxin protein, is translocated into the host nucleus in a T6SS-dependent manner as a cross-kingdom effector. HigA directly binds to the promoter region of the main rate-limiting enzyme IDO1 and upregulates its expression, facilitating the diversion of tryptophan metabolism to the kynurenine pathway, which impairs serotonin production. Moreover, the decreased intestinal serotonin exacerbates host histological damage and promotes Edwardsiella infection. Furthermore, a HigA homolog modulates serotonin metabolism and intestinal histological damage in a Salmonella-infected murine model. Overall, our study elucidates the host-pathogen interaction involving serotonin, in which pathogens intelligently modulate host intestinal serotonin to achieve systemic infection, given the widespread presence of the T6SS-HigA-serotonin axis.

Keyword: *Microbiology, T6SS effector, anti-toxin, serotonin, intestinal inflammation*

Structure-Dependent Triglyceride Protection of Freeze-Dried Lactiplantibacillus plantarum Storage Protection Window, Lipid Oxidation, and Stress Adaptation

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Maintaining probiotic viability during storage remains a major challenge for the development of stable dried probiotic products. Lipid-based matrices can provide physical protection for microorganisms; however, the effects of triglycerides may depend on their molecular structures and oxidative stability. This study investigated the structure-dependent protective effects of tricaprylin, triolein, and trilinolein on freeze-dried Lactiplantibacillus plantarum 124 during storage and subsequent stress exposure. Viability changes, fatty acid retention, oxidation-derived products, stress tolerance, membrane integrity, and transcriptomic responses were systematically analyzed. Results showed that all triglyceride-treated groups exhibited a common protective window at 25 °C for 30 d, with significantly lower storage-induced viability losses than the oil-free control. Tricaprylin showed the highest fatty acid chain retention and the lowest oxidation susceptibility, whereas unsaturated triglycerides, particularly trilinolein, exhibited greater fatty acid degradation and oxidation-related changes. Cells recovered from the protective window showed improved acid and bile tolerance, accompanied by enhanced membrane integrity under acid stress. Transcriptomic analysis revealed that triglyceride-associated protection was linked with regulation of transport, redox balance, DNA-related processes, and cell-envelope responses. These findings demonstrate that triglyceride protection of freeze-dried probiotics is determined by interactions among lipid structure, storage oxidation, and bacterial stress adaptation, providing insights for designing lipid-based probiotic stabilization systems.

Keyword: *Triglycerides, Lactiplantibacillus plantarum, Probiotic stability, Lipid oxidation, Stress tolerance*

Mechanistic Insights into Solute-Dependent Salmonella Growth Kinetics under Water Activity Stress via Water State Characterization and Transcriptomic Analysis

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Water activity ($a_{w)}$ regulation is a key strategy for microbial control in food preservation. However, microorganisms may exhibit distinct growth behaviors under similar a_w conditions due to differences in solute properties and matrix water states. This study investigated how sodium chloride, sucrose, and glycerol regulate the growth of Salmonella enterica serovar Enteritidis through solute-specific water state changes and microbial adaptation. Growth kinetics were evaluated using Gompertz modeling, while Norrish modeling, low-field nuclear magnetic resonance (LF-NMR), and transcriptomic analysis were integrated to elucidate the underlying mechanisms. Results demonstrated that the minimum growth a_w boundaries varied among solutes, with glycerol showing the highest tolerance range (0.93–0.94), followed by sodium chloride (0.96–0.97) and sucrose (0.97–0.98). Despite achieving similar a_w reductions, sucrose caused stronger growth inhibition, whereas glycerol maintained higher water mobility and supported adaptive growth. LF-NMR revealed distinct differences in free and bound water distribution among solute systems, while transcriptomic analysis identified solute-dependent regulation of stress response, osmoprotection, and metabolic pathways. These findings highlight that microbial growth under a_w stress is determined not only by a_w reduction itself but also by solute-mediated water state regulation and biological adaptation, providing new insights for precise food preservation strategies.

Keyword: *Water activity, Solute stress, Water state, Transcriptomics, LF-NMR*

ID: 1541

INNOVATING THE FUTURE OF FOOD SCIENCE

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ABSTRACT: INNOVATING THE FUTURE OF FOOD SCIENCE

Food science and technology play a vital role in improving food quality, safety, nutritional value, and sustainability. Innovating the Future of Food Science focuses on the development of modern techniques and technologies to meet the increasing food demands of the growing global population. Recent advancements, including artificial intelligence, food biotechnology, nanotechnology, and smart packaging, are transforming food production, processing, preservation, and distribution. These innovations help extend the shelf life of food products, minimize food waste, preserve essential nutrients, and maintain food safety. Furthermore, sustainable food production methods and alternative protein sources offer promising solutions to food insecurity and environmental challenges. The development of functional foods and personalized nutrition also provides opportunities to improve public health and meet diverse dietary needs. In Pakistan, food science and technology have significant potential to strengthen the agricultural sector, reduce post-harvest losses, improve food processing methods, and support economic development. However, challenges such as limited technological resources, inadequate infrastructure, and insufficient awareness must be addressed to achieve these goals. Collaboration among researchers, food industries, policymakers, and agricultural experts is essential to promote innovation and implement effective solutions. In conclusion, continuous advancements in food science and technology are crucial for ensuring food security, improving human health, and creating a safe, efficient, and sustainable food system for future generations.

Keyword: *Food Science and Technology, Food safety, Food Preservation*

ID: 1540

Advances and Future Prospects in Meat Processing Science and Technology

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Abstract: China's annual meat production and consumption have consistently exceeded 90 million tonnes, ranking first worldwide. Fresh meat accounts for approximately 80% of total meat consumption. Processed meat products account for above 20%, with traditional Chinese-style products representing approximately 60% of this category. Despite this scale of the industry, China's meat-processing sector continues to face several major challenges, including short processing chains, substantial losses during storage and preservation, an insufficient supply of nutrients and health-oriented products, and the low-value utilization of animal by-products. This report reviews recent scientific and technological advances in four major areas: graded processing of livestock and poultry meat, preservation and loss reduction of fresh meat, development of nutritious and healthy meat products, and diversified utilization of by-products. Particular attention is given to the establishment of independently developed Chinese technologies for the spatiotemporal and multidimensional evaluation of meat quality; the construction of graded processing systems for livestock and poultry meat; the development of a theoretical framework linking post-translational modification of energy-metabolism enzymes with postmortem rigor regulation; advances in precision preservation technologies and equipment; and the development of component-based, multi-product co-production systems for the comprehensive utilization of meat and by-products. Looking ahead, this reports also offers perspectives on strengthening theoretical framework for meat processing, promoting deeper integration across the entire industrial chain, accelerating green and intelligent manufacturing, and expanding the development of nutritious, healthy, and high-value meat products.

Keyword: -

Micro-emulsified encapsulated calcium technology for optimized calcium supplementation

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Micronutrient deficiency, also known as “hidden hunger,” is a prominent global public health issue. Encapsulation technology can enhance the processing stability, bioaccessibility, and targeted release of micronutrients. This study developed an original microemulsion-encapsulated calcium stabilization technology, which regulates calcium salt molecular interactions through a hydrophobic phase barrier, resolves calcium aggregation and precipitation, and constructs an efficient and stable calcium delivery and absorption system. In high-calcium milk with a calcium loading of 150 mg/100 g, calcium bioaccessibility increased by over 40%. In simulated gastrointestinal digestion, free Ca^{2+} in the gastric phase decreased from 10.399 mmol/L to 7.727–9.419 mmol/L, while the calcium binding rate increased from 35.95% to 52.62%–64.90%, achieving gastric-phase sustained release and reducing irritation. In animal experiments, the apparent calcium absorption rate increased by 35.2% compared with $CaCO_3$ and by 17.0% compared with unencapsulated milk calcium, with significant improvements in calcium retention and bone mineral density. This technology enhances calcium bioavailability, isolates calcium from gastrointestinal irritation, and enables gentle calcium supplementation. It also improves carrier stability, palatability, and digestive utilization, supporting functional dairy product innovation and advancing the transition from “single calcium supplementation” to “precision nutrient co-delivery.”

Keyword: -

Sous Vide Processing and Safety Validation of Chicken Adobo and Beef Randang

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This study evaluated the application of sous vide technology to improve the safety and quality of selected Filipino meat dishes, specifically chicken adobo and beef randang. Initial screening identified chicken breast and beef chuck as highly suitable for sous vide processing. Samples were processed at 60°C and 65°C for varying time intervals (2-4 h for chicken and 6-18 h for beef), with thermal lethality monitored to ensure food safety. All sous vide conditions achieved the required 6-log reductions (6D) for Listeria monocytogenes and Clostridium perfringens, confirming effective elimination of vegetative pathogens. However, only beef randang processed at 65°C for 12 and 18 hours met the target 6-log reduction (6D) for proteolytic Clostridium botulinum, indicating the importance of proper storage at temperature lower than 4 °C. Beef randang processed at 65°C for 12 h which met safety targets were compared with traditionally cooked counterparts. Beyond achieving the required lethality, sous vide processing significantly improved product yield by reducing cooking loss by approximately 50%, while maintaining comparable physicochemical, nutritional, and sensory properties and ensuring the absence of pathogens. This study demonstrates that with validated time-temperature parameters, sous vide can enhance the microbiological safety and maintain quality of Filipino dishes.

Keyword: *Sous vide, lethality, chicken adobo, beef randang, safety*

Dietary cholesterol impairs cognition via gut microbiota-derived deoxycholic acid in obese mice

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Dietary cholesterol is often found in a high-fat diet (HFD) and excessive intake is harmful to cognitive function. The gut microbiome constitutes an environmental factor influenced by diet, which regulates cognitive function via the gut-brain axis. The present study explored the role of dietary cholesterol in HFD-induced cognitive impairment and the participation of the gut microbiota and metabolites. Here, we found that dietary cholesterol promoted cognitive impairment in HFD-fed mice, which was associated with an increase in gut microbiota containing 7α-dehydroxylase, including Lachnospiraceae bacterium, Dorea sp., Clostridium sp., and elevated levels of deoxycholic acid (DCA) in the hippocampus. Upon dietary cholesterol intake, the activity of gut microbiota in mice to produce DCA is increased. Fecal microbiota transplantation confirmed that the cognitive impairment-promoting process was driven by gut microbiota. Reducing circulating bile acid levels with cholestyramine improved cognitive decline in mice, whereas hippocampal administration of DCA worsened cognitive function. Pharmacological inhibition of hippocampal apical sodium bile acid transporter reduces neuronal DCA accumulation and improves neuronal apoptosis as well as cognitive impairments in mice. Overall, this study revealed that dietary cholesterol promotes HFD-induced cognitive impairment by inducing the production of DCA through gut microbiota metabolism.

Keyword: *Cholesterol, High-fat diet, Cognitive impairment, Bile acids*

DOREA LONGICATENA AND ITS EXTRACELLULAR VESICLES ATTENUATE OVALBUMIN-INDUCED FOOD ALLERGY IN MICE

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Food allergy is an increasing health concern, and alterations in the gut microbiota may contribute to its development. Metagenomic analyses have revealed a lower abundance of Dorea longicatena in individuals with food allergies. This gut bacterium produces short-chain fatty acids, particularly butyrate, which may promote regulatory T-cell (Treg) responses and suppress T-helper 17 (Th17) responses. This study investigated the anti-allergic effects of D. longicatena and its extracellular vesicles (EVs). EVs were isolated and characterized, and their protein cargo was analyzed by proteomics. A mouse model of ovalbumin (OVA)-induced food allergy was established, and mice were orally administered live or inactivated bacteria, or low- or high-dose EVs. Healthy mice were given EVs to assess their safety. Intestinal organoids were used to investigate EV uptake and signaling. Treatment with D. longicatena or its EVs alleviated allergic symptoms, reduced OVA-specific immunoglobulin E levels, increased Treg levels, decreased Th17 levels, and improved intestinal barrier integrity. EV administration produced anti-allergic effects comparable to those of the bacterium and caused no apparent adverse effects in healthy mice under the conditions tested. These findings suggest that D. longicatena may alleviate food allergy and that its EVs may contribute to this effect, potentially by improving intestinal barrier function.

Keyword: *Food allergy, Dorea longicatena, Gut microbiota, Extracellular vesicles*

Transforming Almond Hulls into Functional Food Ingredients

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Almond Board of California

Agricultural byproducts are often diverted to low-value uses despite containing valuable food components. In California's almond industry, hulls are the largest coproduct stream by mass, yet their potential for human food remains underutilized. Transforming this abundant resource into food-grade almond hull powder offers a practical way to optimize agricultural production, reduce waste, and recover nutrition from material already generated by the food system. Almond hull powder is naturally rich in dietary fiber—about one-third of its dry matter, including soluble and insoluble fractions—and contains diverse phytochemicals, such as phenolic acids, flavonoids, and triterpenoids. Its development as a food ingredient can help address the dietary fiber intake gap while expanding the supply of nutritious, plant-based ingredients.

Almond hull powder can also provide useful formulation functions, including water and oil binding for moisture retention, texture modification in bakery and snack products, and naturally derived color and flavor notes. Food-grade powder can be produced from suitable hull streams using established sorting, cleaning, pasteurization, and milling equipment, with particle size tailored to specific applications. Improved segregation, moisture control, storage, and timely processing are essential to preserve quality and create a dependable ingredient supply. With GRAS (Generally Recognized as Safe) confirmation, this pathway can be implemented within existing infrastructure without major capital investment. Converting an underutilized byproduct into versatile food ingredients advances circular agriculture and makes fuller use of land, water, energy, and labor already invested in almond production. On a scale, this approach can strengthen food-system resilience, diversify the ingredient base, and contribute to a steadier supply of affordable, nutritious food as the world works to reduce hunger and feed a growing population.

Keyword: *almond hull, dietary fiber, phytochemicals, functional foods*

ID: 1534

HUMAN MILK-DERIVED EXTRACELLULAR VESICLES ALLEVIATE FOOD ALLERGY BY RESTORING INTESTINAL BARRIER FUNCTION AND IMMUNE HOMEOSTASIS

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Food allergy is characterized by impaired oral tolerance, intestinal barrier dysfunction, and dysregulated type 2 immunity. Human milk-derived extracellular vesicles (HM-EVs) contain diverse bioactive components, but their role in food allergy remains incompletely understood. We investigated the protective effects of HM-EVs in BALB/c mice with ovalbumin-induced food allergy. HM-EV administration attenuated allergic symptoms, reduced serum immunoglobulin E levels and mast cell activation, and alleviated intestinal histopathological injury. These effects were accompanied by attenuated type 2 immune responses and enhanced regulatory immune responses. HM-EVs also improved intestinal epithelial integrity and increased tight-junction protein expression. Consistently, experiments using intestinal organoids showed that HM-EV treatment promoted organoid growth and epithelial regeneration and increased the expression of barrier-associated proteins, supporting a direct protective effect on the intestinal epithelium. Collectively, these findings suggest that HM-EVs may alleviate food allergy by preserving intestinal barrier integrity and modulating mucosal immune homeostasis, highlighting their potential as naturally derived bioactive vesicles for food allergy intervention.

Keyword: *Food allergy, Human milk, Extracellular vesicles*

HEALTH AND ENVIRONMENTAL EVIDENCE, CHALLENGES, AND SUSTAINABLE STRATEGIES OF PLANETARY HEALTH DIET: A MIXED-METHODS REVIEW

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The Planetary Health Diet (PHD) was proposed by the Lancet Commission in 2019. It is a new way of eating that aims to improve both human health and the environment simultaneously. However, recent practice demonstrates persistent cognitive gaps in terms of systematic quantification of health benefits, robust evidence of environmental impacts, and region-specific implementation pathways. This study systematically integrates epidemiological evidence to clarify the associations between PHD and reduced risks of diseases, including cardiovascular disease, diabetes, and certain cancers. Additionally, the study talks about how it affects the demand for agricultural land, the stress on freshwater resources, the release of greenhouse gases, and the imbalance in nitrogen and phosphorus cycles. The study elucidates various multidimensional obstacles to global PHD adoption, including limitations in natural resources, regional economic inequalities, scaling challenges in food technology innovation, and resistance to cultural and intergenerational transmission. To tackle these issues, the study proposes a four-dimensional synergistic approach: encouraging innovation in food production systems, creating fair food distribution systems, building policy intervention toolkits, and designing behavioral incentives. These evidence-based solutions offer both theoretical foundations and actionable paradigms for sustainable food system transformation.

Keyword: *Planetary Health Diet, Health outcomes, Environment, Challenges, Strategies*

MECHANISMS OF PROTOCATECHUIC ACID IN ALLEVIATING STREPTOZOTOCIN-INDUCED DIABETES IN MICE

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Diabetes is a common metabolic disease that severely threatens public health. Protocatechuic acid (PCA), a phenolic acid, has excellent hypoglycemic activity. This study aimed to investigate the underlying mechanism of PCA in alleviating streptozotocin (STZ)-induced diabetes. Male C57BL/6J mice (7 weeks old) with STZ-induced diabetes were randomly divided into three groups (n = 9 each): diabetic model group, low-dose PCA group (0.5 g/kg body weight), and high-dose PCA group (1.0 g/kg body weight). Mice were fed for 8 weeks. We found that PCA reduced fasting serum glucose and glycated hemoglobin levels, increased pancreatic islet β-cell number, and elevated fasting serum insulin concentration. In the liver, PCA up-regulated the insulin signaling pathway by increasing glucose transporter 2 (GLUT2) protein and the phospho-protein kinase B (p-AKT)/AKT ratio. In addition, PCA increased gut microbiota richness and diversity, and increased the relative abundance of bacteria related to the phosphatidylinositol 3-kinase (PI3K)-AKT signaling pathway. In conclusion, PCA significantly attenuated STZ-induced diabetes in mice. This might be attributed to the up-regulation of the insulin signaling pathway and gut microbiota remodeling.

Keyword: *Protocatechuic acid, Diabetes, Insulin signaling pathway, Glucose transporter, Gut microbiota*

REGIONAL AND SEASONAL VARIATION IN PHYSICOCHEMICAL CHARACTERISTICS OF PHILIPPINE CALAMANSI JUICE: AN EXPLORATORY PRINCIPAL COMPONENT ANALYSIS

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Baseline data on the natural variability of authentic calamansi juice are needed to support quality assessment and future authenticity studies. This study evaluated regional and seasonal differences in Philippine calamansi juice and explored sample patterns using principal component analysis. The physicochemical dataset comprised 76 complete samples from six producing regions collected during dry and wet seasons. Measurements included pH, total soluble solids, titratable acidity, and color parameters (L*, a*, and b*). Regional comparisons used one-way analysis of variance and Tukey's test, while seasonal comparisons used independent samples t-tests. Regional means ranged from 2.14 to 2.38 for pH, 5.67% to 6.95% for titratable acidity expressed as citric acid, and 6.20 to 7.94 °Brix for total soluble solids. Across the reported regions, wet-season samples had significantly higher pH and soluble solids and lower titratable acidity, lightness, and yellowness than dry-season samples ($p < 0.05$). Principal component analysis showed partial regional clustering with substantial overlap, indicating limited geographical differentiation using these physicochemical variables alone. These findings establish a baseline for interpreting natural variation in calamansi juice and support further investigation incorporating chemical profiles for authenticity assessment.

Keyword: *Principal component analysis, Calamansi, Physicochemical, Calamansi juice*

ID: 1529

Sustainable Gellan Gum-Based Biopolymer Coatings Reinforced with NFC and Zein for Paper Food Packaging

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Petroleum-based synthetic plastic packaging poses significant environmental challenges, driving the development of sustainable, bio-based alternatives. Although paper is renewable and biodegradable, its application in food packaging is limited by its high porosity and poor moisture resistance. This study evaluated high-acyl gellan gum (GG) coatings reinforced with co-biopolymers, nanofibrillated cellulose (NFC), and zein (Z), applied to Kraft paper as single and bilayer coatings. Rheological analysis showed elastic-dominant behaviour ($G' > G''$) and shear-thinning flow across the formulations, while highly negative zeta potential values (<36.7 mV) indicated good colloidal stability. Among the formulations, bilayer coatings, particularly GGNFC+GGZ, significantly enhanced tensile strength and water vapour barrier performance by creating a more tortuous diffusion pathway and increasing surface hydrophobicity. Notably, the GGNFC+GGZ bilayer maintained low water vapour permeability and remained relatively stable in tensile strength after eight freeze–thaw cycles, demonstrating good resistance to repeated temperature fluctuations. In a real-food application study, the GGNFC+GGZ bilayer-coated paper slowed the increase in bread firming over nine days of storage. Overall, the GGNFC+GGZ bilayer coating demonstrates strong potential as a functional and environmentally sustainable alternative to conventional plastic food packaging.

Keyword: *Gella gum, Zein, Bilayer coating, Rheology, Freeze-thaw cycle*

ESTABLISHING CHEMICAL AND MICROBIOLOGICAL SAFETY AND QUALITY PARAMETERS FOR PHILIPPINE PEANUT BUTTER

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Food standards are regulatory guidelines that serve as critical foundations for modernizing local food value chains, and enable the micro, small and medium enterprises (MSMEs) to become commercially competitive in the local and global market. In the Philippines, peanut butter is one of the widely consumed high-risk food products that has an outdated regulatory guideline, the DOH AO No. 228 s. 1974. Currently, the only official safety limit enforced for peanut butter is the presence/absence of Salmonella based on the FDA Circular No. 2022-012. To address this gap, a comprehensive industry-wide baseline was established by profiling peanut butter products available in the Philippine market. Sixty (60) samples of peanut butter products were collected from physical stores, online shopping platforms, and directly from local manufacturers. Information such as origin, ingredients, and type (based on texture) were documented. The samples were also characterized based on different physico-chemical, chemical, and microbiological parameters. Data obtained from these profiling activities were used to specify the standard of identity, and important safety and quality indices—including peroxide value, aflatoxin, free fatty acid, and microbiological limits for coliforms, aerobic plate count, and yeast and molds—which were harmonized with international standards.

Keyword: *Peanut butter, product standards, chemical indices, microbiological criteria, standards harmonization*

Chemometric and Machine-Learning applications for food characterisation and authentication

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Food analysis increasingly generates complex data requiring suitable multivariate approaches. This work illustrates how chemometrics and machine learning support food characterisation, authentication and quality control through three case studies. First, volatile profiles of organic Pecorino sparkling wines were monitored during commercial storage using headspace solid-phase microextraction coupled with gas chromatography–mass spectrometry (HS-SPME-GC-MS). Analysis of variance–simultaneous component analysis (ASCA) evaluated the effects of ageing and winemaking process, revealing non-linear changes in volatile composition and differences among production methods. Second, attenuated total reflectance Fourier-transform infrared (ATR-FTIR) spectra and HS-SPME-GC-MS fingerprints of black pepper from Kampot, Madagascar and commercial products were investigated. Principal component analysis (PCA) highlighted spectral and volatile differences, while supervised models predicted sample origin with approximately 90% accuracy on an independent test set. Finally, FT-IR spectra and colourgrams obtained by e-eye analysis were used to authenticate Canestrato, an Italian Slow Food Presidium cheese, against other sheep cheeses. Sequential Preprocessing through Orthogonalization combined with linear discriminant analysis (SPORT-LDA), support vector machines (SVMs) and neural networks were compared through cross-validation and external validation. Linear SVM provided strong prediction and direct coefficient-based interpretation. Overall, these applications show how multivariate analysis converts complex analytical fingerprints into information for food control.

Keyword: *Food Authentication, Chemometrics, Deep-Learning, headspace solid-phase microextraction coupled with gas chromatography–mass spectrometry, attenuated total reflectance Fourier-transform infrared*

Is There Really a Problem with Ultra-Processed Foods?

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International Academy of Food Science and Technology (IAFoST)

Ultra-processed foods continue to generate debate worldwide. In China, this debate is reflected largely in consumers' concerns about, and resistance to, industrially produced foods such as ready-made meals and convenience foods. However, the underlying issues cannot be attributed simply to a particular ingredient or processing method. Particular attention should be paid to the discomfort consumers often experience after eating certain highly processed foods, such as instant noodles, including thirst, nausea, gastric fullness and bloating, a sensation of "food stagnation". These directly perceptible responses provide an important starting point for understanding the problems associated with ultra-processed foods. Conventional research has focused primarily on digestibility, absorption and nutrient utilisation. These measures are insufficient to determine whether food processing and formulation contribute to such discomfort. The mucosa of the digestive tract is the first interface at which ingested food contacts the body and elicits biological responses. These responses may involve mucosal barrier function, local stress responses and interactions with immune cells. The assessment of ultra-processed foods should therefore extend beyond digestion and absorption to examine interactions between food and the digestive tract mucosa. This perspective could support a more direct assessment framework for identifying the food characteristics that cause discomfort and guiding improvements through changes to formulations and processing methods, enabling these effects to be assessed, explained and controlled.

Keyword: -

Engineering Food Systems to Enhance Sustainability, Safety, Health, and Quality of Life

Hongda Chen *

International Academy of Food Science and Technology (IAFoST)

Engineering is an integral and critical part of Sciences of Food. This talk will briefly discuss the essential contributions of food engineering to advancing science of foods for ensuring sustainable food and nutrition security, enhancing food safety, and enriching the quality of life throughout the world. It will suggest the necessity of system approaches through collaborating with engineering and other allied science disciplines to address prevalent and future challenges synergistically and effectively for better

nutrition, diet, and health. The emergence of artificial intelligence (AI) for applications in food, diet, nutrition, and health has demonstrated rich opportunities for collaboration between engineering scholars and other scientists. The Product Rating Integration Systems for Multi-characteristics (PRISM) scheme recently proposed by the IUFSOT Task Force on Food Processing for Nutrition, Diet and Health will illustrate the optimization in product and process design through “Engineering + n” collaboration approach. The strength of cross-disciplinary collaboration in scientific discoveries and technology innovation will continue to serve as an endless fountain of scholarly works for prominent professional journals like the npj Science of Food.

Keyword: -

ID: 1523

Processing-induced Nano Assemblies for Sustainable Food Innovation: Models and Prospects

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The conformational dynamics of proteins and polysaccharides during food processing critically influence functional properties, including solubility, emulsification, and gelation—key parameters in plant-based food systems. Native nanoscale assemblies of nutrients like proteins, polysaccharides, lipids, and polyphenols, exhibit enhanced bioavailability and multifunctionality due to their intrinsic supramolecular organization. Their co-extraction and spontaneous self-assembly from plant tissues support low-energy, sustainable processing. Chemical modifications—such as glycation, disulfide bond rearrangement, and oxidation in proteins—play decisive roles in nanostructure formation, offering opportunities to tailor rheological and organoleptic properties using existing processing infrastructure.

The protein scaffolds, often complexed with polysaccharides via hydrogen bonding or electrostatic interactions, serve as delivery vehicles for hydrophobic bioactives, micronutrients, and amphiphilic phytochemicals, enabling higher stability, targeted release and enhanced bioactivities. Examples are given in tea/soup nanoparticles, coconut proteins, chickpea aquafaba nanoparticles. Upon ingestion, these nanostructures undergo enzymatic hydrolysis and interact with bile salts, mucus, enterocytes, and commensal microbiota, influencing nutrient sensing, taste transduction, and immunomodulation. Their role in attenuating mucosal inflammation, scavenging reactive oxygen species, and maintaining redox and microbial homeostasis underscores their potential in functional food design. Leveraging native food nano-assemblies as biomimetic models may inform engineering strategies for alternative ingredients, advancing nutritional optimisation and food system resilience.

Keyword: +

Pedagogy of Food Science and Engineering in Africa: Challenges and Future Directions Project Officer, Quality Assurance and Accreditation

ADEWALE OLUSEGUN OBADINA *

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Food Science and Engineering education is central to developing the skilled workforce required to transform Africa's agri-food systems, strengthen food security, and enhance industrial competitiveness. However, many African higher education institutions face challenges including outdated curricula, limited laboratory and pilot-scale facilities, weak industry engagement, inadequate digital integration, and insufficient modern teaching resources. These constraints have contributed to gaps between graduate competencies and the evolving needs of industry, research, and entrepreneurship.

It examines the state of Food Science and Engineering pedagogy in Africa, focusing on challenges in curriculum design, teaching methodologies, practical training, research integration, quality assurance, and graduate employability. It considers emerging trends such as artificial intelligence, digital learning, precision fermentation, biotechnology, sustainable food systems, climate-smart processing, and Industry 4.0, and their implications for future graduate competencies.

The presentation proposes a transformative pedagogical framework centred on learner-centred and competency-based education, experiential and problem-based learning, university-industry-government partnerships, interdisciplinary collaboration, entrepreneurship, and internationalisation. It highlights the role of quality assurance, accreditation, faculty development, and regional collaboration in strengthening Food Science education. Finally, it offers strategic recommendations for policymakers, universities, professional bodies, and industry to build a resilient, innovative, and globally competitive workforce capable of advancing Africa's food systems transformation and sustainable development.

Keyword: *Food Science Education, Pedagogy, Competency-Based Education, Higher Education, Curriculum Innovation*

WHAT KNOWLEDGE AND SKILLS WILL FUTURE FOOD SCIENCE GRADUATES NEED?

Phil Bremer *

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Global food systems face unprecedented volatility driven by climate change, geopolitical pressures, and rapid technological shifts. This presentation provides a viewpoint on how food science education must evolve to better deliver core competencies aligned with the IUFoST vision of strengthening the profession to support humanity.

While foundational expertise in food chemistry, processing, production, and safety remains globally non-negotiable, proficiency in digital technologies is increasingly essential, as is integrating ecological, behavioural, and cross-cultural literacy into curricula. To remain relevant, higher education must also recognize and address, stark regional variations in resources, consumer expectations, and environmental impacts, and adapt curricula accordingly. Advanced economies may emphasize emerging technologies, sustainability, international regulatory frameworks, and the importance of maintaining a social license to operate. Conversely, emerging economies may prioritize climate mitigation, post-harvest loss reduction, risk assessment, and food safety management.

Ultimately, future food science graduates must combine traditional foundational knowledge and technical mastery with social competencies, market literacy, adaptability, and strong communication skills. Equipping graduates with these holistic attributes provides a strategic, globally responsive blueprint to empower professionals to navigate complex food systems, effectively engage with diverse stakeholders, and help ensure sufficient, safe food for all.

Keyword: *Food science education, Regional adaptability, Sustainable food systems, Stakeholder engagement, Cross-cultural literacy*

ID: 1520

The design and development of wellness/functional foods

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"Foods and diets for human wellness" is an ever-evolving theme. With the advancement of scientific knowledge and various technologies, the food production and preparation systems as well as human's dietary patterns and lifestyles have undergone considerable changes. Meanwhile, diet-related health consciousness is on the rise worldwide. Preventive or proactive healthcare encourages people to take responsibility to manage their own health rather than relying on drastic medical intervention. The demand for wellness/functional foods is increasing, as these foods can be included in daily diets to offer both enjoyable experiences and targeted therapeutic effects. Thus, design and development of wellness/functional foods that enhance different populations' well-being have become of paramount importance. This presentation provides insights into wellness/functional food design and efficacy assessment, highlighting the needs of interdisciplinary thinking and collaborative efforts.

Keyword: -

ID: 1519

From Waste to Wealth and Health

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Food processing operations generate 30-70% discards. These side steams are generally rich in bioactive components that could generate high value secondary products. Both land-based and aquatic products lend themselves to upcycling in a sustainable manner. Thus, plant seeds, fruits, vegetables and animal processing co-products as well as those from fisheries and aquaculture may serve as a rich source of bioactives. These may include proteins and peptides, lipids, phenolics as well as other desirable components that could promote health and help addressing environmental concerns due to irregular dumping. As an example, seed coats are rich in polyphenols and fruits used for juicing and wine production generate pulp and seeds that are a good source of colorants and bioactive phenolic compounds. The fisheries processing co-products may also serve as a source of long chain omega 3 fatty acids, proteins/peptides, and other bioactives. This presentation highlights the sustainable use of processing waste.

Keyword: -, *upcycling, processed foods and processing discards, bioactive compounds, value-added, polyphenols,*

ID: 1518

Functional Foods: Growth and Callenges

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Functional foods and ingredients thereof have enjoyed a rapid growth in recent years despite the challenges to address sensory and regulatory concerns. This is particularly important in view of the interest in plant foods (protein, fibre, prebiotics), functional drinks (low or no sugar, GLP-1), bakery products (ingredient, fortification, sour dough), as well as fermented food (kimchi, sauerkraut, etc.) and germinated products. Furthermore, gut microbiome and pre-/probiotics and personalized nutrition, sustainability as well as delivery systems are among other areas of interest. Of course, challenges due to sensory quality and regulatory issues remain. The presentation will provide a cursory account of the achievements and challenges with regard to the global trends in functional foods.

Keyword: -, *plant food coproducts, fermented food, germination, sustainability, delivery systems, challenges*

ID: 1517

HIGH-INTENSITY ULTRASOUND FUNCTIONALIZATION OF BROCCOLI BY-PRODUCT PROTEIN CONCENTRATE FOR DEVELOPMENT OF A PROTEIN-RICH INSTANT SOUP MIX

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The valorization of underutilized agricultural by-products into functional protein ingredients offers a promising approach towards sustainable food production and protein diversification. However, the limited solubility and interfacial functionality of plant-derived proteins can restrict their incorporation into value-added food products. This study investigated high-intensity ultrasound (HIUS) as a physical modification approach tailor the structural and functional properties of broccoli by-product protein concentrate (BBPPC) for application in a protein-rich instant soup mix. BBPPC was treated with HIUS followed by characterization of its functional properties. HIUS induced pronounced alternatives in protein conformation and microstructure accompanied by particle size reduction, changes in surface charge and sulfhydryl groups and structural rearrangement. It produced the most favourable functional response with improved solubility, water and oil absorption, emulsifying activity and foaming properties relative to untreated BBPPC. The optimized HIUS-modified BBPPC was subsequently incorporated into an instant soup formulation. The resulting soup mix contained approximately 28-30 % protein and demonstrated satisfactory reconstitution, consistency, appearance and sensory acceptability. Overall, the findings indicate that controlled HIUS-treatment can modulate BBPPC functionality and improve its technological suitability as a protein ingredient. The developed approach provides a potential valorization pathway for broccoli by-products and supports the development of nutritionally enriched, plant-based instant foods.

Keyword: *Plant protein, protein modification, functional properties, instant food*

Ganoderma lucidum-Derived Extracellular Vesicles Ameliorate Chronic Obstructive Pulmonary Disease by Suppressing Inflammatory Responses

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Chronic obstructive pulmonary disease (COPD) is a heterogeneous respiratory disorder with persistent airflow limitation and chronic inflammation. The lung-tonifying edible-medicinal fungus Ganoderma lucidum produces extracellular vesicles (EVs), nanoscale biocompatible lipid-bilayer carriers. This study investigated the therapeutic effects and mechanisms of G. lucidum EVs in COPD.

G. lucidum EVs were isolated from fresh fruiting bodies by differential ultracentrifugation and characterized by TEM, NTA, metabolomics, and small RNA-seq. DIR labeling was used to track oral gut–lung trafficking. A murine COPD model was established via cigarette smoke exposure plus intranasal LPS. Body weight, organ indices, inflammatory/oxidative markers, lung histology, 16S rRNA sequencing, and transcriptomics were analyzed.

EVs appeared as cup-shaped vesicles (100-200 nm, mean: 145 nm) enriched in metabolites and miRNAs, and accumulated in lungs after oral gavage. In COPD mice, EVs attenuated body-weight loss, reduced lung index, suppressed inflammation/oxidative stress (decreased IL-1β, IL-6, TNF-α, MDA; increased IL-10, SOD, GSH-Px), and alleviated alveolar damage, inflammatory infiltration, collagen deposition, and lipid accumulation. 16S sequencing revealed that EVs reversed gut dysbiosis (Ileibacterium enrichment, Faecalibaculum depletion), accompanied by enriched Bacteroidetes and Muribaculaceae. Transcriptomics demonstrated downregulation of pro-inflammatory pathways.

G. lucidum EVs enable oral gut–lung trafficking and modulate pulmonary immunity, showing potential as natural multi-target COPD therapeutics.

Keyword: *Extracellular vesicles derived from Ganoderma lucidum, Chronic obstructive pulmonary disease, Inflammatory Responses*

ID: 1515

Pentadecanoic Acid Regulates Microbiota-Metabolism Axis against Chronic Hepatic Fibrosis

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Hepatic fibrosis represents a critical stage in chronic liver disease, leading to cirrhosis, hepatocellular carcinoma, and liver failure, yet effective preventive interventions remain limited. Pentadecanoic acid (PEA; C15:0), an odd-chain fatty acid derived from dairy and ruminant meat, has recently been recognized as a bioactive nutrient with potential anti-inflammatory and antifibrotic properties. In this study, we integrated evidence from population-based, animal, and cellular investigations. Analysis of 491,134 UK Biobank participants demonstrated that higher dietary PEA intake was significantly associated with reduced liver fibrosis risk, independent of demographic and lifestyle factors. In a diethylnitrosamine (DEN)-induced mouse model, PEA supplementation attenuated fibrotic progression dose-dependently and partially reversed advanced stages. In vitro, PEA suppressed proliferation and induced apoptosis of TGF-β1–stimulated hepatic stellate cells, the key effector cells in fibrogenesis. Proteomics revealed enrichment of apoptosis and pyroptosis pathways, with downregulation of HDAC5, MAP3K1, SRC, and RPS6KB2. Full-length 16S rRNA and fungal ITS sequencing showed PEA increased bacterial diversity, enriched Akkermansia and Muribaculaceae, and reduced fungal diversity, with microbial shifts correlated with apoptosis-related proteins. Collectively, PEA protects against hepatic fibrosis through direct stellate-cell regulation and gut microbiota modulation, highlighting its potential as a safe, diet-derived candidate for chronic liver disease.

Keyword: *Pentadecanoic acid, Hepatic fibrosis progression, Hepatic stellate cell apoptosis, Gut microbiota remodeling*

EFFECTS OF PHYTOSTEROLS WITH PHOSPHOLIPIDS ON BLOOD LIPIDS IN OVERWEIGHT ADULTS WITH DYSLIPIDEMIA: A RANDOMIZED CONTROLLED TRIAL

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Background: Phytosterols lower low-density lipoprotein cholesterol (LDL-C), but the added value of phospholipids in a combined supplement remains uncertain.

Methods: In a two-center, randomized, double-blind, placebo-controlled trial, 119 overweight adults with dyslipidemia were assigned to phytosterols (2.0 g/day), phytosterols plus phospholipids (2.0 plus 0.825 g/day), or placebo for 60 days. The primary outcome was LDL-C at day 60. Baseline- and center-adjusted analyses included 116 participants in the per-protocol population.

Results: Compared with placebo, LDL-C was lower with phytosterols (adjusted difference, −0.24 mmol/L; 95% CI, −0.45 to −0.03) and with the combination (−0.32 mmol/L; 95% CI, −0.53 to −0.11). The combination did not significantly outperform phytosterols alone for LDL-C. It lowered total cholesterol (−0.34 mmol/L) and non-high-density lipoprotein cholesterol (−0.39 mmol/L) compared with phytosterols alone; oxidized LDL was also lower. Triglycerides and high-density lipoprotein cholesterol did not differ significantly among groups.

Conclusion: Phytosterols, alone or with phospholipids, reduced LDL-C over 60 days. Adding phospholipids showed additional effects on selected secondary lipid and oxidative stress markers, warranting confirmation in larger trials.

Keyword: *Phytosterols, Phospholipids, Dyslipidemia, Low-density lipoprotein cholesterol, Randomized controlled trial*

ID: 1513

Advancements in Food Processing and Technology: Ensuring Safety, Quality, and Sustainability in Modern Food Systems

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The global food industry is undergoing a rapid transformation driven by advancements in food processing and technology. The primary objective of modern food processing is not only to preserve food but also to ensure food safety, nutritional quality, and extended shelf life while meeting consumer demands.

This paper reviews and investigates recent innovations in both thermal and non-thermal processing technologies including Ultra-High Temperature (UHT) processing, High-Pressure Processing (HPP), Pulse Electric Field (PEF), and advanced aseptic packaging systems. The study emphasizes the role of Food Safety and Quality Management Systems such as HACCP, ISO 22000, and GMP in controlling contamination during processing and in operational areas.

Our findings highlight that the integration of automated processing, hygienic equipment design, and smart packaging solutions significantly reduces microbial contamination, minimizes post-processing losses, and improves the overall efficiency of the food supply chain. Furthermore, proper handling and maintenance of non-operational machinery in production zones were identified as a critical factor in preventing cross-contamination in powdered and ready-to-mix food products.

The paper concludes that the adoption of sustainable, energy-efficient, and technology-driven processing methods is essential for achieving global food security, reducing food waste, and complying with international food safety standards. This research provides valuable insights for researchers, food technologists, and industry professionals working towards innovative and safe food systems.

Keyword: *Food processing and Technology, Ensuring safety, GMP, Sustainable food system*

EXTRACTION, CHARACTERIZATION, AND ANTIOXIDANT EVALUATION OF PROTEIN FROM CHENOPODIUM ALBUM L. LEAVES USING ULTRASOUND-ASSISTED TRI-PHASIC PARTITIONING TECHNIQUE

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The growing demand for sustainable plant proteins has renewed interest in underutilized leafy vegetables as alternative protein sources. Chenopodium album L. (bathua) is rich in proteins and bioactive compounds, yet its protein extraction and functional attributes remain underexplored. This study evaluated Ultrasound-Assisted Tri-Phasic Partitioning (UATPP) for recovering bathua leaf protein using blanched leaf powder treated at 0, 5, 10, and 15 min ultrasonication. Extracts were assessed for protein yield and recovery, proximate composition, structural features (FTIR, XRD, ^{1}H NMR, circular dichroism, SEM) and antioxidant properties (total phenolics (18.34 ± 0.20 mg GAE/g protein) and flavonoids (7.49 ± 0.10 mg QE/g protein) FRAP (4.06 ± 0.07 µmol Fe^{2+}/g). Ultrasonication markedly enhanced extraction efficiency, with 15 min yielding the highest protein yield (62.61%) and recovery (86.11%), while 10 min produced maximal crude protein content. Spectroscopic and microscopic analyses indicated altered molecular ordering and surface morphology without disruption of primary structure. Antioxidant evaluation showed 10 min ultrasonication gave peak phenolic and flavonoid contents, whereas 15 min produced the highest ferric reducing antioxidant power. Overall, UATPP emerges as a green, efficient approach for obtaining structurally improved, antioxidant-rich bathua leaf protein, highlighting its promise as a functional ingredient for food and nutraceutical formulations. These findings support value addition to leafy crop residues and align with circular bioeconomy goals in sustainable protein ingredient development.

Keyword: *Ultrasound-Assisted Tri-Phasic Partitioning, Tri-Phasic Partitioning, Leaf protein, Protein recovery, Chenopodium album L.*

Artificial intelligence-generated sensory responses to non-traditional flavor ingredients in chocolate brownies

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Abstract

Background and Hypothesis

Artificial Intelligence (AI) has been increasingly discussed as a potential mechanism to support traditional sensory evaluation, which is limited by high cost, time, and human bias. This study evaluated non-traditional flavor ingredients in chocolate brownies as a food model system to assess the alignment of AI-generated responses to human sensory descriptive analysis and physicochemical properties.

Methodology

Ten brownie formulations containing conventional and non-traditional ingredients (stevia, gochujang, barbecue, miso, chicken stock, fish sauce, garlic, liquid smoke, Splenda, and a classic control) were prepared. Color, moisture content, and texture profile analysis were measured instrumentally. A trained human panel (n=20) evaluated sensory attributes using a hybrid Spectrum/QDA approach with a 15-point intensity scale; each formulation was evaluated in duplicate. AI sensory responses were generated using ChatGPT 5.4 mini, with 20 virtual panelists prompted to evaluate the formulations. Data was analyzed using mixed-model ANOVA, radar plots, and principal component analysis.

Results

Significant differences were found in color (crumb redness and crumb yellowness), hardness, and moisture content across formulations. Regarding sensory outputs, ChatGPT generally overestimated responses to basic tastes and aromas. However, ChatGPT was closely aligned with human responses in terms of texture descriptors. In savory formulations (miso and fish oil), ChatGPT had a positive bias towards “bitterness” and “umami”. On the other hand, marginal differences were found for “density” and “chewiness”.

Conclusion

This study shows that AI tools such as ChatGPT can be potentially used to screen different formulations. Further studies across a wide range of food categories are suggested to integrate advanced AI systems into sensory evaluation, and support sensory-driven product development.

Funding and acknowledgement

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Keyword: *artificial intelligence, sensory evaluation, chocolate brownie, machine learning, sensory*

Alternative Protein Source: Optimization of Pigeon Pea (Cajanus cajan) Protein Extraction using Response Surface Methodology

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Driven by the rising demand for sustainable plant-based proteins, pigeon pea (Cajanus cajan) offers a promising alternative to conventional protein sources. This study optimized the extraction of pigeon pea protein isolate and evaluated the physicochemical and functional properties of the resulting spray-dried protein powder. Response Surface Methdology (RSM) using Central Composite Design (CCD) was used to optimize alkaline extraction pH (8.0–10.0), isoelectric precipitation pH (3.0–6.0), and solid-to-liquid ratio (1:10–1:25 w/v) to achieve higher protein content and yield. Optimal extraction conditions were identified at alkaline pH 10.00, isoelectric pH 4.04, and a 1:22.45 solid-to-liquid ratio with 29% protein content and 9% yield. Solid-to-liquid ratio directly correlated with protein content, whereas isoelectric precipitation followed a parabolic trend. The spray-dried powder contained 64% crude protein, 6% crude fat, and 18% carbohydrates with a water holding capacity of 2.99 ± 0.01 g/g, emulsifying activity index of 67.63 ± 0.84%, emulsifying stability index of 55.80 ± 1.25%, and foaming capacity of 28.67 ± 1.15%.These findings showed the technical feasibility of extracting protein from pigeon pea as a functional, sustainable plant-based ingredient.

Keyword: *Plant based protein, Pigeon pea, Central Composite Design, Response Surface Methodology, Functional property*

Cutting Salt Without Losing Flavor: How Seaweed-Derived Umami Can Improve Healthier Foods

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Background: High dietary sodium consumption is associated with high blood pressure, a major risk factor for cardiovascular disease (CVD). In the Philippines, this remains a problem despite implementing sodium reduction policies and strategies (e.g. use of salt replacers). An emerging approach utilized amino acids, specifically the glutamic and aspartic acid, that elicit the umami taste which enhance the salt perception in food making it viable for sodium reduction applications. These compounds can be derived from agricultural products such as seaweeds.

Objective: The potential of using Philippine seaweeds as sustainable sources of umami compounds and their application in reducing sodium content in food products were explored.

Materials and Methods: The study involved the extraction of the umami compounds, followed by its application in food products. Among the screened red seaweed species (Kappaphycus alvarezii, Eucheuma denticulatum, Gracilaria edulis), G. edulis was selected for its high protein content (5.360 g/100 g). The seaweeds were initially converted to powder followed by a step-wise extraction process involving enzyme-assisted and chemical-assisted extractions. High Performance Liquid Chromatography with UV detector (HPLC-UV) was used to quantify the target amino acids while Response Surface Methodology (RSM) optimized the extraction parameters to maximize amino acid yield in the extract. Two ready-to-eat (RTE) MeaLusog® products, Tuna Afritada (TA) and Sweet & Sour Chicken Balls (SSCB), were partially or fully reformulated using seaweed powder as a source of the salty taste. The sensory acceptability and sodium content of these products were evaluated.

Results and Findings: Results showed that the extract contains glutamic and aspartic acids. Response surface models showed that the amount of cellulase and incubation time significantly affected glutamic acid yield ($p<0.05$), with the highest concentrations achieved at 1% cellulase combined with 6-hour incubation. For aspartic acid, optimal extraction occurred at 0.9-1.0% cellulase, 0.1-0.8% protease with either 1-hr or 6-hr incubation. Numerical optimization predicted 191-206 µg/ml glutamic acid and 1037-1144 µg/ml aspartic acid at ideal conditions (0.949-1% cellulase, 0.1-0.559% protease and 5.985-6 hours incubation time). Sensory evaluation using the Hedonic test revealed that seaweed powder effectively replaced conventional flavor enhancers as the overall acceptability of the reformulated products (6.73) was not significantly different ($p>0.05$) from the original (6.97). Lastly, sodium analysis showed a 32.49% reduction in the sodium content in the reformulated products (469.5mg/100g) from the original formulation (695.5mg/100g).

Conclusion and Recommendations: This study showed the potential of Philippine seaweeds, particularly G. edulis, as a viable umami source for sodium reduction. Future research should explore broader food applications, refinement of extraction protocols, and implement by-product valorization to enhance commercial viability.

Keyword: *seaweeds, umami, glutamic acid, aspartic acid, sodium reduction*

Nutritional profile and biological value of a beverage powder mix for older adults

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Sarcopenia, the age-related decline of muscle loss and function, significantly impacts the quality of life and independence of older adults. While adequate protein intake is crucial for mitigating sarcopenia, many older adults struggle to meet their protein needs from diet alone. This study investigated the dietary and biological value of a developed beverage powder made from a mixture of plant and dairy-based protein powders designed to support muscle health in older adults. Proximate analysis, specifically protein, fat, carbohydrate, dietary fiber, and calorie content determination of the developed powder, were conducted. The amino acid composition was measured using high-performance ion exchange chromatography. Protein completion was assessed by comparing it to the reference protein's amino acid composition established by the FAO/WHO expert committee's recommendations. A powdered beverage mix was developed using a blend of pea protein isolate, soy protein isolate, and whey protein isolate. The product contained 37.4 grams of protein, 2.1 grams of fat, 50.8 grams of carbohydrates, and a total of 372 calories per 100 g. The powdered beverage can supplement over 60% of the disparity between the recommended daily protein intake of 71 g and the actual protein intake of 44 g of adults 60 years old and older, based on the 2018 Expanded National Nutrition Survey. Essential amino acids were present in considerable amounts in the beverage powder mix, with leucine (3778 mg/100 g), lysine (3391 mg/100 g), and valine (2397 mg/100 g) accounting for the largest proportion. Alternatively, proline (2504 mg/100 g), aspartic acid (4125 mg/100 g), and glutamic acid (7984 mg/100 g) are among the most abundant non-essential amino acids. The beverage powder mix’s amino acid score is 57.9%, with sulphur-containing amino acids (cysteine and methionine) as the limiting amino acids. The beverage powder mix also exhibited a high biological value of 84.3%. This suggests that the blend of plant and dairy proteins in the beverage powder mix effectively complements each other to enhance protein utilization in aging individuals.

Keyword: *healthy aging, older adults, protein, beverage powder*

Coconut-Based Cereal Mix as Supplemental Feeding Alternative for School-Age Children

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The school-age phase is a critical period for growth and mental development. Implementing a school-based supplementary feeding program is essential in addressing the prevalence of stunting and underweight among school-age children in the Philippines. This study developed a shelf-stable cereal mix product incorporating coconut products to meet the nutritional needs of school-age children and provide an alternative to existing school-based feeding programs. The study evaluated the physicochemical, sensory, chemical, and microbiological properties of the product. The processes and formulations were optimized and standardized on a laboratory scale and for large-scale production. A time-and-motion study and shelf-life study were also conducted. A coconut-based cereal mix containing coconut flakes and flavored with coconut nectar was developed for school-age children. The product has hedonic acceptability scores ranging from “like moderately” to “like very much”. Nutrient analysis showed that a 50-g serving of the ready-to-eat coconut-based cereal mix (RTE-CCM) can provide 16% calories, 28% protein, 23% fiber, 18% potassium, 3% calcium, 17% iron, and 16% zinc of the recommended energy and nutrient intake (REI/RNI) for children aged 6-9 years old. RTE-CCM does not contain trans-fat, added sugar is less than 10g, saturated fat content is within the 0-7 g limit, and sodium content is less than 120 mg, which conforms to the Green Category of the Department of Education (DepEd) Order No. 13 s. 2017 (Policy and Guidelines on Healthy Food and Beverage Choices in Schools and DepEd Offices). This category designates foods and beverages that are optimal choices for distribution at school canteens and supplementary feeding programs. RTE-CCM is stable even after 12 months of storage at room temperature. It meets the microbiological quality standards set by the Philippine Food and Drug Administration for Breakfast Cereals and Cereal-based Foods for Infants making the product safe for consumption. The financial feasibility study of the RTE-CCM revealed a positive net-present value, signifying a positive cash flow over a five-year period and a payback period of 2.4 years. In a single-shift production setup, the facility can generate 960 packs of the cereal mix, each weighing 50 g, with the involvement of three direct production workers. The developed RTE-CCM offers a promising alternative for supplemental feeding programs. Further intervention studies are recommended to validate the effectiveness of the product in addressing child malnutrition.

Keyword: *school age, feeding program, coconut, cereal mix*

Protein content and amino acid composition of a high-protein beverage made from different protein powders for older adults

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Older adults need adequate protein intake to combat sarcopenia, the age-related loss of muscle mass, strength, and function. Different dietary protein types and sources can have a significant effect on muscle protein synthesis in response to protein consumption. This study investigated the effect of combining different protein powder sources on the protein content and amino acid profile of a high-protein beverage (HPB) for older adults. Varying levels of pea protein isolate (PPI), soy protein isolate (ISP), and whey protein isolate (WPI) in the formulation were optimized. Protein content and branched-chain amino acid (BCAA) content, specifically isoleucine, leucine, and valine, were measured. Protein content of HPB powders ranged from 36% to 38%. Protein content increased with higher levels of ISP but decreased with higher levels of PPI and WPI. Isoleucine and valine content showed an inverse relationship with PPI and WPI levels. Isoleucine content ranged from 1675 mg to 2416 mg per 100 g, while valine content ranged from 1866 mg to 2274 mg per 100 g. In contrast, increasing WPI levels also increased isoleucine, leucine, and valine content. Leucine values ranged from 2807 mg to 3705 mg per 100 g. A 45-g serving of the optimized HPB powder provides 24% of the recommended nutrient intake (RNI) for protein in older (60+ years old) adults. It also provides approximately 86%, 44%, and 69% of the daily isoleucine, leucine, and valine requirements, respectively, for a 60-kg adult. Optimized protein blends in HPB offer a practical way for the delivery of essential amino acids and can significantly contribute to the protein needs of older adults, promoting healthy aging and muscle maintenance.

Keyword: *older adults, sarcopenia, amino acid, protein, healthy aging*

α-Linolenic acid-rich perilla oil improves sarcopenic obesity in mice at different life stages via modulating energy substrate utilization

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Objective: The global prevalence of sarcopenic obesity (SO) exceeds 7% and continues to rise, yet effective nutritional strategies remain scarce. n-3 polyunsaturated fatty acids (n-3 PUFAs) may reduce the risk of muscle loss. This study examined whether α-linolenic acid (ALA), a plant-derived n-3 PUFA, alleviates SO in mice at different life stages. **Methods:** Targeted fatty acid metabolomics compared circulating ALA between patients with SO and healthy older adults. SO models were established in young (8 weeks) and aged (12 months) mice to test an ALA-rich functional oil, and the underlying mechanisms were explored. **Results:** Patients with SO had significantly lower circulating ALA, and random forest machine learning linked ALA to muscle function phenotypes. In both models, ALA-rich perilla oil improved muscle mass and function, increased myofiber cross-sectional area, reduced skeletal muscle lipid infiltration, and ameliorated insulin resistance. Together, PET/CT and small-animal imaging showed altered skeletal muscle uptake and utilization of glucose and fatty acids as energy substrates, and proteomics implicated CD36-mediated endocytosis. A high-fat-exposed myotube model reproduced the altered substrate uptake, which ALA ameliorated. **Conclusion:** ALA may therefore be a potential nutritional factor for SO, exerting muscle-protective effects by modulating energy substrate metabolism.

Keyword: *α-linolenic acid, sarcopenic obesity, energy substrate utilization, different life stages*

HEAT-INACTIVATED BIFIDOBACTERIUM BREVE 207-1 IMPROVES GLUCOSE METABOLISM IN TYPE 2 DIABETES MELLITUS PATIENTS: A RANDOMIZED CONTROLLED TRIAL

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Postbiotics represent a promising alternative to live probiotics for metabolic health, but their clinical efficacy and mechanisms in type 2 diabetes (T2DM) remain unclear. We conducted a randomized, triple-blind, placebo-controlled trial involving 90 patients with T2DM who received heat-inactivated Bifidobacterium breve 207-1 or placebo for 24 weeks. Compared with placebo, the postbiotic group showed significantly improved glycemic control, with lower fasting blood glucose (5.94 vs. 7.15 mmol/L, P=0.014) and HbA1c (6.50% vs. 7.05%, P=0.044), accompanied by improved β-cell function (HOMA-β, P=0.040). Gut microbiota composition was not significantly altered, whereas intestinal barrier-related markers, including diamine oxidase, intestinal fatty acid-binding protein, and IL-1β, were reduced. Untargeted metabolomics identified increased pyrroline-5-carboxylate (P5C), which correlated positively with HOMA-β and inversely with HbA1c and diamine oxidase, while decreased FFA(18:2) was associated with HbA1c reduction. These findings suggest that heat-inactivated B. breve 207-1 improves glucose metabolism in T2DM, potentially through restoration of intestinal barrier integrity and modulation of host metabolic pathways rather than gut microbiota remodeling. This study supports postbiotics as a potential precision nutrition strategy for metabolic disorders.

Keyword: *Postbiotics, Bifidobacterium breve 207-1, Type 2 diabetes mellitus, Glucose metabolism, Intestinal barrier function*

Interpreting Emerging Evidence on Branched-Chain Amino Acids: Scientific Insights and Communication Challenges (The Case of BCAA/LEAA)

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Branched-chain amino acids (BCAAs), particularly leucine, have been extensively investigated in sports nutrition for their roles in muscle protein metabolism, recovery and adaptation to exercise. Leucine acts as an important nutrient signal for muscle protein synthesis; however, effective protein synthesis also requires adequate availability of other essential amino acids. This distinction provides a physiological basis for considering leucine-enriched essential amino acid (LEAA) formulations within the broader context of amino acid nutrition. Recent metabolomic and epidemiological studies have also associated elevated circulating BCAA concentrations with obesity, insulin resistance and type 2 diabetes, creating an apparent paradox between their established physiological functions and their emergence as metabolic biomarkers. Importantly, circulating BCAA concentrations should not be equated directly with dietary BCAA exposure or interpreted as evidence of causality. Using BCAA and LEAA as a case study, this presentation examines evidence across mechanistic, sports nutrition, clinical and population-based research. It highlights the importance of distinguishing dietary intake from circulating biomarkers, association from causation, and acute physiological responses from long-term health outcomes. Communicating these distinctions, while considering dose, amino acid composition, population and metabolic context, is essential for responsible interpretation of emerging evidence and for strengthening scientific communication and public understanding.

Keyword: *Branched-Chain Amino Acids, Leucine-Enriched Essential Amino Acids, Sports Nutrition, Metabolic Health, Scientific Communication*

ID: 1502

From Evidence to Understanding: Advancing Science Communication in Food Ingredients

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Scientific evidence on food ingredients, from preservatives and sweeteners to emulsifiers and novel proteins, does not automatically translate into public understanding or acceptance. The same evidence can be read as a safety tool or as a harmful chemical. When this gap persists, novel ingredients are rejected along with their benefits, public trust in food companies, institutions, and regulation erodes, and technological progress stalls. Drawing on more than a decade of research on public perceptions of novel food technologies in Singapore and beyond, this talk examines why the same evidence produces such diverse public responses. It identifies four sociopsychological considerations that shape perceptions of food ingredients: the audience (knowledge gaps, naturalness bias, and food neophobia), the message (framing and labeling effects), the messenger (trust in regulators, scientists, and manufacturers), and the context (social amplification of risk and cultural and religious identity). The talk then distills these factors into four principles for effective communication: differentiating communication objectives across distinct consumer segments, co-developing consumer-informed food labels, targeting technological, epistemic, and institutional trust, and leveraging artificial intelligence to personalize communication and combat misinformation. Evidence from surveys, experiments, and focus groups, including recent work on AI chatbots for misinformation correction, illustrates each principle. Implications for food scientists, industry, and regulators are discussed.

Keyword: -

TRAINING THE FUTURE FOOD WORKFORCE: GLOBAL PERSPECTIVES ON FOOD TRACEABILITY AND STANDARDIZED FOOD SAFETY EDUCATION

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Institute for Food Safety and Health - Illinois Institute of Technology

Training of current and future workforce on food safety and traceability is an important task for the global food industry in ensuring the production of safe and wholesome foods for our consumers. The Food Safety Preventive Controls Alliance (FSPCA) is a public-private partnership created by the U.S. Food and Drug Administration (FDA) to develop standardized and core training curricula for the food industry —particularly small- and medium-size companies—so that they can better comply with the food safety and traceability rules mandated by the U.S. FDA Food Safety Modernization Act (FSMA). This presentation will provide an overview of the Preventive Controls for Human Food (PCHF) and Foreign Supplier Verification Programs (FSVP) curricula. In addition, the presentation will focus on the Food Traceability Rule (FTR) - Training for the Food Industry curriculum, that covers FTR record keeping requirements, Critical Tracking Events, Key Data Elements, how traceability data are transmitted through the supply chain, and what is required in a Traceability Plan.

Keyword: *Food Traceability, Food Safety, FSPCA, Preventive Controls*

Front-of-Package Food Labeling: Impact and Understanding in Mexico

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Front-of-package food labeling has become the official way to quickly and easily inform consumers about the nutritional content of products. This strategy uses clear and visible symbols on the front of the packaging, making the information easily identifiable at the point of purchase.

The main purpose of front-of-package labeling is to facilitate healthier choices when selecting food products. By visually identifying elements such as sugar, sodium, and saturated fats, consumers can quickly recognize products containing high amounts of these components. Thus, the primary objective of this front-of-package labeling is to serve as a preventative mechanism, promoting more conscious and responsible choices.

Six years after the implementation of front-of-package food labeling in Mexico, this study analyzes the results obtained regarding consumer understanding. During this period, efforts dedicated to training on nutritional topics or monitoring the effects of the labeling have been limited. The government, industry, and consumers themselves have all shown a lack of commitment in this regard.

Keyword: -

ID: 1499

Food-Derived Bioactive Peptides for Human Health: Research Progresses and Challenges

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Food proteins are an essential macronutrient as we cannot synthesize food proteins. In addition to providing nutritional value as well as important functionalities for various food applications, food proteins are increasingly recognized for their biological activities, particularly due to their small peptides. Peptides embedded within the protein sequences are inactive; once released, they can have numerous bioactivities. This talk will discuss recent research progresses in i) preparing and characterizing food-derived bioactive peptides using in silico method, AI/ML-enabled approach as well as integrating AI/ML with in silico- and activity-guided methods, ii) bioavailability of bioactive peptides, iii) mechanistic study of action using multi-omics technology, and iv) mitigating inherent bitterness of food protein hydrolysates and bioactive peptides without compromising their activities. This talk will also discuss the major barriers such as insufficient efficacy evidence, poor oral bioavailability, sensory challenges, and regulatory fragmentation, and cost of production, that prevent them from translational applications.

Keyword: -

ID: 1498

Transformation of Upcycled Food Proteins into Functional Emulsifiers and Nutraceutical Delivery Systems

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The transition toward a circular food system requires agricultural by-products to be fully utilized as valuable sources of proteins, dietary fibres, phenolics, and other bioactive components. However, converting these complex and variable materials into viable food ingredients requires more than efficient extraction. The resulting ingredients must provide desirable functionality, nutritional value, sensory quality, safety, and economic feasibility to support the development of sustainable future foods.

This presentation will introduce emerging technologies for transforming underutilized protein sources into high-value functional ingredients. Particular attention will be given to the targeted modification of protein structures and the strategic use of their interactions with other food components, such as polysaccharides and phenolics, to improve solubility, interfacial properties, emulsifying capacity, and gelation, while providing additional health benefits. Nonthermal technologies such as high-pressure processing and cold plasma will be discussed as tools for further tailoring protein functionality while reducing reliance on chemical modification and intensive thermal treatment. The applications of these protein-based functional ingredients in developing clean-label beverages, emulsions, nutraceutical delivery systems will also be highlighted.

Keyword: -

FOOD ADDITIVE MANUFACTURING: CURRENT STATUS, PROGRESS, AND REFLECTIONS

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As an innovative manufacturing paradigm for the future food industry, food additive manufacturing (FAM)—encompassing 3D, 4D, and 5D printing—integrates multidisciplinary expertise spanning smart manufacturing, materials science, and nutrition, thereby achieving a paradigm shift from three-dimensional structural fabrication to breakthroughs across temporal and functional dimensions. This presentation offers a comprehensive overview of the current state of FAM in food, systematically examining the R&D progress, developmental trends, and prevailing challenges of multi-dimensional printing through the lens of food ingredient printability regulation. A detailed analysis is presented on the operational principles, applicable material categories, and forming characteristics of mainstream printing modalities, including extrusion-based, inkjet, and binder jetting techniques. Special emphasis is placed on recent advances in printing feedstocks derived from plant-based, animal-based, and food-medicine homologous sources. Finally, the presentation critically evaluates the developmental trajectory and existing bottlenecks of FAM, identifying key challenges such as the inherent tension between printing resolution and throughput, the absence of standardized material specifications, and the limited autonomy of printing hardware. Future research imperatives include multi-nozzle collaborative architectures, the engineering of intelligent stimuli-responsive materials, and their translational deployment in pivotal application domains—including personalized nutrition for the elderly, space food systems, and foods for special medical purposes—to catalyze the maturation and sustainable expansion of the FAM industrial ecosystem.

Keyword: *Food additive manufacturing(FAM); 3D/4D/5D printing, Overview and current situation, Research progress; development trend*

ID: 1496

The Fat Paradox: Essential, Misunderstood, and Evolving

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Since the Ancel Keys report advanced the lipid hypothesis nearly 70 years ago, nutritionists and government agencies have condemned dietary saturated fat. The epidemiological and even some clinical evidence suggested that dietary saturated fat is atherogenic and may contribute to some forms of cancer. However, a closer examination of the biological chemistry of saturated fatty acids suggests that none of the saturated fatty acids from C2 through C20 actually contribute to these maladies. Yet, the physiological dynamics of saturated fatty acids and health remain controversial. In particular, palmitic acid (C16), the dominant fatty acid in human milk (~20%), represents about 20% to 30% of all human fatty acid production (via hepatic synthesis). A closer examination of palmitic acid metabolism reveals pleiotropic effects and its role as a critical precursor to an array of substances that inhibit tumorigenesis. Clearly, the roles of innate and dietary fatty acids are complex and require more research to clarify the metabolic dynamics of fatty acids produced in the body and consumed through the diet.

Keyword: -

Advanced Lipids for Functional and Health-Oriented Food Innovation (Focusing on the latest innovation in palm oil-based fats and oils for advanced food formulation)

Robert Basker *

Global Specialty Ingredients

The rapidly evolving food industry is creating demand for lipid systems that deliver improved nutritional profiles, functionality, sensory quality, stability and sustainability. Palm oil and its fractions provide a versatile and scalable platform for developing advanced food fats because of their unique triacylglycerol composition, balanced fatty acid profile, and exceptional potential for fractionation and structural modification. This presentation explores the transformation of palm oil from a conventional commodity fat into precision-designed lipid systems for next-generation food applications.

Particular attention will be given to palm olein, palm oil, palm oil fractions, lauric fats and oils, and their conversion into speciality fats through fractionation, blending, interesterification, and enzymatic modification. These technologies enable controlled manipulation of triacylglycerol structure, solid fat content, melting profile, crystallisation behaviour, and polymorphism, allowing lipid systems to be designed for specific applications, including bakery, confectionery, spreads, frying, dairy, and plant-based foods. Enzymatic interesterification of palm olein has been shown to modify acylglycerol composition and crystallisation characteristics, providing opportunities for tailored functionality.

Emerging technologies such as structured lipids, diacylglycerol-rich systems and oleogels offer further opportunities to develop health-oriented formulations. Structured lipids can be designed by modifying the fatty acid composition or positional distribution within triacylglycerols, while oleogelation can transform liquid oils into semi-solid structures with potential applications in fat replacement and controlled lipid functionality.

The presentation will demonstrate how palm-derived fats can serve as building blocks for advanced lipid systems that balance functionality, nutritional objectives, sensory performance, processing requirements and sustainability. The future direction is a transition from **commodity palm oil to precision-designed palm-based lipids**, integrating lipid chemistry, enzymatic technology, crystallisation science, and advanced food formulation to create healthier and higher-performing foods.

Keyword: -

Functional Lipids and Bioactive Components in Emerging Food Applications

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The Sunway Biofunctional Molecules Discovery Centre (SBMDC) pursues the discovery and application of biofunctional molecules across drug discovery, pharmacology, molecular oncology, neuroscience, and bioprospection, with natural products forming the central investigative thread. Bridging discovery science and healthcare delivery, SBMDC operates an Innovation Hub in partnership with Sunway Multicare Pharmacy, translating research outputs into potential tangible health solutions. Within this framework, functional lipids and bioactives represent an emerging and high-value class of biofunctional molecules at the intersection of nutritional science, nutraceuticals, and next-generation food design.

As global food systems undergo a paradigm shift to prioritise nutrition, sustainability, and clean-label integrity, lipids are evolving from basic macronutrients into critical drivers of functional food innovation. Concurrently, rising consumer and regulatory scrutiny of ultra-processed foods (UPFs) presents formidable challenges in maintaining food structure, oxidative stability, and sensory quality. This presentation explores the multifaceted role of Red Palm Oil (RPO) as a natural, minimally processed functional lipid matrix exceptionally rich in high-value bioactives.

Unlike conventional refined oils, RPO naturally preserves a potent phytonutrient blueprint, including high concentrations of alpha- and beta-carotenoids (provitamin A) and a unique vitamin E synergy dominated by tocotrienols, bioactives with well-documented cardioprotective, neuroprotective, anti-inflammatory, and emerging anti-cancer properties. Recent collaborative research demonstrated that soy protein fibril-stabilised RPO Pickering emulsions effectively replace up to 50% of chicken fat in meat emulsion systems without compromising textural properties, while significantly reducing lipid oxidation during storage. Crucially, RPO's inherent antioxidant network imparts superior thermal and oxidative stability under intense processing conditions, entirely avoiding trans-fat generation.

Leveraging these innate physicochemical and health-promoting attributes, this session highlights emerging applications of RPO in next-generation food innovation — as a clean-label fat alternative in plant-based meat and dairy analogues, mimicking requisite juiciness, mouthfeel, and melting profiles, and as a stable delivery matrix for targeted nutritional fortification. Ultimately, this presentation underscores how evidence-based lipid science and international research synergies can successfully reshape consumer narratives on palm oil bioactives as pillars of resilient, future-ready food systems.

Keyword: *Red Palm Oil; functional lipids; tocotrienols; carotenoids; plant-based food; oxidative stability; fortification; bioactive*

ID: 1493

From Food Science to Market Success: How Innovation Becomes Adoption in a Global Food System

Charice Grace *

Almond Board of California

The future of food will be shaped not only by scientific discovery, but by our ability to translate innovation into real-world impact. As global food systems face increasing demands for healthier, more sustainable, and resilient solutions, the challenge is no longer creating new knowledge. It is ensuring that knowledge is understood, adopted, scaled, and trusted across the value chain.

This presentation explores how food science moves beyond the laboratory to drive commercial adoption and meaningful societal outcomes. Drawing on insights from major international food and ingredient events, it highlights how food scientists, R&D teams, marketers, and commercial leaders collaborate to address formulation challenges, improve sustainability, enhance nutrition, and develop products that resonate with consumers.

Attendees will gain practical perspectives on identifying emerging market opportunities, communicating scientific benefits effectively, and building cross-functional partnerships that accelerate innovation. Through real-world examples using almond ingredients, the session will demonstrate how successful innovation requires both technical excellence and a clear understanding of consumer and industry needs.

Ultimately, the greatest opportunities for the future of food lie not only in scientific breakthroughs, but in our collective ability to transform science into solutions that consumers trust, companies adopt, and global food systems can sustain.

Keyword: -

BERRY POMACE AS AN UPCYCLED FUNCTIONAL INGREDIENT IN BAKERY PRODUCTS: A RAPID STRUCTURED REVIEW OF NUTRITIONAL AND TECHNOLOGICAL EFFECTS

Albina Oblitsova *

Advanced Engineering School "Institute of Biotechnology, Bioengineering and Food Systems", Far Eastern Federal University, Vladivostok, Russia

Berry processing generates fiber- and polyphenol-rich pomace that may be valorized as a functional bakery ingredient, but incorporation can compromise texture and sensory quality. This rapid structured review evaluated the nutritional and technological effects of berry pomace in bakery products. Experimental studies published in 2020–2026 were identified using PubMed and publisher databases and screened for berry pomace incorporation into bread, muffins, cakes, or cookies. Data were extracted on berry source, inclusion level, product matrix, dietary fiber, phenolic/antioxidant indicators, texture, volume, and sensory acceptability. Across the included studies, pomace enrichment consistently increased dietary fiber and/or phenolic content and antioxidant capacity. The principal technological trade-off was increased water binding and structural disruption, frequently expressed as reduced loaf volume, darker color, and increased firmness at higher inclusion levels. In wheat bread and conventional muffins, acceptable sensory quality was most often reported at low-to-moderate inclusion levels, whereas cookies and some gluten-free systems tolerated higher substitution. Pre-hydration and formulation adjustments partially mitigated quality losses. Berry pomace therefore offers a promising upcycled ingredient for functional bakery products, but optimal inclusion is matrix-specific and should balance nutritional gain with processing and sensory performance.

Keyword: *berry pomace, bakery products, upcycling, dietary fiber, polyphenols*

ULTRA-PROCESSED FOODS" IN LATAM: THE ERRONEOUS REGULATORY CONSEQUENCES OF USING AN UNVALIDATED CONCEPT

Susana Socolovsky *

ALACCTA President Elect, Argentina

The NOVA classification has spread in Latin America in an unprecedented way influencing not only the dietary guidelines of several countries but also tarnishing regulatory decisions that affect not only the credibility of processed foods but also endanger Codex compliance of food labelling. The concept "ultra-processed" foods has undeniable scientific flaws: it is imprecise and misleading and too vast to describe appropriately the nutritional content of the foods it includes.

The presentation will describe in detail the regulatory constraints and consequences in several countries where the concept has been adopted, resulting in erroneous front-of-pack regulations, restrictive sales in schools of foods with excellent nutritional compositions and advertising bans.

As scientists, we must address the growing impact of an inadequate, scientifically dubious, and inapplicable concept in regulatory practice by communicating with several UN organizations as the Pan American Health Organization, as well as the World Health Organization and FAO that have embraced a non-scientific concept which is damaging the perception of foods industrially produced that help feed the planet. We owe to Food Science and Technology the resolution of this conundrum.

Keyword: -

ID: 1489

Green refining of protein sources using natural deep eutectic solvents: opportunities for novel protein ingredients

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Plant protein processing has traditionally prioritized yield and purity. Yet, sensory quality and functionality are also shaped by co-extracted polyphenols and other secondary metabolites, which cause off-flavours, discolouration, and antinutritional effects, limiting consumer acceptance and the use of promising crops. Rather than accepting these compounds, masking them with costly flavour-modifying ingredients, or removing them with organic solvents during post-processing, a holistic approach should weigh sensory and techno-functional properties alongside fractionation efficiency. Natural deep eutectic solvents (NADES), mixtures of naturally occurring, biodegradable components, offer a tunable, green platform for this: their composition can be matched to target compounds, enabling the selective removal of unwanted phytochemicals from intact biomass under mild conditions. Herein, NADES-based refining is presented as a design framework rather than a single process, illustrated by yellow pea, a familiar but flavour-limited legume, and rapeseed, a neglected but protein-rich oilseed. In both, NADES pre-processing removed polyphenols and other antinutritional phytochemicals in a promising step towards improving plant protein sensory quality and consumer appeal. Then, from this blank canvass it becomes possible to intentionally design protein-phytochemical interactions, allowing further control over protein structure, solubility, and interfacial behaviour, while still prioritizing protein recovery and desirable organoleptic profiles.

Keyword: -

Microalgae protein production and extraction: pulsed electric fields for efficient and scalable processing

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Microalgae can offer a more sustainable protein source, but their cell structures and demanding downstream processing limit recovery. This work presents pulsed electric fields (PEF) as a strategy for selective protein extraction and scalable processing of heterotrophically cultivated Auxenochlorella protothecoides. PEF generated controlled membrane pores while preserving cellular structure, allowing intracellular proteins to diffuse during incubation. After 24 h, incubation increased protein yield by 122% and was 1.7 times more energy efficient than the benchmark high-pressure homogenization. At the cellular level, pulse configuration determined the balance between mass transfer and survival. Split pulses increased protein extraction by 38%, whereas a single pulse at 15 kV cm^{-1} enabled membrane resealing and maintained survival. At the process level, rheology-based residence time modeling enabled consistent treatment as flow capacity increased from 21 to 300 mL min^{-1}. Selective permeabilization advantages continued during microfiltration. Intact PEF-treated cells formed a more permeable cake layer, increasing protein transmission from 54.53 to 141.75 g m^{-2} h^{-1} and providing 5.6 times greater energy efficiency than homogenization. These results connect cellular responses with process engineering and demonstrate the potential of PEF for efficient, scalable microalgae protein production. Overall, integrating electropermeabilization, process modeling, and membrane separation establishes PEF as an energy-efficient, scalable platform for microalgal protein recovery.

Keyword: -

ID: 1487

Sustainable Design of Food Processing Platforms for Improved Nutritional Metrics and Product Functionality

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Emerging food processing techniques necessitate a detailed understanding of process-product-operation interactions. Innovative thermal, electromagnetic, mechanical, and combined technologies offer powerful avenues to tailor both techno-functionality (e.g., interfacial stabilization, structurability) and biofunctionality (e.g., nutritional quality including bioaccessibility and bioavailability) in modern food systems. While process-induced chemical reactions in traditional thermal operations are well-characterized through stoichiometric and thermodynamic laws, contemporary food design must extend beyond simple concentration changes.

Integrating nutritional and structural assessments directly into food process design is critical to optimizing nutrient delivery and overall product performance. Furthermore, aligning these process innovations with holistic sustainability assessments—encompassing social, economic, and environmental dimensions—enables multi-parameter evaluation to drive more sustainable food production.

Selected case studies on ultra-short thermal treatment, electromagnetic pulsed electric fields, and mechanical or thermo-mechanical platforms —such as high-pressure and extrusion processing—demonstrate the efficacy of this integrated framework. Ultimately, coupling novel processing platforms with rigorous nutrition, functionality, and sustainability metrics provides a viable pathway toward next-generation, high-value food products.

Keyword: -

ID: 1486

UPCYCLING OF TREE NUT CO-PRODUCTS

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Upcycling tree nut co-products has emerged as a focal issue for food industries worldwide, driving increased efforts to develop waste-utilization strategies. Co-products such as husks/hulls, shells, skins, oil cake residues, and nutmeat pieces have gained significant recognition as reservoirs of valuable biomolecules for subsequent utilization in various sectors. These co-products contain polyphenolic compounds that can be used in functional foods, as well as pharmaceutical and cosmetic applications due to their antioxidant, anti-inflammatory, antiglycation, and antimicrobial effects. Oil cake residues are rich in protein (45-55%) and lignocellulose (30-35%), which can be used to produce bioactive peptides and dietary fiber, respectively. However, recovering these fractions will require greener processing strategies that fit into a sustainable circular economy, viz. ultrasound-assisted and microwave-assisted extractions, or the employment of supercritical fluids. Tree nut co-products also have non-food applications. Shells, for instance, can be processed into binders or fillers for fiberboards; bioplastics for green packaging; livestock fodder; biofuels; or biochar. This presentation reviews key food and non-food applications of tree nut co-products and discusses where room for development still exists.

Keyword: *Tree nuts, Valorization, Upcycling, Co-Products, Phenolics*

FUNCTIONAL NUTRITIONAL INTERVENTIONS DIFFERENTIALLY MODULATE ADIPOSE REMODELING AND METABOLIC HEALTH

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Background: Aging-associated adipose dysfunction contributes to impaired lipid and glucose homeostasis. This study compared yeast protein (YP), wheat oligopeptides (WOP), and branched-chain amino acids (BCAA) for their effects on adipose remodeling and metabolic health in naturally aged mice.

Methods: Body composition, adipose depots, circulating lipid and glucose–insulin indices, adipokines, inflammatory markers, adipose histology, and expression of genes related to energy metabolism and adipocyte remodeling were evaluated.

Results: Natural aging was associated with unfavorable adipose redistribution and metabolic deterioration. All three interventions improved selected aging-associated phenotypes but produced distinct response profiles. YP showed the most pronounced improvements in glucose–insulin and circulating lipid indices and increased adipose Sirt1 and Prdm16 expression. WOP reduced white adipose accumulation and enhanced expression of genes associated with energy metabolism and adipocyte remodeling. BCAA increased UCP1 immunoreactivity in white adipose tissue, indicating a distinct remodeling response. Overall, the interventions affected adipose distribution, metabolic status, and remodeling-related molecular markers through different response patterns.

Conclusion: YP, WOP, and BCAA exert distinct effects on age-related adipose remodeling and metabolic health, supporting protein- and peptide-specific nutritional strategies for healthy aging.

Keyword: *functional foods, adipose remodeling, metabolic health, healthy aging, nutritional intervention*

FUNCTIONAL NUTRITIONAL INTERVENTIONS ATTENUATE MUSCLE DECLINE AND MODULATE GUT MICROBIOTA DURING AGING

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Background: Age-related skeletal muscle decline is accompanied by disturbed protein homeostasis, inflammation, and gut dysbiosis. This study compared yeast protein (YP), wheat oligopeptides (WOP), and branched-chain amino acids (BCAA) in naturally aged mice.

Methods: Muscle function was assessed by grip strength and rotarod testing. Muscle morphology and ultrastructure were evaluated by histology and transmission electron microscopy. Serum inflammatory cytokines and muscle atrophy-related markers were quantified by immunoassays, protein-homeostasis-related signaling by Western blotting and quantitative polymerase chain reaction, and gut microbiota by 16S ribosomal RNA sequencing.

Results: Natural aging impaired muscle performance and structural integrity. Compared with 18-month aged controls, serum interleukin-1β was reduced by 40.0%, 36.5%, and 22.3% after BCAA, WOP, and YP, respectively. Muscle myostatin decreased by 34.9%, 38.9%, and 39.1%, respectively, while YP reduced interleukin-6 by 33.9%; BCAA and YP also reduced Atrogin-1 by 47.5% and 41.1%. These changes were accompanied by improved muscle morphology, modulation of protein-homeostasis-related markers, and distinct gut microbial shifts.

Conclusion: The three interventions produced complementary muscle, inflammatory, and gut responses, supporting functional nutritional strategies for healthy aging.

Keyword: *Functional protein, healthy aging, skeletal muscle, gut microbiota, protein homeostasis*

Quality and Functional Characteristics of Dairy Products Supplemented with Fermented Philippine Indigenous Fruits: Rubus rosifolius and Muntingia calabura

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Food products enriched with probiotic-fermented fruits have gained increasing attention due to their potential to promote health through enhanced nutritional and bioactive properties. This study evaluated the potential of two underutilized Philippine fruits, Rubus rosifolius and Muntingia calabura, as functional ingredients in dairy products. The juice from each fruit was fermented with a co-culture of Lactiplantibacillus plantarum and Lacticaseibacillus casei and the optimized product was incorporated into yogurt and ice cream at 5%, 7.5%, and 10% supplementation levels. Fermented juices were evaluated first for physicochemical properties, viable lactic acid bacteria count and phytochemical contents while the supplemented dairy products were assessed for physicochemical characteristics, sensory quality, and probiotic viability during 7 days of refrigerated storage. Fermentation enhanced the physicochemical properties, antioxidant potential, and viable probiotic counts of both fruit juices. The supplemented dairy products were acceptable in terms of sensory quality, and exhibited improved probiotic viability and physicochemical characteristics even during storage, although viscosity gradually decreased over time. These findings demonstrate the potential of the fermented indigenous fruits as safe, value-added functional food ingredients for developing health-promoting dairy products.

Keyword: *Functional Dairy Products, Fermented Fruit Juice, Lactic Acid Bacteria, Fermented Dairy Products*

PHYTOCHEMICAL CHARACTERIZATION AND BIOACTIVE POTENTIAL OF THE ENDEMIC BROWN MACROALGAE FUCUS VIRSOIDES

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This study investigates Fucus virsoides, an endemic brown macroalga of the Adriatic Sea that, despite its ecological and biological significance, remains relatively underexplored. As a member of the brown algae, Fucus virsoides represents a potentially valuable source of structurally and functionally diverse bioactive compounds, including complex polysaccharides, polyphenols, fatty acids, and vitamins, many of which have been associated with beneficial biological activities.

Bioactive compounds were extracted using a green ethanol/water solvent system (1:1, v/v) in combination with two environmentally sustainable extraction techniques: ultrasound-assisted extraction (UAE) and matrix solid-phase dispersion (MSPD). The obtained extracts were evaluated spectrophotometrically for their total phenolic content (TPC), while their antioxidant capacity was assessed using the ABTS radical-scavenging assay. A detailed characterization of the phenolic profile was performed by liquid chromatography coupled with tandem mass spectrometry (LC–MS/MS). In addition, ultra-high-performance liquid chromatography coupled with quadrupole time-of-flight mass spectrometry (UHPLC–QToF-MS) was employed for broader compound identification, enabling a more comprehensive characterization of the chemical composition of Fucus virsoides.

The identified bioactive constituents, particularly polyphenolic compounds and polysaccharides, may possess a range of biological activities, including antioxidant, anti-inflammatory, and antimicrobial effects. These properties highlight Fucus virsoides as a promising marine source of natural bioactive ingredients with potential applications across the pharmaceutical, food, and cosmetic industries. In particular, its bioactive compounds could be further explored for the development of natural dietary supplements, functional food ingredients, and innovative dermocosmetic formulations.

Acknowledgement: This research was supported by the Croatian Government and the European Union through the European Regional Development Fund-the Competitiveness and Cohesion Operational Programme (KK.01.1.1.01) The Scientific Centre of Excellence for Marine Bioprospecting-BioProCro.

Keyword: *Fucus virsoides, extraction, polyphenols, antioxidant activity*

When food synergy breaks: Failure-mode mapping and a stage-gated evidence pipeline for functional food bioactive combinations

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Combining food bioactives offers opportunities to improve functional foods, yet synergistic effects observed under controlled conditions may not persist during processing, storage, digestion, or metabolism. Drawing on our published critical review, we present a framework for evaluating the reliability of bioactive combinations. We distinguish effect, exposure, and system synergy and map failure modes across the food-to-gut continuum, including compositional drift, matrix interactions, processing-induced changes, digestive transformations, and microbiome variability. Synergy is treated as a conditional outcome shaped by component ratios, doses, timing, and biological context. We propose a stage-gated evidence pipeline linking synergy quantification to evaluation of stability in food matrices, gastrointestinal fate, and biological relevance. The framework distinguishes apparent, fragile, and robust synergy according to supporting evidence and sensitivity to relevant challenges. A proposed minimum reporting checklist, MISE-Food, supports transparent documentation and comparison across studies. Together, these tools provide a practical basis for identifying vulnerable combinations, prioritizing validation, and guiding the development of functional foods with more reproducible performance.

Keyword: *Food synergy, Bioactive combinations, Functional foods, Failure-mode mapping, Evidence evaluation*

Characterization of physicochemical properties, fatty acids, flavor volatiles and phenolic compounds of avocado varieties

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A comprehensive investigation was done on 10 New Zealand-grown avocado (Persea americana Mill.) varieties to evaluate the physical and chemical characteristics of their peel, seed, and pulp. Significant variability was identified in the physicochemical properties, phenolic and volatile profiles across the distinct parts and different varieties of avocados. A total of 88 terpenes and terpenoids, 22 alcohols, 22 aldehydes, 15 esters, and 9 ketones related to aromatic attributes of peels and seeds. The fatty acid composition of avocado varieties varied greatly; oleic acid predominated in avocado pulps and peels, while linoleic acid was the most abundant in avocado seeds. Nonanoic and pentadecanoic acids were tentatively detected in the avocado seed oil for the first time. Chlorogenic acid was the most prevalent phenolic compounds in all peels, whereas epicatechin had the highest concentrations in all seeds. Avocado byproducts were a substantial source of volatiles and bioactive compounds with potential food applications.

Keyword: *Fruit byproduct; Genetic variation; Oleic acid; Chlorogenic acid; Persea americana; Avocado seed*

Comparative Effects of Thermal and Non-Thermal Processing on the Quality, Anthocyanins, and Volatile Profile of Black Mulberry Juice

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Black mulberry (Morus nigra L.) juice is rich in anthocyanins and phenolic compounds, but its colour, bioactive constituents, and aroma are susceptible to thermal degradation. This study compared low-temperature long-time treatment (LTLT; 65 °C, 30 min) and high-temperature short-time treatment (HTST; 90 °C, 30 s) with ultrasound (20 kHz, 60% amplitude, 10 min), high pressure processing (HPP; 400 MPa, 5 min), UV-C treatment (254 nm, thin-film reactor), and high pressure homogenisation (HPH; 150 MPa). Physicochemical properties, colour, total and individual anthocyanins, total phenolic content, antioxidant capacity, cloud stability, and volatile composition were evaluated using spectrophotometric methods, HPLC-DAD, and HS-SPME-GC/MS. Both thermal treatments reduced total phenolic content and antioxidant capacity by approximately 70%. HTST caused the greatest colour change, increased browning, and substantially reduced volatile compounds associated with fresh aroma. Thermal processing also decreased cyanidin-3-O-glucoside and cyanidin-3-O-rutinoside. Among the non-thermal treatments, HPP achieved the greatest retention of anthocyanins, antioxidant capacity, and colour. Ultrasound yielded the highest extractable phenolic content, while HPH provided the best cloud stability. UV-C effectiveness was limited by poor penetration through the highly absorbing juice matrix. Overall, HPP was the most effective treatment for preserving the physicochemical and bioactive quality of black mulberry juice among the technologies evaluated.

Keyword: *Black mulberry, Morus nigra L., anthocyanins, non-thermal processing, high pressure processing*

HEAT-INACTIVATED BIFIDOBACTERIUM BREVE 207-1 PREVENTS GLUCOSE METABOLISM DETERIORATION IN PATIENTS WITH TYPE 2 DIABETES MELLITUS: A RANDOMIZED CONTROLLED TRIAL

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Postbiotics represent a promising alternative to live probiotics for metabolic health, but their clinical efficacy and mechanisms in type 2 diabetes (T2DM) remain unclear. We conducted a randomized, triple-blind, placebo-controlled trial involving 90 patients with T2DM who received heat-inactivated Bifidobacterium breve 207-1 or placebo for 24 weeks. Compared with placebo, the postbiotic group showed significantly improved glycemic control, with lower fasting blood glucose (5.94 vs. 7.15 mmol/L, P=0.014) and HbA1c (6.50% vs. 7.05%, P=0.044), accompanied by improved β-cell function (HOMA-β, P=0.040). Gut microbiota composition was not significantly altered, whereas intestinal barrier-related markers, including diamine oxidase, intestinal fatty acid-binding protein, and IL-1β, were reduced. Untargeted metabolomics identified increased pyrroline-5-carboxylate (P5C), which correlated positively with HOMA-β and inversely with HbA1c and diamine oxidase, while decreased FFA(18:2) was associated with HbA1c reduction. These findings suggest that heat-inactivated B. breve 207-1 improves glucose metabolism in T2DM, potentially through restoration of intestinal barrier integrity and modulation of host metabolic pathways rather than gut microbiota remodeling. This study supports postbiotics as a potential precision nutrition strategy for metabolic disorders.

Keyword: *Postbiotics, Bifidobacterium breve 207-1, Type 2 diabetes mellitus, Glucose metabolism, Intestinal barrier function*

ID: 1474

Integrated Multi-Analytical Characterization of Indian Himalayan Sea Buckthorn for Traditional Food Innovation and Future Applications

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Sea buckthorn (Hippophae rhamnoides L.) is an underexploited Himalayan resource with promising potential for whole-plant valorization. This study compared root, stem, leaf, and berry powders from Indian Himalayan sea buckthorn to assess their physicochemical and advanced structural and functional attributes. Samples from mature plants in Leh, Ladakh, were analyzed for antioxidant activity, total phenolic content, FTIR, ^{1}H NMR, XRD, SEM-EDX, DSC, TGA, particle size, and zeta potential measurements. Significant part-specific differences were observed. Berries showed the highest fat content (21.10%) and strong antioxidant activity (94.63%), while stems showed the highest protein (22.28%). Advanced characterization by FTIR, XRD, SEM, and ^{1}H NMR revealed distinct functional groups, crystallinity patterns, surface morphologies, and metabolite compounds across sea buckthorn plant parts, confirming significant structural and functional diversity. Thermal and colloidal measurements also varied, with berry powder showing the smallest, more uniform particles and roots displaying the strongest negative zeta potential and highest residual mass after thermal decomposition. Overall, sea buckthorn exhibits significant structural and functional diversity across plant parts, supporting targeted use in food, nutraceutical, and biomass applications. Future work should expand multi-location and multi-season validation and link these profiles to bioactivity outcomes.

Keyword: *Sea buckthorn, Indian Himalayas, Multi-analytical characterization, FTIR, NMR*

Study on the twin-screw extrusion of edamame flour, soy protein isolate, and corn starch for a high-moisture meat analog

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This study evaluated the effects of edamame flour (EF) substitution level (0, 10, 20, and 30% w/w of SPI) and FMC (50, 55, and 60%) on the physicochemical and structural properties of HMMA. Corn starch was fixed at 10% in all formulations, and EF partially replaced SPI according to the specified percentages. According to experimental results, it was found that variations in EF substitution and FMC significantly ($p < 0.05$) increased crude fat content (0.32 – 5.88%), L* (51.79 – 58.89), b* (17.33 – 22.96), and cooking loss (6.46 – 10.00%), while decreased crude protein content (90.85 – 78.41%), a* (3.01 – -1.81), WHC (5.21 – 4.26 g/g), cooking yield (148.48 – 124.70%), textural profile (hardness (3.98 – 1.75 kgf), springiness (3.04 – 2.78 mm), gumminess (27.21 – 13.61 N), chewiness (80.12 – 39.55 N*mm), cutting force (transversal (2.61 – 1.14 kgf) and longitudinal (1.51 – 0.81 kgf)), and degree of texturization (1.75 – 1.08). Moreover, elevated FMC significantly ($p < 0.05$) increased moisture content (50.01–60.35%) and slightly increased OHC (1.27–1.58 g/g). Increased EF substitution level slightly improved ($p < 0.05$) the OHC (1.46 – 1.58 g/g), but slightly reduced cohesiveness (0.92 – 0.91). Visual and microstructure analyses revealed that HMMA produced at 55% FMC with 20% EF substitution level is the best formulation for producing the most defined and visible anisotropic fibrous structure. This formulation effectively reduced the tough, chewy texture and degree of texturization of the pure SPI matrix, yielding a product closest to chicken meat. Overall, formulating HMMA with EF and SPI provides an effective strategy for developing high-quality meat analogs with desirable physicochemical and structural properties.

Keyword: *edamame, soy protein isolate, high-moisture meat analogue, twin-screw extrusion*

MULTI-OMICS INSIGHTS INTO THE PROTECTIVE EFFECTS OF SALIDROSIDE AGAINST HYPERURICEMIA-ASSOCIATED LIVER–KIDNEY METABOLIC DYSFUNCTION IN RATS

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Abstract:

Background: Hyperuricemia (HUA) is increasingly recognized as a metabolic abnormality closely associated with systemic metabolic disturbances. However, its effects on hepatic and renal metabolic homeostasis remain incompletely understood. Salidroside (Sal), a natural phenolic glycoside active ingredient from Rhodiola rosea L., may have metabolic regulatory function. This study employed a multi-omics approach to investigate the protective effects of Sal against HUA-associated liver-kidney metabolic dysfunction.

Methods: A rat model was established using a high-fat diet combined with potassium oxonate and hypoxanthine gavage. Biochemical, histopathological, metabolic, and inflammatory indicators were evaluated. Hepatic and renal transcriptomic and untargeted metabolomic analyses were performed to identify Sal-responsive genes, metabolites, and pathways.

Results: HUA induced hepatic lipid metabolic dysregulation and enhanced NLRP3-associated inflammation, with altered expression of Srebf1, Acaca, Fasn, Ppara, and Cpt1a. Sal improved biochemical and histopathological abnormalities, and partially restored metabolic homeostasis. Multi-omics analyses further revealed that Sal predominantly affected genes, metabolites, and metabolic pathways related to lipid metabolism, energy metabolism, and inflammation in the liver and kidney.

Conclusion: Sal alleviates HUA-associated metabolic disturbances and may protect hepatic and renal function by modulating uric acid metabolism and lipid metabolism- and inflammation-related pathways. This supports Sal as a potential nutritional intervention for HUA.

Keyword: *Salidroside, Hyperuricemia, Metabolic dysfunction, Inflammation*

LUTEOLIN STABILIZES EPHX1 AND ENGAGES AN ARACHIDONIC ACID–PPARD–ACSL4 AXIS ASSOCIATED WITH LIPID PEROXIDATION AND MLKL SIGNALING IN GASTRIC CANCER

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Abstract

Luteolin is a flavonoid with reported anticancer activity, but its targets and effects on arachidonic acid (AA)-containing lipid pools in gastric cancer remain unclear. Serum profiling of Chebulae Fructus and molecular modeling prioritize luteolin for evaluation. Thermal shift and cycloheximide-chase assays show increased epoxide hydrolase 1 (EPHX1) stability and slower degradation, without altering mRNA. Lipidomics shows reduced monoacylglycerol (20:4) and free fatty acid (20:4), increased arachidonoyl-phosphatidylethanolamine species, and lower free-to-esterified AA ratios. EPHX1 silencing attenuates luteolin-induced acyl-CoA synthetase long-chain family member 4 (ACSL4) upregulation, lipid peroxidation, malondialdehyde (MDA), lactate dehydrogenase (LDH) release, and mixed lineage kinase domain-like protein (MLKL) phosphorylation. Exogenous AA restores peroxisome proliferator-activated receptor delta (PPARD) and ACSL4 expression and lipid peroxidation in EPHX1-depleted cells. PPARD silencing reduces ACSL4 and MDA; ACSL4 silencing reduces lipid peroxidation and MLKL phosphorylation. Ferrostatin-1 reduces MDA and LDH release and partially reduces MLKL phosphorylation; Necrostatin-1S reduces LDH release and MLKL phosphorylation without restoring ACSL4 or glutathione peroxidase 4 (GPX4). In xenograft tumors, luteolin reduces tumor growth, correlating with lower Ki-67 and GPX4 and higher EPHX1, PPARD, ACSL4, 4-hydroxynonenal (4-HNE), p-MLKL, and iron staining. These findings support an EPHX1-AA-PPARD-ACSL4 model contributing to lipid remodeling and lipid-peroxidation signaling, without confirming binding, activation, or flux.

Keyword: *Gastric cancer, Luteolin, EPHX1, Ferroptosis, Necroptosis*

GAME-CHANGING FOOD PROCESSING: FROM THEORY TO INDUSTRIAL REALITY

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Basic research can lead to the invention of game-changing technologies when it addresses true industrial and societal needs. This presentation illustrates such a pathway through two case studies viz. low-pressure superheated steam drying and electrodialysis desalination for the production of low-sodium and low-potassium fish sauce. The objective is to show how fundamental, academic studies can turn into innovative practical realities. In the case of low-pressure superheated steam drying, understanding and applications of transport phenomena in combination with food materials science and process design and development are key to the success. For fish sauce desalination, detailed understanding of electrodialysis phenomenon in combination with food chemistry and sensory science are at the core of the process. Laboratory findings were used to guide process design, optimization, scale-up and product validation. Low-pressure superheated steam drying can produce high-quality dried foods with attractive color, aroma and texture; nutritional benefits are also very well preserved. Electrodialysis desalination can reduce sodium and potassium in fish sauce while retaining its characteristic taste and identity. These examples show that fundamental engineering studies can become commercial realities when scientific understanding is integrated with industrial feasibility, consumer needs and public-health benefits.

Keyword: *Electrodialysis desalination, Low-pressure superheated steam drying, Materials science, Process design, Transport phenomena*

CAROTENOID DIVERSITY IN ETHIOPIAN PLANT FOODS: EXPANDING FOOD COMPOSITION DATA FOR NUTRITION AND FOOD SYSTEMS

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Background: Ethiopia has rich food and plant biodiversity, yet national food composition data have historically lacked information on important bioactive compounds such as carotenoids. Improved data are needed to strengthen dietary assessment and inform nutrition-sensitive food systems.

Objective: To generate carotenoid composition data for priority Ethiopian plant-based foods and highlight foods with potential nutritional importance.

Methods: Fifty-eight priority plant-based foods were collected from sampling areas selected for the Ethiopian Food Composition Table project. Concentrations of carotenoids were determined using standardized analytical methods.

Results: Carotenoid concentrations varied substantially among foods. The highest β-carotene concentrations were found in Moringa stenopetala leaves (7411 µg/100 g), Ethiopian kale (1929 µg/100 g), and garlic with peel (1539 µg/100 g). Among fruits, mango had the highest β-carotene concentration (1242 µg/100 g. Red sorghum contained the highest β-carotene among cereals (26 µg/100 g). Legumes contained 44–268 µg/100 g β-carotene. Garlic with peel, dried rue seed, and processed grass pea were notable sources of α-carotene, while orange, mango, and avocado were rich in β-cryptoxanthin.

Conclusion: Ethiopian foods show substantial diversity in carotenoid composition. Integrating carotenoid data into the national food composition database can strengthen dietary assessment and support nutrition policy, crop diversification, and resilient food systems transformation.

Keyword: *Carotenoids, Food composition database, Food Systems, Ethiopia, Plant foods*

NUTRITIONAL AND BIOACTIVE POTENTIAL OF CHEKA AND BORDE: TRADITIONAL ETHIOPIAN FERMENTED BEVERAGES

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Background: Cheka and Borde are traditional Ethiopian cereal-based fermented beverages that are widely consumed, but their nutritional and bioactive properties and component bioaccessibility remain insufficiently characterized.

Objective: This study aimed to characterize the nutritional and bioactive profiles of Cheka and Borde and assess changes following simulated gastrointestinal digestion.

Methods: Proximate composition and bioactive components were determined using standardized analytical procedures. Bioaccessibility was evaluated using the INFOGEST 2.0 static gastrointestinal digestion model, and digestion-resistant peptides were characterized by peptidomic analysis.

Key Results: Borde contained higher protein, carbohydrates, fiber, starch, riboflavin, essential amino acids, peptides, γ-aminobutyric acid, phenolic compounds, and antioxidant activity than Cheka, while having lower phytic acid and glucose contents. Both beverages exhibited comparable angiotensin-converting enzyme inhibitory activity. Gastrointestinal digestion increased the bioaccessibility of amino acids and peptides and enhanced antioxidant activity, while reducing phenolic content. Digestion-resistant peptides showed predicted angiotensin-converting enzyme inhibitory, dipeptidyl peptidase-IV inhibitory, antioxidant, anti-inflammatory, and antithrombotic activities.

Conclusion: Cheka and Borde demonstrated substantial nutritional and bioactive potential, with Borde showing a particularly favorable profile. These findings support the nutritional and functional potential of these indigenous Ethiopian fermented beverages.

Keyword: *Beverages, Bioaccessibility, Bioactivity, Fermentation, Nutrition*

MOLECULAR INTERACTIONS GOVERNING THE PHYSICOCHEMICAL, NUTRITIONAL AND SENSORIAL PROPERTIES OF MILK–TEA SYSTEMS

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Milk–tea properties depend on interactions among proteins, carbohydrates, lipids and tea polyphenols, with their effects controlled by composition and processing conditions. These factors determine how proteins associate with polyphenols, which can reduce bitterness and astringency, modify colour and improve phenolic stability; however, stronger cross-linking can increase haze, precipitation and lower polyphenol availability. Changes in protein association then influence viscosity, solubility and rehydration, because limited protein–protein interactions can support structure, whereas extensive aggregation reduces functionality. Carbohydrates further regulate this balance by interacting with proteins through hydrogen bonding, van der Waals forces, ionic interactions and Maillard conjugation. Maltodextrin can reduce protein self-association, improve emulsification and limit phase separation, while excessive carbohydrate–carbohydrate association can separate the system into protein-rich and carbohydrate-rich phases. The same protein–carbohydrate reactions also affect sensory and nutritional quality: controlled Maillard reactions generate flavour, yellow-brown colour and antioxidant compounds, whereas excessive glycation reduces amino-acid availability, digestibility and heat stability. Lipid interfaces additionally redistribute proteins and polyphenols, altering emulsion stability and phenolic accessibility. Therefore, milk–tea quality results from the balance among these interactions, and optimisation of casein:whey, lactose:maltodextrin and polyphenol levels together with heating, homogenisation, concentration and drying is required to maximise sensory quality, nutritional functionality, solubility, stability and storage performance.

Keyword: *Milk–tea, Protein–polyphenol interactions, Protein–carbohydrate interactions, Physicochemical stability, Sensory and nutritional quality*

INTEGRATED METABOLOMICS AND LIPIDOMICS ENABLE AUTHENTICATION OF ORGANIC LEAFY VEGETABLES ACROSS CULTIVATION SYSTEMS

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Reliable authentication of organic foods remains a major challenge worldwide. Here, we applied an untargeted mass spectrometry-based foodomics platform to investigate the metabolic signatures associated with organic cultivation in water spinach (Ipomoea aquatica) and lettuce (Lactuca sativa). Profiles of primary metabolites, secondary metabolites, and lipids were comprehensively characterized and validated using commercial standards and in-house lipid fragmentation analysis. Chemometric modelling revealed distinct separations between organically and conventionally cultivated vegetables. Among the observed changes, tryptophan and phenylalanine were consistently enriched in organically grown samples, highlighting their potential as universal markers of organic farming. Lettuce exhibited a stronger metabolic response to cultivation practices than water spinach, suggesting species-dependent sensitivity. Lipidomic analysis further identified significant decreases in sulphoquinovosyl diacylglycerols (SQDGs) and lysophosphatidylcholines (Lyso-PCs) under organic cultivation. These findings demonstrate that cultivation practices drive characteristic metabolic alterations and underscore the potential of foodomics-based strategies for organic food authentication and quality assessment.

Keyword: *Food adulteration, Origin Authentication, Organic farming, Foodomics, Mass spectrometry*

POMEGRANATE ELLAGITANNIN-RICH EXTRACT IMPROVES CHOLESTEROL METABOLISM THROUGH GUT MICROBIOTA-MEDIATED BILE ACID REMODELING

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Pomegranate (Punica granatum) is a palatable fruit rich in poorly absorbed bioactives, typically ellagitannins, and exhibits lipid-lowering activity. While ellagitannins reach the lower gut almost intact, bacteria transform them into absorbable urolithins. Meanwhile, ellagitannins regulate gut microbiota functions, e.g., bile acid (BA) metabolism, subsequently influencing cholesterol homeostasis. We investigated whether the cholesterol-lowering effect of a pomegranate ellagitannin-rich extract (PGET) depends on gut microbiota, urolithins, or both, and the underlying mechanisms.

Germ-free (GF) mice, with/without human fecal microbiota transplantation (FMT), received vehicle, urolithins, or PGET for seven weeks. Lipid metabolic phenotype, microbiota composition, and BA metabolism and signaling were assessed. In-vitro fermentation, intestinal cell-based assays and metabolomics were conducted for mechanistic investigation.

PGET significantly reduced plasma cholesterol in FMT but not GF mice, with lower circulating FGF15 and higher cholesterol-to-BA conversion. Particularly, PGET decreased chenodeoxycholic acid (CDCA) and increased downstream BA levels. Correlation analysis revealed Akkermansia's significance in CDCA bioconversion which was confirmed by fermentation assays. Caco-2 cell rescue study further validated the involvement of FXR-FGF19 signaling.

Overall, PGET improves cholesterol metabolism in a gut microbiota-dependent manner, characterized by Akkermansia enrichment, BA remodeling, and FXR-FGF15/19 suppression. These findings provide new insight into how ellagitannins influence cholesterol homeostasis through microbiota-mediated BA remodeling.

Keyword: *Pomegranate ellagitannins, Gut microbiota, Bile acid metabolism, Cholesterol metabolism, Akkermansia*

Cross-Scale Spatiotemporal Mapping and Metabolic Dynamics of Aflatoxin Accumulation in Aspergillus flavus-Infected Peanuts

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Aflatoxin accumulation in Aspergillus flavus-infected peanuts involves dynamic metabolic and spatial changes important for understanding the early progression of contamination. Peanuts were inoculated with toxigenic and nontoxigenic Aspergillus strains and monitored across infection stages. NIR-HSI coupled with machine learning (ML) was used for rapid, non-destructive classification and quantification of aflatoxins, using uHPLC-MS/MS-derived concentrations as reference values, while MSI coupled with ML resolved metabolic changes at the microscale. NIR-HSI achieved 100% accuracy in discriminating control, toxigenic, and nontoxigenic Aspergillus-infected peanuts, with AFB1 and AFB2 models achieving Rcv/Rpre values of 0.94/0.84 and 0.87/0.90, respectively. NIR-derived spectral biomarkers showed stage-dependent patterns consistent with MSI-resolved metabolic dynamics, including lipid oxidation and flavonoid-related antimicrobial responses at 0–24 h, enhanced fungal carbohydrate utilization at 24–48 h, and extensive metabolic disruption with pronounced aflatoxin accumulation at 48–72 h. Spatially, NIR-HSI biomarkers and MSI showed concordant patterns, with infection generally initiating near the peanut surface around the hypocotyl and progressing inward. Collectively, these findings demonstrate cross-scale alignment between NIR spectral biomarkers and microscale metabolic responses, linking non-destructive detection with the spatiotemporal evolution of aflatoxin contamination in peanuts.

Keyword: *Aflatoxin, Peanut, Near-Infrared Hyperspectral Imaging, Mass Spectrometry Imaging, Machine Learning*

DIGESTION AND FECAL FERMENTATION BEHAVIOR OF AMPELOPSIS GROSSEDENTATA POLYSACCHARIDE AND ITS MODULATION ON HUMAN GUT MICROBIOME

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Polysaccharides from Ampelopsis grossedentata tea (AGP) have shown diverse health-promoting effects, but their gastrointestinal stability and microbial fermentation fate remain poorly understood. In this study, the digestion and fecal fermentation properties of AGP, as well as its impact on gut microbiota and microbial metabolic profiles, were evaluated. The hot-water-extracted AGP was characterized as an acidic, high-molecular-weight heteropolysaccharide rich in uronic acid residues. AGP was largely resistant to simulated gastrointestinal digestion and could reach the colon, being utilized by intestinal flora. During fecal fermentation, AGP underwent selective and stepwise degradation, with 69.92 ± 1.53% of total carbohydrates consumed after 48 h. Interestingly, its uronic acid domains exhibited delayed utilization, decreasing by 64.44 ± 2.03% between 12 and 24 h, accompanied by pronounced changes in molecular weight distribution and microstructure. AGP fermentation promoted sustained SCFA production, especially for acetate and propionate. It also induced time-dependent changes in microbial community structure, with Bacteroides dominating as the primary degrader. Metabolomics revealed extensive alterations in amino acid metabolism, among which arginine biosynthesis emerged as the most enriched pathway. These findings provide new insights into the microbial utilization of AGP and provide a mechanistic basis for future utilization of AGP as a potential prebiotic food ingredient.

Keyword: *Ampelopsis grossedentata, tea polysaccharides, fecal fermentation, gut microbiome modulation*

Integrated Cascading Biorefinery: Transforming Multi-Stream Agri-Food and Horticulture Waste into Functional Ingredients and High-Performance Supercapacitor Carbon Electrodes

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The transition toward a circular bioeconomy requires advanced "Waste to Wealth" pathways that eliminate processing footprints through cascading valorisation. While agro-industrial and horticultural operations generate massive volumes of fruit, oilseed, and floral waste, conventional disposal methods ignore the multi-tier material potential of these biomass streams.

This study investigated a holistic, zero-waste multi-stream framework to recover bioactive molecules, essential oils, and plant proteins, while sequentially converting secondary extraction residues into advanced carbon materials for green energy storage.

A sequential biorefinery approach was deployed across three distinct waste sectors: (1) Fruit & Oilseed Streams: Antioxidants extracted from banana peels were applied to extend the oxidative shelf-life of Indian flatbreads; citrus essential oils were isolated from citurs peels, and functional proteins were recovered from defatted oilseed cakes. (2) Horticultural Cascading Stream: Discarded floral biomass underwent primary extraction to harvest high-value nutraceutial and bioactive compounds. Crucially, the resulting secondary biomass residue was collected and carbonized bia eco-friendly chemical activation and pyrolysis protocols to synthesize porous carbon electrode materials. The synthesized electrodes were structurally characterized and evaluated in zinc-ion hybrid supercapacitor assemblies.

Banana peel extracts successfully reduced lipid oxidation in Indian bread matrices without altering sensory acceptability. Citrus essential oils and oilseed proteins exhibited robust antimicrobial and techno-functional properties, respectively. Most notably, carbon electrodes derived from secondary floral waste showed an ultra-porous architectural framework, enabling exceptional electrochemical performance, low internal resistance, and excellent cyclic stability in zinc-hybrid supercapacitors.

The research provides a scalable, cross-disciplinary blueprint for modern industrial ecology. By seamlessly marrying food science with advanced materials engineering, this cascading model shows that complex biological wastes can be systematically upcycled--first meeting nutritional needs and ultimately addressing the global need for low-cost, environmentally friendly energy storage materials.

Keyword: *horticultural waste, functional ingredients, bioactives, electrodes*

ID: 1428

Development of sustainable treatment methods to increase resistant starch content in the faba bean starch fraction

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Meat alternatives are increasingly popular among consumers. Plant protein air-classification process results in high amount of starch-rich fraction (SF), which is mostly used as animal feed. Pulse SF contains naturally occurring resistant starch (RS) with health benefits, such as glycemic index balancing by short-chain fatty acid production in colon, but RS level can also be increased with various treatment methods.

In this research, three faba bean (two native, one germinated) starch-rich side-streams from air-classification protein concentration are treated with enzymatic hydrolysis, heat-moisture treatment (HMT), or two extrusion technologies (twin and multiple screw). Study aims to produce sustanaible food ingredient with increased level of RS. Changes in RS level, amylose/amylopectin ratio, proximate components, sugars, and amino acids are analyzed. Treatment methods are evaluated with Life-Cycle-Assessment and Techno-Economic-Assessment.

Preliminary results have shown that higher screw speed and moisture in extrusions increase RS levels in SFs. HMT also affected RS levels in native and germinated SFs, depending on moisture content and temperature. This research will contribute to the transition towards sustainable and circular food system by valorizing SF generated during faba bean protein concentration. In addition, it provides novel insights into the nutritional, technological, environmental, and economic performance of the developed food ingredients.

Keyword: *faba bean, resistant starch, extrusion cooking, heat-moisture treatment, enzymatic hydrolysis*

Development of Plant-Based Seafood Alternatives Using High Moisture Extrusion and Second-Stage Processing

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In recent years, under the trend of plant-based diets, developing plant-based meat with good texture is an important issue. High moisture meat analogue (HMMA) has high potential in vegan products because it can simulate meat fiber and chewing feeling through extrusion technology. The purpose of this study is to use co-rotating twin-screw extrusion to develop plant-based fish cakes and fish balls, and to evaluate the effect of formula and processing conditions.

In the first part, we used wheat gluten and pea protein isolate (90%) with seaweed powder (Undaria pinnatifida, 10%) to make vegan fish cakes. We tested different feed moisture contents (FMC, 45, 50, and 55%) and die temperatures (120, 135, and 150 °C). In the second part, we used mung bean flour (MBF, 10-30%) and pea protein (PP, 70-90%) to produce HMMA first, and then mixed it with a fixed wheat protein formula to make plant-based fish balls.

The results showed that FMC and raw material ratio have significant influence on the physical properties. For plant-based fish cakes, when FMC was 45% and die temperature was 150 °C, the product had the best cutting force, chewiness, and water holding capacity. It was more suitable for second-stage processing and got the highest score in sensory evaluation. For plant-based fish balls, the highest texturization degree was found in 10:90 and 20:80 (MBF:PP) ratios with 50% FMC. Because of the added wheat protein gel network, all fish ball groups showed good springiness (9.22-10.05 mm). Moreover, the 20:80 ratio group with 50% FMC had the best oil holding capacity (5.43%) and water holding capacity (7.10%), and the cooking loss was controlled well. Sensory evaluation also proved that 10:90 and 20:80 ratios with 50% FMC had better taste, flavor, and overall acceptability.

In conclusion, setting FMC at 50% with a 10:90 ratio is suitable for making tender vegan fish products, while the 20:80 ratio showed the most balanced physical properties. This study can be a useful reference for future plant-based seafood development.

Keyword: *High moisture extrusion, Plant-based seafood, Textural properties, Sensory evaluation*

INTAKE EVALUATION OF DIETARY SATURATED FATTY ACIDS IN CHINESE CHILDREN AND ADOLESCENTS

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Objective To evaluate dietary intake of saturated fatty acids and its health risks among Chinese children and adolescents aged 4-17. **Methods** Food consumption data were obtained from the China food consumption survey in 2017-2020, and concentration data were derived from the Chinese Food Composition Table and testing data. Individual daily dietary intake of saturated fatty acids was calculated using a simple distribution model and evaluated according to the Acceptable Macronutrient Distribution Range in Dietary Reference Intakes for China (2023). **Results** The average dietary intake of saturated fatty acids among Chinese children (aged 4-11) and adolescents (aged 12-17) was 17.35 g/d and 19.76 g/d, the average energy supply ratio was 9.99% and 9.25%, respectively. The proportions of Chinese children and adolescents whose energy supply ratio of dietary saturated fatty acids was equal to or greater than 8% were 71.66% and 64.06%, respectively. Livestock meat and cooking oil were the major sources of dietary saturated fatty acids among Chinese children and adolescents, and their combined contributions reached 50.73% for children and 54.78% for adolescent. **Conclusion** Chinese children and adolescents show a relatively high average energy supply ratio of dietary saturated fatty acids, and 68.68 % of this population have a ratio of 8 % or higher.

Keyword: *children and adolescents; saturated fatty acids; simple distribution model; intake evaluation*

Optimization of Extraction Conditions for Bioactive Compounds from Platycodon grandiflorus Root Using BBD-RSM

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Platycodon grandiflorus, a member of the Campanulaceae family, is a plant widely distributed throughout East Asia. This study aimed to determine suitable extraction conditions for triterpenoid saponins from fresh P. grandiflorus roots through response surface methodology (RSM). Polygalacin D_2 and polygalacin D were used as the target constituents. A Box–Behnken Design (BBD) consisting of 27 experimental runs was employed to investigate four extraction factors: extraction time, ethanol concentration, liquid-to-solid ratio, and extraction temperature.

Second-order regression models were established to describe the effects of these extraction parameters on the yields of polygalacin D_2 and polygalacin D. Analysis of the response surfaces revealed distinct extraction behaviors between the two saponins under different experimental conditions. For polygalacin D_2, the predicted optimum was obtained at an extraction time of 60 min, an ethanol concentration of 0%, a liquid-to-solid ratio of 27.3, and an extraction temperature of 20.0°C, resulting in a predicted yield of 4.4 μg/g. In contrast, the predicted optimal conditions for polygalacin D were 180 min of extraction, 0% ethanol, a liquid-to-solid ratio of 20.0, and a temperature of 40.0°C, with a predicted yield of 8.6 μg/g.

The optimized conditions were similar only with respect to ethanol concentration, whereas extraction time, liquid-to-solid ratio, and extraction temperature differed between the two compounds. These findings demonstrate that appropriate extraction conditions can differ according to the target saponin and may serve as fundamental information for optimizing the extraction of saponins from P. grandiflorus roots.

Keyword: *Platycodon grandiflorus, Box-Behnken Design (BBD), Response Surface Methodology (RSM), Polygalacin D2, Polygalacin D*

REDISPERSIBLE CASEIN-ZEIN NANOCARRIERS ENABLE SELECTIVE LOADING OF SAPONIN RD FROM CRUDE EXTRACTS FOR IMPROVED THERAPY OF ACUTE ALCOHOLIC LIVER INJURY

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Panax notoginseng saponin Rd exhibits promising hepatoprotective activity against acute alcoholic liver injury, yet its application is hindered by poor water dispersibility and the high cost of obtaining purified Rd. To address this, casein-surface zein nanoparticles (CAS/zein NPs) were developed to selectively encapsulate Rd directly from crude saponin extracts for alleviating acute alcoholic liver injury. By optimizing the casein/zein mass ratio, the nanoparticles exhibited excellent redispersibility after freeze-drying, achieving a particle size of 60 nm upon encapsulating saponins in water. Casein incorporation reduced thermal stability of particles via altering protein crystallinity, while subsequent interaction with saponins restored it. Selective loading of Rd over other ginsenosides was achieved through spatial-level hydrogen bonding. Experiments in rats showed that Rd, whether loaded in CAS/zein NPs or not, effectively protected against acute alcoholic liver injury by lowering aspartate aminotransferase (AST), alanine aminotransferase (ALT), and malondialdehyde (MDA) in liver tissue. Notably, AST levels were reduced more efficiently when Rd was delivered via CAS/zein NPs. This research provides insight into the rational design of redispersible protein-based nanocarriers for the selective encapsulation of bioactive saponins from crude extracts to treat acute alcoholic liver injury.

Keyword: *Saponin Rd, Zein nanoparticles, Encapsulation, Casein, Hepatoprotective activity*

Chemical basis of flavor variation among different commercial brands of trotter soup revealed by integrated aroma, taste, and sensory analyses

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Pig trotter soup（PTS）, prized for collagen and savory flavor, exhibits significant brand-to-brand variation due to differing raw materials, formulations, and processing, yet systematic flavor characterization is lacking. We analyzed four commercial brands (Hongpailou, Mixiaofu, Wangjiamatou, Maizhenxuan) via volatile compound analysis, taste-active component quantification, and sensory evaluation. Hongpailou showed the most distinct aroma, with higher spice-derived volatile concentrations (2-butanone, 2-methylbutanal, linalool, D-limonene), while lipid-oxidation aldehydes/alcohols formed the common aroma backbone across all samples. Umami and saltiness were the key taste attributes; Wangjiamatou scored highest sensorily. Overall, lipid oxidation products constituted the basic aroma, whereas spice volatiles and taste compounds drove brand differentiation. This study provides a chemical basis for flavor discrepancies and offers a reference for future flavor optimization.

Keyword: *Pig Trotter Soup, Flavor, GC-IMS, Electronic Nose, Brand Differentiation*

A DUAL-RESPONSE COLORIMETRIC SENSOR ARRAY INTEGRATED WITH DEEP LEARNING FOR MOBILE INTELLIGENT FRESHNESS ASSESSMENT OF AQUATIC PRODUCTS

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The growing demand for rapid, on-site monitoring of aquatic product freshness has highlighted the limitations of conventional methods, which often rely on sophisticated instruments and time-consuming procedures. This study proposes an intelligent system for rapid freshness assessment of aquatic products (salmon and shrimp) based on a dual-response colorimetric sensor array integrated with optimized deep learning models. In terms of engineering, the sensor array adopts a triple-channel design incorporating pH-responsive anthocyanin, alizarin red S, and indole-specific p-dimethylaminobenzaldehyde, enabling simultaneous detection of total volatile basic nitrogen and indole metabolites during spoilage. On the AI front, six deep learning architectures were systematically evaluated, with GhostNet and Xception achieving optimal performance—classification accuracy exceeding 98.00%. By integrating dual-response signals, the system captures complementary spoilage pathways, improving average accuracy from 95.90% (single-channel) to 97.13%, demonstrating the algorithmic advantage of multi-channel data fusion. Furthermore, for engineering application, the optimized MobileNet_v1 model was successfully deployed in a mobile application, enabling real-time freshness detection with an accuracy of 97.20% and an inference time of only 12 milliseconds. This work establishes a reliable framework for on-site food quality monitoring, offering a cost-effective and robust alternative to conventional methods while enhancing supply chain transparency.

Keyword: *Intelligent freshness assessment, dual-response sensor array, deep learning, mobile deployment, aquatic product safety*

ID: 1417

Feeding the Clock: How Chrononutrition Fights Jet Lag, Circadian Disruption, and Neurodegeneration

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Circadian rhythms orchestrate vital physiological processes, including immune functions and behavior. Systemic inflammation disrupts these rhythms by compromising clock gene expression and intensifying neuroinflammation. While chrononutrition offers promising approaches for circadian regulation, the therapeutic potential of prebiotic polysaccharides remains unexplored. We investigated whether prebiotic polysaccharides (yeast β-glucan and chicory inulin) could mitigate systemic inflammation-induced disruptions in circadian rhythms and neuroinflammation in C57BL/6J mice, comparing their effects with melatonin (a chronobiotic) and ibuprofen (an anti-inflammatory drug). Following lipopolysaccharide (LPS) injection, both prebiotics effectively restored circadian clock gene expression and reduced neuroinflammation, with efficacy comparable to melatonin and ibuprofen treatment. Yeast β-glucan particularly excelled in reversing hippocampal microglial activation and preventing recognition memory deficits. This study highlights the therapeutic potential of prebiotics as a dietary intervention for addressing circadian disruption and neuroinflammation under inflammatory challenges.

Keyword: *Prebiotics, Chrononutrition, Polysaccharides, Circadian rhythms, Neurodegeneration*

ID: 1414

pH-Dependent Structural Modifications of Lupin Proteins Induced by High-Pressure Homogenization

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Lupin proteins are promising plant-based ingredients whose functionality can be enhanced by emerging processing technologies. This study evaluated the effects of high-pressure homogenization (HPH) on the structural properties of lupin protein isolate under acidic (pH 2.0), neutral (pH 7.0), and alkaline (pH 11.0) conditions. Samples were treated at 50, 100, and 150 MPa and compared with untreated controls. Structural changes were assessed by size-exclusion chromatography (SEC), sulfhydryl group determination, intrinsic fluorescence, and UV–Vis spectroscopy. SEC analysis at pH 7 showed reduced retention times after HPH, indicating increased apparent hydrodynamic size, together with increased peak intensity and relative area. The most pronounced effect occurred at 100 MPa, suggesting enhanced protein–protein interactions and formation of soluble aggregates. Sulfhydryl analysis revealed pH-dependent structural changes, with increased exposure of sulfhydryl groups under acidic conditions and greater exposure of previously inaccessible groups under alkaline conditions. Intrinsic fluorescence indicated modifications in tertiary structure, particularly at pH 2 and 11, while UV–Vis spectra supported pressure- and pH-dependent conformational rearrangements. Overall, HPH effectively modified lupin protein structure, demonstrating that pressure and pH play important roles in protein conformational behavior and highlighting the potential of HPH to tailor plant protein functionality.

Keyword: *high-pressure homogenization, ;protein structure, Lupinus albus protein*

Enrichment of GABA in soybeans through Lactococcus lactis and Lactobacillus plantarum fermentation and its application in cookie production

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Soybeans were separately fermented by Lactococcus lactis (L. lactis) and Lactiplantibacillus plantarum (L. plantarum), as well as by a mixture of L. lactis and L. plantarum. The CFU, pH, phytic acid content, total phenolic content, antioxidant activity, and GABA content of fermented soybean powder were investigated under different fermentation times (24, 48, 72 h) and dry temperatures (37°C, 65°C). The findings demonstrate that co-fermentation with L. lactis and L. plantarum exhibits significant efficacy in decreasing soybean phytic acid levels. Single-strain fermentation with L. lactis displayed more pronounced benefits in sustaining probiotic viability, retaining soybean total phenolic content and antioxidant activity, and enhancing GABA accumulation. Subsequently, soybean powder fermented by L. lactis was incorporated into cookie dough for cookie preparation. The GABA content in cookies made from L. lactis-fermented soybean powder was significantly higher than that in cookies made from pure wheat flour and those added with unfermented soybean powder. L. lactis-fermented soybean powder better maintained the shape and hardness of cookies compared to cookies added with unfermented soybean powder. This result provides a basis for promoting soybean fermentation with L. lactis to enhance the nutritional value of cereal foods, and offers valuable references for the development of fully plant-based foods.

Keyword: *fermentation, probiotics, GABA, cookie*

MICROWAVE ASSISTED EXTRACTION OF SESAME MEAL PROTEIN: INFLUENCE OF CONVENTIONAL AND GREEN EXTRACTION METHODS ON STRUCTURAL AND TECHNO-FUNCTIONAL PROPERTIES.

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Sesame meal, an underutilized byproduct of the sesame oil industry, represents a promising sustainable source of plant protein. This study compares microwave assisted conventional alkaline and salt extraction with green deep eutectic solvent (DES) extraction of sesame meal protein isolate (SMPI) in terms of physicochemical, structural and techno-functional properties. Microwave assisted salt extraction showed the highest protein purity (90.75%) and yield (39.45%). Structural analysis indicated that microwave assisted SMPI extraction increased fluorescent intensity, free sulfhydryl content, and in vitro digestibility, suggesting conformational modifications in protein structure. Electrophoretic profile confirmed preservation of major SMPI fractions, although varying band intensities reflected structural rearrangements without extensive degradation. Both alkaline and DES extraction increased β-sheet content, with microwave-assisted DES extracted SMPI showing the highest β-sheet content (66.01%). Scanning electron microscopy demonstrated surface fragmentations in all microwave assisted SMPI samples. Microwave treatment significantly enhanced the interfacial behaviour of salt and DES extracted SMPI, particularly solubility, water absorption capacity, emulsifying and foaming properties. Thermal analysis showed a single endothermic transition and lower denaturation temperature for microwave assisted SMPI. Overall, microwave assisted extraction effectively modifies SMPI structure, enhancing its techno-functional properties across conventional and green extraction processes.

Keyword: *Sesame Meal, Green Extraction, Salt Extraction, Microwave, Functional properties*

TOWARDS ORGANIC FOOD AUTHENTICATION: FOODOMICS REVEALS CULTIVATION-DEPENDENT METABOLIC AND LIPID SIGNATURES IN LEAFY VEGETABLES

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Reliable authentication of organic foods remains a major challenge worldwide. Here, we applied an untargeted mass spectrometry-based foodomics platform to investigate the metabolic signatures associated with organic cultivation in water spinach (Ipomoea aquatica) and lettuce (Lactuca sativa). Profiles of primary metabolites, secondary metabolites, and lipids were comprehensively characterised and validated using commercial standards and in-house lipid fragmentation analysis. Chemometric modelling revealed distinct separations between organically and conventionally cultivated vegetables. Among the observed changes, tryptophan and phenylalanine were consistently enriched in organically grown samples, highlighting their potential as universal markers of organic farming. Lettuce exhibited a stronger metabolic response to cultivation practices than water spinach, suggesting species-dependent sensitivity. Lipidomic analysis further identified significant decreases in sulphoquinovosyl diacylglycerols (SQDGs) and lysophosphatidylcholines (Lyso-PCs) under organic cultivation. These findings demonstrate that cultivation practices drive characteristic metabolic alterations and underscore the potential of foodomics-based strategies for organic food authentication and quality assessment.

Keyword: *Food adulteration, Origin Authentication, Organic farming, Foodomics, Mass spectrometry*

Fucoidan Regulates the Absorption and Metabolism of Nicotinamide Riboside When Supplemented in a Functional Rice Flour

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BACKGROUND & HYPOTHESIS: Fucoidan is a naturally occurring marine polysaccharide isolated from brown seaweeds. Fucoidan has been widely investigated as a functional ingredient for functional food development. However, fucoidan's contribution to the intestinal absorption and intracellular metabolism of nicotinamide riboside (NR) remains unclear. Herein, we developed functional rice flour supplemented with the selected fucoidans and examined its effects on NR absorption. **METHODS:** We used a modified Caco-2 permeability assay to simulate biologically relevant conditions and evaluate the transepithelial transport and metabolism of NR. **RESULTS:** Functional rice flour enhanced NR and NAD transport across the Caco-2 monolayer in an enzymatically active environment. However, no substantial differences in NR Papp values were observed in the conventional Caco-2 permeability assay. Functional rice flour was therefore thought to promote NR metabolic events rather than directly increase its epithelial membrane permeability. Furthermore, decreased transepithelial transport of the NR metabolic intermediates, NMN and NAM, demonstrated the role of functional rice flour in facilitating the conversion of NR to NAD and NAD flux. **CONCLUSION:** Fucoidan can facilitate the intracellular conversion of NR to NAD, predominantly via the NR salvage pathway, with a modest enhancement of the NAM salvage pathway. The molecular mechanism remains unclear.

Keyword: *Fucoidan, Nicotinamide Riboside, NR, Functional Food*

REGULATORY CONSIDERATIONS OF RECENTLY INDIVIDUALLY RECOGNIZED KOREAN HEALTH FUNCTIONAL FOOD INGREDIENTS WITH BIOAVAILABILITY-ENHANCING PROCESSING TECHNOLOGIES

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Advances in food processing technologies, including nano-dispersion, phospholipid-based formulation, and precision fermentation, enhance the bioavailability of bioactive compounds from natural sources. In Korea, recently individually recognized functional ingredients using such technologies were investigated: Curcuma longa extract, produced by nano-dispersion or phospholipid-based formulation, and fermented soy germ powder, standardized to S-equol. Safety was analyzed using consumer summary reports published at recognition, and market safety was evaluated under real-world conditions since commercialization. Curcuma longa extract and the fermented soy germ powder were each reviewed for evidence of consumption, safety information, intake assessment, and human safety data at recognition, with toxicity data additionally submitted for the latter. Product manufacturing notifications since recognition show 45 marketed products containing Curcuma longa extract and 1 containing the fermented soy germ powder, with no domestic adverse events reported; this short market history limits assessment of real-world safety. Internationally, curcumin-associated liver injury has prompted regulatory responses, with several authorities highlighting risks of bioavailability-enhanced formulations, and the UK Committee on Toxicity has called for further pharmacokinetic assessment of novel micellar, nano, and micro formulations. These findings suggest that Korea's safety assessment framework should account for processing technologies that increase bioavailability and systemic exposure, alongside strengthened post-market monitoring.

Keyword: *Health functional food, Polyphenol, Bioavailability, Curcumin, Safety assessment framework*

ID: 1406

Turn it down to eat more healthily

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Public attention to health and well-being has intensified in recent years. However, healthy foods often trigger psychological reactance, partly due to the “healthy = untasty” intuition, particularly when health appeals are perceived as overtly persuasive. Drawing on cross-domain mapping, we propose that lower felt activation elicited by low-arousal music may provide an affective context that partially corresponds with the lower-activation connotations of healthy-food cues. This proposed correspondence may enhance perceived comprehension of healthy-food information and thereby strengthen healthy-food responses. Four studies were conducted: one field experiment (Study 1) and three scenario-based experiments (Studies 2a, 2b, and 3). Low-arousal (vs. high-arousal) background music was associated with a greater proportion of sold items classified as healthy (Study 1) and stronger healthy-food consumption intentions (Studies 2a, 2b, and 3). Perceived comprehension carried significant indirect effects in the latter relationship (Studies 2a, 2b, and 3). Both music conditions also yielded higher perceived comprehension and consumption intention than ambient noise alone, with low-arousal music retaining an additional advantage over high-arousal music (Study 3). These findings suggest that low-arousal background music functions as a meaningful atmospheric cue supporting healthier consumption, offering a practical alternative to overt health messaging in food-service settings.

Keyword: *background music, music arousal, cross-domain mapping, perceived comprehension*

CONSUMER SEGMENTS, AWARENESS, AND BARRIERS TO SOY YOGURT ADOPTION IN NORTHERN VIETNAM

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Soy yogurt is still a relatively new product in Vietnam, and information on consumer awareness, acceptance, and adoption remains limited. This study investigated consumer awareness, consumption, attitudes, and potential consumer groups for soy yogurt in Northern Vietnam. An online questionnaire was completed by 809 respondents. Descriptive statistics were used to summarise consumer responses, and latent class analysis was applied to 13 attitudinal statements. Based on model fit, entropy, minimum class size, and interpretability, a three-class solution was retained. The results showed that 35.5% of respondents were aware of soy yogurt, and 27.9% were current users. Limited product availability was reported by 74% of non-users. Among current users, the main reasons for consumption were perceived health benefits (39%) and preferred flavour (36%). The three-class solution demonstrated excellent classification quality (entropy = 0.95), identifying three distinct consumer segments: sceptical consumers (12.0%), positive consumers (27.3%), and mainstream consumers (60.7%). The positive segment showed the highest acceptance scores and greater product awareness, whereas the mainstream segment was characterised by lower awareness and moderate acceptance. These findings highlight distinct consumer profiles and suggest opportunities for segment-specific product development and consumer communication strategies to support the adoption of for soy yogurt in Vietnam.

Keyword: *Soy yogurt, consumer segmentation, latent class analysis*

Valorisation of Farmed Australian Saltwater Crocodile (Crocodylus porosus) Carcass Material as a Novel Source of Bioactive Collagen Peptides

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The Australian saltwater crocodile (Crocodylus porosus) skin industry generates substantial under-utilised carcass material, including cartilage-rich cuts, representing an untapped opportunity for value-added food and nutraceutical ingredients. This study isolated and characterised collagen from farmed C. porosus rib and tail cartilage using sequential acid and pepsin-enzymatic extraction, achieving an overall yield of approximately 8%, comparable to other aquatic collagen sources. SDS-PAGE, western blotting and LC-MS/MS peptide mapping confirmed the extracted material as predominantly Collagen Type I, with minor Type V and VIII contributions. FTIR spectroscopy demonstrated characteristic amide A, B, I, II and III bands consistent with an intact triple-helical structure, closely resembling bovine reference collagen. Differential scanning calorimetry showed a denaturation temperature of 74.1°C, slightly higher than bovine collagen (71.4°C). Functional assays revealed concentration- and format-dependent bioactivity: substrate-bound collagen peptides significantly enhanced in vitro keratinocyte wound healing (EC50 0.17 µg/mL), while soluble peptides inhibited proliferation at higher concentrations (IC50 5 µg/mL). Antioxidant capacity was detected via CUPRAC and FRAP assays. These findings establish crocodile collagen as a biochemically comparable alternative to mammalian and marine collagen sources, supporting its potential application in functional foods, nutraceuticals and cosmetic formulations, while offering the Australian crocodile industry a pathway toward zero-waste, diversified revenue streams.

Keyword: *Crocodile collagen, Carcass valorisation, Bioactive peptides, Alternative protein sources*

CHARACTERISTICS OF DIETARY PROTEIN SOURCES AND GLYCEMIC METABOLIC RISK IN KOREAN ADULTS

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Data from the 2021–2023 Korea National Health and Nutrition Examination Survey were analyzed to examine the association between the proportion of animal protein intake and prediabetes prevalence among Korean adults. 9,868 adults aged ≥19 years were included after excluding individuals with diabetes, antidiabetic medication use, impaired renal function, extreme energy intake, or missing data. The proportion of animal protein intake was calculated as the percentage of total protein derived from animal sources and categorized into tertiles (T1–T3). Prediabetes was defined as fasting glucose of 100–125 mg/dL or HbA1c of 5.7–6.4%. Complex-sample analyses and logistic regression were performed. Prediabetes prevalence decreased from 43.4% in T1 to 38.3% in T2 and 30.4% in T3. In unadjusted analyses, the odds ratios were 0.82 (95% CI: 0.74–0.91) in T2 and 0.59 (95% CI: 0.53–0.67) in T3 versus T1. However, after adjustment for sociodemographic, health-related, dietary, and anthropometric factors, associations were no longer significant (T2: OR 1.04, 95% CI: 0.91–1.19; T3: OR 0.95, 95% CI: 0.79–1.14). These findings indicate that animal protein proportion was not independently associated with prediabetes after confounder adjustment. Therefore, dietary patterns and characteristics should be considered when assessing prediabetes-related nutritional risk.

Keyword: *Animal protein proportion, Prediabetes, Protein intake, KNHANES*

ASSOCIATION BETWEEN PROTEIN INTAKE ADEQUACY AND PREDIABETIC GLYCEMIC INDICATORS AMONG KOREAN ADULTS

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This study examined the association between total protein intake ratio and prediabetes prevalence among Korean adults using 2021–2023 Korea National Health and Nutrition Examination Survey data. A total of 9,868 adults aged ≥19 years were included after excluding individuals with diabetes, antidiabetic medication use, impaired renal function, extreme energy intake, or missing data. Total protein intake ratio was calculated relative to the recommended intake of 0.91 g/kg/day and categorized as low (<75%), adequate (75–<125%), or high (≥125%). Prediabetes was defined as fasting glucose of 100–125 mg/dL or HbA1c of 5.7–6.4%. Complex-sample analyses and logistic regression were performed. The proportions in the low, adequate, and high protein intake groups were 20.4%, 40.3%, and 39.3%, respectively. Prediabetes prevalence was 39.0%, 39.9%, and 32.7%, respectively. The high-intake group showed favorable anthropometric and metabolic profiles. Compared with the low-intake group, adjusted odds ratios for prediabetes were 0.84 (95% CI: 0.72–0.99) in the adequate-intake group and 0.53 (95% CI: 0.43–0.64) in the high-intake group. These findings suggest that maintaining protein intake at or above recommended levels relative to body weight may be associated with lower prediabetes prevalence and support nutritional strategies for metabolic risk reduction.

Keyword: *Total protein intake, Prediabetes, Protein intake ratio, KNHANES*

High-Pressure Processing of Hydrolyzed Sesame Protein: Gelation for Next-Generation Protein-Rich Foods

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The growing demand for protein-rich foods,has intensified the need for protein ingredients combining nutritional value with tailored functionality. Hydrolyzed proteins are attractive due to their enhanced accessibility during digestion; however, hydrolysis compromise protein-protein interactions and gel forming ability.This study investigated HPP as a clean label strategy to engineer the gelation behavior of hydrolyzed sesame protein. Sesame protein was pretreated by HPP at 200, 400, and 600 MPa/10 min/25 °C, followed by Alcalase hydrolysis for 2 min. HPP increased the degree of hydrolysis by 29.74, 8.99, and 54.99% at 200, 400, and 600 MPa, respectively, compared with the unprocessed sample. Structural analysis revealed changes in secondary structure, including reductions of 68.07 and 5.92% in α-helix content at 200 and 400 MPa, respectively. Viscoelastic analysis showed that the 400 MPa treatment exhibited the highest G′ values, indicating greater structural resistance. Conversely, 200 MPa reduced gel rigidity, while 600 MPa markedly decreased the viscoelastic module, suggesting disruption of the gel network. Overall, 400 MPa provided the most favorable balance between structural modification and gel formation, demonstrating the potential of HPP to engineer hydrolyzed sesame protein into a functional, clean-label ingredient for next generation protein-rich foods.

Keyword: *Sesame Protein, High Pressure Processing, Hydrolysis*

Application of Golden Chlorella–Starch Inks for 3D Printed Dysphagia Foods

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This study investigated the potential of Golden Chlorella (GC), derived from Chlorella protothecoides, as a functional food ink for three-dimensional (3D) printing. GC is a nutrient-rich microalgal ingredient characterized by its high protein content and valuable lipid, vitamin, and mineral components. To optimize the formulation, four starch types were incorporated at different concentrations. The resulting GC–starch inks were characterized using rheological, microstructural, and other textural analyses. The GC–starch inks successfully produced complex 3D structures with properties suitable for texture-modified foods. Formulations containing corn starch (CS) or potato starch (PS) exhibited superior printability, structural stability, and printing accuracy. In particular, inks containing 10% - 20% CS and 20%-30% PS demonstrated high printing fidelity and satisfied the criteria corresponding to IDDSI Levels 4–5. These findings demonstrate the potential of GC–starch inks for developing nutrient-rich, 3D-printed foods for individuals with dysphagia.

Keyword: *3D food printing, Golden Chlorella, Dysphagia food, Corn starch, Potato starch*

INFLUENCE OF TIMED AND TARGETED COUNSELLING ON MATERNAL HEALTH SERVICES AND PRACTICES IN UGANDA

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Introduction: Timed and Targeted Counselling (ttC) is a home-based behaviour-change intervention delivered by trained Village Health Teams. Evidence of its influence on maternal health service utilisation and practices in Uganda remains limited. This study compared maternal health outcomes among women exposed and unexposed to ttC.

Methodology: A retrospective quasi-experimental study was conducted in selected World Vision Uganda programme areas across four regions. Women from communities where ttC had operated for at least four years were compared with women from similar non-ttC communities. Propensity score matching yielded 1,624 participants (812 per group). Household surveys, focus group discussions and key informant interviews were conducted. Risk differences, odds ratios and logistic regression assessed intervention effects.

Key findings: First-trimester antenatal care (ANC) initiation was higher among ttC-exposed women than controls (59.1% versus 42.6%; OR=1.95, 95% CI: 1.60–2.37; $p<0.001$). Adequate ANC attendance (at least four visits) was also higher (61.1% versus 38.9%; OR=2.46, 95% CI: 2.01–3.01; $p<0.001$). ttC significantly improved insecticide-treated net use, iron and folic acid uptake and daily use, tetanus vaccination, appropriate handwashing and knowledge of pregnancy danger signs (all $p<0.001$). Differences in skilled birth attendance and postnatal care within two days were not statistically significant.

Conclusion: ttC improved ANC utilisation and several preventive maternal health practices but did not significantly influence skilled delivery or early postnatal care.

Recommendation: ttC should be scaled up alongside targeted measures addressing barriers to facility delivery and timely postnatal care.

Keyword: *Timed and Targeted Counselling, maternal health, antenatal care, maternal health practices*

DEVELOPMENT OF INNOVATIVE PRODUCTS FOR THE PRODUCTION PROCESS OF FRUIT FILLINGS AND GELS

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Fruit fillings and gels are conventionally produced using vacuum cookers with indirect steam heating, a slow process resulting in uneven temperature distribution, scorching, and inconsistent product quality. This project develops three innovative products to overcome these limitations: (1) a direct steam-injection heating system integrated into the recirculation line, combined with predictive control software; (2) an improved-recipe apple fruit filling using a natural thickener derived from apple by-products; and (3) an apple gel, a completely new product, using the same by-product-based thickener. The scientific hypothesis is that precise temperature control combined with appropriate thickener selection improves product quality, texture, microbiological stability, and shelf life while reducing production costs. Research progresses from TRL 2 to TRL 7 through industrial research (concept formulation, laboratory testing, low-level prototype validation) and experimental development (technology validation, demonstration in relevant and operational environments). Expected outcomes include validated prototypes ready for certification and commercialization, valorization of apple pomace and core (approximately 30% of processed mass) into a functional ingredient, energy savings of 20–30%, and reduced use of conventional thickeners. The innovation supports circular economy principles, sustainable food processing, and export growth toward EU and global markets.

Keyword: *fruit filling, gel, apple by-products, direct steam heating, natural thickener, food process innovation*

ID: 1397

Factors and Mechanisms Affecting the Structure and Digestibility of Jackfruit Seed Starch

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Jackfruit is a high-quality tropical fruit whose seeds are rich in starch, accounting for approximately 60% to 80% of their dry weight. Jackfruit seed starch (JSS) exhibits a high content of resistant starch (RS). An in-depth understanding of the factors and mechanisms influencing JSS digestibility holds significant scientific value for managing blood glucose levels and promoting intestinal health. However, current research on JSS predominantly focuses on extraction optimization, structural characterization, and modification, leaving its digestibility insufficiently explored in a systematic manner. Therefore, this study investigates the effects of internal factors (botanical source, granule size, and internal structure) and external factors (hydrothermal processing) on the structure and digestibility of JSS.

Keyword: *Jackfruit seed starch, Digestibility, Size fractionation, Chemical surface gelatinization, Hydrothermal treatment*

Synthesis of panose-type oligosaccharides derived from four disaccharides with different glycosidic linkages and its application

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The growing interest in blood glucose regulation and low glycemic responses has increased the demand for slowly digestible carbohydrates. Starch-based oligosaccharides, composed primarily of α-1,4 and α-1,6 linkages, are readily hydrolyzed by digestive enzymes in the human body. Therefore, designing glycan structures containing non-digestible glycosidic linkages such as α-1,2, β-1,4, and β-1,6 which are resistant to human digestive enzymes, is necessary. In this study, novel panose-type oligosaccharides bearing both digestible α-1,6 and non-digestible glycosidic linkages were enzymatically synthesized using α-1,6-transglucosidase from Thermoanaerobacter thermocopriae (TtTG) with four disaccharides as acceptors: kojibiose, palatinose, cellobiose, and gentiobiose. DP3 and DP4 oligosaccharides were isolated from each reaction, and their digestibility was evaluated using mammalian α-glucosidase. Among the tested products, oligosaccharides derived from kojibiose showed the lowest digestibility, followed in increasing order by those derived from cellobiose, gentiobiose, and palatinose. These findings indicate that the type of glycosidic linkage in the acceptor disaccharide significantly influenced the digestibility of oligosaccharides produced via enzymatic transglucosylation.

Keyword: *Panose-type oligosaccharides, non-digestible glycosidic linkages, digestibility*

ENGINEERING STARCH-BASED SUPRAMOLECULAR ASSEMBLIES THROUGH ENZYMATIC DEBRANCHING

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Starch is one of the most abundant and versatile biopolymers used in food and industrial applications. Enzymatic debranching of starch generates short linear glucan chains that can spontaneously reassociate into ordered supramolecular structures through self-assembly. This approach provides a promising strategy for designing starch-based materials with tailored structures and functionalities without chemical modification. This presentation will highlight recent advances in the design and engineering of starch-based supramolecular assemblies generated through enzymatic debranching. Particular attention will be given to the mechanisms governing glucan self-assembly and the influence of processing and formulation conditions on structural organization across multiple length scales. The resulting changes in crystalline architecture, hydration characteristics, rheological behavior, and colloidal stability will be discussed in relation to their functional performance. Strategies for modulating assembly behavior through molecular modification and biopolymer incorporation will also be presented, demonstrating how structural organization can be tailored to achieve desired functionalities. Finally, the potential applications of these glucan assemblies as food-grade delivery systems and functional carbohydrate materials will be discussed. This work demonstrates the potential of enzymatic debranching as an approach for controlling glucan self-assembly and developing starch-based materials with tunable properties and diverse applications.

Keyword: *Enzymatic debranching, Starch, Short-chain glucans, Self-assembly, Glycoscience*

TRANSLATE HERBAL TRADITION TO SUSTAINABLE SOLUTION: AN EXPEDITION ON THE INTERFACE OF FOOD

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In response to the challenges of climate change, a global shift from animal-based to plant-based diets has been proposed as a key strategy for creating a more sustainable food system. Yet food is more than nutrition; it shapes identity, culture, and wellbeing. While substantial progress has been made in improving the safety and nutritional quality of alternative proteins and fats, challenges related to taste and uncertainties about long-term health effects continue to limit their wider adoption.

Food traditions offer valuable knowledge on balancing nutrition, health, and sensory enjoyment. The Chinese herbal tradition, where food is often regarded as medicine, is a particularly rich source of inspiration. At Leeds, we are investigating how insights from herbal traditions can inform modern food technologies, building on extensive research into the nanostructures and bioactivities of tea, herbal decoctions, and traditional soups.

This research explores food-body interactions across multiple levels, from sensory perception, digestion, and metabolism to tissue, cellular, and molecular processes. Particular attention is given to interactions among food components at oil-water interfaces in colloidal systems. Through this interdisciplinary approach, the work seeks to translate traditional wisdom into scientifically grounded, sustainable solutions for the future of food.

Keyword: *Food nanostructure, taste, cell signalling, gut health, sustainable food system*

END OVER END (EOE) ROTATIONAL VS EOE INTERMITTENT OSCILLATION AGITATION THERMAL PROCESSING: EFFECTY ON THE HEAT TRANSER AND QUALITY OF PRODUCS IN GLASS JARS

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Two commercial thermal processing concepts were compared: End-over-end (EOE) rotation (currently widely used) vs end-over-end oscillation. Studies were carried out with food simulating materials (Nylon) and radish in glass jars. A thermocouple equpped particle was used to gather transient temperatures in the glass jar filled with particles and 2% brine. Processing conditions were: 115, 120 and 125°C and rotational speeds, 10 and 30 RPM. The glass jars were hot filled, sealed and placed inside the retort. For continuous EOE, the basket was rotated normally at a fixed RPM, while for the oscillatory EOE, it was set to reverse rotation direction every 2 min. Time-temperature data were used compute heat penetration paramters (f_h, j_{ch}) and the process time for a target lethality, which were used to compare the two modes. Tests were subsequently carried out using freshly radish and product quality evaluated.

Results demonstrated that EOE oscillation process generally resulted in better heat transfer rates, shorter process times and better quality. EOE continuous rotation performed slightly better at the lower RPMs, but best results for quality were achieved with oscillatory EOE processing at 30 RPM and 125^{o}C, demonstrating a better scope for the adaptation of oscillatory EOE for thermal processing applications.

Keyword: *Thermal processing, Optimization, Quality, Retort, Novel processing*

Synthesis of tributyrin and tripropionin and their alleviative effects on colitis and gut microbiota in mice

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Butyrate and propionate are two major short chain fatty acids produced in the large intestine and play an important role in gut health. However, their undesired smell and biochemical properties limit their direct application as a dietary supplement. To overcome these, we synthesized odorless tributyrin (Tb) and tripropionin (Tp) using glycerol, butyric acid or propionic acid as substrates and acidic ionic liquids as a catalyst. The production rate was more than 93 %. To test their effect on gut health, 0.5 % and 1 % Tb and Tp were added into diets. It was found that Tb and Tp supplementation could significantly alleviate the colitis symptoms in mice, improve the integrity of gut barrier, modulate inflammatory response. Moreover, 1% Tb and Tp supplementation could restore the gut microbiota diversity, and reconstruct the composition. Furthermore, the protective effect of Tb and Tp on colitis was dampened after depleting gut microbiota. Fecal microbiota transplantation confirmed that Tb and Tp-altered gut microbiota contribute to the protection against colitis. The present study was the first time to use the newly developed acidic ionic liquid catalyst to synthesize Tb and Tp. It was concluded that Tb and Tp could be developed as dietary supplements for gut health.

Keyword: *Tributyrin, Tripropionin, SCFAs, Gut microbiota, Colitis*

FROM ENZYME INSIGHT TO INDUSTRY IMPACT: OUR STRATEGY BUILT ON THE α-AMYLASE FAMILY

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We have developed unique new functional materials and ingredients by exploring the catalytic functions of enzymes belong to α-amylase family. We found that branching enzymes catalyze not only intermolecular but also intramolecular transglycosylation and developed highly-branched cyclic dextrin, Cluster Dextrint^{TM}, by utilizing the intramolecular transglycosylation. We also developed a new method to synthesize glycogen by using three enzymes, sucrose phosphorylase, glucan phosphorylase, and branching enzyme. This synthetic approach enables us to control the molecular mass and particle diameter of glycogen, resulting in glucan dendrimers of various sizes. We are currently evaluating glucan dendrimer as potential drug delivery system carrier. We discoered that large cyclic-α-1,4-glucans, cycloamylose with DP ranging from 17 to 400, can be produced from amylose via intramolecular transglysocylation by 4-α-glucanotransferase. We also achieved in industrial-scale production of completely liner amylose, Bioamylose^{TM}, with very narrow molecular mass distribution, using the combined action of sucrose phosphorylase and α-glucan phosphorylase. Bioamylose^{TM} is currently used in fine chemical industries. In addition, we developed phosphoryl oligosaccharides of calcium, POs-Ca^{TM}, from potato starch for enhancing remineralization of early-stage dental caries. Using Super Photon ring 8 GeV, Spring-8, we futhter revealed that subsurface lesions remineralized by POs-Ca were recrystallized into hydroxyapatite.

Keyword: *α-amylase family, intramolecular transglycosylation, highly-branched cyclic dextrin, glucan dendrimer, cycloamylose*

STARCH-POLYPHENOL COMPLEXES AS LOW-GLYCEMIC FUNCTIONAL FOOD INGREDIENTS FOR TYPE 2 DIABETES MANAGEMENT

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Type 2 diabetes mellitus (T2D) remains a major global metabolic challenge, highlighting the need for food-based strategies to reduce postprandial glycemic excursions and improve long-term glucose homeostasis. As starch is a primary dietary energy source, increasing slowly digestible starch and resistant starch (RS) in staple foods offers a promising approach to stabilize glycemic responses and support gut health. However, many starch-based foods are rich in rapidly digestible starch but low in RS, which may contribute to adverse metabolic outcomes. Therefore, developing starch-based ingredients with enhanced RS content and metabolic functionality is an important challenge for the food industry. This presentation explores starch–polyphenol complexes as low-glycemic food ingredients, with a focus on starch–epigallocatechin gallate (EGCG) complexes as RS. Our studies show that starch botanical origin, polyphenol molecular structure, and EGCG addition sequence differentially regulate starch digestion kinetics, α-amylase inhibition, glucose transport through SGLT1 and GLUT2, and RS formation. Furthermore, corn starch–EGCG complexes improved glucose homeostasis in db/db mice by remodeling the gut microbiota, modulating bile acid signaling, enhancing intestinal barrier function, and restoring hepatic glycogen metabolism. These findings provide a structure-based framework for designing starch–polyphenol functional foods for T2D management.

Keyword: *Starch-polyphenol complexes, Gut microbiota, Type 2 diabetes*

EFFECTS OF BAICALIN ON MITOCHONDRIAL FUNCTION AND CIRCADIAN REGULATION IN DEXAMETHASONE-INDUCED SKELETAL MUSCLE ATROPHY

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Skeletal muscle atrophy is characterized by loss of muscle mass and function, accompanied by mitochondrial dysfunction and circadian disruption. Baicalin, a flavonoid derived from Scutellaria baicalensis, has antioxidative and anti-inflammatory properties, but its effects on glucocorticoid-induced muscle atrophy and circadian regulation remain unclear. Male C57BL/6 mice were treated with dexamethasone (Dex; 20 mg/kg, i.p.) and orally administered baicalin (100 mg/kg). Body weight, muscle fiber size and type composition, mitochondrial oxidative capacity, and expression patterns of atrophy- and myogenic differentiation-related genes were assessed. Dex significantly reduced final body weight and increased the proportion of small-sized fibers in the gastrocnemius, plantaris, and soleus muscles. Baicalin partially attenuated these changes without significantly affecting fiber type composition. Dex also reduced mitochondrial oxidative capacity at ZT18 which is active time and disrupted time-dependent expression patterns of genes associated with muscle atrophy and myogenic differentiation. Baicalin partially restored mitochondrial oxidative capacity and rhythmic expression of genes related to muscle atrophy (Atrogin-1 and MuRF1), myogenic differentiation (Pax7 and Myogenin), and the core circadian clock (Bmal1, Clock, Per2, and Cry2). These findings suggest that baicalin may alleviate Dex-induced skeletal muscle atrophy by modulating mitochondrial function and circadian-related gene regulation, supporting its potential role in preserving skeletal muscle health.

Keyword: *Circadian rhythm, Skeletal muscle atrophy, Baicalin, Mitochondrial function, Oxidative Stress*

Balancing Technological Innovation with Regulatory Compliance in Cereal and Pulse Milling Products

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The global food system is at a critical juncture, tasked with balancing the urgent need for nutritional density with the imperatives of environmental sustainability. Within the theme of "Global nutrition, food security and policy", this presentation explores the transformative impact of recent Brazilian regulatory shifts on cereal and pulse processing. Central to this discussion is the implementation of RDC 493/2021 and IN 92/2021 by the Brazilian Health Regulatory Agency (ANVISA). These landmarks in food law redefined the criteria for "whole grain" labeling and percentage-based requirements. It will be examined how these regulations compel innovation in the milling and formulation of gluten free alternatives cereals, as well as emerging alternative flours derived from pulses. By mandating that "whole" ingredients must be present in quantities greater than refined counterparts and maintaining their original bran and germ proportions ANVISA has created a more transparent marketplace. However, this also presents significant technological hurdles, such as mitigating sensory challenges in high-fiber pulse-based innovations; adapting supply chains to ensure traceability and compliance. Ultimately, by aligning Brazilian industry standards with global health goals, these pathways ensure that "innovative" products are authentically health promoting and contribute to a more sustainable, plant-based products forward food future.

Keyword: *grain processing, whole grain labeling, pulse-based flours, Milling and formulation, Sustainable food systems*

INTEGRATING REGULATION AND UPCYCLING IN FOOD SCIENCE FOR A SUSTAINABLE TOMORROW

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University of Sao Paulo

The aim is to demonstrate how food science and technology are shaping the future by integrating regulatory frameworks with innovative upcycling practices, creating sustainable and resilient food systems. Brazil has recently updated its solid waste legislation (National Solid Waste Plan 2024/25 and Law No. 15.088/2025), reinforcing circular economy principles and waste valorization. The food sector is strategic, generating large volumes of by-products that can be transformed into functional ingredients and sustainable solutions. Regulation ensures safety, traceability, and sustainability, while innovation drives new products and processes. Current example of research in our Group is cocoa replacer from upcycled materials. Fundamental points can be exploited by regulatory landscape, innovation in upcycling, scientific and technological impact, challenges and opportunities. Aspects of international relevance are highlights how emerging economies like Brazil are aligning public policies and applied science to address global challenges of waste reduction and sustainability; contributes to the debate on how regulation and innovation can work together to transform waste into value-added resources. We intend to emphasize that the future of food science depends on the ability to integrate regulation and innovation, turning waste into resources and promoting healthier, more sustainable, and resilient food systems.

Keyword: *Food System, Sustainability, Food Science and Technology, Nutrition, Regulation*

Functional Ingredients and Novel Foods in the Future of Food in Latin America

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Latin America is emerging as a dynamic region in the development of functional ingredients and novel foods, driven by its rich biodiversity, traditional dietary practices, and growing scientific and technological capabilities. This presentation explores current trends in research and innovation across the region, focusing on bioactive compounds derived from traditional agri-food resources, novel processing technologies, and the development of next-generation food products.

Significant progress has been made in identifying functional ingredients from native plant and animal sources and incorporating them into novel food formulations with targeted nutritional and health benefits. Advances in food science are enabling the development of products that not only meet nutritional requirements but also respond to growing consumer expectations regarding sustainability, wellness, and functionality.

However, the development of functional ingredients and novel foods in Latin America faces challenges, particularly in establishing clearer frameworks for defining novelty, assessing safety, and substantiating associated health claims. Harmonized approaches could strengthen consumer trust, facilitate innovation, and support market access.

Multidisciplinary collaboration among academia, industry, and regulatory stakeholders is essential to foster responsible innovation and ensure the sustainable growth of the sector, positioning Latin America as an increasingly relevant contributor to the future of global food systems.

Keyword: *Novel foods, Bioactive compounds, Sustainability, Functional ingredients*

HESPERETIN AMELIORATES BRAIN AGING BY RESTORING CIRCADIAN GENE EXPRESSION AND ATTENUATING NEUROINFLAMMATION IN D-GALACTOSE-INDUCED AGING MICE

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Brain aging is accompanied by disruption of circadian regulation, which may contribute to neuronal dysfunction and neuroinflammation. Hesperetin, a natural flavonoid, has anti-oxidant and anti-inflammatory effects; however, its role in brain circadian regulation during aging remains unclear. This study investigated the effects of hesperetin (100 mg/kg body weight) in a D-galactose (D-gal; 150 mg/kg body weight, i.p.)-induced aging mouse model. H&E staining showed neuronal shrinkage and increased pyknotic neurons in the cortex and hippocampus of D-gal-treated mice, whereas these histological abnormalities were attenuated by hesperetin. Serum IL1β and IL6 levels were elevated by D-gal and significantly reduced by hesperetin. In the cortex, hesperetin enhanced ZT (zeitgeber) 6–ZT18 differences in Per2, Cry2, and Rev-erbα expression and normalized the inverted Npas2 expression pattern observed after D-gal treatment. In the hippocampus, D-gal markedly altered the ZT6–ZT18 expression patterns of Cry2 and Rev-erbα, which were restored toward control patterns by hesperetin. Hesperetin also recovered NeuN and Map2 expression and attenuated increases in GFAP, CD68, Il1b, and Tnfa. These findings suggest that hesperetin may alleviate brain aging by restoring diurnal clock-gene expression and reducing neuronal damage and neuroinflammation, highlighting circadian regulation as a potential mechanism underlying its neuroprotective effects in the aging brain.

Keyword: *Brain aging, Hesperetin, Circadian rhythm, Neuroinflammation, Neuroprotective*

Microbiome modulation of sourdough bread produced with Levilactobacillus brevis ED25 and Limosilactobacillus reuteri E81 as potential starter cultures

enes Dertli [*1], Mukadder Aksoy[2], Zuhal Alkay[2], Tekmile Cankurtaran-Kömürcü[2], Stephen R. Lindemann[3], Yunus Emre Tunçil[2]

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In this study sourdoughs and sourdough breads were produced with Levilactobacillus brevis ED25 and Limosilactobacillus reuteri E81 as potential starter cultures and the role of sourdough breads for the microbiome modulation was tested. For this, four types of sourdough starters as Type I, Type II, Type III, and Type IV were produced and sourdough breads were subjected to in vitro fecal fermentation followed by microbiome analysis using 16S rRNA based gene sequencing and distinct results were obtained. For instance using Levilactobacillus brevis ED25 increased the proportion of Roseburia and Ruminococcaceae groups as high butyrate producer groups and importantly butyrate levels for this sample was indeed higher. The Type IV fermentation system, along with Liml. reuteri and combination starter culture applications, provided higher α-diversity and species richness. In contrast, β-diversity analyses revealed that different sourdough strategies and flour types did not lead to distinct separations in microbial community composition, indicating that the effects occurred primarily at the level of microbial diversity and species richness. Results of this study demonstrated the importance of the starter type as well as utilization of different cultures for the microbiome modulation role of sourdough.

Keyword: *sourdough; mirobiome*

ANTIMICROBIAL SCREENING OF NEPHROLEPIS EXALTATA EXTRACT AND ALGINATE FORMULATION FOR NATURAL FOOD PRESERVATION

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Goztepe Ihsan Kursunoglu High School

Plant-derived antimicrobials offer an accessible alternative to synthetic food preservatives, yet screening has concentrated on culinary and medicinal species. Nephrolepis exaltata (Nephrolepidaceae), an ornamental fern cultivated worldwide, has not previously been evaluated for preservation applications. Aerial parts were shade-dried, milled, and extracted with 70% ethanol by ultrasonication, then concentrated by rotary evaporation. A film-forming formulation containing 10% extract was prepared with sodium alginate, glycerol, and ethanol. Minimum inhibitory concentrations were determined by broth microdilution over 200–0.195 mg/mL against inocula adjusted to 0.5 McFarland, using Mueller–Hinton broth for bacteria and RPMI for yeast, with tigecycline and voriconazole as positive controls and triphenyltetrazolium chloride as viability indicator. Extract values were 50–100 mg/mL for Gram-positive bacteria (Staphylococcus aureus, Enterococcus faecalis, Staphylococcus epidermidis), 75–125 mg/mL for Gram-negative bacteria (Acinetobacter baumannii, Pseudomonas aeruginosa), and 50 mg/mL for Candida albicans. Formulation approximately doubled these values. Activity was weak against established interpretive criteria, though consistent Gram-positive and antifungal selectivity was observed. Determinations were single; replication is in progress. These findings establish a first activity baseline for an unscreened species and indicate that bioassay-guided fractionation, rather than crude extract application, would be required for practical use.

Keyword: *natural preservatives, antimicrobial activity, minimum inhibitory concentration, Nephrolepis exaltata, sodium alginate*

(3) Voxel-Level Multi-Dimensional Food Fabrication: Structural Reverse Engineering and Bio-Orchestration of Biomaterial Scaffolds for Next-Generation Alternative and Cultivated Proteins

Jin-Kyu Rhee *

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This presentation explores voxel-level multi-dimensional food fabrication strategies designed to bridge micro-scale cellular environments with macro-scale organoleptic textures for next-generation alternative and cultivated proteins. By combining structural reverse engineering with precise biophysical convergence, we develop anisotropic hydrogel scaffolds using edible biomaterials. Advanced rheological optimization of bio-inks enables micro-dispensing with high spatial fidelity and Z-axis stacking stability, creating controlled spatial architectures that promote targeted cell alignment, proliferation, and tissue maturation. Furthermore, multi-dimensional structural design principles are applied across the entire chronological food experience—encompassing thermal processing, cooking transformation, oral shear mechanics, mastication, and post-ingestion digestion. These engineered biomaterial matrices provide scalable, sustainable platforms for replicating the fibrous texture, water-holding capacity, and nutritional profile of conventional meat. By integrating bio-orchestration into 3D food printing systems, this framework accelerates the commercialization of consumer-accepted cultivated meats and hybrid protein constructs, establishing a sustainable LOHAS ecosystem.

Keyword: *3D Food Printing, Biomaterial Scaffolds, Structural Reverse Engineering, Alternative and Cultivated Proteins, Bio-Orchestration*

ID: 1377

Fermentation of Traditional Turkish Coffee with Kombucha

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Coffee kombucha is attracting a lot of attention in the functional food industry. Current studies tend to focus on filtered coffee or spent coffee grounds. However, the potential of Turkish coffee as a kombucha substrate has not yet been investigated, despite its high antioxidant capacity and the fact that it is brewed with its finely ground particles. This study aims to demonstrate the continuous extraction of bioactive compounds from suspended coffee grounds by fermenting unfiltered Turkish coffee with a SCOBY. Traditionally prepared sugared Turkish coffee was fermented with a SCOBY at 25 °C for 7–14 days, and the pH and organic acid profiles were monitored post-fermentation. Total phenolic content and the phenolic profile were analysed via HPLC, and the levels of 5-hydroxymethylfurfural (HMF) and caffeine were determined. The fermentation process triggered the continuous release of phenolic compounds from the coffee grounds, thereby increasing the total antioxidant capacity. The coffee matrix supported lactic acid production, balancing the sharp acetic acid taste and reducing the final caffeine content. This study presents a novel product that combines traditional Turkish coffee culture with modern trends in fermented beverages.

Keyword: *Turkish coffee, Kombucha, Fermentation, Phenolic compounds*

Proximate composition and Sensory Acceptability of Plant-Based Yoghurt Analogues from Mixtures of Soymilk and Pigeon Pea Milk

Dorothy Arukwe * **, Blessing Offia Olua, Ijeoma Okereke**

Michael Okpara University of Agriculture, Umudike

Introduction: Lactose intolerant individuals avoid dairy-based yoghurt, while the lactose free alternatives are expensive. This study evaluated the proximate composition and sensory properties of plant-baaed yoghurt analogues produced from mixtures of soybean and pigeon pea milks.

Methodology: Pigeon pea and soybean milks were mixed into four ratios: PSY0 (0:100), PSY1 (10:90), PSY2 (20:80), and PSY3 (30:70). Cow milk (PSY4) served as the control. All the milks samples were fermented to produce yoghurts, which were then assessed for proximate composition and sensory acceptability using standard analytical methods.

Findings: Protein, ash, fat and carbohydrate contents decreased as pigeon pea milk increased, while moisture rose. However, the plant-based yoghurt had higher protein, fat, ash abd moisture levels than the cow milk yoghurt. Energy values declined with higher pigeon pea milk inclusion and remained below those of the cow milk yoghurt. Sensory evaluation showed that the cow milk yoghurt (PSY4) was most preferred, followed by the soy-only sample (PSY0) and sample PSY1 across all attributes assessed.

Conclusion: Overall, acceptable yoghurts were produced soy-pigeon pea blends. These plant-based yoghurt analogues offer nutritionally valuable, dairy-free options suitable for lactose-intolerant individuals and vegans, and are therefore recommended.

Keyword: *Pigeon pea, soy milk, plant-based yoghurt, fermentation, sensory acceptability*

Innovation in the method of high-efficiency and low-damage physical mutagenesis of active biomaterial microbial strains

Haile Ma *

Jinangsu University

Mutagenesis is an important means of improving the performance of microbial strains. UV mutagenesis is the most commonly used physical mutagenesis method, but the strong killing of UV radiation is a double-edged sword, while inducing cell mutations, it also severely damages their basic metabolic capacity. Finally, a severely damaged mutagenesis cell is obtained. In contrast, the Adaptive Laboratory Evolution (ALE) is a non-damaging mutagenesis method, but the mutation process takes too long, with some even requiring decades

To solve the above problem, this paper established a new mode of dual-light source combined mutagenesis with a "UV-laser" temporal sequence. It broadens the mutation spectrum and increases the probability of positive mutagenesis by increasing a wavelength light, and reduces UV damage to cells through the repair effect of the laser. Addressing the low efficiency of ALE method, this paper established a new method of Ultrasound-Assisted Adaptive Laboratory Evolution (UAE), which utilizes low-frequency ultrasound to strengthen the stress effect environmental factor changes on microbial cells, thereby accelerating the process of cell DNA mutation.

This paper verified the effect of laser in reducing UV damage through UV-laser mutagenesis of Bacillus velezensis, and ultrasound in shortening ALE time through UAE mutagenesis of Aspergillus oryzae.

Keyword: *microbial strain, high efficiency, low damage, physical mutagenesis*

The key hazardous characteristics of peracetic acid-induced viable but non-culturable Listeria monocytogenes

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Peracetic acid (PAA) is widely used for disinfecting fresh agricultural products, yet its sublethal effects on foodborne pathogens remain poorly studied. This study aimed to investigate whether PAA treatment completely kills Listeria monocytogenes or induces it into a viable but non-culturable (VBNC) state, and to analyze the associated virulence phenotypes. Four strains (CICC23929, CICC21578, CICC21542, and CICC21532) were exposed to varying PAA concentrations ranging from 50 to 500 mg/L. Flow cytometry combined with plate counting confirmed the induction effect of PAA. Results showed that specific PAA concentrations successfully induced all strains into the VBNC state. The VBNC bacteria retained expression of key virulence genes (prfA, hly, inlA, inlB, actA, iap, flaA, plcA, inlC) and virulence proteins (PrfA, InlA), and exhibited significant cytotoxicity toward human colon epithelial cells Caco-2 in plaque assays. Furthermore, VBNC bacteria demonstrated strain-specific enhanced resistance to environmental stresses (low temperature, acidity, osmotic pressure, and disinfectants), as well as increased tolerance to multiple antibiotics. Overall, PAA-induced VBNC L. monocytogenes retains substantial pathogenic potential and displays heightened stress and antibiotic tolerance, highlighting a potential food safety risk and underscoring the need to improve detection and control strategies beyond conventional culturing methods.

Keyword: *Listeria monocytogenes, Viable but non-culturable, Peracetic acid, Pathogenicity, Stress resistance*

RATIOMETRIC SELF-CALIBRATING CONDUCTIVE HYDROGEN-BONDED ORGANIC FRAMEWORK FOR RELIABLE ARA H 1 BIOSENSING

Maojie Hu * **, Youfa Wang**

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Ara h1 is the primary allergen in peanuts, responsible for triggering most allergic reactions, many of which can be severe. Thus, there is an urgent need to develop accurate and sensitive detection methods to protect allergic populations. However, most reported detection methods yield a single signal output, which may substantially compromise result accuracy. Herein, we developed a novel self-calibrating ratio electrochemical immunosensor for ultrasensitive Ara h 1 detection, leveraging a signal amplification strategy based on a conductive porous hydrogen-bonded organic framework (HOF). To our knowledge, this is the first application of a ratio electrochemical biosensor in food allergen detection. Due to the high porosity, large specific surface area, and superior electrochemical properties of HOF, the biosensor developed using a dual-signal ratio analysis method demonstrated significantly improved sensitivity and detection accuracy, achieving a detection limit as low as 1.29 ng/mL, outperforming most previously reported Ara h1 biosensors. Furthermore, the developed biosensor was validated through testing with 20 real samples and spiking experiments, confirming its potential and reliability for actual sample detection. This study opens new avenues for the precise detection of Ara h1 and other sensitizing proteins, providing a promising rapid analytical tool for managing peanut allergies.

Keyword: *Peanut allergy, Ara h 1, Hydrogen bonding organic framework, Ratio biosensor, Detection*

Dry Fractionation as a sustainable alternative for protein concentrates production

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Air classification is a sustainable dry fractionation technology that enables the production of plant protein concentrates without the use of water or chemical solvents. Compared with conventional wet extraction processes, it reduces water consumption, energy demand and wastewater generation, making it an environmentally friendly alternative for obtaining plant-based protein ingredients.

The aim of this study was to apply ultrafine milling and air classification to faba bean, lupin, amaranth, green pea and grass pea flours to evaluate their protein enrichment potential. Ultrafine milling reduced particle size and enhanced the separation efficiency during air classification, generating fine and coarse fractions with distinct compositional profiles.

Results showed a significant enrichment of protein in fine fractions. While the initial protein content of the raw materials was approximately 30%, the protein concentration in the fine fractions reached values of up to 60% after fractionation.

These findings demonstrate that dry fractionation by air classification is an effective strategy for producing protein-enriched fractions from plant materials. Across all matrices, the finest fractions
showed the highest protein content, whereas the coarser fractions were enriched in carbohydrates.
Furthermore, the initial milling step was identified as a key factor affecting air classification efficiency, as
particle size distribution directly influenced component separation and enrichment.

Keyword: *Air classification, milling processing, protein concentrate*

Improving Process for Extracting Oleosomes from Pumpkin Seeds: Physical Stability Through High-Pressure Homogenization

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Oleosomes are lipid storage structures present in oilseeds and nuts, consisting of triglycerides surrounded by a phospholipid monolayer and proteins, which provide high physicochemical stability. Conventional oil extraction methods usually destroy these structures. Therefore, the development of extraction processes capable of preserving oleosomes is of increasing interest to produce natural emulsions from byproducts. These oleosomes can be obtained without chemical agents or energyintensive emulsification processes. However, these emulsified systems tend to destabilize. Therefore, this study evaluated the use of high-pressure homogenization (HPH) to improve the final stability of these structures.

Extraction process consisted of seed hydration, cold pressing, HPH of liquid fraction and centrifugation. That process was compared with a control sample without HPH. The results proved that samples treated with HPH achieved more homogeneous distribution with smaller particles, which led to the subsequent recovery of an oleosome with a higher protein content—a factor that could affect the stability. These results were confirmed by microscopic analysis, which revealed that oil droplets were protected by a higher protein content at the interface, thereby promoting greater physical stability. The evolution of these oleosome-rich emulsions stored under refrigerated conditions was also analysed, finding greater structural integrity in those produced with HPH process.

Keyword: *oleosomes, high-pressure homogenization, Emulsion stability*

An Ultrasensitive Strategy for Milk Allergen Monitoring by Integrating Magnetic Enrichment and DNAzyme-Assisted Electrochemical

YAJIE TANG *

Key Laboratory of Environmental Medicine and Engineering, Ministry of Education, and Department of Nutrition and Food Hygiene, S

Milk allergy is one of the most common food allergies worldwide, and β-lactoglobulin (β-LG), the major allergenic protein in bovine milk, poses a potential health risk even at trace concentrations. Therefore, the development of rapid, sensitive, and reliable analytical methods for β-LG monitoring is of great importance for food safety management. In this study, an ultrasensitive electrochemical aptasensor was developed by integrating magnetic separation enrichment with Pb^{2+}-dependent DNAzyme cyclic amplification for β-LG detection. A thionine-loaded copper-based covalent organic framework (Cu-COF@Thi) was employed as an electroactive platform owing to its large surface area and efficient electron-transfer capability. Upon specific recognition of β-LG, complementary DNA released from magnetic beads initiated the formation of an active DNAzyme in the presence of Pb^{2+}, which continuously cleaved substrate strands immobilized on the electrode surface. This process resulted in the dissociation of Cu-COF@Thi from the electrode and a significant decrease in the electrochemical signal. By combining target enrichment, catalytic signal amplification, and a signal-off sensing strategy, the proposed platform provides a promising approach for highly sensitive food allergen monitoring in complex food matrices and offers potential applications in food quality control and food safety surveillance.

Keyword: *β-Lactoglobulin, electrochemical aptasensor, covalent organic framework, DNAzyme, food allergen detection*

An Ultrasensitive Strategy for Milk Allergen Monitoring by Integrating Magnetic Enrichment and DNAzyme-Assisted Electrochemical

YAJIE TANG [*1], **JIN WANG**[2]

[1] *Department of Nutrition and Food Hygiene, School of Public Health, Southeast University, Nanjing, China*
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Milk allergy is one of the most common food allergies worldwide, and β-lactoglobulin (β-LG), the major allergenic protein in bovine milk, poses a potential health risk even at trace concentrations. Therefore, the development of rapid, sensitive, and reliable analytical methods for β-LG monitoring is of great importance for food safety management. In this study, an ultrasensitive electrochemical aptasensor was developed by integrating magnetic separation enrichment with Pb^{2+}-dependent DNAzyme cyclic amplification for β-LG detection. A thionine-loaded copper-based covalent organic framework (Cu-COF@Thi) was employed as an electroactive platform owing to its large surface area and efficient electron-transfer capability. Upon specific recognition of β-LG, complementary DNA released from magnetic beads initiated the formation of an active DNAzyme in the presence of Pb^{2+}, which continuously cleaved substrate strands immobilized on the electrode surface. This process resulted in the dissociation of Cu-COF@Thi from the electrode and a significant decrease in the electrochemical signal. By combining target enrichment, catalytic signal amplification, and a signal-off sensing strategy, the proposed platform provides a promising approach for highly sensitive food allergen monitoring in complex food matrices and offers potential applications in food quality control and food safety surveillance.

Keyword: *β-Lactoglobulin, electrochemical aptasensor, covalent organic framework, DNAzyme, food allergen detection*

COMPARATIVE EFFECTIVENESS OF FERROUS SULFATE VERSUS FERROUS FUMARATE IN YINGYANGBAO FOR IMPROVING ANEMIA IN INFANTS

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National Institute for Nutrition and Health, Chinese Center for Disease Control and Prevention, Beijing, China

Objective To compare the effectiveness of Yingyangbao with ferrous sulfate plus vitamin C versus ferrous fumarate in improving anemia in infants aged 6-14 months, and to provide evidence for optimizing iron formulation in Yingyangbao for rural areas in China.

Methods A total of 494 children aged 6-14 months were enrolled and assigned to intervention (n=264) or control (n=230). Controls received Yingyangbao with ferrous fumarate plus NaFeEDTA. The intervention group received Yingyangbao with ferrous sulfate plus NaFeEDTA and vitamin C (35 mg/d). Both received 7.5 mg/d iron for 12 months. Hemoglobin was measured at baseline, 3, 6, and 12 months.

Results No baseline differences in hemoglobin or anemia prevalence were found. At 3 months, hemoglobin in the intervention group was higher in children aged 12-14 months and 6-14 months ($P<0.01$), and anemia prevalence was lower in those aged 9-11 months and 6-14 months ($P<0.01$). At 6 months, no differences were found. At 12 months, hemoglobin remained higher in the intervention group ($P<0.05$), but anemia prevalence was not significantly different (6.0% vs. 3.8%, $P>0.05$).

Conclusion Yingyangbao with ferrous sulfate plus vitamin C was superior to ferrous fumarate in improving infant anemia, with earlier onset and greater hemoglobin elevation, supporting optimization of Yingyangbao iron formulation.

Keyword: *infants, Yingyangbao, iron deficiency anemia, ferrous sulfate, ferrous fumarate*

MICROALGAE AS PROTEIN-RICH FOOD BIOMASS – CHALLENGES AND OPPORTUNITIES

Shao Quan Liu *

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Microalga is one of the attractive protein-rich food biomass producers to tackle climate changes, environmental problems, and food security given its efficiency and productivity compared to crops such as soybeans. Cultivation of microalgal biomass through photosynthesis has a low cost but needs large areas of land, which competes with traditional crops. In contrast, cultivation of heterotrophic microalgae under dark conditions seems to be a promising option in city states and land-scarce regions/countries. Food processing by-products (or "wastes") contain rich nutrients that may serve as the inexpensive medium for cultivating heterotrophic microalgae. This talk covers the development of media derived from soy whey and brewer's spent grain hydrolysates for microalgal growth using Auxenochlorella protothecoides as a case study. This new approach provides a low-cost way of cultivating microalgae as protein-rich food biomass for the circular bioeconomy and sustainable foods. Challenges such as biomass yield, digestibility and sensory issues are also touched upon.

Keyword: *Microalgae, biomass, protein, side stream, sustainability*

(2) Visualizing and Predicting Quality Changes in Fresh Produce to Support Postharvest Loss Reduction in Global Supply Chains

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Institute of Global Innovation Research, Tokyo University of Agriculture and Technology, Japan

Fresh produce is distributed through increasingly long and complex supply chains, where temperature fluctuation, mechanical stress, and biological variability can accelerate quality deterioration before products reach consumers. This presentation introduces our studies on visualizing, assessing, and predicting quality changes in fruits and vegetables to support sustainable postharvest management. Several case studies will be presented, including the evaluation of pre-cooling as a key practice for maintaining quality during distribution, the prediction of internal quality attributes from peel color information using random forest models, the application of optical and spectroscopic techniques such as image analysis and fluorescence fingerprinting for quality assessment, and the development of cushioning materials that contributed to the feasibility of sea shipment of fully ripened fruit by reducing mechanical damage during transport. Export shipment trials, controlled storage experiments, and laboratory measurements were combined to evaluate changes in appearance, firmness, weight loss, soluble solids content, acidity, and other quality attributes. These approaches provide objective indicators for identifying critical handling factors, including temperature management and mechanical stress, and for improving distribution strategies. By linking measurement, prediction, and postharvest management, this work supports more sustainable and resilient fresh produce supply chains under the One Health framework.

Keyword: *Pre-cooling, Random Forest, Peel color, Fluorescence fingerprinting, Cushioning materials*

Strengthening Food Safety System in Indonesia's National Free Nutrition Meal Program (MBG)

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The National Free Nutrition Meal Program (MBG) represents a strategic national initiative to improve the nutritional status and learning capacity of Indonesian students. Given the scale and complexity of its implementation, establishing a robust and standardized food safety system is essential to prevent foodborne risks and ensure consistent meal quality. This project presents the development and implementation of a Comprehensive Food Safety System to support safe meal production within the MBG framework, piloted at SPPG Karangtempel, Semarang. The system encompasses systematic hazard identification, determination and monitoring of critical control points, standardized operational procedures, personal hygiene compliance, supplier verification, traceability mechanisms, documentation control, and internal audit processes. Emphasis is placed on preventive risk management, capacity building, and continuous monitoring to ensure consistent compliance among food handlers and supervisory personnel. By strengthening food safety governance at the production level, this initiative aims to minimize food safety failures, reduce the risk of contamination, and ensure that meals distributed to students are safe for consumption. The model developed at SPPG Karangtempel is designed to be scalable and adaptable, offering a practical framework for strengthening food safety assurance across MBG service units nationwide

Keyword: *Food Safety, Food Supply System, Global Frameworks, MBG*

(1) Antibiotic Use in Crop Production and Dynamics of Antibiotic Resistant Bacteria in Soils

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The globalization of food systems has increased the movement of agricultural products and raised concerns about the spread of antimicrobial resistance (AMR). While AMR has been widely studied in human medicine and livestock production, less is known about antibiotic use in crop production. Antibiotics such as streptomycin and oxytetracycline are used to control bacterial plant diseases, but their effects on soil microbial communities remain unclear.

We investigated the impact of antibiotic application during lettuce and onion cultivation on antibiotic-resistant bacteria and resistance genes in soil. Antibiotic treatment did not significantly change overall microbial community structure. However, the proportion of resistant bacteria increased in some bacterial groups. These isolates carried multiple resistance-related genes, and some were resistant to more than one antibiotic.

Our findings do not indicate that antibiotic application directly generates new resistance. Instead, the results suggest selective enrichment of resistant bacteria already present in soil. No clear evidence of plasmid-mediated horizontal gene transfer was detected.

Overall, antibiotic use in crop production may affect the abundance of resistant bacteria in soil, but its implications for human health remain uncertain. Further One Health-based research is needed to better understand AMR dynamics and support sustainable food production.

Keyword: *antibiotic use, antibacterial resistant bacteria, crop production, soil*

Levilactobacillus brevis ED25 and Limosilactobacillus reuteri E81 Improve the Technological and Nutritional Quality of Sourdough Bread

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The utilization of defined starter cultures in sourdough fermentation is essential for producing bread with consistent technological and nutritional quality. This study evaluated the effects of Levilactobacillus brevis ED25 and Limosilactobacillus reuteri E81, used individually or combined, on sourdough bread quality. Sourdoughs were prepared by spontaneous fermentation or inoculated with the selected starters. Microbial composition was assessed by plate counting and 16S rRNA sequencing, while bread was analyzed for physical, nutritional, and sensory properties. Scanning electron microscopy examined sourdough morphology. Starter-inoculated sourdoughs were dominated by lactic acid bacteria, whereas spontaneous fermentation contained higher levels of undesirable microorganisms, demonstrating effective microbial suppression by the starters. Sourdough fermentation increased total phenolics, flavonoids, antioxidant capacity, and soluble and total dietary fiber, while reducing phytic acid by approximately 27% compared with the control. The highest total dietary fiber (13.59%,d.b.) was observed in whole wheat bread produced with the combined starter culture. Fermentation also lowered the predicted glycemic index, particularly in starter-culture breads, indicating improved starch digestibility. Sensory evaluation showed that breads produced with Levl. brevis received higher scores for taste, aroma, and overall acceptability than those produced with Liml. reuteri. Overall, these starter cultures improved microbiological safety, nutritional value, technological performance, and sensory quality.

Keyword: *Sourdough bread, glycemic index, functional food*

VIABILITY EVALUATION OF LYOPHILIZED PURE CULTURES OF ACETIC ACID BACTERIA PRODUCING PHILIPPINE NATA DE COCO

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The viability of lyophilized pure cultures of cellulose-producing acetic acid bacteria (AAB) isolated from nata de coco mother liquors obtained from Alaminos, Laguna (APC); Malvar, Batangas (MPC); and Taguig, Metro Manila (TPC), was evaluated. Pure cultures were freeze-dried using skim milk as cryoprotectant, revived, and tested for their fermentation profile and capability to produce nata de coco at 3-month intervals for 9 months. The physicochemical properties of the fermentation medium (total soluble solids, pH, and percent total titratable acidity) as well as thickness, color, and texture of the nata de coco films produced were evaluated. Results showed that APC, MPC, and TPC had nonsignificant differences in physicochemical properties from their corresponding control at all time points tested. They remained capable of producing nata de coco films with the same properties as those produced by the control cultures, indicating their unchanged metabolic activity even with lyophilization. Cellulose thickness showed significant differences only between the lyophilized APC and control APC at Month 9. Meanwhile, color and texture properties showed no significant differences between the control and lyophilized samples throughout storage. Overall, the results evidenced that lyophilized nata-de-coco-producing pure cultures of AAB remain viable and maintain their cellulose-producing capability even with prolonged storage.

Keyword: *Lyophilization, acetic acid bacteria, microbial preservation, nata de coco, starter cultures*

Past, Present and the Future of Large-Scale Food Fortification in Nigeria

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Micronutrient deficiencies continue to be a public health problem, especially among children and women of reproductive age in Nigeria. The 2021 National Food Consumption and Micronutrient Survey (NFCMS) report has highlighed inadequate dietary intake of the micronutrients as one of the major challenge. For decades, Nigeria has considered and mandated Large-Scale Food Fortification (LSFF) as one of the cost-effective strategies to combat micronutrient deficiencies. Currently, salt, wheat flour, sugar, vegetable oil are mandatorily fortified with various micronutrients. Salt iodisation has been one of the most successful. However, the current efforts are hindered by challenges of quality premix supply, industry compliance, poor awareness to create demand, among others. As a result, the Country is considering additional strategies including additional LSFF vehicles like rice and buuollon. Efforts are also being invested to assess the impact of the current LSFF including modeling of different scenarios to identify the best strategy to ensure ignificant reduction of micronutrient deficiencies. This paper revises the policy, program and regulatory frameworks in Nigeria vis-a-vis industry compliance and consumer awareness and provide actionable recommendations.

Keyword: *Large-Scale Food Fortification, Micronutrient Deficiencies*

• Saltiness enhancement by depolymerized gum arabic

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Salt reduction maintaining the palatability has been an important issue for food science and technology. Mimicking the saltiness sensation through the mucin layer on the tongue, we set up a thin layer of mucin mixed with gum arabic (GA) on a polycarbonate membrane, added 60 mM NaCl to the donor compartment and KH_2PO_4 buffer (1.5 mL, pH 7.5) to the receptor compartment, and examined changes in sodium permeability. With decreasing Mw of GA, Na^+ permeability was found to increase. The peak around 200 nm in the CD spectrum, which reflects mucin's random coil structure, was halved when depolymerized GA was added, suggesting that the mucin coil loosened. The lowest Mw GA showed the strongest random coil peak, and the mucin network was the easiest to swell. Adding GA increased the scattering intensity, suggesting the occurrence of phase separation. In SAXS Kratky plot, mucin/GA appeared as globular (bell-shaped), while mucin/depolymerized GA showed a random coil (rising curve). TEM observations also showed that the smaller the depolymerized GA, the more the mucin chains swelled, the network became looser, and Na^+ could pass through more easily. The present method will be compared with other methods inhomogeneous distribution and odor-induced taste enhancement.

Keyword: *salt, gum arabic, depolymerization, mucin, saliva, diffusion, SAXS, TEM, CD*

Molecular mechanism of astringency cased by polyphenols

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Astringency has traditionally been thought to occur because polyphenols interact with proline-rich proteins (PRPs) in saliva, causing precipitation and reducing lubrication in the mouth. However, recent research shows that polyphenols mainly interact with salivary mucins (MUC), and PRPs actually help reduce the aggregation of polyphenols and mucins. We investigated the interactions of five different polyphenols—Catechin, Gallic acid, Epigallocatechin gallate, Proanthocyanidin, and Tannic acid—with mucin MUC7 and bPRP using molecular docking, fluorescence quenching, synchronous fluorescence measurements, Fourier transform infrared, and circular dichroism. Interaction with polyphenols was found to reduce the random coils in MUC, which breaks the hydration layer of the saliva film. The increase in β-sheets makes the film stiff and non-lubricating, and the redshift of tryptophan shows that the inside of MUC is exposed and its structure unravels. PRPs are structurally stable and suggested to act as 'protective proteins.' From all this, it was experimentally confirmed that astringency is mainly caused by the destruction of the lubricating film due to structural changes and aggregation of MUC. These results matched well with the molecular docking findings, showing that the binding energy of polyphenols with MUC is generally lower than that with bPRPs, and the binding affinity order.

Keyword: *polyphenol, astringency, mucin, saliva, molecular docking, fluorescence quenching, circular dichroism*

VALORIZATION OF SOYBEAN HULLS THROUGH THE DEVELOPMENT OF FOOD-GRADE PECTIN–ALGINATE HYDROGELS

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Soybean hulls are an abundant agro-industrial by-product that remains largely underutilized despite their content of valuable polysaccharides. This work aimed to recover pectin from soybean hulls through a sustainable thermal extraction process and evaluate its application in the development of food-grade hydrogels. Pectin was extracted using hot-water hydrolysis followed by ethanol precipitation and characterized in terms of extraction yield, moisture, protein content, and Fourier Transform Infrared Spectroscopy (FTIR). The extraction process resulted in an average yield of 4.95%, while FTIR analysis confirmed the presence of characteristic pectic polysaccharide structures.

Hydrogel formulations were developed using soybean hull pectin alone or in combination with sodium alginate and calcium chloride as a crosslinking agent. The influence of pH, polymer concentration, and calcium concentration on gel formation was systematically evaluated. The most stable formulations were obtained with 3–3.5% pectin, 0.6% alginate, and 100 mM $CaCl_2$ under mildly acidic conditions. Rheological analyses revealed viscoelastic and shear-thinning behavior, confirming the formation of structured hydrogel systems. As a proof of concept, the optimized hydrogel successfully incorporated viable Lactiplantibacillus plantarum 299V cells during storage. These results demonstrate the potential of soybean hull-derived pectin as a sustainable ingredient for the development of functional hydrogel-based food systems.

Keyword: *soybean hulls, pectin, hydrogel, food processing, by-product valorization*

Targeting Olfactory Receptor 51E2 for Colorectal Cancer Prevention and Therapy

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Olfactory receptors (ORs), initially identified as odorant receptors in the olfactory epithelium, are increasingly recognized as functional chemosensors in diverse tissues and as potential therapeutic targets. In this study, we investigated the biological role and therapeutic potential of OR51E2 in colorectal cancer (CRC) using both human and murine models. OR51E2 expression was consistently downregulated in CRC, as demonstrated by public transcriptomic datasets (GEPIA and TCGA) and paired tumor and adjacent normal tissues from CRC patients. Mechanistic analyses revealed that OR51E2 downregulation was associated with m^6A RNA methylation rather than DNA methylation. In human CRC cells, the dietary aroma compound β-ionone activated OR51E2, elicited intracellular Ca^{2+} signaling, suppressed the MEK/ERK pathway, and induced apoptotic cell death. These anti-tumor effects were also confirmed in a human CRC xenograft model. In murine CRC cells, propionate, a gut microbiota-derived short-chain fatty acid, acted as an Or51e2 ligand and inhibited cell proliferation. Consistently, propionate significantly suppressed colorectal tumorigenesis in an azoxymethane/dextran sulfate sodium-induced colitis-associated CRC model, whereas this protective effect was abolished in Or51e2-deficient mice. Collectively, our findings identify OR51E2/Or51e2 as a functional tumor suppressor and highlight its activation by dietary and endogenous ligands as a promising strategy for the prevention and treatment of CRC.

Keyword: *OR51E2, Colorectal cancer, m6A RNA methylation, β-Ionone, Tumor suppressor*

Microbiome metabolites, Taurine- and Glycine-Conjugated Deoxycholic Acids, Mitigates Obesity

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Secondary bile acids (SBAs)—deoxycholic acid (DCA) and its conjugated derivatives, taurodeoxycholic acid (TDCA) and glycodeoxycholic acid (GDCA)—are key microbiome metabolites that regulate metabolic homeostasis, yet their comparative potencies remain unclear. We systematically evaluated DCA, TDCA, and GDCA in cellular and diet-induced obesity (DIO) mouse models. In 3T3-L1 adipocytes and human adipose-derived mesenchymal stem cells, all SBAs suppressed adipogenesis and boosted lipolysis and fatty acid oxidation, with GDCA exhibiting the greatest potency. SBA treatment suppressed de novo lipogenesis by reducing malonyl-CoA and NADPH. Knockdown experiments confirmed these catabolic actions depend on dual FXR and TGR5 signaling. In DIO mice, daily SBA administration (100 mg/kg) attenuated weight gain, reduced adiposity, improved glucose tolerance and insulin sensitivity, and upregulated thermogenesis, with TDCA and GDCA outperforming DCA. Together, conjugated SBAs—particularly GDCA—demonstrate superior metabolic efficacy over unconjugated DCA through coordinated FXR and TGR5 activation, offering promising therapeutic targets for obesity and metabolic dysfunction.

Keyword: *Microbiome metabolites, obesity, glucose metabolism, secondary bile acids*

Chemical Composition and Phytochemical Characterization of Himalayan Wild Blueberry (Vaccinium glaucoalbum): A Traditionally Consumed Fruit of Arunachal Pradesh, India

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Himalayan wild Blueberry (Vaccinium glaucoalbum), locally known as Frepchang, has long been part of the traditional diet of the Monpa community in Arunachal Pradesh, India. Despite generations of traditional use, scientific information on its chemical composition and functional potential remains limited. This study comprehensively evaluated the fruit's physicochemical properties, proximate composition, mineral profile, antioxidant activity, and phytochemical composition to assess its potential for future food applications.

The fruit exhibited high total soluble solids (20.06 °Brix), appreciable vitamin C (17.85 mg/100g), total sugars (7.06 g/100g), low pH (2.57), and titratable acidity (1.04%, as citric acid). Proximate analysis (per 100g fresh weight) revealed moisture (80.65%), carbohydrates (15.77%), fiber (1.74%), protein (1.00%), fat (0.32%), ash (0.52%), and an energy value of 69.96 kcal/100 g. Potassium (1378 mg/kg), calcium (343.7 mg/kg), and magnesium (102.1 mg/kg) were the predominant minerals. The fruit also showed high total phenolic content (335.10 mg GAE/100g) and strong antioxidant activity (91.54% DPPH inhibition). HPLC analysis identified rutin, epigallocatechin, catechin, apigenin, and syringic acid as the major phenolic compounds.

These findings provide a comprehensive characterization of the Himalayan wild blueberry and highlight its potential for the development of functional foods, nutraceuticals, and other value-added food products.

Keyword: *Vaccinium glaucoalbum, Himalayan Wild Blueberry, Traditional foods, Chemical composition, Functional Foods*

MULTIPLEXED AND ULTRASENSITIVE FOODBORNE PATHOGENS DETECTION WITH AN ORTHOGONAL ARGONAUTE CIRCUIT BASED ON ENCODED MICROSPHERE MICROSCOPIC IMAGING

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Multiplexed and sensitive detection of pathogens is crucial for controlling risks of public health. Here, we present a mesophilic Clostridium butyricum Argonaute (CbAgo)-based guide DNA (gDNA)-target DNA-circuit (GTC) platform based on encoded microsphere microscopic imaging for multiplexed and ultrasensitive detection of pathogens. A user-friendly interactive interface enables rapid customized screening of orthogonal gDNAs and rational design of cleavage circuits from pathogen genome sequences, reducing cross-hybridization to below 0.032% and enhancing the cleavage efficiency of CbAgo by up to 157%. Encoded polystyrene microspheres by particle size and color serve as programmable multiprobes in microimaging bioassay, allowing simultaneous and ultrasensitive detection of multiple pathogens through spatial confinement and facilitating straightforward signal decoding via computer vision. The platform demonstrated excellent performance in multiplexed detection of three pathogenic bacteria (10^1 to 10^7 CFU/mL) across 60 real-world samples within 70 min without DNA amplification. Compared with quantitative polymerase chain reaction, the GTC platform shows a 10-fold improvement in sensitivity with a limit of detection down to 1 CFU/mL and exhibits higher accuracy in the detection of real samples. This work establishes an intelligent biosensing strategy for multiplexed pathogen detection and provides a promising next-generation digital platform for public health monitoring.

Keyword: *Clostridium butyricum Argonaute, digital sequence engineering, orthogonal sequence database, foodborne pathogenic bacteria, multiplexed detection*

Artificial Intelligence (AI) in Nutrition Assessment and Clinical Support

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Artificial intelligence (AI), particularly large language models (LLMs), is rapidly transforming healthcare by providing clinicians with unprecedented access to the collective body of biomedical knowledge. Unlike traditional computational approaches that often require specialized programming expertise, modern LLMs enable physicians, dietitians, and other healthcare professionals to interrogate complex, multidimensional datasets using natural language, thereby democratizing access to powerful analytical capabilities. This paradigm is especially promising for precision nutrition, where meaningful clinical decisions require integration of metabolic physiology, genetic variation, microbiome composition, dietary exposures, environmental influences, and longitudinal patient histories.

The power of these technologies, however, depends fundamentally on the quality of the questions posed and the clinical context in which the results are interpreted. AI is an extraordinarily powerful clinical instrument, but like any sophisticated tool, its value is determined by the knowledge, judgment, and experience of the individual using it. Appropriate interpretation requires clinicians capable of recognizing missing antecedent information, identifying critical confounding variables, weighing competing diagnoses, and integrating patient-specific biological, social, and environmental factors that may not be explicitly represented within an algorithmic response.

Keyword: *Artificial Intelligence (AI), Personalized Nutrition, Personalized Medicine, Healthcare, Validation*

AI-enabled microbial detection

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Rapid, accurate, and cost-effective microbial detection remains a critical challenge for ensuring food safety and quality, as conventional culture-based and molecular methods are labor-intensive, require specialized instrumentation, and delay decision-making. Recent advances in artificial intelligence have enabled transferable microbial detection platforms that combine conventional cultivation, white-light microscopy of microcolonies, and deep learning to identify microorganisms before visible colony formation. Across multiple applications, AI models demonstrated robust performance in detecting bacteria and yeast while overcoming challenges posed by complex food matrices. Deep learning models accurately detected foodborne pathogens, including Escherichia coli, Listeria monocytogenes, Salmonella spp., and Bacillus spp., after only 3 h of cultivation, achieving high precision and recall while substantially reducing false positives through interference-aware training. Microcolony-domain pretraining further improved model transferability across bacterial genera, species, and previously unseen food matrices. Beyond bacterial pathogens, the same framework accurately classified seven food-associated yeast species within 6 h, while generative adversarial network (GAN)-generated synthetic images improved recognition of underrepresented species. Collectively, these studies demonstrate that AI-driven microcolony analysis provides a versatile, scalable, and low-cost platform for rapid microbial detection, classification, and quantification across diverse microorganisms and food systems.

Keyword: *AI, Detection, Microbes, Imaging, Pre-training, Generative AI*

WATER AS THE DRIVER OF SPATIALLY HETEROGENEOUS PHYSICOCHEMICAL TRANSITIONS IN HIGH PROTEIN BREADMAKING

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Water is central to the thermomechanical and physicochemical transformations that occur during bread baking. However, its role in determining the spatial development of crumb structure remains poorly understood. This study investigated how spatial heterogeneity in water behaviour influenced oven expansion in a high protein bread system with egg white protein (EWP) as the protein source. Real-time bread expansion was quantified using on-line image analysis, while one-dimensional temperature profiling was performed to characterise spatial heat transfer throughout baking. Mapping bread volume to temperature profiles demonstrated that spatial differences in heat transfer created heterogeneous water-mediated transitions, including water evaporation, steam generation, starch gelatinisation, protein denaturation, and crust formation. Delayed heating in high protein bread preserved a water-plasticised viscoelastic core capable of sustaining internal expansion forces when the upper layers had already lost moisture and undergone structural setting. Continued expansion of the ungelatinised core compressed the upper crumb against the hardened crust, resulting in crumb inversion as an outcome of uneven water distribution. These findings established spatially heterogeneous phase transitions of water as the mechanistic link between heat transfer and bread expansion mechanics in a high protein breadmaking model system.

Keyword: *water, bread, high protein, physicochemical, heat transfer*

ENVIRONMENTAL STRESS ADAPTATION AND PHENOTYPIC HETEROGENEITY IN SHRIMP-BORNE VIBRIO PARAHAEMOLYTICUS

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Vibrio parahaemolyticus is a major seafood-borne pathogen, yet how retail environments shape its adaptive and risk-associated traits remains unclear. Here, we characterized phenotypic and genomic features of 13 isolates from shrimp sold via traditional markets and online platforms in China. Phenotypic assays showed substantial heterogeneity in auto-aggregation, motility, NaCl tolerance and biofilm formation. Notably, biofilm-forming capacity was strongly correlated with both NaCl tolerance ($r = 0.98$) and auto-aggregation ($r = 0.91$), suggesting a close link between surface-associated persistence and environmental stress adaptation. Whole-genome sequencing confirmed species assignment for all isolates, with average nucleotide identity values exceeding 95% relative to reference strains. Pangenome analysis further revealed distinct gene repertoires associated with retail source. Isolates from online retail platforms encoded a broader set of biofilm-associated genes, together with stress response determinants, including adiAC, cadC and mazEF, and uniquely carried the virulence gene tdh. By contrast, isolates from traditional retail markets were enriched in antimicrobial resistance genes, including bla_{CARB} and aphA, as well as efflux pump-associated genes. These findings indicate that the retail environment may shape divergent adaptive strategies and risk profiles in V. parahaemolyticus, with implications for source-specific surveillance and risk assessment in aquatic food supply chains.

Keyword: *Vibrio parahaemolyticus, phenotypic heterogeneity, biofilm formation, stress adaptation, comparative genomics*

Water in food and food processing classifications

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While food production relies on water and water is a ubiquitous yet overlooked variable in food processing, it has a significant impact on physical, chemical and nutritional properties of foods. Water-dependent factors in food processing include, for example, physical and chemical, including thermochemical food properties. In heating, food temperature and thereby reaction kinetics are often controlled by water, e.g., food temperature at normal pressure may not heat to >100 °C. At a low pressure, such as vacuum in freeze-drying, water remains frozen despite its surrounding temperature and supplied heat. Conversely, at a high pressure during extrusion cooking food temperature may increase to >>100 °C. Food processing impact on nutritional properties are consequently affected by the time-temperature histories during treatments, which dictate physicochemical changes. Food classification has often confused food processing and processed food and led to misinterpretation of the effects of food processing on nutrition and health. A separate food processing extent scaling, where water is a significant contributing factor, is therefore required to be included as variable and to avoid confusion in processing-related food classifications.

Keyword: *Water, Processing Level, Food Classification, Processing Classification, Food and Health*

AVOTASTIC OAT BUNS: THE DEVELOPMENT AND SENSORY ACCEPTABILITY OF HEART-FRIENDLY SNACK BUNS INTENDED FOR ADULTS (20-59 YEARS OLD) WITH HYPERTENSION AND DYSLIPIDEMIA

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Cardiovascular disease continues to be a major health issue, largely driven by poor lifestyle and dietary choices. The researchers developed and evaluated Avotastic Oat Buns, a heart-healthy snack made from avocado leaves and oats, targeted for adults aged 20–59 with hypertension and dyslipidemia. Rich in potassium, magnesium, zinc, fiber, and phenols, the product was designed to support cardiovascular health. This study aimed at product development, sensory acceptability, and nutritional evaluation. During the development phase, dehydrated avocado leaves were incorporated into a standardized oatmeal recipe to produce a bread bun, which underwent microbial testing and nutrient analysis to evaluate its safety, quality, and nutritional value. Sensory evaluation was conducted using a 9-point hedonic scale among the previously mentioned targeted respondents, assessing appearance, aroma, taste, texture, and overall acceptability. Findings showed high consumer acceptability across all sensory attributes. Nutrient analysis confirmed the presence of key micronutrients beneficial for cardiovascular health, including potassium, magnesium, zinc, and dietary fiber, while microbial testing verified the product's safety for consumption. Overall, Avotastic Oat Buns were highly acceptable based on sensory evaluation and were developed as a nutrient-dense, plant-based snack. The product offers high levels of zinc and fiber, supporting individuals with hypertension and dyslipidemia.

Keyword: *Cardiovascular disease, Hypertension, Dyslipidemia, Avocado leaves, Oats*

Beyond Food Preservation: Technological Stresses as Drivers of Antimicrobial Resistance and Virulence in Foodborne Staphylococci

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Food preservation and sanitation are fundamental to food safety; however, the evolutionary consequences of repeated exposure to sublethal technological stresses remain largely unexplored. This knowledge gap is particularly evident for food-associated coagulase-negative staphylococci (CoNS). We investigated the effects of food-related environmental stresses, including osmotic, acidic and alkaline conditions, food preservatives, and disinfectants (benzalkonium chloride and chlorine dioxide), on adaptive responses of S. aureus and S. epidermidis. Phenotypic antimicrobial susceptibility testing, quantitative biofilm assays, and RT-qPCR analysis of resistance genes (tetK, ermC, and aac(6′)-aph(2″)) revealed that sublethal exposure to technological stressors increased tolerance to clinically relevant antibiotics while modulating biofilm formation and resistance gene expression in a strain-dependent manner. Our findings demonstrate that disinfectants and food preservatives, traditionally regarded exclusively as antimicrobial interventions, may also function as selective pressures driving bacterial adaptation. These results provide novel evidence linking food-processing environments with the emergence and persistence of antimicrobial-resistant staphylococci, particularly CoNS, and challenge the conventional view of food preservation practices. Project funded under the designated subsidy of the Minister of Science and Higher Education of the Republic of Poland under the task entitled “The Research Network of Life Sciences Universities for the Development of the Polish Dairy Industry”.

Keyword: *food safety, coagulase-negative staphylococci (CoNS), antimicrobial resistance, disinfectants, technological stress*

Effects of Ultrasonic-assisted and Conventional Soaking on Hydration Kinetics, Nutritional Quality, Metabolomic Profile, and development of Gluten free muffins from Soybean flour

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Graphic Era Deemed to be University

This study compared the effects of conventional soaking (CS) and ultrasonic-assisted soaking (UAS) on hydration kinetics, nutritional quality, metabolomic profile and gluten free muffins making properties of soybean. The hydration curve of soybean exhibited a typical sigmoidal hydration pattern. UAS treatment caused significant increase in concentrations of several essential amino acids, including phenylalanine, valine and threonine compared to raw soybean flour. The polyphenolic compounds such as, gallic acid, p-coumaric acid, quercetin, chlorogenic acid, protocatechuic acid, and trans-ferulic acid were significantly higher in soybean flour prepared using UAS than raw soybean flour while kaempferol was 1.27-fold higher. Metabolomic profile deciphered diverse classes of compounds including amino acid derivatives, carbohydrate derivatives, fatty acid derivatives and phenolic compounds. The higher expression level was recorded for soybean flour prepared using UAS. Protein profile of soybean flour prepared using UAS was different from raw soybean flour. FTIR spectra revealed significant changes in secondary structure. Soybean flour prepared with UAS was incorporated at 20% and 40% in rice flour for evaluating gluten-free muffin making properties. The incorporation of soybean flour at 20% level prepared by UAS led to better quality rice-soybean based gluten-free muffin than those prepared using raw soybean flour at same level.

Keyword: *Ultrasound, Soybean, Hydration kinetics, Polyphenolic compounds, FT-IR*

Valorisation of Snapper (Pagrus auratus) byproducts: Enzymatic hydrolysis for protein hydrolysate production

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The fish processing industry produces a significant amount of waste, leading to environmental pollution and economic losses. This waste is a potential source of bioactive compounds. This study investigates the valorisation of snapper byproducts (head, fins, frame and a mixture of these) into value-added compounds using enzymatic hydrolysis. The aim of this study was to determine how enzymatic hydrolysis affects the chemical composition of protein hydrolysates. Data on the total protein content (86 ± 0.79 for head), degree of hydrolysis (40.33 ± 2.01 for mixed), soluble protein content (8.68 ± 0.40 for head), TCA-solubility index (20.72 ± 0.11 for mixed), protein recovery (35.24 ± 5.25 for frame), and hydrolysis yield (36.21 ± 0.06 for fin) were highest compared to other byproducts across different protease hydrolysates. This research aims to significantly reduce fish waste by transforming low-value waste into high-value ingredients and to extend the real-world applications of protein hydrolysates in the food, pharmaceutical, and nutraceutical industries, contributing to a sustainable and economical fish processing industry.

Keyword: *Fish waste, Enzymatic hydrolysis, Protein hydrolysate, Chemical characterisation*

AROMA CHARACTERISTICS OF GRILLED SQUID EXTRACTS OBTAINED BY SUPERCRITICAL CARBON DIOXIDE AND SUBCRITICAL WATER EXTRACTION METHODS

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The aroma characteristics of edible extracts vary with extraction conditions; however, the specific effects of solvent properties and temperature have not been fully elucidated. In this study, grilled squid was used as a model sample to investigate differences in aroma characteristics among extracts obtained by supercritical carbon dioxide (40 °C) and subcritical water (120 °C, 150 °C, and 180 °C). Comprehensive GC/MS analysis of volatile compounds in the extracts identified or tentatively identified 165 compounds. Principal component analysis and analysis of variance revealed clear differences in aroma profiles depending on extraction method and temperature. Esters and nitrogen-containing compounds were characteristic of the supercritical carbon dioxide extracts, whereas sulfur-containing compounds and aldehydes were prominent in the subcritical water extracts, suggesting an influence of solvent polarity. In addition, during subcritical water extraction, ketones and aldehydes increased with rising temperature, indicating a relationship with thermally induced chemical reactions. Furthermore, gas chromatography/olfactometry (GC/O) analysis confirmed that some of these characteristic compounds significantly contribute to human aroma perception, demonstrating that chemical differences are reflected in sensory differences. This study provides useful insights for designing extraction conditions of edible extracts in terms of aroma quality.

Keyword: *Aroma, Grilled squid, Supercritical carbon dioxide extraction, Subcritical water extraction*

Quantitative Flow-Cytometric Evidence of Divergence Between Culturability and Physiological Viability in High-Pressure-Treated Listeria monocytogenes

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High-pressure processing (HPP) is applied in food preservation to reduce Listeria monocytogenes, but its antimicrobial efficacy is commonly assessed by colony counting, which detects only cells capable of growth under the applied recovery conditions. This study quantified the divergence between culturability and physiological viability after HPP. Four L. monocytogenes strains representing clonal complexes CC31 and CC101 were treated at 200, 400, or 600 MPa for 5 min. Survivors were enumerated on nutrient-rich and selective media, while membrane integrity and metabolic activity were assessed by flow cytometry using SYTO 9/propidium iodide, thiazole orange/propidium iodide, and C12-resazurin staining. Plate counts decreased with increasing pressure, and no colonies were detected after 600 MPa. Recovery on selective medium was lower than on nutrient-rich medium at 200 and 400 MPa, indicating sublethal injury. In contrast, approximately 72–74% of cells exposed to 600 MPa retained intact membranes, while a comparable proportion remained metabolically active. The novelty lies in quantifying the unexpectedly large physiologically active fraction persisting after 600 MPa despite complete loss of detectable culturability. These findings indicate that CFU-based endpoints alone may overestimate the lethal effect of HPP. Funded by the Minister of Science under the “Regional Initiative of Excellence” Programme.

Keyword: *High-pressure processing, Listeria monocytogenes, flow cytometry, food*

CHALLENGES OF RECOMBINANT MILK PROTEINS: THE IMPORTANCE OF CASEIN PHOSPHORYLATION

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Dairy proteins have a versatile application in food industry due to their nutritional and functional properties. However, the consumption of dairy proteins is associated with sustainability and animal welfare issues. Precision fermentation (PF) offers a more sustainable approach to traditional dairy production, using engineered microbes to produce milk proteins and address environmental and ethical concerns. One of the critical concerns is ensuring these produced proteins provide a comparable functionality to traditional milk proteins when used in a food matrix.

One of the main challenges faced by PF-produced dairy proteins is the lack of phosphorylation, which is critical for their functionality in the production of dairy products such as cheese, yoghurt and ice cream. In this study, the native casein micelles, α-, β-, and κ-caseins, were enzymatically dephosphorylated to mimic the PF-produced milk proteins. The functional properties of all four native caseins were benchmarked against their dephosphorylated counterparts. The functional properties, such as surface activity of proteins at the air-water interface, as well as solubility, particle size, and acid-induced gelation at different calcium concentrations and temperatures, were studied to establish a solid basis for understanding the functional challenges of recombinant milk proteins and improving their design for food applications.

Keyword: *Diary proteins, Precision fermentation, Casein phosphorylation, Protein functionality*

Development of high moisture meat analogues from the blends of legume & cereal proteins for improved textural & nutritional properties

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Combinations of three legume protein isolates (soy, pea & mung) with two cereal protein isolates (wheat gluten & rice) were studied for their amino acid profile, texture characteristics and colour, when extruded under high moisture conditions for high moisture meat analogue applications. The results show that blends comprising of legume protein & cereal protein in 70:30 ratio gave optimal results for both nutritional & textural profile. Comparison of textures of the extrudates for the various combinations revealed differences. Amongst the three legume proteins, mung bean based extrudates were harder than soy & pea based extrudates. Amongst the two cereal proteins, wheat gluten addition resulted in higher resilience & cohesiveness making extrudates rubbery, while addition of rice protein isolates reduced resilience & cohesiveness of the extrudates making them more brittle. These results provide insights on blending the various proteins to achieve high amino acid scores (AAS) & sufficient manoeuvrability to design high moisture meat analogue for whole meat applications with textures to suit different meat dishes & cultural preferences.

Keyword: *HMMA,, Legume protein,, cereal protein,, texture,, amino acids,*

“BRANCH SIDE CHAIN AND ESTERIFICATION THEORY” - WHY CHOLESTEROL IS WELL ABSORBED AND PHYTOTEROLS ARE NOT ABSORBED?

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High consumption of cholesterol is positively, whereas phytosterols are negatively associated with the risk of heart diseases. Phytosterols are widely used in functional foods to lower blood cholesterol because they could inhibit intestinal cholesterol absorption. Cholesterol and phytosterols are structurally similar, however, cholesterol is well absorbed (>60%) and phytosterols are little absorbed (<2%). We propose a “branch side chain and esterification” theory to study the underlying mechanisms. To prove the hypothesis, we have synthesized a series of sterol analogues and found all analogs could be well absorbed except for those analogs with a side chain having 3 or more branches. We used C^{13} isotope to trace the absorption of cholesterol and phytosterols, finding that ACAT2 could esterify cholesterol to produce cholesteryl ester, which was then packed into chylomicrons followed by absorption, whereas phytosterols were poor substrates of ACAT2, could not be converted to phytosteryl esters and are therefore not absorbed. It was concluded that phytosterols could not be absorbed because they have a side chain with three or more branches and also cannot be esterified by ACAT2. This work provides a theoretical basis for the use of phytosterol-based supplements in treating dyslipidemia and preventing heart diseases.

Keyword: *Cholesterol, Phytosterols, Heart Diseases, Absorption*

DESIGN AND DEVELOPMENT OF CUSTOMIZED LIPID POWDER FROM VIRGIN VEGETABLE OIL INDUSTRY BY-PRODUCTS FOR FUNCTIONAL FOOD APPLICATIONS

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The increasing demand for lipids with balanced fatty acid composition has accelerated the development of customized lipids with optimized omega-6/omega-3 ratios. In this study, spent coconut, almond, flaxseed, and sesame meals generated during virgin vegetable oil production were utilized as sustainable feedstocks for the co-extraction of customized lipids using supercritical carbon dioxide (SC-CO_2). The co-extraction strategy produced a customized lipid containing 34.25% saturated fatty acids, 32.06% monounsaturated fatty acids, and 33.47% polyunsaturated fatty acids, with an optimized omega-6/omega-3 ratio of 1:1.8. The customized lipid was subsequently encapsulated by spray drying, and the process was optimized using Response Surface Methodology (RSM). The optimized formulation, comprising a core-to-wall ratio of 1:2 and an inlet temperature of 170 °C, achieved an encapsulation efficiency of 72.06% and a powder yield of 68.5%. SEM analysis revealed that encapsulates exhibited spherical structure with smooth surfaces and minimal agglomeration, indicating effective encapsulation. Furthermore, the optimized powder demonstrated low moisture content (3.20%), high solubility (84.73%), and good flowability (Hausner ratio: 1.20; Carr's index: 16.85%). These findings demonstrate the potential of encapsulated customized lipid powder as a sustainable ingredient for functional food formulations and precision nutrition applications.

Keyword: *Virgin oil byproducts, Supercritical CO_2 extraction, Customized lipids, omega-6/omega-3 ratio, spray drying*

ENHANCEMENT OF SHELF LIFE AND MICROBIAL SAFETY IN READY-TO-EAT SOY-SAUCE-MARINATED RAW CRAB THROUGH HIGH-PRESSURE PROCESSING

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This study aimed to evaluate the microbial inactivation efficacy and preservation performance of high-pressure processing (HPP; 300 and 600 MPa for 5 min) applied to ready-to-eat raw soy sauce–marinated crab (Plagusia squamosa). The results demonstrated that treatment at 600 MPa effectively reduced aerobic plate counts (APC), psychrotrophic bacteria counts (PBC), and Enterobacteriaceae to below the detection limits. Moreover, during refrigerated storage at 4 °C, only the 600 MPa–treated samples maintained effective suppression of these microorganisms for up to 15 days. In addition, both 300 and 600 MPa treatments significantly retarded the formation of total volatile basic nitrogen (TVB-N) throughout refrigerated storage. Based on the Taiwan Food and Drug Administration (TFDA) guideline requiring APC levels below 5.0 log CFU/g for ready-to-eat raw seafood products, the 600 MPa treatment extended the product shelf life to 12 days. High-throughput sequencing (HTS) analysis further revealed that HPP markedly reduced species richness and simplified the microbial community structure. By selectively suppressing spoilage-associated microorganisms, HPP played a critical role in delaying crab meat spoilage. Overall, HPP at 600 MPa for 5 min exhibited superior non-thermal pasteurization efficacy, effectively enhancing both the storage stability and food safety of ready-to-eat raw soy sauce–marinated crab.

Keyword: *Ready-to-eat seafood, Soy sauce-marinated crab, High-pressure processing, High-throughput sequencing*

HIGH-HYDROSTATIC PRESSURE FOR MICROBIAL INACTIVATION AND SHELF-LIFE EXTENSION OF SOUS-VIDE BARRAMUNDI MEATS

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This study evaluated the effects of high pressure (HP, 500 MPa, 5 min) and its combination with sous-vide cooking (SV) (55 °C, 30 min) on the quality and microbiological stability of barramundi meats during storage at 4 °C for 15 days. The results showed that both SV and HP reduced aerobic plate counts (APC) and psychrotrophic bacteria counts (PBC), while the combined treatment exhibited a synergistic bactericidal effect. All treatments increased lightness (L*), yellowness (b*), and hardness, while slightly decreased redness (a*). The combined treatment, however, reduced cohesiveness and chewiness. After storage, the combined treatment effectively inhibited or delayed microbial growth and total volatile basic nitrogen (TVBN) accumulation, followed by HP alone, while SV alone was less effective. Based on the TVBN threshold for acceptable seafood freshness (<25 mg/100 g), the shelf life of barramundi meats was extended from 9 days (untreated) to 12 days with SV, and up to 15 days with the combined treatment. High-throughput sequencing further revealed that HP effectively suppressed spoilage bacteria such as Enterobacteriaceae, thereby altering the spoilage progression in SV barramundi during storage. Overall, these findings demonstrate that HP significantly enhances the preservation and extends the refrigerated shelf-life of SV-cooked barramundi meat.

Keyword: *High-pressure processing, Sous-vide cooking, Shelf-life, High-throughput sequencing*

A PLACE BASED DIETARY BIOMARKERS TO INFORM THE NUTRITION POLICY

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A place-based biomarker approach was used to examine dietary inequalities across four food-insecure UK communities, providing evidence relevant to **nutrition, food security, and policy**. Traditional self-reported dietary assessments often overlook structural and environmental constraints shaping food choices. To address this gap, urine and hair samples were collected from participants in Reading (n=53), Brighton & Hove (n=25), Tower Hamlets (n=11), and Plymouth (n=38), all located in high-deprivation areas. Urinary biomarkers: 3-hydroxyhippuric acid, sucrose, and sodium-to-potassium ratio were analysed to assess fruit, vegetable, and tea intake, sugar consumption, and salt exposure, while hair $\delta^{15}N$ values indicated protein sources.

Biomarker profiles revealed distinct place-specific dietary patterns. Fruit, vegetable, and tea intake appeared similar across sites, but Reading showed markedly higher urinary sucrose, suggesting greater consumption of sugar-rich foods. Tower Hamlets exhibited both the highest sodium-to-potassium ratio and $\delta^{15}N$ values, indicating elevated salt intake and greater reliance on animal-derived protein.

These findings demonstrate how **objective biomarkers** can uncover nutritional inequalities shaped by local food environments and cultural practices, insights essential for designing equitable, community-tailored interventions within broader **food security policy frameworks**. Despite limitations, including small sample sizes and single-spot samples, this approach strengthens evidence for targeted strategies to improve diet quality in disadvantaged communities.

Keyword: *Biomarker*

Comparative evaluation of hybrid drying techniques for orange fleshed sweet potato: drying kinetics, quality, thermodynamic analysis, and computational fluid dynamics

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This study compared single and hybrid drying methods, consisting of convective hot-air (CH), infrared (IR), and microwave (MW) drying. To evaluate their effects on the drying characteristics, energy efficiency, and quality attributes of orange fleshed sweet potato (OFSP). Three OFSP varieties were investigated with and without blanching pre-drying treatment using a randomized complete block experimental design. Moisture ratio (MR), drying rate (DR), effective moisture diffusivity (D_{eff}), activation energy (E_a), colour parameters (L*, a*, b*, ΔE), β-carotene retention, mineral composition and microstructure changes were analysed. Among all the drying methods investigated, CH-IR-MW drying reduced the drying time by 85-98%, achieved the highest DR (0.06 $kg.min^{-1}$), highest D_{eff} (2.79×10^{-9} $m^2.s^{-1}$) and lowest specific energy consumption (SEC) of 0.026 $MJ.kg^{-1}$. It also resulted in lower colour changes (ΔE= 4.81-19.54), better granule integrity and the highest β-carotene retention. Among eleven mathematical models evaluated, the Demir et al. model most accurately predicted the MR (R^2 values > 0.99, low RMSE and χ^2). Furthermore, Computational Fluid Dynamics simulations were undertaken to analyse the airflow patterns, temperature distribution and the moisture transfer during CH-IR-MW drying. These findings demonstrate the potential of hybrid drying technology to improve processing efficiency while preserving the nutritional and quality attributes of OFSP.

Keyword: *β-carotene, blanching pre-drying treatment, hybrid drying, scanning electron microscopy, thin-layer drying, mineral content*

Development, Optimization, and Validation of Lateral flow aptamer-based Rapid Analytical Food Testing Kits for Detection of Folic Acid in Fortified Foods

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Objective:

Optimization of SELEX cycles with per-cycle enrichment monitoring using a gold-nanoparticle-based aggregation assay.

Methodology:

The randomized ssDNA library was sourced from Creative Biogene, New York, USA with sequence-specific primers synthesized by Eurofins Genomics. Gold nanoparticles were prepared via the citrate-reduction method and employed following incubation of folic acid with the ssDNA pool to enable differential partitioning of target-bound versus unbound sequences. Progressive enrichment across SELEX cycles was assessed by aptamer Folic acid induced modulation of GNP aggregation, providing a sensitive readout of binding population shifts.

Results and Conclusion:

A characteristic SPR peak at ~520 nm, accompanied by a visible color transition from dark purple to red-wine, confirmed the expected surface plasmon shifts of the GNPs. Asymmetric PCR (50:5 FP:RP) yielded products of ~60 bp, indicating successful amplification of selected ssDNA sequences for subsequent SELEX cycles. Progressive enrichment was observed across cycles, with aggregation assays showing a shift in response from 0.03 µM to 0.06 µM aptamer concentrations upon NaCl-induced aggregation. Thus, this technique will help in monitoring the Folic acid content in food and feed samples including wheat and rice.

Keyword: *Gold nanoparticles, SELEX, Aptamers*

DEVELOPMENT OF ACTIVE FOOD PACKAGING BASED ON A CHITOSAN MATRIX REINFORCED WITH POLYPHENOL EXTRACT FROM THE TROPICAL RED MACROALGAE

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To address the demand for sustainable active packaging, this study fabricated biodegradable films using a chitosan matrix incorporated with polyphenol-rich Porphyra vietnamensis extract (0–20%) via solvent casting. Extract addition significantly altered the optical profile, decreasing lightness (L*) from 85.86 to 43.96 and increasing total color difference (ΔE), while yielding structurally intact matrices (0.11–0.21 mm thick). Crucially, extract integration enhanced the WVP barrier; the 15% formulation achieved the lowest water vapor permeability (26.0 $g \cdot mm^{-2} \cdot day^{-1} \cdot kPa^{-1}$) compared to the control (36.7 $g \cdot mm^{-2} \cdot day^{-1} \cdot kPa^{-1}$). Antioxidant assays revealed concentration-dependent efficacy: the 20% formulation maximized DPPH radical scavenging (27.2%), whereas the 15% matrix optimized both ferric reducing antioxidant power (9.7 mgAAE/g) and total antioxidant capacity (8.6 mgAAE/g). Scanning electron microscopy confirmed uniform extract dispersion within the biopolymer network without severe agglomeration, while Fourier-transform infrared spectroscopy confirmed the structural stability of the functional groups. Ultimately, incorporating 15-20% P. vietnamensis extract into chitosan matrices yields superior barrier and antioxidant profiles, presenting a highly viable biomaterial for advanced food packaging applications.

Keyword: *Active packaging, Antioxidant film, Porphyra vietnamensis, Chitosan*

FOOD MATRIX AND HYDRATION TIME MODULATE TEXTURE AND RHEOLOGY OF LIQUIDS THICKENED WITH XANTHAN GUM AND GUAR GUM

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Hydrocolloid-thickened liquids are central to texture-modified foods for dysphagia, yet their functionality is often inferred from water-based tests that may not reflect nutrient-dense beverages. This study examined whether liquid matrix and post-preparation hydration time modulate the behaviour of systems thickened with xanthan gum and guar gum. Separate dispersions of each hydrocolloid were prepared at 1.0 g/100 mL in each liquid matrix (filtered water, whole milk, and orange juice) and evaluated after 0, 30, and 60 min of hydration using three independent batches per hydrocolloid, matrix, and time condition. Samples were characterized by the International Dysphagia Diet Standardisation Initiative syringe flow test, spoon observation, back-extrusion texture analysis, and controlled-shear rheology fitted to the Herschel-Bulkley model. Matrix, hydration time, and their interaction significantly affected residual syringe volume for both gums, showing that results obtained in water were not transferable to milk or orange juice. Spoon observation differentiated cohesive, filament-forming guar systems from more spoon-retentive xanthan systems. Back-extrusion and rheology captured complementary responses related to deformation, adhesiveness, shear-thinning behaviour, consistency index, flow behaviour index, and apparent viscosity. Orange juice behaved as an acidic particulate matrix. These findings demonstrate that matrix-specific, time-controlled assessment is essential for designing thickened beverages for dysphagia-oriented food applications.

Keyword: *Dysphagia, thickened liquids, rheology*

PULSED ELECTRIC FIELD ENABLES DUAL REGULATION OF FLAVOR FORMATION AND HAZARDOUS COMPOUND MITIGATION IN FRIED POTATO

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Improving flavor quality while reducing hazardous compound formation is a key goal in the development of safer fried foods. This study investigated the effects of pulsed electric field (PEF) pretreatment on flavor formation and hazardous compounds in fried potatoes, and further used a reducing sugar–lysine aqueous model to clarify its direct regulation of Maillard reaction pathways. The results showed that low-intensity PEF treatment at 0.5 kV/cm increased reducing sugars, glyoxal, methylglyoxal, and acrylamide, whereas treatments at 1.0–2.0 kV/cm significantly reduced these compounds, as well as 5-hydroxymethylfurfural, Nε-(Carboxymethyl)-L-lysine (CML), and Nε-(1-Carboxyethyl)-L-lysine (CEL). PEF pretreatment at appropriate intensities also decreased lipid-oxidation-derived volatiles while promoting key aroma compounds, including hexanal, 2-methylbutanal, pyrazines, 2,5-dimethylpyrazine, and 3,5-diethyl-2-methylpyrazine. Based on the integrated evaluation of flavor profile and hazardous compounds, 1.5 kV/cm was identified as the optimal condition. Model-system results showed that PEF treatment of reducing sugars accelerated α-dicarbonyl compound formation and promoted pyrazine and furan generation without significantly increasing advanced glycation end products, whereas lysine treatment showed an opposite effect. These findings demonstrate that PEF pretreatment is a promising approach for targeted flavor enhancement and hazard mitigation in fried potato processing.

Keyword: *Pulsed electric field, Fried potato, Flavor formation, Hazardous compounds, Maillard reaction*

Establishing a processing window for high-irradiance 405-nm light treatment in paprika powder using Enterococcus faecium as a Salmonella surrogate

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Low-moisture spices can harbor Salmonella for prolonged periods, highlighting the need for effective dry decontamination technologies. This study evaluated the inactivation of Salmonella spp. and Enterococcus faecium (NRRL B-2354) in paprika powder (aw ≈ 0.55) during ultra-high irradiance (UHI) 405-nm blue light treatment and developed kinetic models to support process validation. Paprika (3 g) was treated as a thin layer at a 5-cm distance using irradiances of 548, 697, and 842 mW·cm^{-2} for 60–300 s (32.9–252.5 J·cm^{-2}). Both organisms exhibited dose-dependent inactivation, with greater lethality at higher irradiances. At 697 mW·cm^{-2} for 300 s, reductions reached 7.78 ± 0.17 log for Salmonella and 6.76 ± 0.42 log for E. faecium. Survivor curves were non-log-linear, and the Geeraerd model provided the best fit, enabling calculation of validation-oriented D-values. At irradiances achieving ≥5-log reductions, E. faecium required an equivalent or greater dose than Salmonella, supporting its use as a conservative surrogate. UHI treatment increased product temperatures to 132°C, indicating a substantial photothermal contribution. These findings establish a processing window and modeling framework to support validation of high-irradiance 405-nm blue light treatments for paprika powder.

Keyword: *Blue light, Low moisture foods, Salmonella, Validation, Spices*

THE CENTRAL ASIAN FOOD DATASET: A DIGITAL ATLAS FOR AUTOMATED NUTRITIONAL SURVEILLANCE

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Background: Accurate dietary assessment in Central Asia is limited by the absence of localized food databases and the labor-intensive nature of traditional recall methods.

Methods: We curated the first comprehensive Central Asian Food Dataset (CAFD), comprising 16,000+ images across 42 food categories. Using a ResNet-152 deep learning architecture and transfer learning, we trained a model for automated food recognition and classification.

Results: The model achieved a top-1 classification accuracy of 88.70%. This high performance demonstrates the effectiveness of deep learning in identifying the complex morphological and textural features of traditional Central Asian dishes (e.g., Plov, Beshbarmak).

Conclusions: The CAFD provides a critical digital infrastructure for the modernization of regional nutrition research. It enables the development of smartphone-based assessment tools and facilitates large-scale longitudinal studies linking traditional dietary patterns with cardiometabolic risk factors. Furthermore, it serves as a digital repository for preserving Central Asian culinary heritage through a technological lens.

Keyword: *Central Asian Food Dataset (CAFD), Computer vision, Dietary assessment, Food image recognition, Nutrition surveillance*

DEVELOPMENT OF FOOD-BASED DIETARY GUIDELINES FOR CENTRAL ASIA: A FRAMEWORK FOR REGIONAL NUTRITION RESILIENCE

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Background: Central Asia faces a dual burden of malnutrition exacerbated by a lack of coordinated, evidence-informed Food-Based Dietary Guidelines (FBDGs).

Objectives: To propose a harmonized framework for regional nutrition policy translation across Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan, and Turkmenistan.

Methods: Following a comparative analysis of WHO/FAO guidelines, we developed a roadmap for regional data synchronization. The framework prioritizes multisectoral collaboration and the establishment of a Central Asian regional food-based dietary guidelines

Results: Key pillars include the integration of food-system sustainability, maternal-child nutrition metrics, and digital dietary assessment technologies. Proposed harmonization targets include standardized dietary intake biomarkers and culturally-aligned food grouping systems to bridge the gap between shared heritage and differing national policies.

Conclusions: Regional coordination is essential for addressing escalating diet-related non-communicable diseases. This framework provides the scientific and policy architecture necessary to transition toward healthier, more resilient, and sustainable food systems in Central Asia, serving as a model for other underrepresented global regions.

Keyword: *Food Systems, Dietary Guidelines, Global Health, Public Health*

A NEURO-SYMBOLIC HYBRID MODEL FOR PERSONALIZED NUTRITION

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Background: Personalized nutrition requires balancing several physiological requirements with complex socio-cultural preferences. While mathematics optimization can help to ensure nutrient precision, it lacks the contextual adaptability.

Methods: This study developed a hybrid optimization model. A mathematical solver generated ten nutritionally optimized meal plans based on the first Central Asian food dataset (CAFD), comprising 16,000+ images across 42 food categories. These were processed by Large Language Models (LLM) to select the optimal plan based on synthetic patient profiles. Performance of this model was compared against LLM standalone approaches using a 5-point Likert scale across four domains (practicality, personalization, nutrient accuracy and variety).

Results: The hybrid model demonstrated better performance, achieving higher scores in practicality (3.99) and personalization (3.81) while maintaining high nutrient accuracy (3.96). While standalone mathematical model provided higher absolute nutrient precision (4.93), it performed worse in practical aspects. The hybrid model's significantly improved relevance for personalization and practicality ($p < 0.05$).

Conclusions: Integrating mathematical optimization with LLMs produces meal plans that are both nutritionally valid and culturally relevant, bridging the gap between clinical requirements and real-world lifestyle needs.

Keyword: *Precision Nutrition, AI, Central Asia, Datasets*

A Study of the Incorporation of Foxtail Millet into the Brown-Rice Puffed Snacks

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The study aimed to develop brown rice-based extruded snacks incorporated with different proportions of foxtail millet (Setaria italica L.) flour using the collet extrusion technology. Functional properties were also studied at different die temperatures (100, 110, and 120°C). According to the experimental results, WSI ranged from 7.40 to 11.85 and was significantly influenced by both DT and FM ($p < 0.05$), with higher values observed at FM levels of 40–50%. Moisture content showed no significant variation with either FM or DT ($p > 0.05$), although a slight decreasing trend was observed as DT increased. The ash content ranged from 1.41% to 1.92% and increased significantly ($p < 0.05$) with increasing FM levels. The highest ash value was recorded at 120°C DT and 50% FM. DPPH free radical scavenging activity ranged from 38.31% to 60.73% and was significantly increased by DT ($p < 0.05$), with the highest value observed at 120 °C with 40% FM (64.48 ± 4.26%), while FM showed limited effects except at higher inclusion levels. Furthermore, increasing both DT and FM significantly increased TPC content ($p < 0.05$). Collectively, incorporating 30–40% foxtail millet flour at 110–120 °C DT provided an optimal balance among texture, expansion, and functional and antioxidant properties of the extruded products.

Keyword: *Foxtail millet, Brown rice, Collet extrusion, Puffed snack*

FLUENCE-DEPENDENT EFFECTS OF PULSED LIGHT ON FUNCTIONAL PROPERTIES OF AIR-CLASSIFIED NAVY BEAN PROTEIN CONCENTRATES

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Plant-based protein ingredients produced through dry fractionation offer a sustainable alternative to wet extraction but often exhibit limited functionality. This study evaluated the effects of pulsed light (PL) treatment on the solubility, rheological, and thermal properties of air-classified navy bean protein concentrates. Protein concentrates were produced by dry fractionation and air classification and treated with PL for 30, 50, 70, 90, and 110 s, corresponding to effective fluences of 0.06, 0.10, 0.13, 0.17, and 0.21 J/cm², respectively. Protein solubility (pH 2-12), temperature-dependent rheological behavior using oscillatory rheometry, and thermal properties using differential scanning calorimetry (DSC) were evaluated. PL markedly improved protein solubility under neutral and alkaline conditions, with the greatest enhancement observed at 90 and 110 s, where solubility approached 86.5-99.5% at pH 10-12 about 1.8-2.2-fold improvement from untreated sample. Temperature sweep measurements showed that the 0.17 and 0.21 J/cm² treatments exhibited higher storage modulus (G′) during heating than the untreated control, indicating enhanced heat-induced network formation. DSC revealed reduced denaturation enthalpy following PL treatment with only minor changes in denaturation temperatures, suggesting partial structural modification of the proteins. Overall, pulsed light treatment induced fluence-dependent functional changes on navy bean protein concentrates, demonstrating its potential to enhance protein functionality.

Keyword: *pulsed light, dry fractionation, protein functionality, solubility, protein modification*

APPLICATION OF ULTRASONIC-ASSISTED DEEP FRYING AS AN ALTERNATIVE TO TRADITIONAL DEEP FRYING IN THE PRODUCTION OF STRAW MUSHROOM (Volvariella volvacea) CHIPS

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Straw mushroom (Volvariella volvacea) is a popular, nutrient-dense edible mushroom whose high moisture content (85–90%) and high perishability limit its commercial utilisation. Traditional deep frying (DF) enhances flavour but often leads to nutrient loss and high oil uptake. This study investigates an ultrasound-assisted frying system (UAFS) as an alternative for producing mushroom chips. Blanched and coated (flour and cornstarch mixture) samples were fried at various temperature-time combinations (180°C, 190°C, 200°C) using DF and a custom UAFS (50 kHz, 120W). Evaluation included moisture loss, oil uptake, colour (L*, a*, b*), texture (hardness, N), and a 9-point hedonic sensory scale, with data analysed via ANOVA and Duncan's test at a 95% confidence level. Contrary to literature expectations, preliminary results indicated that UAFS treatments exhibited higher oil absorption than traditional deep frying. However, despite the increased oil uptake, UAFS has shown improvement on the overall textural crispness, colour, and consumer acceptability of the straw mushroom chips. This unexpected finding highlights unique structural interactions between ultrasound waves and high-moisture fungi, offering crucial insights into optimising acoustic food processing.

Keyword: *Ultrasonic-assisted deep frying (UADF), Traditional deep frying, Oil absorption, Sensory characteristics, Straw mushroom (Volvariella volvacea)*

DISRUPTION OF FUR-MEDIATED IRON HOMEOSTASIS UNDERLIES THE ANTIBACTERIAL ACTIVITY OF CINNAMON ESSENTIAL OIL AGAINST SALMONELLA ENTERITIDIS

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Salmonella Enteritidis is a critical foodborne pathogen widely found in poultry meat. Cinnamon essential oil (CEO) is a promising natural antibacterial candidate, but its molecular antibacterial mechanisms remain largely unclear. Herein, proteomics, molecular docking, functional analysis, and iron homeostasis tests were combined to uncover its action mode. It was revealed that CEO suppressed S. Enteritidis proliferation dose-dependently in LB broth and chicken juice. Proteomic screening detected the differential expression of 950 proteins associated with metabolism, membrane function, virulence and iron homeostasis. Iron homeostasis presented an unreported core antibacterial pathway, accompanied by significant expression shifts of ferric uptake regulator Fur. Cinnamaldehyde, the major component of CEO, could bind to the Fur protein and disrupt iron balance. Compared with the wild-type strain, the Δfur mutant displayed stronger CEO-triggered growth suppression and sublethal damage as well as iron-dependent intracellular reactive oxygen species (ROS) accumulation, verifying Fur's critical function in CEO bacteriostasis. Iron supplementation alleviated ROS overproduction and rescued the growth defect of Δfur under CEO stress, restoring the mutant's growth capacity comparable to or even higher than wild-type cells. Collectively, Fur-mediated iron balance disturbance is a key pathway through which CEO combats S. Enteritidis, offering novel insights into natural essential oil antibacterial strategies.

Keyword: *Essential oil, Salmonella, Iron homeostasis, Chicken juice, Sanitizer*

Fermentation of Traditional Turkish Coffee with SCOBY

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Coffee kombucha is gaining significant attention in the functional beverage industry. Current studies predominantly focus on filtered coffee brews or spent coffee grounds. However, the potential of traditional Turkish coffee brewed with its finely ground particles and possessing a high antioxidant capacity as a kombucha substrate remains uninvestigated. This study aims to demonstrate the continuous extraction effect of suspended coffee grounds on bioactive compounds through the fermentation of unfiltered Turkish coffee. Traditionally prepared sugared Turkish coffee was fermented exclusively with SCOBY at 25 °C for 10 days. Post-fermentation, pH, organic acids, total phenolic content (TPC), 5-hydroxymethylfurfural (HMF), and caffeine levels were evaluated. The organic acid profile revealed acetic acid as the dominant metabolite, confirming the dominant metabolic activity of acetic acid bacteria within the SCOBY. Importantly, the unfiltered coffee matrix triggered the continuous release of phenolics from the suspended grounds, significantly increasing the TPC. Furthermore, caffeine content was reduced, and residual HMF, which contributes to the sensory profile of the beverage, was detected. This study presents a novel beverage that integrates traditional Turkish coffee with modern fermentation trends.

Keyword: *organic acids, phenolic compounds, kombucha,, fermentation, functional coffee*

DEVELOPMENT OF A NATIONAL VITAMIN B6 DATABASE THROUGH COMPREHENSIVE ANALYSIS OF PYRIDOXINE, PYRIDOXAL, AND PYRIDOXAMINE IN KOREAN FOODS

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An accurate food composition database is essential for dietary assessment, nutrition policy, and precision nutrition research. The previous Korean national vitamin B_6 database was based only on pyridoxine (PN). This study established a comprehensive national vitamin B_6 database by determining pyridoxine (PN), pyridoxal (PL), and pyridoxamine (PM) in representative Korean foods. A total of 765 food samples, including 42% processed foods, were collected between 2023 and 2025 based on food consumption, nutrient contribution, and database priorities. Vitamin B_6 vitamers were quantified using HPLC with fluorescence detection (HPLC-FLD). Vitamer composition varied markedly among food groups, demonstrating that analysis of all three vitamers provides a more accurate estimate of total vitamin B_6 than PN alone. PN predominated in plant-based foods, whereas PL and PM contributed substantially to vitamin B_6 in animal-derived foods. The method showed excellent linearity (R^2 = 0.9999–1.0000), accuracy (99.2–103.4%), precision (RSD_r = 0.7–4.9%; RSD_R = 2.9–3.7%), and satisfactory detection and quantification limits. Analytical performance was further verified using standard reference materials, FAPAS proficiency testing, and three years of quality control. This database provides reliable data for vitamin B_6 intake assessment and precision nutrition research in Korea.

Keyword: *vitamin B6 vitamers, food composition database, HPLC-FLD, method validation, precision nutrition*

PH-RESPONSIVE ALGINATE HYDROGELS DERIVED FROM FERMENTED UNDARIA PINNATIFIDA BY-PRODUCTS FOR CONTROLLED INTESTINAL DELIVERY OF BIOACTIVE COMPOUNDS

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Sustainable valorization of seaweed by-products is an important strategy for advancing the circular bioeconomy. This study developed an integrated biorefinery process for Undaria pinnatifida stem by-products by combining lactic acid bacteria (LAB) fermentation, alginate molecular tailoring, and pH-responsive hydrogel fabrication for intestinal delivery of bioactive compounds. Fermentation was performed for 24 h using Weissella cibaria, Lactiplantibacillus plantarum, Streptococcus salivarius, and a mixed culture (LM). The mixed culture showed the highest enhancement of soluble phenolic compounds, increasing total polyphenol content from 27.43 to 104.25 μg GAE/g. Alginate recovery from the fermented residue increased from 20.1% to 32.6%, while its weight-average molecular weight decreased markedly from 2,016.85 to 220.04 kDa, indicating effective fermentation-induced depolymerization. Calcium-crosslinked hydrogels prepared from the modified alginate exhibited pronounced pH-responsive release behavior. Phlorotannin release remained below 35% under simulated gastric fluid (pH 1.2) but reached 96.9% within 120 min under simulated intestinal fluid (pH 6.8), demonstrating efficient intestinal-targeted delivery. These findings demonstrate that LAB fermentation simultaneously enhances bioactive compound recovery and tailors alginate properties, providing a sustainable platform for producing pH-responsive delivery systems from seaweed processing by-products.

Keyword: *Undaria pinnatifida stem, lactic acid bacteria fermentation, alginate, pH-responsive hydrogel, intestinal delivery*

ISOLATION AND CHARACTERIZATION OF AMYLOID-LIKE PROTEIN AGGREGATES FROM WHITE BREAD FOR THEIR INTERACTION WITH PATHOGENIC AMYLOIDS

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High temperatures, acidic pH, and physical agitation are commonly observed during cooking or industrial food processing, conditions that favor some protein misfolding and the formation of amyloid-like protein aggregates (APA). The formation of APA in food systems might negatively impact their nutritional properties. The proteins in various bakery products are generally subjected to high temperatures, which may lead to the formation of APA. To test this hypothesis, the presence of APA in white bread was examined. The isolated protein displayed typical characteristics of amyloids, in Congo red, Thioflavin T & 8 anilino-1-naphthalene sulfonic acid assays. Fibrils in TEM, and negative minima at 223 nm in Circular Dichroism were observed. The presence of amyloid-like structures in one of the most common foods, such as bread, consumed by people of all ages, raises health concerns and needs to be addressed scientifically. A major gut-brain axis has already been established, confirming the possibility that protein fragments can reach the endothelium that forms brain capillaries. In this study, we have characterized the fragments of gluten after simplifying in-vitro digestion for their interaction with the A-beta amyloid and Alpha-Synuclein. Both amyloids have been shown to interact significantly with digested gluten fragments in an in-silico study.

Keyword: *Amyloid-like protein aggregates, Food processing, Alpha Synuclein*

Adequate dietary potassium intake supports longevity through a conserved cross-tissue homeostatic pathway

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Potassium is an essential dietary mineral central to human nutrition and healthy aging. Inadequate dietary potassium intake is a global public-health concern associated with hypertension, cardiovascular disease, neuromuscular dysfunction, impaired bone and muscle maintenance, and accelerated biological aging. However, the mechanisms by which organism sense and adapt to low dietary potassium remain poorly understood. Here, using Caenorhabditis elegans as a model for nutrient-response biology, we identify a conserved cross-tissue pathway that maintains potassium balance under dietary potassium deficiency. Low potassium activates a stress-responsive p38 MAPK–ATF-7 signaling axis that selectively increases expression of the potassium transporter CATP-3 in the hypodermis, thereby preserving organismal potassium homeostasis and survival. This response integrates local tissue adaptation with ASI sensory neuron-mediated signaling and is distinct from canonical osmotic-stress responses, indicating a dedicated nutrient-specific survival program. Similar regulation of potassium-transport pumps is observed in yeast and mammalian cells, supporting evolutionary conservation and relevance to human nutrition. Together, these findings identify potassium regulation as an actively coordinated cross-tissue process linked to lifespan and immune resilience, providing a mechanistic basis for dietary strategies targeting potassium-related disorders, cardiovascular health, and healthy aging.

Keyword: *dietary potassium, mineral nutrition, anti-aging, p38 MAPK*

RADIO FREQUENCY TREATMENT AS A POTENTIAL ALTERNATIVE TO ETHYLENE OXIDE STERILIZATION FOR ENHANCING MICROBIAL SAFETY AND QUALITY OF WHITE PEPPER AND TURMERIC POWDER

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Spices are low-moisture foods that are susceptible to microbial contamination, particularly by Salmonella typhimurium and Escherichia coli, and require an effective decontamination method to ensure food safety and quality. This study evaluated the efficacy of Radio frequency treatment for decontamination of pathogens in white pepper and turmeric powder, while preserving quality. White pepper and turmeric powder samples were inoculated with Salmonella typhimurium and Escherichia coli and treated using a Radio frequency system at electrode gaps of 110, 140, and 170 mm for 3, 4, and 5 min., reaching a maximum temperature of 65˚C. Microbial inactivation was assessed and quality attributes, including colour, moisture content, water activity, total phenolics, antioxidant activity and active compounds were analysed. The optimized treatment (110 mm electrode gap and treatment time of 5 min.) achieved maximum log reductions of **5.81** and **5.00 log CFU/g** for E. coli in white pepper and turmeric, respectively, and **4.70** and **4.30 log CFU/g** for Salmonella. No significant changes ($p > 0.05$) were observed in the quality parameters of spice samples before and after treatment. Radio frequency treatment is a novel thermal process alternative to ethylene oxide fumigation for enhancing microbial safety while maintaining spice quality and supporting compliance with international standards.

Keyword: *Radiofrequency heating, Spices, Microbial inactivation, Quality attributes*

BACE-ON: A VEGAN BACON ALTERNATIVE FROM NATA DE COCO

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The increasing prevalence of non-communicable diseases associated with high consumption of processed meat products has intensified the demand for healthier plant-based alternatives. We evaluated the feasibility of developing vegan bacon from nata de coco, hereafter referred to as BaCe-on. The effects of marinade formulation and thermal treatment on the properties of nata de coco strips were determined. Three marinade formulations [i.e., savory (SAV), smoky (SMK), and sweet and spicy (SNS)] and three thermal treatments (i.e., air frying, oil frying, and oven drying) were utilized. Color and texture properties were analyzed, while organoleptic evaluation was conducted using a 9-point hedonic scale under a Balanced Incomplete Block Design. The most preferred treatment was subjected to proximate analysis. Results showed that marinade formulation significantly affected color and texture properties, while thermal treatment significantly affected sensory properties. The SNS air-fried sample obtained the highest sensory ratings and was identified as the most preferred treatment. Proximate analysis revealed that this sample has low crude fat (1.20%) and ash (2.08) contents, with a crude fiber content of 2.46%. These results demonstrate the potential of BaCe-on as a healthy vegan bacon alternative with acceptable sensory and nutritional properties.

Keyword: *nata de coco, bacon, non-communicable diseases, fermentation, meat alternative*

LEVERAGING NATIONAL GOVERNMENT-LED PUBLIC-PRIVATE PARTNERSHIPS TO ACCELERATE MSME FOOD INNOVATION: EVIDENCE FROM CARAGA, PHILIPPINES

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National science agencies are uniquely positioned to catalyzed public-private partnerships that close the innovation gap facing food MSMEs. This paper presents impact evidence from FAST (Facilitate, Accelerate, Scale and Transform) MSMEs, a government-led program operationalizing academia-industry-government collaboration through the Caraga Food Innovation Consortium. FAST embeds MSMEs and FIC personnel in structured capacity-building covering food innovation, new product development (NPD), and sensory evaluation, paired with hands-on co-creation incubation. The structured NPD process ran for 6 months and products developed reach at least TRL 6.

Results demonstrate measurable impact on both innovation outputs and institutional capability. From the initial eight incubated MSMEs, five successfully achieved new products and improved processes, reporting full satisfaction across support alignment, training quality, and innovation confidence, with unanimous willingness to recommend the program. FIC personnel rated academia-government-industry coordination at a perfect 5.00 and the program "Excellent" overall, citing strengthened competencies in product development and MSME mentoring. Furthermore, active MSME participation and commitment to innovation emerged as critical determinants of successful collaboration outcomes.

Following its successful implementation, FAST is in its second cohort. The program offers a replicable, government-anchored model demonstrating how structured public-private partnerships, combining technical training with applied innovation support, can durably strengthen MSME competitiveness.

Keyword: *Food Innovation, academia-industry-government, co-innovation, MSME, New Product development*

TEXTURE, RHEOLOGY AND MICROBIOLOGICAL STABILITY OF A CLEAN-LABEL REDUCED-FAT DAIRY SPREAD

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The replacement of modified starch and synthetic additives in reduced-fat dairy spreads remains a major challenge due to their key roles in texture and microbiological stability. This study evaluated the technological feasibility of a clean-label reduced-fat dairy spread containing 30% fat (75.4% fat reduction compared with butter) without modified starch. A formulation previously selected by consumer focus groups was monitored during 28 days of refrigerated storage. Two versions were compared: a preservative-free formulation (F22_SC) and a control containing 0.1% potassium sorbate (F22_CC). Physicochemical, microbiological, rheological, textural and spreadability properties were evaluated throughout storage. Both formulations maintained stable pH, water activity and colour, while exhibiting predominantly elastic ($G' > G''$) and pseudoplastic behaviour, desirable for spreadable products. Texture and spreadability analyses indicated only moderate structural rearrangements during storage, maintaining acceptable technological performance. However, microbiological stability differed markedly between formulations. The preservative-free spread showed rapid microbial growth after 14 days, whereas the sorbate-containing formulation remained microbiologically stable throughout storage. These findings demonstrate that clean-label reformulation without modified starch can preserve desirable technological properties in reduced-fat dairy spreads, but additional preservation strategies are required to ensure microbiological stability and achieve commercially viable shelf life.

Keyword: *Clean-label, Reduced-fat dairy spread, Rheology, Texture, Shelf-life*

PREPARING CASSAVA STARCH–WHEY PROTEIN COMPOSITES THROUGH GENIPIN CROSSLINKING, AND THERMAL PROCESSING: STRUCTURAL AND FUNCTIONAL IMPLICATIONS

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Cassava starch–whey protein composites were created using spray drying with 0.05% genipin (w/w) as a green crosslinker, followed by gradual dry heat treatment at 120 °C for up to 8 hours to examine their combined effects on physicochemical, thermal, structural, and optical properties. Spray drying alone decreased gelatinization enthalpy, while 2% whey protein addition lowered peak and breakdown viscosity and revealed a novel whiteness-preserving effect compared to starch-only controls. Without thermal activation, genipin crosslinking restored gelatinization enthalpy to native-like levels but produced the highest swelling power at 90 °C (36.80 g/g), suggesting that genipin crosslinking alone does not restrict starch granule swelling in the absence of heat. One hour of dry heating activated genipin crosslinks, sharply increasing trough viscosity and gel hardness; these effects became more pronounced up to 4 hours, where final viscosity and hardness peaked alongside reduced swelling power. Beyond 4 hours, excessive crosslinking reduced peak viscosity, hardness, and swelling, and caused the greatest powder color deviation (ΔE = 13.19). Overall, genipin–whey protein treatment with 4 hours of heating was identified as the optimal treatment, yielding the highest gel hardness, final viscosity, and controlled swelling power, suited for mechanically strong, thermally stable cassava starch–whey protein applications.

Keyword: *Cassava starch, Genipin, Whey protein, Crosslinking, Dry heat*

ASTAXANTHIN-PRODUCING PROBIOTIC (BREVUNDIMONAS SP.) AS A FUNCTIONAL FEED ADDITIVE FOR NUTRITIONAL BIOFORTIFICATION OF PACIFIC WHITE SHRIMP (LITOPENAEUS VANNAMEI)

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Developing functional feed strategies that enhance aquaculture biosecurity while improving the nutritional value of farmed seafood is important for sustainable food systems. This study evaluated Brevundimonas sp., an astaxanthin-producing bacterium, as a probiotic dietary supplement to improve disease resistance, gut microbiota stability, and nutritional quality in Pacific white shrimp (Litopenaeus vannamei). Brevundimonas sp. biomass was prepared by cold-air drying to preserve probiotic viability and antioxidant content. Juvenile shrimp underwent a 30-day feeding trial across four dietary treatments (0, 10^4, 10^6, and 10^8 CFU/g), followed by assessment of intestinal bacterial communities (16S rRNA amplicon sequencing), immune-related gene expression, and a Vibrio harveyi pathogen challenge. Shrimp flesh quality was characterized via amino acid, fatty acid, and carotenoid profiling. Probiotic supplementation significantly reduced cumulative mortality after the V. harveyi challenge and up-regulated immune transcripts (penaeidin3a, lectin,proPO). Amplicon sequencing showed a bacterial community clustering, indicating better gut homeostatic stability. Notably, supplementation increased astaxanthin accumulation in shrimp flesh by 2- to 2.5-fold compared to shrimp from the control group. These findings indicate that Brevundimonas sp. could function as an effective biological agent for disease mitigation and as a post-harvest biofortification tool that enhances the antioxidant and nutritional value of farmed shrimp.

Keyword: *Astaxanthin biofortification, Probiotic functional feed, Antibiotics alternative, Food security*

Comparison of Two Pretreatment Strategies for Mannitol Fractionation from High-Ash Seaweed Extracts Using Sequential Ion-Exchange Purification

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Seaweed extracts are a promising source of mannitol but typically contain over 56% (w/w) ash, which complicates purification. This study compared two pretreatment methods for recovering mannitol-rich fractions from a high-ash seaweed extract. In the first method, the crude extract was dissolved directly in deionised water before sequential cation- and anion-exchange treatment. In the second, the extract was hydrolysed with 1.2 M H_2SO_4, diluted, neutralised with $CaCO_3$, centrifuged, and the supernatant subjected to the same ion-exchange process. Purified solutions were concentrated by rotary evaporation and oven-dried. Product yields from both pretreatment routes were compared, and the carbohydrate composition of the dried products was determined by HPLC. The study evaluates the influence of pretreatment on desalting efficiency, product recovery, and sugar composition. The results provide guidance for developing an efficient purification process for producing mannitol-rich ingredients from seaweed extracts and supporting the sustainable valorisation of marine biomass.

Keyword: *Seaweed extracts, mannitol, monosaccharide, fractioning*

Anti-photoaging Effects and Structural Features of an Exopolysaccharide from Limosilactobacillus fermentum FB10

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Prolonged exposure to UVB irradiation is one of the major extrinsic factors contributing to skin photoaging. Exopolysaccharides (EPS), as bioactive components derived from probiotics, have attracted increasing attention due to their antioxidant, anti-inflammatory, and immunomodulatory properties. Previously, EPS isolated from Limosilactobacillus fermentum FB10 (EPS-FB10) was screened for anti-photoaging potential in vitro. In this study, EPS-FB10 was further evaluated using a UVB-induced skin photoaging model in hairless mice, together with structural analysis. After 7 weeks of oral administration, dorsal skin tissues were collected for H&E staining and quantitative real-time PCR (qRT-PCR) analysis. EPS-FB10 improved UVB-induced impairment of skin barrier function and modulated the expression of genes related to antioxidant defense, hyaluronic acid synthesis, collagen metabolism, and inflammatory responses. Structural analysis showed that EPS-FB10 had an average molecular weight of approximately 1.52×10^3 kDa. Further analysis of its high-molecular-weight fraction (h-EPS-FB10) indicated that it was mainly composed of mannose, galactose, glucose, and arabinose, with a proposed backbone containing α-(1→2,6)-linked mannose and β-(1→2)-linked galactose residues. These findings suggest that EPS-FB10 may have potential as a probiotic-derived bioactive ingredient for functional food applications related to skin health.

Keyword: *Anti-photoaging activity, Exopolysaccharide, Structure characterization*

A TASTE BUD ORGANOID PLATFORM FOR TASTE EVALUATION: ADVANCING FOOD INNOVATION, NUTRITION, AND HEALTH

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Taste perception is a critical determinant of food preference, dietary intake, and overall health. Altered taste function, arising from aging, infections, chronic diseases, or medical interventions, can adversely affect nutrition and quality of life. However, the development of effective strategies to understand and modulate taste responses has been limited by the lack of physiologically relevant experimental models. Here, we developed a taste bud organoid model from hamster lingual tissues that self-organizes into a stratified, polarized epithelium containing taste bud-like structures. Histological analysis, immunofluorescence staining, qRT-PCR, and single-cell RNA sequencing confirmed the presence of major taste cell populations, including type I, type II, type III, progenitor, and basal epithelial cells, with marker expression and cellular organization resembling native lingual tissue. Importantly, functional validation demonstrated robust, modality-specific responses to all five basic tastes. Organoids showed dose-dependent responses to sodium chloride, citric acid, sucrose, denatonium, and monosodium glutamate, corresponding to salty, sour, sweet, bitter, and umami stimulation, respectively. We established a structurally mature and functionally responsive taste bud organoid platform capable of quantitative taste sensing. This system provides a versatile model for studying taste development, gustatory signaling, disease-associated taste dysfunction, drug and toxicity screening, and future food, beverage, and regenerative applications.

Keyword: *Organoids, Taste, Sensation*

PLASMIDOMIC LANDSCAPE OF STAPHYLOCOCCUS AUREUS AND THE EMERGENCE OF A CC5 SUBCLADE HARBORING THE CONJUGATIVE PLASMID PSK41: IMPLICATIONS FOR FOOD SAFETY AND ANTIMICROBIAL RESISTANCE

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Staphylococcus aureus can contaminate food products and persist in food-related environments, posing significant challenges to food safety and public health. However, the role of plasmids in mediating antimicrobial resistance (AMR) and facilitating host adaptation in S. aureus has been largely underestimated. We conducted a global plasmidome analysis of 1395 isolates (human: 88.2%, animal: 11.8%) spanning 90 years. Plasmids were detected in 66.8% of strains, typically one to two per genome. We identified 35 distinct plasmid-borne antimicrobial resistance genes (ARGs), with a significant temporal increase in their abundance. Over 85.5% of these plasmids were predicted to be mobilizable, indicating a high transmission potential. Notably, clonal complex 5 (CC5) carried the highest plasmid burden, particularly subclade CC5.6, which exhibited high prevalence of conjugative pSK41 plasmids and ARGs. Although this lineage has not been reported elsewhere, its emergence raises concerns about ARG dissemination through conjugative plasmids. These findings emphasize the role of plasmids in the global spread of AMR and have important implications for food safety and resistance control strategies in food production.

Keyword: *Staphylococcus aureus, Plasmidome, Horizontal gene transfer, Conjugative plasmid*

PROTEOMICS-GUIDED INSIGHTS INTO THE ANTIBIOFILM AND ANTIVIRULENCE ACTION OF HMB AGAINST LISTERIA MONOCYTOGENES

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In this study, we systematically evaluated the antibiofilm and antivirulence potential of 2-Hydroxy-4-methoxybenzaldehyde (HMB) against L. monocytogenes and its food-derived isolates. HMB exhibited a minimum inhibitory concentration of 512 μg/mL, while subinhibitory concentrations significantly inhibited biofilm formation without affecting planktonic growth. HMB treatment markedly impaired biofilm development on abiotic surfaces and key virulence-associated phenotypes, including cell surface hydrophobicity, listeriolysin, and flagellar motility. Comparative proteomic analysis revealed extensive remodelling of the L. monocytogenes proteome, with 62 downregulated and 43 upregulated proteins, notably affecting pathways related to motility, virulence, and biofilm regulation. These findings were further corroborated by qPCR validation and molecular docking studies, which demonstrated stable interactions between HMB and key virulence-associated proteins, supporting a multi-target mode of action. The in vivo anti-infective potential of HMB was validated using a Galleria mellonella infection model, where HMB treatment exhibited no host toxicity, significantly improved larval survival, and reduced bacterial burden following L. monocytogenes infection. Collectively, this integrated in vitro, proteomic, in silico, and in vivo investigation highlights HMB as a promising natural antivirulence and antibiofilm agent with potential application in mitigating L. monocytogenes contamination and infection in the food safety context.

Keyword: *2-Hydroxy-4-methoxybenzaldehyde, Antibiofilm, Antivirulence, Listeria monocytogenes, Proteomics*

Sensory Fatigue in Food Consumption: Mechanisms, Measurement Challenges and Implications for Eating Behaviour

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Prolonged exposure to the same food can reduce sensory responsiveness, a phenomenon linked to sensory adaptation. Sensory fatigue is defined as a temporary near-complete or complete loss of taste and flavour perception following sustained exposure to a food stimulus. Despite its relevance, it remains conceptually ambiguous and is often conflated with sensory adaptation and sensory-specific satiety (SSS).

This presentation aims to clarify the definition of sensory fatigue, distinguish it from related processes, identify key contributing factors, evaluate current assessment methodologies, and examine its implications for food intake and nutrition. Evidence suggests that sensory fatigue primarily reflects peripheral desensitisation of sensory receptors, whereas SSS is driven by central hedonic processes; both may interact to reduce sensory intensity and pleasantness, contributing to satiation and meal termination.

Current assessment methods, including filter paper, gravitational flow and sip-and-spit techniques, provide controlled insights but lack ecological validity, highlighting the need for more realistic approaches. Sensory fatigue may influence dietary behaviour, energy intake and nutritional status, particularly in vulnerable populations. This presentation identifies key research gaps and outlines future directions to advance understanding and support the development of food products that sustain sensory appeal while promoting better nutrition, especially in populations such as older adults.

Keyword: *Sensory fatigue, Sensory-specific satiety, Taste perception, Sensory adaptation, Food intake*

EFFECTS OF COLD PLASMA PROCESSING ON THE IMMUNOREACTIVITY, STRUCTURE AND FUNCTINOAL PROPERTIES OF SILKWORM PUPA PROTEIN

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Sustained global population growth boosts protein demand, whileconventional animal protein production imposes severe environmental burdens,driving rising demand for sustainable alternative proteins. Silkworm pupa protein(SPP), as an alternative protein, offers balanced amino acids and bioactivities, yet itsapplication is limited by inherent allergenicity. Cold plasma (CP) emerged as a novelfood processing technology capable of reducing allergenicity while enhancing proteinquality and functionality. This study treated SPP with CP for different durations to alleviate its allergic risk. After 5 min of CP treatment, IgE and IgG binding capacities decreased by approximately 57% and 75%, respectively, and in vitro digestibility wassignificantly enhanced. This reduced immunoreactivity was linked to structural changes in SPP. Dynamic light scattering indicated that CP treatment increased the hydrodynamic diameter of SPP proteins from 512.09 nm to 8790.16 nm, and scanning electron microscopy verified CP-triggered protein aggregation. Ultraviolet spectraconfirmed that treatment induced protein unfolding and exposed buried tryptophanand tyrosine residues, while simultaneously improving the functional properties of proteins. As an eco-friendly processing technique, CP effectively reduces SPP immunoreactivity and elevates its nutritional quality, showing great potential for the development of food formulations.

Keyword: *Silkworm pupa protein, Cold plasma treatment, immunoreactivity, Structure changes*

A high-fiber diet mimics aging-related signatures of caloric restriction in mammals

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Caloric restriction (CR) delays aging-related hallmarks in various organisms by slowing growth and development while enhancing metabolic homeostasis. However, desirable diets that harness the metabolic benefits of CR without imposing food intake restrictions remain elusive. We evaluated the effects of a high-fiber diet we developed, in which 30% of the macronutrients in a standard diet are replaced with indigestible cellulose, compared to a CR control consisting of a nighttime-2h-restricted feeding regimen. Our findings show that the 2h-restricted feeding triggered a robust systemic response associated with the anti-aging benefits typically observed with CR. Intriguingly, the high-fiber diet did not reduce food intake but mimicked the aging-related signatures of CR in male mice from young to old age. These results indicate that the high-fiber diet confers promising benefits for metabolic homeostasis and represents a valuable candidate for further health and aging studies.

Keyword: *high-fiber diet, caloric restriction, aging, cellulose*

THERMAL IMAGING-BASED ASSESSMENT OF COOKING AND HOLDING OF BATCH FRIED CHICKEN (Gallus gallus domesticus L.)

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Thermal imaging (TI) offers a rapid, non-contact, and non-destructive approach in assessing sufficiency-of-cook (SoC) and suitability for consumption of fried food. However, industry adoption remains limited due to its novelty and lack of exploration. The study aimed to evaluate TI's capability and accuracy in determining the SoC of batch-fried chicken (BFC). The study also assessed how post-fry holding affects the quality (moisture content, water activity, and oiliness) of BFC. TI was used to take surface and core temperature measurements until the samples reached the thermal danger zone (60°C) and was compared against thermocouples. A moisture analyzer, water activity meter, and blotting paper were used to compare the quality of pre- and post-held BFC. Results showed that TI was able to display observable differences between the thermographs of cooked and undercooked samples. TI readings showed near-perfect correlation to thermocouple readings, suggesting high accuracy. BFC should be consumed within 20.5 minutes after frying. As for quality, moisture and water activity remained stable. However, oil release increased significantly during holding, indicating greater oil absorption. These findings strengthen the case for TI as a method for quality control. Potentially leading to greater adoption by the food industry.

Keyword: *thermal imaging, quality control, deep frying*

METABOLIC EVOLUTION IN OAT SOLID-STATE FERMENTATION: INSIGHTS FROM PROTON NUCLEAR MAGNETIC RESONANCE AND MACHINE LEARNING

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Solid-state fermentation (SSF) is increasingly used to enhance the nutritional functionality of cereal-based foods, yet the metabolic mechanisms underpinning these improvements remain poorly understood. This study applied untargeted ^{1}H-NMR foodomics to characterize metabolic transformations during SSF of oat flour using Lp. plantarum, R. oligosporus, and a co-culture system. A total of 74 metabolites were identified across major biochemical classes, including amino acids and derivatives (32), organic acids (16), carbohydrates (8), alcohols (4), nucleotides (7), lipid-related metabolites (5), and nitrogen-containing metabolites (3). Distinct, system-dependent metabolic transformations were observed. Summed free amino acids increased over fermentation time in all systems, with the greatest increases in R. oligosporus (~4.3-fold) and co-culture (~3.5-fold) compared to Lp. plantarum (~2.6-fold) between 0 and 120 h. Lactate accumulation dominated in Lp. plantarum and co-culture systems, while bioactive γ-aminobutyric acid increased most (~4-fold) in the co-culture relative to 0 h SSFed. Aromatic metabolites, including 3-phenyllactate and indole-3-lactate, were elevated in fungal-containing systems during SSF. Glucose accumulation and increasing UDP-N-acetylglucosamine indicated polysaccharide degradation and fungal biomass formation. These findings provide mechanistic insight into SSF-driven biochemical transformations and demonstrate how microbial selection can be leveraged to modulate metabolic pathways in fermented cereal systems.

Keyword: *Solid-state fermentation, untargeted metabolomics, proton nuclear magnetic resonance, oats (Avena sativa), machine learning*

CHARACTERIZATION OF THE TEMPORAL SENSORY PERCEPTION OF FERMENTED AND UNFERMENTED Rubus rosifolius Sm. USING TEMPORAL DOMINANCE OF SENSATIONS

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Fermentation using Lactiplantibacillus plantarum is known to alter the sensory characteristics of fruits, yet its effects on many indigenous species remain poorly understood. Sapinit or Rubus rosifolius, an underutilized functional fruit, has limited sensory characterization despite its potential for food innovation. This study investigated the effect of fermentation on the temporal sensory profile of its purée using Temporal Dominance of Sensations (TDS). A trained sensory panel (n = 12) evaluated fermented and unfermented sapinit purée using TDS. The attribute set for unfermented fruit included astringent, berry, carrot juice, cilantro, sour, sweet, and wood, while fermented samples involve astringent, berry, fermented, sour, sweet, and wood attributes. Results revealed distinct temporal sensory patterns between the two treatments. Unfermented fruit was characterized by an initial dominance of sweetness, followed by prolonged astringency, which persisted for up to 30 seconds. In contrast, fermented fruit exhibited a more dynamic sensory progression, transitioning from sweetness to sourness before ending with astringency, with sour sensation persisting for up to 24 seconds. These findings demonstrate that fermentation modifies the temporal sensory perception of Rubus rosifolius Sm. by introducing additional sensory transitions and altering the duration of dominant attributes, while preserving astringency as a defining sensory characteristic of the fruit.

Keyword: *Rubus rosifolius Sm., lactic acid fermentation, flavor profile, temporal dominance of sensations*

Disruption of Wall Teichoic Acid Glycosylation Increases Meropenem Susceptibility in Staphylococcus aureus

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Abstract: Wall teichoic acid (WTA) glycosylation plays a critical role in maintaining cell wall integrity and physiological functions in Staphylococcus aureus; however, its contribution to carbapenem susceptibility remains unclear. In this study, we constructed three mutants (ΔtarS, ΔtarM, and ΔtarMS) derived from the S. aureus strain BAA1717 via homologous recombination. Colony blot assays confirmed the loss of WTA glycosylation in all mutants. While growth kinetics, cell morphology, and staphyloxanthin production did not differ significantly between the wild-type and mutant strains, deletion of either tarS or tarM reduced the minimum inhibitory concentration (MIC) of meropenem fourfold. Notably, the double mutant exhibited an eightfold reduction, suggesting additive effects of WTA glycosylation on meropenem susceptibility. Furthermore, flow cytometry analysis revealed that treatment with 1 μg/mL meropenem reduced both α- and β-WTA glycosylation levels in both the wild-type and mutant strains. These findings demonstrate that disruption of WTA glycosylation compromises cell wall homeostasis and increases susceptibility to meropenem, providing new insights into the role of WTA glycosylation in β-lactam susceptibility and suggesting a potential strategy for enhancing antimicrobial efficacy against S. aureus.

Keyword: *Staphylococcus aureus, wall teichoic acid glycosylation, meropenem susceptibility*

A CRISPR-CAS12A-BASED METHOD FOR SCARLESS DELETION OF PLASMID-BORNE ANTIMICROBIAL RESISTANCE GENES IN STAPHYLOCOCCUS AUREUS

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Antimicrobial resistance genes (ARGs) are often maintained in Staphylococcus aureus on plasmids and other mobile genetic elements, enabling horizontal transfer intra- or inter- species. Functional analysis of plasmid-borne genes requires precise, scarless deletion of target genes while preserving the plasmid backbone and neighboring genes, which remains technically challenging. Here, we established a CRISPR-Cas12a-based method for scarless editing of plasmid-borne genes. We targeted blaR1 on the penicillinase plasmid carried by methicillin-resistant S. aureus (MRSA) N315. The gene blaR1 encodes the β-lactam sensor protein BlaR1, a key regulator that detects β-lactam signals and induces β-lactamase BlaZ expression through the bla pathway. Using the pCpfSA editing plasmid carrying a cas12a expression cassette, we constructed an editing vector containing a blaR1-targeting crRNA and homologous donor arms. After electroporation into N315, the target deletion was generated by homologous recombination. The editing plasmid was subsequently cured by serial passage, and mutants were verified by PCR and nanopore sequencing across the deletion junction. Consequently, the blaR1 was deleted scarlessly without detectable disruption of adjacent blaZ and blaI. This method provides an effective tool for functional analysis of plasmid-borne genes, especially antimicrobial resistance genes, in S. aureus.

Keyword: *Staphylococcus aureus, CRISPR-Cas12a, Plasmid-borne ARGs, Scarless deletion, blaR1*

Beyond Antioxidant: Unlocking the Full Potential of α-Tocopherol for Human Health and Plant Adaptation to Environmental Stresses

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Alpha (α)-tocopherol, the most biologically active form of vitamin E, is a potent lipophilic antioxidant that constitutes only a minor fraction of the total tocopherol pool in most oilseed crops. To develop a high-value functional food, we engineered transgenic (TR) Brassica juncea (Indian mustard) by overexpressing γ-tocopherol methyl transferase, achieving a ~6-fold increase in seed α-tocopherol content compared to wild-type (WT) plants. Beyond nutritional enhancement, we investigated the physiological resilience of these TR plants, demonstrating higher tolerance to salinity, heavy metal and drought stress. TR plants exhibited lower oxidative damage, reduced reactive oxygen species accumulation, and elevated endogenous antioxidant enzyme activity, confirming that elevated α-tocopherol fortifies plant cells against environmental stressors. We further checked the efficacy of feeding α-tocopherol enriched seeds in securing the antioxidant defense in mice. We found significant increase in the content of various phase I and phase II enzymes with a corresponding decrease in peroxidative damage. Also, the transgenic seeds were found to have chemopreventive effects against DMBA-induced skin papillomagenesis in mice model. Our results highlight the potential of increased α-tocopherol in transgenic B. juncea in health of humans and agricultural crop plants.

Keyword: *α-tocopherol, Brassica juncea, Abiotic stress, Transgenics*

QUANTITATIVE CHARACTERIZATION OF MICROSTRUCTURAL CHANGES ASSOCIATED WITH MICROWAVE VACUUM DEHYDROFREEZING THROUGH ELECTRICAL IMPEDANCE SPECTROSCOPY AND X-RAY MICROTOMOGRAPHY

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The phase transition of water during the freezing process is concomitant with the volumetric expansion, inducing undesirable microstructural changes, ultimately compromising key quality attributes like texture and structural integrity. In this context, dehydrofreezing has shown considerable potential, wherein partial dehydration is done prior to freezing to reduce the moisture content, limiting nucleation sites and promoting finer, more uniform ice crystals, thereby mitigating the structural damage to cell membrane. Microwave vacuum dehydration-freezing (MVDF) was conducted by partial dehydration of carrot samples through microwave vacuum drying, followed by freezing to -20ºC. It was observed that partial dehydration did not affect the colorimetric parameters of carrots. Texture profile analysis, conducted to evaluate mechanical response, exhibited significant decrease in the initial elastic modulus, indicating that microstructural changes were induced by the MVDF process. Impedance behavior and X-Ray μCT images were further analyzed to investigate cellular integrity and associated microstructural changes. Dehydrofrozen-thawed carrot samples exhibited a semi-elliptical pattern in the Cole–Cole plot in contrast to conventionally frozen samples, indicating better preserved membrane structure. X-ray microtomographic analysis revealed that MVDF samples exhibited a shift in trabecular separation, with peak frequencies at smaller separation ranges compared to conventionally frozen samples, indicating finer frozen microstructure in MVDF samples.

Keyword: *Dehydrofreezing, X-ray Microtomography, Electrical impedance spectroscopy, Microwave vacuum dehydration*

Development of chitosan–wheat protein scaffolds for bovine satellite cell culture <Updated>

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Soy and wheat glutenin proteins have been widely explored for food and biomaterial applications, but their comparative and combined effects on food-relevant cell types, such as bovine satellite cells, remain underreported. This study develops chitosan scaffolds incorporating soy protein and wheat glutenin through isoelectric precipitation and polyelectrolyte complexation, with each plant protein incorporated at approximately 10% protein content. The resulting scaffolds exhibited neutral to slightly positive surface charge, which may help reduce electrostatic repulsion between negatively charged proteins and cells. Although wheat glutenin supported cell adhesion better than soy protein, combining both proteins led to stronger proliferation, suggesting additive cell-supporting effects. As major soy globulins and wheat glutenin lack the classical RGD adhesion motif, the underlying adhesion mechanism is being investigated through complementary experimental and computational approaches. Ongoing docking and coarse-grained simulations indicate that plant proteins may interact directly with integrin receptors, while serum-derived bridging proteins may also contribute to adhesion. This presentation further evaluates whether gliadin-associated cytotoxicity limits the use of intact wheat gluten and discusses how directional freezing-derived aligned porous architectures influence cell proliferation and differentiation. Collectively, this work provides mechanistic insight for designing scalable plant protein–chitosan scaffolds for cultivated beef.

Keyword: *Cultivated meat, bovine satellite cells, cell proliferation, chitosan–protein scaffold, directional freezing*

Breathable Edible Wax Coatings Incorporated with Bio-Derived Porous Cellulose Cryogel Microparticles for Jujube Preservation

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Wax coating is an important preservation method extending jujube's shelf life. Although wax-based coatings provide a moisture resistant and physical microbial barrier, their dense structure excessively restricts the CO_2 and O_2 permeation, leading to anaerobic respiration and off-flavor formation. To increase the CO_2 and O_2 permeation of wax-based coating while minimizing its impact on inherent properties, microcrystalline cellulose cryogel particles (CCPs) were developed and incorporated into carnauba wax-based edible coating (CCPCW) creating micro gas channel. This design integrates bio-based CCPs with an edible wax matrix, providing a sustainability-oriented strategy for developing breathable and edible fruit packaging materials without relying on conventional synthetic plastic films. 1.00 % CCPCW increased the CO_2 and O_2 permeability by 190 % and 227 %, compared to CW, respectively. The inherent properties of CW, moisture and physical fungal barrier were retained. Finally, the jujube preservation performance of CCPCW was conducted. The CCPCW reduced the acetaldehyde and ethanol production of jujubes by 34.79 % and 15.81 %, respectively. These findings demonstrate that cellulose cryogel-enabled breathable wax coating provides an effective strategy for reducing fermentation-related off-flavors while preserving the protective advantages of conventional wax coatings for sustainable postharvest fruit preservation and edible coating design.

Keyword: *Microcrystalline cellulose, Cryogel, Edible coating, Bio-based materials, Fruit preservation*

REDESIGNING FOOD SYSTEMS FOR CLIMATE RESILIENCE AND FOOD SECURITY

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Climate change is exposing the limitations of food systems designed for relatively stable environmental and economic conditions. Rising temperatures, extreme weather events, water scarcity, and disruptions to global supply chains demonstrate that the challenge is no longer simply to produce more food, but to redesign food systems capable of functioning under continuous uncertainty. This conceptual paper argues that climate resilience emerges from the architecture of food systems rather than from individual technological solutions. It proposes that resilient food systems should be designed as distributed, diversified, circular, and spatially integrated networks that strengthen adaptive capacity across multiple scales while reducing dependence on vulnerable supply chains. This systemic perspective extends beyond food production to encompass resource management, logistics, governance, and organizational structures. A conceptual framework is presented to support the transition from production-oriented models towards adaptive food system design. The framework integrates environmental, spatial, logistical, and organizational dimensions into a coherent systems perspective, offering pathways for strengthening climate resilience while ensuring long-term food security. The proposed approach contributes to current discussions on sustainable food systems by emphasizing system redesign as a prerequisite for future resilience and global food security.

Keyword: *climate change, food systems, food security, climate resilience, circular economy*

PERSONALIZED NUTRITION AND GUT HEALTH AS DRIVERS OF HEALTHY, SUSTAINABLE AND TARGETED DIET AND FOOD INNOVATION

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Healthy and sustainable diets are essential to address major global challenges, including non-communicable diseases, population ageing, food system sustainability, and climate change. However, translating sustainability principles into effective dietary recommendations remains challenging due to nutritional adequacy, consumer acceptance, affordability, and the large inter-individual variability in nutritional needs and responses to foods.

Personalized nutrition offers a promising approach by tailoring dietary recommendations to individual characteristics, lifestyles, biological profiles, gut microbiota composition, and behavioral determinants. Advances in nutritional sciences, biomarkers, and multi-omics enable the identification of dietary needs, prediction of responses to interventions, and improvement of adherence to dietary advice.

Within OnFoods, intervention studies have explored the feasibility and impact of personalized nutrition, identifying nutritional, metabolic, microbial, and functional response clusters that improve our understanding of inter-individual variability and health outcomes. These findings provide the basis for defining population-specific nutritional needs and guiding the development of functional foods and ingredients tailored to specific physiological characteristics and consumer responses, with particular attention to gut health and microbiota-mediated effects.

The newly launched and interconnected RE-FOOD project will translate this knowledge into innovative functional ingredients and foods derived from sustainable bioresources and agri-food side streams, supporting healthier consumers and more sustainable, circular food systems.

Keyword: *Personalized nutrition, Gut microbiota, Functional foods, Sustainable food systems, inter-individual variability*

PLANT-BASED ALTERNATIVES IN THE UPF ERA: SEPARATING EVIDENCE FROM MYTHS

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Food reformulation and the growing availability of plant-based alternatives (PBAs) may contribute to the transition toward healthy and sustainable diets. In recent years, however, the debate surrounding PBAs has been increasingly influenced by concerns about ultra-processed foods, as many products are classified within this category. Assessing PBAs solely according to their degree of processing may, however, oversimplify a highly heterogeneous food group.

Within OnFoods, recent investigations of plant-based meat, cheese, and fish alternatives available on the Italian market have generated new evidence on their nutritional characteristics, formulation, and reformulation potential. While some products present critical issues, particularly related to sodium content, others exhibit favorable nutritional profiles, highlighting substantial variability across the category.

Furthermore, ongoing reformulation efforts demonstrate opportunities to improve the nutritional value of PBAs, with implications for front-of-pack nutrition labeling and consumer guidance. A multidimensional approach integrating nutritional quality, food design, and nutrition labeling may therefore provide a more robust framework for evaluating PBAs than processing-based classifications alone. Strengthening collaboration among academia, industry, and policymakers will be essential to translate scientific evidence into product innovation, effective nutrition communication, and healthier, more sustainable food systems.

Keyword: *plant-based alternatives, ultra-processed foods, food reformulation, nutritional quality, sustainable diets*

Public-private partnerships for food system innovation: Lessons learnt from ONFOODS

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Food systems require innovation models that connect scientific excellence, industrial validation and public value. This presentation reports about OnFoods, the Italian Extended Partnership for sustainable food and nutrition, as a case study of a large-scale public-private partnership. Funded through the NRRP/NextGenerationEU, OnFoods mobilised €114 million over three years, including €20 million in cascade funding, bringing together 26 universities, research bodies and companies, more than 800 participants, more than 140 newly recruited junior researchers, and more than 200 PhD students and postdoctoral researchers. Its seven interconnected Spokes address the food system from production, circularity and safety to personalised nutrition, malnutrition, behaviour, policy and education. Focusing on impacts, the presentation will show how shared governance, cross-disciplinary work packages and embedded industry collaboration translated research into open-access outputs, pilot validation, prototype development, reformulation strategies, analytical methods, data resources and policy-oriented tools. More than a funding mechanism, OnFoods functioned as a capacity-building and technology-transfer platform, generating new public-private collaborations and pathways for SMEs. The lessons learnt highlight the importance of mission-oriented coordination, measurable milestones, open science, early engagement with industrial constraints, and sustained investment in human capital to accelerate food system innovation.

Keyword: *food system innovation, public-private partnership, sustainable healthy diets*

LIFE CYCLE ASSESSMENT IN SUSTAINABLE FOOD PROCESSING AND CIRCULAR FOOD SYSTEMS: A SCOPING REVIEW OF METHODS, IMPACT CATEGORIES AND DIGITAL TOOLS

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Lappeenranta–Lahti University of Technology LUT

This scoping review synthesizes recent applications of life cycle assessment (LCA) in sustainable food processing and circular food systems from 2021 to 2025. We systematically screened Scopus and Web of Science for English-language studies assessing food products, food-system components, or circular processing systems, extracting data on impact categories, life cycle impact assessment methods, uncertainty analysis, and use of digital tools. Across 44 included studies, Global Warming Potential was assessed in all cases, while comprehensive multi-impact profiles and explicit reporting of characterization methods (e.g. ReCiPe, Environmental Footprint) were rare, limiting transparency and comparability. Formal uncertainty analysis and confidence-interval reporting were inconsistently implemented, and digital technologies beyond conventional LCA software were used in only a minority of studies, with artificial intelligence or machine learning still emerging. Evidence was strongly concentrated in European contexts, with limited coverage of food systems in the Global South. We propose reporting and methodological recommendations for food-system LCAs, including mandatory disclosure of characterization methods, broader impact category coverage, improved uncertainty quantification, and targeted expansion of high-quality evidence for under-represented regions to support robust assessment of innovative and circular food technologies.

Keyword: *Life Cycle Assessment (LCA) in Food Systems, Sustainable Food Systems and Global Food Security, Food Processing and Engineering for Sustainability, AI, Data Science and Digital Transformation in Food LCA, Environmental Impact Assessment of Novel Food Technologies*

QUALITY AND FUNCTIONAL CHARACTERISTICS OF DAIRY PRODUCTS SUPPLEMENTED WITH FERMENTED PHILIPPINE INDIGENOUS FRUITS: Rubus rosifolius and Muntingia calabura

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Food products enriched with probiotic-fermented fruits have gained increasing attention due to their potential to promote health through enhanced nutritional and bioactive properties. This study evaluated the potential of two underutilized Philippine fruits, Rubus rosifolius and Muntingia calabura, as functional ingredients in dairy products. The juice from each fruit was fermented with a co-culture of Lactiplantibacillus plantarum and Lacticaseibacillus casei and the optimized product was incorporated into yogurt and ice cream at 5%, 7.5%, and 10% supplementation levels. Fermented juices were evaluated first for physicochemical properties, viable lactic acid bacteria count and phytochemical contents while the supplemented dairy products were assessed for physicochemical characteristics, sensory quality, and probiotic viability during 7 days of refrigerated storage. Fermentation enhanced the physicochemical properties, antioxidant potential, and viable probiotic counts of both fruit juices. The supplemented dairy products were acceptable in terms of sensory quality, and exhibited improved probiotic viability and physicochemical characteristics even during storage, although viscosity gradually decreased over time. These findings demonstrate the potential of the fermented indigenous fruits as safe, value-added functional food ingredients for developing health-promoting dairy products.

Keyword: *Functional Dairy Products, Fermented Fruit Juice, Lactic Acid Bacteria, Fermented Dairy Products*

INTEGRATED TAXONOMIC AND PREDICTIVE FUNCTIONAL PROFILING OF THE TENGBA MICROBIOME

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Tengba is a traditional fermented delicacy of Besao, Mountain Province, Philippines, prepared using freshwater crabs, ground rice, water, and salt at the first hint of pregnancy in the household. Despite its cultural significance, its microbiome remains uncharacterized using culture-independent methods. This study established the first taxonomic and predicted functional profiles of the tengba microbiome through near full-length 16S rRNA gene sequencing, ITS amplicon sequencing, and bioinformatic analyses using EMU, QIIME 2, PICRUSt2, and FUNGuild. The bacterial community was dominated by Tetragenococcus halophilus, followed by Lactobacillus pobuzihii, Virgibacillus spp., and other lactic acid bacteria, halophilic bacteria, and food-grade coagulase-negative staphylococci. The fungal community was overwhelmingly dominated by Wickerhamiella versatilis, with minor contributions from Yamadazyma triangularis and Cutaneotrichosporon debeurmannianum, which were primarily classified as saprotrophs. Predictive functional profiling revealed enrichment of pathways associated with DNA replication, stress response, carbohydrate metabolism, and osmoprotection, including DNA helicase, DNA polymerase, histidine kinase, and phosphotransferase system components. The combined taxonomic and functional profiles indicate a salt-adapted microbial community that supports fermentation stability, flavor development, nutrient bioavailability, and the galactagogue properties of tengba. This study provides the first culture-independent microbial and functional baseline for tengba and establishes a foundation for future metabolomic, functional, and fermentation studies.

Keyword: *Tengba, Taxonomy, Functional Profiling, Bioinformatics*

Translating bulk protein into bioactive potential: A multi-scale exploration based on hempseed

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A novel, predictive understanding of the composition to bioactivity relationships within hempseed protein isolate has been established, revealing its potent capacity to yield targeted bioactive peptides. To achieve this, a systemic, multi-scale investigation was conducted to map the transition of hempseed protein isolate from a bulk ingredient to a source of highly specific bioactives. First, the influence of different processing techniques on the complex protein matrix was characterised physicochemically and functionally and then decoded using label-free quantitative proteomics. To translate this micro-level proteomic profile into physiological outcomes, a custom in silico bioinformatic pipeline was developed for prediction. This automated computational framework simulated multiple enzymatic hydrolysis simultaneously, enabling the high-throughput prediction of targeted bioactive peptide release. These computational findings were subsequently rigorously validated via in vitro bioassays, which quantified significant anti-hypertensive and anti-diabetic activities. This research showcases a novel integrative approach, demonstrating how computational tools can be effectively paired with experimental methodologies to advance the discovery of bioactive peptides in food proteins. Ultimately, this establishes a new scientific understanding of hempseed bioactivity while providing a scalable, precision-driven model to accelerate the global development of health-promoting, plant-based functional ingredients.

Keyword: *Hempseed protein isolate, Label-free proteomics, In silico digestion, Bioactive peptides, Bioinformatics pipeline*

IMPACT OF REGULAR GRAPE CONSUMPTION ON EYE HEALTH AND THE REGULATION OF ADVANCED GLYCATION END PRODUCTS

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Higher advanced glycation end products (AGEs) levels have been associated with chronic disease development, including age-related macular degeneration. Increasing antioxidant intake can limit endogenous AGE formation thus this study investigated the impact of regular consumption of grapes that are rich in antioxidants including resveratrol, anthocyanins, and catechins, on plasma, skin, and dietary AGEs levels, alongside eye health parameters, in older Singaporean adults.

A total of 38 participants (60–85 years) were enrolled in this 16-week parallel, double-blind randomized controlled trial and assigned to either placebo or freeze-dried grape powder (FDGP, 46 g/d) group. Plasma AGEs were quantified using liquid chromatography-mass spectrometry; skin AGEs were assessed using a skin autofluorescence reader; dietary AGEs were estimated from published datasets. Visual acuity, contrast sensitivity, macular pigment optical density and visual function questionnaire-25 were analysed. All measurements were taken pre- and post-intervention.

The change in plasma pentosidine was significantly different between the FDGP (-0.65±1.02 nM) and placebo (0.15±1.03 nM) groups. However, no changes were observed for other AGE levels or eye health parameters.

Although no measurable benefits were observed for eye health outcomes, regular grape consumption may help downregulate specific plasma AGEs levels in older Singaporean adults.

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Keyword: *advanced glycation end products, randomized controlled trial, grapes, antioxidant, older adults*

Bridging the Fibre Gap: Where Did We Go Wrong?

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Dietary guidelines recommend a Suggested Dietary Target (SDT) of 25 g/day of fibre. However, about 70% of adults do not meet these recommendations. Meta-analytical evidence shows that achieving the SDT is associated with around a 30% reduction in all-cause mortality

Despite strong evidence linking dietary fibre to metabolic health, disease prevention, and longevity, a substantial gap persists between recommended and actual intake. Current approaches, including fortification of processed foods with isolated fibres and general advice to consume whole grains, fruits, and vegetables, have not produced meaningful improvements at the population level. This highlights the need to reconsider both the science and delivery of dietary fibre.

This presentation will address three key areas: (1) differential metabolic effects of soluble and insoluble fibres, with emphasis on gut microbiome-mediated mechanisms; (2) structural and technological barriers that limit effective incorporation of fibre into processed foods, and emerging solutions; and (3) the need to refine the definition of “whole food” in relation to fibre functionality and processing.

Using evidence from in vitro, animal, and human studies, the presentation will discuss how mechanistic insights into dietary fibre, combined with food structure and processing innovations, may help close the fibre gap and improve population health outcomes

Keyword: *Dietary fibre, gutmicrobiome, satiety, metabolic health*

PHYSICOCHEMICAL CHARACTERISTICS OF NANOVESICLES DERIVED FROM WHITE ROSE FLOWER ACCORDING TO PRETREATMENT CONDITIONS

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This study evaluated the physicochemical properties of extracellular vesicles (EVs) derived from white roses according to pretreatment methods (raw, hot-air drying, cold-air drying, and freeze-drying), plant parts (petals vs. non-petal parts), and flowering stages (bud vs. full bloom). The raw samples exhibited the smallest particle size (83.00 nm), the highest particle concentration (3.07×10^{11} particles/mL), and the highest absolute zeta potential (−33.79 mV), indicating the most favorable physical properties. Among the drying methods, hot-air drying resulted in the largest particle size (104 nm) and lower stability, whereas freeze-drying maintained a high particle concentration (2.93×10^{11} particles/mL) and a stable zeta potential (−27.90 mV). In the comparison by plant part, non-petal parts showed a higher particle concentration (3.71×10^{11} particles/mL) than petals, and by flowering stage, the particle concentration (2.05×10^{11} particles/mL) was higher in the bud stage. These results indicate that the physicochemical properties of plant-derived EVs are influenced by raw material state and pretreatment conditions, providing foundational insights for their development as promising bioactive carriers in functional food and nutraceutical applications.

Keyword: *Extracellular vesicles (EVs), White rose, Pretreatment conditions, Physicochemical properties*

CIRCULATING GABA: A POTENT AND UNEXPECTED PERIPHERAL SIGNAL THAT SUPPRESSES APPETITE AND INDUCES WEIGHT LOSS

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Appetite-suppressive effects of amino acids, including γ-aminobutyric acid (GABA), have been studied since the 1980s. However, their limited efficacy has hindered practical development. Recently, we unexpectedly found that a high-dose GABA diet (5%) markedly reduced food intake and body weight in mice, accompanied by elevated blood GABA levels. Because exogenous GABA is rapidly degraded by hepatic GABA transaminase (GABA-T) and exists at only trace concentrations in blood, we hypothesized that increasing circulating GABA availability is critical for appetite suppression. To test this, diet-induced obese mice fed a 2% GABA diet received either vigabatrin (Vig), a GABA-T inhibitor, or antisense oligonucleotides (ASO)-mediated hepatic GABA-T knockdown. Both GABA-T inhibition and hepatic GABA-T knockdown significantly increased circulating GABA levels and robustly suppressed food intake in GABA-fed mice, resulting in strong body weight loss (-15%) within two weeks, primarily through fat mass reduction. In contrast, GABA, Vig, or ASO alone had no such effects. Notably, these anorexigenic and weight-loss effects were comparable to those of the FDA-approved-anti-obesity drugs semaglutide and tirzepatide and exceeded those reported for any amino acid to date. These findings identify circulating GABA as a potent peripheral anorexigenic signal that will lead to development of amino acid-based strategies for obesity treatment.

Keyword: *GABA, appetite, weight loss, obesity, food intake*

TRANSLATIONAL EVALUATION OF SOY PEPTIDES TOWARDS ALTERNATIVE THERAPEUTIC MANAGEMENT OF MALNUTRITION

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Background: Malnutrition remains a major global health burden with limited mechanistic insight and effective nutritional interventions. Existing animal models inadequately mimic human pathology, hindering translational progress.

Objective: To establish a clinically relevant non-human primate (NHP) model of undernutrition and evaluate soy-derived functional peptides as a targeted therapeutic intervention.

Methods: Undernutrition was defined in NHP model using weight-for-age z-score, supported by biochemical and histopathological analyses. Soy peptide supplementation was assessed for effects on growth, organ function, hepatic lipid metabolism, and mitochondrial integrity. Translational relevance was evaluated through clinical studies in cancer malnutrition, measuring serum biomarkers, body weight, and quality of life.

Results: WAZ ≤ -1.83 was established as the cutoff criterion for malnourished NHP model recapitulating key features of human malnutrition, including multi-organ injury, hepatic steatosis, inflammation, and mitochondrial dysfunction. Soy peptide supplementation significantly improved WAZ, reversed organ pathology, reduced hepatic lipid accumulation, suppressed inflammation, and restored mitochondrial function. Clinical studies among malnourished cancer patients demonstrated soypeptide supplementation attenuated weight loss, significantly improved in serum albumin, reduced inflammatory indices, and enhanced quality of life.

Conclusion: Soy-derived peptides are a promising, translational strategy for malnutrition management, supported by robust preclinical and clinical evidence.

Keyword: *Malnutrition, Soy peptide, Non-human primate, Therapeutic alternative, Translational research*

Eco-innovative zero-waste seaweed based biorefinery

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Seaweed is an abundant, versatile biomass growing without land, freshwater, or fertilisers, yet its uncontrolled proliferation can cause ecological imbalances, making it ideal for valorisation. This work designs a zero-waste, multi-stage cascading biorefinery for Alaria esculenta, a common brown seaweed generating multiple high value products from a single biomass.

Hydrodynamic cavitation (HDC) was employed as a novel non-thermal extraction technology to physically disrupt the recalcitrant cell walls of seaweed. HDC (20°C, 30 min) followed by a two-step membrane-based purification process yielded fucoidan and laminarin- two bioactive polysaccharides, along with mannitol, a natural sweetener. This integrated eco-innovative extraction-purification strategy replaces traditional methods of prolonged thermal extraction and purification using large volumes of organic solvents. Subsequently, the residual biomass was used to recover sodium alginate, a popular hydrocolloid in food, packaging and biomedicine. The leftover residue was then exploited to produce polysaccharide-protein composites. Instead of aiming for resource-intensive protein isolate production, generating these composites preserved synergistic protein-polysaccharide interactions resulting in remarkable foaming and emulsification techno-functionality. The remaining fibre-rich fraction was directly converted to cellulose for biobased packaging applications.

This work thereby provides a scalable blueprint for a marine bioeconomy, sustainably transforming seaweed into multiple value chains across food, health, and biomaterial sectors.

Keyword: *Alaria esculenta, Zero-waste, Hydrodynamic cavitation, Bioactive, Seaweed biorefinery*

Microalgae biorefineries for sustainable food systems: circular cultivation, energy-efficient processing, and scalable downstream integration

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Microalgae can support more sustainable food systems by providing nutrient-rich biomass with low-land demand, but large-scale implementation remains limited by costly cultivation, energy-intensive processing, and limited understanding of ingredient functionality. This study developed an integrated microalgae biorefinery that combines circular cultivation on hydrolyzed side-streams, pulsed electric field (PEF) disruption, cross-flow microfiltration, and digital process optimization for scale-up. Microalgae grown on local side-streams, including brewer's spent grain and soy whey, achieved productivity comparable to standard medium while maintaining high protein and lipid contents. Compared with high pressure homogenization, PEF reduced the energy demand for protein extraction by 40% and increased protein transmission during microfiltration from 54.5 to 141.75 g m^{-2} h^{-1}. Digital simulations supported process optimization across flow rates and biomass concentrations, enabling consistent treatment during scale-up. By integrating circular resource use, energy-efficient processing, and scalable separation, this work addresses key barriers to microalgae-based food production. The recovered protein fractions were further evaluated for their technofunctional properties and suitability for formulation, advancing a structure-process-property perspective on how cultivation and downstream processing shape the behavior of food-relevant materials. The approach is relevant to sustainable protein innovation internationally, particularly in regions seeking resilient and resource-efficient food manufacturing systems.

Keyword: *microalgae biorefinery, circular cultivation, pulsed electric fields, digital process optimization, downstream processing*

Microwave treatment and phenolic compound incorporation as complementary strategies to tailor the functionality of maize starch

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Phenolic compounds are increasingly incorporated into starch-based systems to improve their nutritional value and modify their functionality. Their interactions with starch can be enhanced through pretreatments to obtain ingredients with tailored properties. This study investigated the individual and combined effects of microwave treatment (MWT) and the incorporation of two phenolic compounds with different chemical structures, rutin and protocatechuic acid (PA) on maize starch properties. Phenolics were incorporated either before or after MWT to distinguish the effects of microwave-assisted starch–phenolic interactions from those of simple mixtures. Pasting behaviour, gel rheology, thermal properties and in vitro starch digestibility were evaluated. MWT alone markedly modified starch functionality by reducing paste viscosity, increasing gel strength and decreasing gelatinisation enthalpy. However, when phenolic compounds were involved, the response strongly depended on the compound and the incorporation sequence. Rutin generally preserved or reinforced gel structure, whereas PA weakened the gel network, reduced thermal stability and produced the largest changes in pasting behaviour, particularly when added before MWT. Regarding changes in in vitro starch digestibility, PA increased the resistant starch fraction more effectively than rutin. These findings demonstrate that MWT combined with selected phenolic compounds provides an effective strategy to tailor starch functionality for food applications.

Keyword: *Phenolic-starch interactions, Microwave-treated starch, Rheological properties, In vitro starch digestibility*

Nutritional Quality of Foods Featuring Child-Directed Marketing Strategies Before and After the Implementation of Brazilian Front-of-Package Labeling Regulations

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Child-directed marketing on food labels influences children's food preferences and purchasing behaviors and is frequently associated with ultra-processed foods of poor nutritional quality. This study evaluated the nutritional profile of foods displaying child-directed marketing strategies commercialized in Brazil before and after the implementation of the front-of-package labeling regulations RDC 429/2020 and IN 75/2020. A descriptive analysis was conducted using nutritional information from packaged foods featuring child-oriented marketing elements, including licensed characters, cartoons, games, and toys. A total of 959 products from the pre-regulation period and 473 from the post-regulation period were evaluated. Despite the implementation of the new regulations, several food categories continued to present unfavorable nutritional profiles. In the post-regulation period, G7—the largest category evaluated (n = 334)—showed high median values of added sugars (32.0 g/100 g), carbohydrates (63.0 g/100 g), and total sugars (34.0 g/100 g). Sodium content also remained elevated in some categories, reaching 580.0 mg/100 g in oils, fats, and oilseed products. These findings indicate that foods using child-directed marketing strategies remain predominantly unhealthy, highlighting the need for stronger policies regulating food marketing directed at children in Brazil.

Keyword: *child-directed marketing, food labeling, front-of-package labeling, nutritional quality, Brazil*

Development of Carboxymethyl Chitosan/Pullulan Composite Edible Films Incorporated with Erica Manipuliflora Extract for Food Preservation

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This study investigated the incorporation of Erica manipuliflora extract into carboxymethyl chitosan–pullulan edible films, evaluating its impact on the films' properties and the shelf life of apples. Film formulations containing 0%, 1% and 1.5% of the extract were prepared and characterised using UV–Vis, FTIR, contact angle, TGA, SEM, moisture content , water vapour permeability (WVP), opacity measurement, biodegradability and antioxidant activity investigations. The films were then applied as coatings to apples and stored for 30 days. Changes in pH, total soluble solids, titratable acidity, colour, decay rate and weight loss were monitored during this period. FTIR analysis confirmed interactions between the extract and the polymer matrix, while SEM revealed concentration-dependent structural changes. Incorporating the extract improved film performance by reducing WVP, moisture content, and swelling degree. Antioxidant activity increased with increasing extract concentration. Compared with uncoated samples, coated apples showed improved quality retention, with the 1.5% extract formulation providing the best preservation of colour, surface appearance, and overall quality throughout storage. These results demonstrate that E. manipuliflora-enriched carboxymethyl chitosan–pullulan films can enhance the functional properties of edible coatings and effectively extend the shelf life of apples. This highlights their potential as sustainable, bioactive food packaging materials.

Keyword: *Carboxymethyl chitosan, Pullulan, Erica manipuliflora, Food packaging*

Cholesterol-Lowering Effects of Bifidobacterium breve IDCC 4401(BBR 4401): Integrated Preclinical and Clinical Evidence

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This study aimed to evaluate the cholesterol-lowering effects of Bifidobacterium breve IDCC 4401 (BBR 4401), a heat-killed probiotic strain, through integrated preclinical and clinical investigations. In vitro screening demonstrated that BBR 4401 exhibited a high cholesterol-binding capacity, which remained stable even after heat treatment. In a hypercholesterolemic rat model, oral administration of BBR 4401 significantly reduced serum total and LDL-cholesterol, hepatic lipid accumulation, and increased fecal bile acid excretion in a dose-dependent manner. Based on these promising findings, a 12-week randomized, double-blind, placebo-controlled trial was conducted in adults with moderate hypercholesterolemia. Subjects who consumed BBR 4401 showed significant reductions in LDL-C and apolipoprotein B compared to the placebo group. No adverse events or safety concerns were observed. These results suggest that BBR 4401 may serve as a safe and effective postbiotic intervention for managing hypercholesterolemia.

Keyword: *Probiotics, Heat-killed probiotics, Bifidobacterium breve, cholesterol, hypercholesterolemia*

P1-like Phage-Plasmids Drive blaCTX-M-27 Transmission Through Lysogenic Conversion and Transposition

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P1-like phage-plasmids (PPs) are hybrid mobile genetic elements that combine features of both P1-like phages and plasmids. This study aimed to elucidate mechanisms of antimicrobial resistance genes transfer mediated by P1-like PPs, focusing on $bla_{CTX\text{-}M\text{-}27}$ dissemination in S. Indiana. Among 147 S. Indiana isolates, 9 (6.1%) carried P1 elements, with 6 harboring extended-spectrum β-lactamases gene $bla_{CTX\text{-}M\text{-}27}$. Phylogenetics indicated $bla_{CTX\text{-}M\text{-}27}$ acquisition as a secondary event in S. Indiana. Further phylogenetic analysis of P1 elements across diverse bacterial hosts showed that $bla_{CTX\text{-}M\text{-}27}$ was specifically associated with P1-like PPs in S. Indiana, indicating host-specific adaptation. Comparative genomic analysis of P1-like PP p14076B showed the absence of key variable phage regions but the presence of a Tn1722 derivative transposon carrying $bla_{CTX\text{-}M\text{-}27}$. Although p14076B lacked plasmid-like conjugative capability, it retained phage infection ability through lysogenic conversion. Transposition assays confirmed that Tn1722 derivative mediated transfer of $bla_{CTX\text{-}M\text{-}27}$, with AT/GC skew shifts at insertion sites, and the tnpA gene significantly influenced transposition frequency. These findings highlight that Tn1722 derivative mediates intra-host transfer of $bla_{CTX\text{-}M\text{-}27}$ through transposition, while lysogenic conversion of P1-like PPs facilitates inter-species dissemination. These insights provide critical understanding of the role of P1-like PPs in the spread of ARGs.

Keyword: *P1-like Phage-Plasmids, Tn1722 derivative, blaCTX-M-27, lysogenic conversion, transposition*

Effect of a Mango- and Chia-Based Beverage on Gut Microbiota in Children with Excess Weight: Study Design and Implementation Progress

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Background: Childhood obesity is associated with metabolic disturbances and alterations in gut microbiota. Mango and chia contain dietary fiber, polyphenols, and other bioactive compounds with potential prebiotic effects.

Objective: To evaluate the effect of a mango- and chia-based beverage on gut microbiota composition and related nutritional and gastrointestinal outcomes in children with excess weight.

Methods: A controlled nutritional intervention was conducted in 100 children allocated to receive either a mango beverage or a mango beverage supplemented with chia. Anthropometric, dietary, gastrointestinal, adherence, and sensory data were collected. Fecal samples were obtained before and after the intervention. Gut microbiota will be characterized through 16S rRNA gene sequencing, including sequence quality control, taxonomic profiling, alpha- and beta-diversity analyses, and differential abundance assessment.

Implementation progress: Recruitment and intervention were completed, with 92 post-intervention fecal samples available. DNA extraction has been completed, and sequencing and bioinformatic analyses are scheduled for the next phase. The beverages were successfully produced and distributed, with adequate adherence and sensory acceptability.

Conclusion: This study will provide evidence on the potential of a mango- and chia-based beverage to modulate gut microbiota in children with excess weight.

Keyword: *mango, chia, gut microbiota, 16S rRNA sequencing, functional beverage*

Optimization of proline–citric acid natural deep eutectic solvent for ultrasound-assisted recovery of flavanones from orange peel waste

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Orange peel, a major citrus processing by-product, is rich in bioactive flavonoids with recognized health benefits. This study developed a sustainable green extraction approach using a proline–citric acid natural deep eutectic solvent (NADES) combined with ultrasound-assisted extraction to recover flavanone-rich extracts from orange peel powder. Response surface methodology via a central composite design optimized three key variables: proline mole fraction (0.2–0.8), water content (6–75%, w/w), and liquid-to-solid ratio (3–37 mL/g). Extraction efficiency was monitored through total phenolic content (TPC), total flavonoid content (TFC), and antioxidant activities by DPPH, FRAP, ABTS methods. Major flavanones including naringin, hesperidin, naringenin, and hesperetin were quantified via HPLC. Under optimized conditions (proline mole fraction of 0.9, water content of 30%, liquid-to-solid ratio of 40 mL/g), the process yielded a TPC of 20.52±0.65 mg GAE/g DW and TFC of 14.14±0.23 mg NRE/g DW, alongside enhanced antioxidant activity. HPLC analysis confirmed hesperidin and naringin as the predominant flavanones. These findings demonstrate that proline-citric acid NADES serves as an efficient, environmentally friendly alternative to conventional organic solvents for valorizing orange peel waste, supporting the development of sustainable functional food ingredients.

Keyword: *Orange peel waste, Natural deep eutectic solvent (NADES), Ultrasound-assisted extraction, Flavanone*

Knowledge, Attitudes, and Practices of Food Industry Professionals Toward Rabbit Meat Utilization in Filipino Cuisine: Implications for Sustainable Protein Diversification

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Abstract

The growing emphasis on sustainable food systems has increased interest in alternative protein sources that address nutritional, environmental, and food security challenges. Rabbit meat has emerged as a promising option due to its high-quality protein, low fat and cholesterol content, and efficient production. Despite these advantages, its integration into Filipino cuisine remains limited. This study examined the knowledge, attitudes, and practices (KAP) of Filipino food industry professionals regarding rabbit meat utilization and identified factors influencing its adoption.

A convergent mixed-methods design combined quantitative survey data with qualitative insights from food industry professionals. Findings revealed moderate knowledge and generally favorable attitudes toward rabbit meat; however, its actual culinary utilization remained low. Multiple linear regression analysis showed that age, educational attainment, years of experience, and occupation collectively explained 40.5% of the variance in adoption-related practices ($R^2 = 0.405$). Qualitative findings identified barriers including limited availability, unfamiliarity with preparation techniques, supply constraints, and concerns regarding consumer acceptance.

The findings underscore the need for targeted education, culinary innovation, and industry strategies to support the culturally appropriate integration of rabbit meat into Filipino cuisine and promote sustainable protein diversification.

Keyword: *Rabbit meat, Alternative proteins, Filipino cuisine, Knowledge, attitudes, and practices, Sustainable food systems*

DEVELOPING FUNCTIONAL NON-DAIRY CREAMER FROM COCOA OIL: REPLACING GLUCOSE WITH PREBIOTICS

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Cocoa butter predominantly consists of cardioprotective oleic acid, theobromine, vitamins D and E, and stearic acid, a neutral saturated fatty acid regarding cholesterol. Conversely, conventional non-dairy creamers utilize hydrogenated fats and over 60% glucose syrup, raising concerns over trans fatty acids and high glycemic indexes. This study developed a functional powdered creamer by utilizing cocoa butter and replacing glucose syrup with three commercial prebiotics. Using a mixture design, glucose syrup was completely replaced with a blend of fructooligosaccharides, inulin, and isomaltulose. Spray drying was optimized at an inlet temperature of 170 °C, an outlet of 80 °C, and a 10 mL/min feed rate. The formulation with an optimal prebiotic ratio of 1:1:1 achieved a 78.90% product yield and 87.10% solubility, meeting all physicochemical and microbiological standards. Crucially, the developed creamer powder successfully stimulated the growth of probiotic lactic acid bacteria strains (L. bulgaricus, L. gasseri, L. plantarum, and L. johnsonii) and exhibited cellular anti-inflammatory activity in RAW 264.7 macrophages. A single 3 g serving delivered 1.2 g of prebiotics, complying with the Thai Ministry of Public Health dietary fiber regulations. These insights demonstrate the strong potential of prebiotic-substituted cocoa butter creamers as novel ingredients for the functional food industry.

Keyword: *Cocoa butte, Non-dairy creamer, Functional food, Cocoa oil, Prebiotic*

PROFILING OF WATER-SOLUBLE COMPONENTS OF EUPHORBIA HIRTA: INSIGHTS TOWARD NUTRACEUTICAL DEVELOPMENT

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Aqueous infusion of the herb Euphorbia hirta, called tawa-tawa in the Philippines, is used in Asian traditional medicine as an anti-thrombocytopenic nutraceutical preparation. Despite E. hirta's ethnopharmacological use, the comprehensive characterization of its clinically-relevant secondary metabolites remains limited. Hence, Philippine-grown E. hirta was extracted with water and spray-dried to obtain a shelf-stable crude extract that was subsequently partitioned according to polarity into water (TWA) and ethyl acetate (TWE) fractions. The water fraction was further purified through gel filtration chromatography, and all fractions were analyzed using ESI-QTOF-MS set at MS^E mode. The data were processed, aligned, and dereplicated using Progenesis QI, while principal component analysis (PCA) and S-plot analysis were employed to identify the metabolites. A total of 3,761 metabolite features were initially detected, of which 1,348 high-confidence features were retained after statistical filtering. PCA demonstrated a clear differentiation between TWA and TWE, indicating marked differences in their profiles. Among the 397 discriminating features of the aqueous fraction, 27 metabolites were putatively annotated. In silico ADMET evaluation using ADMETLab 2.0 further suggested favorable pharmacokinetic properties and low predicted toxicity for the annotated compounds, thereby providing a comprehensive metabolomic characterization of E. hirta and establishing a foundation for future commercial nutraceutical development.

Keyword: *Euphorbia hirta,, tawa-tawa, metabolomics, nutraceutical, ADMET prediction*

Active Laser Precision 3D Imaging Robotics for Accurate Packaging and Operations

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Many jobs in food and agriculture, such as crab meat picking and mushroom packaging, require precise hand-eye coordination. For robotic operations, accurate 3D vision is essential to guide robotic actuators effectively. Current 3D imaging systems, including standard RGBD cameras, typically lack the necessary depth resolution (often worse than 1 cm), making them unsuitable for precision tasks. Additionally, stereo cameras may fail in detecting reliable landmarks for certain food items.

In this presentation, we will introduce a novel active laser-scanning 3D imaging system developed to meet the demands of precision in food and agriculture applications. This system achieves submillimeter depth resolution, ideal for 3D vision and robotic operations. We will showcase results from tasks such as fresh mushroom packaging, automated blue crab picking, and more. This patented technology has potential across the agricultural and food processing sectors, enabling selective harvesting, seed manipulation, and fast, accurate 3D vision for smart automation.

Keyword: *3D vision, robotics, Packaging and Processing, Machine Intelligence., Smart packaging*

Physicochemical and Microbiological Changes in Bread Enriched with Fresh, Black, and Encapsulated Garlic During Storage

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In this study, the textural, physicochemical, and microbiological changes of breads produced with fresh garlic, black garlic, and encapsulated garlic were investigated during storage. Bread samples were stored at 25 °C in polypropylene packages for 1, 4, and 7 days, and texture profile analysis (hardness, springiness, adhesiveness, chewiness, and resilience), water activity, moisture content, total aerobic mesophilic bacteria (TAMB), and yeast–mold counts were evaluated. Results showed that hardness and chewiness generally increased during storage in all samples, while springiness and resilience decreased. The highest hardness was observed in bread containing fresh garlic (4% FG), whereas the control bread showed the lowest values. Water activity ranged between 0.93 and 0.98, indicating conditions favorable for microbial growth throughout storage. Moisture content decreased in all breads as storage time progressed.

Keyword: *garlic, black garlic, bread, texture, encapsulation*

From Food Neophobia to Acceptance: Effects of Educational and Sensory Interventions in Promoting Edible Insects as Sustainable Food in Indonesia

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The increasing demand for sustainable protein sources has positioned edible insects (EI) as a promising alternative, yet consumer acceptance remains challenging. This study examined EI perceptions and acceptance in Indonesia by comparing a non-established entomophagy region (NER; Semarang City) and an established region (ER; Gunungkidul Regency), while evaluating a combined educational and sensory intervention. A quantitative approach involved 451 baseline survey respondents, followed by a quasi-experimental pre-post-test control group design (n = 100). Data were analyzed using descriptive statistics, Mann–Whitney U test, and Spearman's correlation. NER consumers showed stronger food neophobia, including disgust, unfamiliarity, and preference for processed EI products with concealed insect forms. ER respondents showed greater familiarity, emphasis on nutritional value, and tolerance toward visible insect presentation. Across both regions, limited knowledge of EI benefits was the main barrier to acceptance. The intervention significantly increased acceptance in both NER and ER ($p < 0.01$), highlighting the effectiveness of cognitive and sensory exposure. Acceptance in NER was associated with environmental awareness, age, sex, and income, whereas in ER only age remained significant. These findings highlight the role of socio-cultural exposure and knowledge in shaping EI acceptance and the need for context-specific strategies to support EI adoption.

Keyword: *Food acceptance, Consumer Behaviour, Edible insects, Entomophagy, Food intervention*

SUSTAINABLE FOOD PACKAGING FILMS DERIVED FROM OAT AND WHEAT STRAW CELLULOSE: STRUCTURAL, BARRIER, AND THERMAL PERFORMANCE EVALUATION

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Agricultural residues represent a promising source of sustainable materials for food packaging applications. Oat and wheat straw were utilised for the extraction of cellulose through alkaline treatment. Cellulose films were optimised using response surface methodology (central composite design, 13 runs) to investigate the effects of citric acid and glycerol concentrations on tensile strength. To enhance fibre disintegration and fibrillation, cellulose suspensions were ultrasonicated at 1000 W and maximum amplitude for 60 min. Both cellulose suspensions exhibited comparable particle sizes (95-98 µm). FTIR analysis confirmed the removal of non-cellulosic components, while thermogravimetric analysis revealed major degradation between 320 and 380 °C, with residual char contents of 19.67% and 19.85% for oat and wheat cellulose, respectively.

Oat cellulose films exhibited higher tensile strength (11.15 ± 3.72 MPa) than wheat cellulose films (9.02 ± 3.27 MPa). Wheat cellulose films showed higher UVA blocking (97.81%) and opacity (12.17 A_{600} mm^{-1}) than oat cellulose films (97.08% and 8.35 A_{600} mm^{-1}). The OTR and WVTR values were 1.15 cc m^{-2} day^{-1} and 0.228 g m^{-2} day^{-1}, respectively, for wheat films, and 1.42 cc m^{-2} day^{-1} and 0.274 g m^{-2} day^{-1}, respectively, for oat films. These findings highlight the potential of straw-derived cellulose films for sustainable food packaging applications.

Keyword: *cellulose, Response Surface Methodology, Central Composite Design, Oat and Wheat straw, Ultrasonication*

REVOLUTIONIZING NOVEL FOOD INGREDIENT DISCOVERY FOR BRAIN HEALTH : HOW AI AND NEW TECHNOLOGY ACCELERATE INNOVATION

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Through the collaborative efforts of the newly established research centre RCOcean and startups such as Crystal Vision at The Hong Kong Polytechnic University, we have developed an innovative platform that integrates green and blue technologies. By harnessing AI-driven multi-omics approaches, this platform has uncovered abundant sources of novel natural bioactive small molecules and polypeptides from diverse plants and animals, opening new opportunities for nutraceutical ingredient discovery and development.

Combining artificial intelligence with chemical fractionation, isolation, and genomic profiling, we have systematically characterized the molecular composition of these compounds. They exhibit wide-ranging biological functions, including neuroprotection, ion channel modulation, antimicrobial activity, and hormone-like signaling. Several promising candidates have advanced to new dietary ingredient applications, achieving U.S. Food and Drug Administration (FDA) New Dietary Ingredient (NDI) and Generally Recognized As Safe (GRAS) certifications.

Hong Kong’s supportive technology transfer ecosystem has bridged China and the international community, accelerating translational research and commercialization of innovative biomedical products. Collectively, these findings highlight the chemical basis of natural neuroactive molecules and underscore their potential as valuable leads for brain health. By linking traditional knowledge with modern scientific innovation, our work contributes to advancing therapeutic breakthroughs in neurological health.

Keyword: *Natural bioactive molecules, Brain health, Neuroprotection*

RNase H2-Mediated Isothermal Amplification Coupled with CRISPR-Cas12b for Rapid Detection of Common Aquaculture Viruses

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Aquatic products are a vital source of high-quality protein for humans, while viral diseases in aquaculture pose severe threats to both the industry and aquatic food safety. Currently, RNase H2 is predominantly employed in probe cleavage for single-nucleotide mutation discrimination, with limited application in mediating isothermal amplification.

This study innovatively developed a novel RNase H2-mediated isothermal nucleic acid amplification technique capable of achieving highly sensitive target amplification. To enhance on-site visual detection of aquatic viruses, this method was further integrated with the robust trans-cleavage activity of CRISPR/Cas12b to eliminate false-positive results, utilizing single-stranded DNA fluorescent probes coupled with portable detection instruments to construct a rapid, accurate, and visualizable point-of-care detection platform. The platform was successfully applied for the detection of three common Class-II aquatic viruses—Spring Viremia of Carp Virus (SVCV), Cyprinid Herpesvirus II (CyHV-2), and Decapod Iridescent Virus 1 (DIV1). This work establishes a novel isothermal amplification-based detection platform for on-site screening of aquatic viruses, providing technical support for pathogen monitoring in aquatic products, early risk warning at aquaculture sources, and food safety assurance.

Keyword: *RNase H2, CRISPR-Cas12b, aquaculture viruses, nucleic acid detection*

Two-Stage Mixed-Dye-Based Isothermal Amplification with Ribonuclease-Cleavable Enhanced Probes for Dual-Visualization Detection of SARS-CoV-2 Variants of Interest

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Rapid and visual detection of SARS-CoV-2 variants is vital for timely assessment of variant transmission in resource-limited settings. Here, a closed-tube, two-stage, mixed-dye-based isothermal amplification method with ribonuclease-cleavable enhanced probes (REP), termed REP-TMAP, for dual-visualization detection of SARS-CoV-2 variants including JN.1, BA.2, BA.4/5, and Delta is introduced. The first stage of REP-TMAP is reverse transcription recombinase polymerase amplification and the second stage is dual-visualization detection synergistically mediated by the REP and the mixed dyes of cresol red and hydroxy naphthol blue. In REP-TMAP reaction, the color change under ambient light indicates SARS-CoV-2 infection, while the fluorescence change under blue light excitation specifies variant type. On detecting transcribed RNA of SARS-CoV-2 spike gene, this assay is rapid (within 40 min), highly sensitive (10–200 copies per reaction), and highly specific (identification of single-base mutations). Furthermore, the assay has been clinically validated to accurately detect JN.1, BA.2, and BA.4/5 variants from 102 human oropharyngeal swabs. The proposed assay therefore holds great potentials to provide a rapid, dual-visualization, sensitive, specific, point-of-care detection of SARS-CoV-2 variants and beyond.

Keyword: *Isothermal Amplification, SARS-CoV-2 Variants, Visualization Detection*

Enhancing Juiciness and Meat-Like Texture in High-Moisture Meat Analogues: Effects of Edible Oil Type and Inclusion Level

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The present study evaluates the effect of incorporating four vegetable oils with distinct fatty acid profiles—coconut, palm, sunflower, and sesame oil—into a high-moisture meat analogue formulated from soy protein isolate and wheat gluten (70:30). Oils were incorporated as oil-in-water emulsions at concentrations of 5, 10, 15, and 20% and processed through high-moisture extrusion. The study investigates how oil type and concentration influence extrusion processing parameters, textural properties, and rheological behaviour of meat anlogues. This work aims to study the role of lipid composition and incorporation level in structure formation and appropriate textural profile of meat analogue.

Keyword: *High moisture meat analogue, extruder, Texture, Rheology, plant protein*

MICROSTRUCTURAL CHANGES DURING SOLID-STATE FERMENTATION OF OATS DRIVE NUTRIENT DIGESTIBILITY AND BIOACTIVE RELEASE

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Solid-state fermentation (SSF) is increasingly explored as a sustainable strategy to enhance the nutritional functionality of cereal-based foods. This study investigated how SSF-induced microstructural modifications influence nutrient digestibility and bioactive properties of oat flour. Oats were fermented for 0, 48, and 120 h using mono-cultures of Lactiplantibacillus plantarum or Rhizopus oligosporus, and a co-culture system, followed by compositional, microstructural, and in vitro INFOGEST digestion analyses. Distinct system-dependent transformations were observed during SSF. Lp. plantarum induced minimal compositional changes, whereas R. oligosporus-containing systems significantly reduced phytic acid and increased α-amino group content. Fungal fermentations also exhibited earlier matrix disruption, starch crystallinity loss, and particle fragmentation than Lp. plantarum mono-cultures, although all systems converged towards a highly disrupted structure after 120 h. These structural modifications were associated with altered digestibility behaviour. Lp. plantarum reduced starch digestion rates, whereas R. oligosporus increased initial starch accessibility through extensive matrix degradation. Protein digestibility improved primarily following prolonged fermentation, particularly during intestinal digestion. SSF also enhanced phenolic bioaccessibility and antioxidant activity after digestion, with the greatest antioxidant response observed in the co-culture system. These findings demonstrate that SSF-driven microstructural reorganisation is a key mechanism governing nutrient accessibility and functional properties in fermented oat systems.

Keyword: *Solid-state fermentation, Oats, Digestibility, Microstructure, Co-culture*

CURRENT ASPECTS OF QUALITY AND SAFETY ASSURANCE IN RADIATION PROCESSING OF LOW-MOISTURE FOODS

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Federal Scientific Center of Hygiene named after F.F. ERISMAN of ROSPOTREBNADZOR

Radiation processing is an effective method for reducing microbial contamination in low-moisture foods, including dried fruits, spices and nuts. However, its practical application requires scientifically justified technological regulations defining dose ranges, critical quality and safety indicators, and monitoring points during storage.

Low-moisture foods cannot be considered automatically safe, since Salmonella, spore-forming bacteria, yeasts, molds and toxigenic fungi may persist for long periods despite low water activity. Therefore, irradiation regimes should be validated separately for each product matrix. For dried fruits, the main control indicators include microbial contamination, mycotoxins, color stability and preservation of biologically active compounds. For spices, attention should be paid not only to microbial safety, but also to essential oils, carotenoids, antioxidant activity and color parameters. For nuts, the key limiting factor is lipid oxidation, assessed by peroxide value, malondialdehyde, antioxidant activity and signs of rancidity.

A multistage monitoring scheme at 0, 1, 3, 6 and 12 months makes it possible to evaluate both the immediate decontamination effect and the stability of quality during storage. Thus, safety assurance should be based on a matrix-specific approach combining microbiological validation, physicochemical control and organoleptic assessment.

Keyword: *radiation processing, electron beam, low-moisture foods, ood safety, microbial decontamination*

Orange juice enriched with defective coffee extract and the effect of pasteurization

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Enriching processed juice with coffee extract is a strategy to add more antioxidants and increase quantity and variety of phenolic compounds. The aim of this work was to evaluate the enrichment of orange juice with coffee extract and effect of pasteurization. The extract with 161.92 mg GAE/g total phenolics compounds (TPC) and 3615.34 µmol Trolox /mg antioxidant capacity (TAC) (dry bases) was obtained from defective (85%) and green (15%) coffee. 1% extract was added to orange juice (OJ; 12,8º Brix) and pasteurized at 95°C for 30 and 60 seconds (JE). TAC by ORAC, TPC, vitamin C (VC) and pectin methylesterase activity (PME) were analyzed. The addition of extract increased TPC of OJ by almost 200% (OJ 385.03; JE 1144.55 µg GAE/ml) and there was no effect with pasteurization. TAC of OJ decreased with treatment, but adding the extract showed no significant difference between raw and pasteurized juice (OJ 21486.741; with 60s OJ 9861.25 and JE 23644.19 µmol Trolox /ml). VC decreased 12% with addition of extract but may have occurred due to the incorporation of oxygen during mixing. PME was inactivated with treatment. Therefore, enriching processed juice with coffee extract preserved the antioxidant power and increased the phenolic compounds.

Keyword: *Antioxidant, By-products, Phenolic compounds*

Alginate-Based Encapsulation of Nongmangkha (Phlogacanthus thyrsiflorus) Flower Extract for Enhanced Stability, Bioaccessibility, and Functional Food Applications

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Edible flowers are emerging as valuable sources of bioactive compounds for functional food development; however, their direct incorporation into foods is often limited by poor stability, low bioavailability, and potential sensory challenges. NThis study explores alginate-based encapsulation as a hydrocolloid-driven strategy to preserve and deliver Nongmangkha flower (Phlogacanthus thyrsiflorus) bioactives in functional food systems.

To evaluate loading effects, extract concentrations were varied from 1 to 4% (w/v), resulting in encapsulates with total phenolic content ranging from 3.63 to 13.23 mg GAE g^{-1} and DPPH radical scavenging activity increasing from 48.69% to 75.79%. In vitro gastrointestinal digestion revealed a biphasic release profile, characterised by rapid initial diffusion followed by sustained intestinal release ($k_1 \gg k_2$). Compared with the crude extract, encapsulated phenolics showed significantly reduced degradation under gastric conditions and prolonged availability during the intestinal phase.

Encapsulated beads containing 3% flower extract were subsequently incorporated into watermelon-based gummies (0.5–2.0%, w/w) and ash gourd–based ready-to-serve (RTS) beverages, alongside appropriate control formulations. Both product matrices exhibited enhanced phenolic and flavonoid content, improved antioxidant activity, and favourable physicochemical stability. Sensory evaluation indicated that gummies containing 1.5% encapsulated extract achieved the best balance between nutritional enhancement and consumer acceptability.

Keyword: *Alginate encapsulation, Phenolic compounds, Gastrointestinal digestion, Release kinetics, Functional gummies*

Nanocellulose from passion fruit peel for starch–xanthan gum films and cherry tomato coatings

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Postharvest losses of fruits and vegetables are a key challenge for food sustainability, creating a demand for biodegradable films and coatings to prolong shelf life. This study focuses on the valorization of Passion fruit peel (PFP) through the extraction of cellulose using microwave-assisted alkali treatment, followed by bleaching and acid hydrolysis to obtain nanocellulose for film preparation. The optimized extraction conditions were microwave power of 561.86 W, irradiation time of 4.33 min and NaOH concentration of 7.61% achieved 71.55% delignification yield. Nanocellulose was obtained via sulfuric acid (35%) hydrolysis, yielding 23.20 ± 3.03% with a whiteness index of 31.561 ± 0.912%. FTIR analysis confirmed successful cellulose isolation, while crystallinity increased from 59.48% (cellulose) to 68.51% (nanocellulose). Further, nanocellulose (5–20% w/w) was incorporated into starch-xanthan gum-based film. The film containing 15% nanocellulose (NC3) showed a tensile strength of 2.858 ± 0.145 MPa, solubility of 34.81 ± 3.42% and water vapour permeability of 6.473×10^{-6} g/Pa-m-h. This film was further applied as a coating on cherry tomatoes and its effect was studied. Coated tomatoes showed significantly lower weight loss, higher firmness and minimal changes in TSS while maintaining stable pH compared to uncoated samples indicating reduced respiration and moisture loss, delayed senescence and microbial growth.

Keyword: *Waste utilization, Optimization process, Film and coating, Nanocellulose*

Development of flat-die extruded polycaprolactone (PCL)-carrageenan composite films as a scalable approach for marine biopolymer-based food packaging.

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Carrageenan composites produced via extrusion remain scarcely reported, as carrageenan's limited melt flow makes continuous film production through extrusion challenging. PCL's low melting temperature enables co-extrusion with carrageenan, overcoming this limitation. This study evaluated PCL-carrageenan films containing 20-50 wt.% carrageenan against neat PCL control and is the first report of loadings above 40 wt.% via extrusion-casting. Composite thicknesses (0.401-0.438 mm vs. 0.290 mm neat) confirmed good process stability. Increasing carrageenan reduced tensile strength (22.84-5.07 MPa) and elongation (320-61%), consistent with SEM-confirmed immiscibility and aggregation; mechanical performance remained acceptable up to 30 wt.%, supporting this trade-off for shelf-life evaluation. Seal strength peaked at 20 wt.% (94.87 N), possibly by localized interdiffusion at the seal interface. Oxygen transmission decreased in composites, from increased diffusion tortuosity, lowest at 70:30 (166.31 $cm^3\ m^{-2}\ day^{-1}$), suited to oxygen-sensitive products, while water vapour transmission increased (0.00626-0.0255 $g\ cm^{-2}\ day^{-1}$), reflecting carrageenan hydrophilicity. TGA showed single-stage degradation for neat PCL and two-stage for composites, from early carrageenan loss, with increased residue (22.46% at 50:50). Opacity decreased, UVA blocking slightly increased (97.16-98.91%), and soil disintegration increased at higher loadings. The study will evaluate composite performance in a refrigerated diced beef packaging trial, validating this approach.

Keyword: *biodegradable film,, Marine polysaccharides, sustainable packaging, extrusion film casting, Biopolymer-based packaging*

IN SILICO GUIDED PRODUCTION OF ACE-INHIBITORY PEPTIDES FROM GRACILARIA CHANGII USING ENZYME-ASSISTED EXTRACTION

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The development of marine-derived anti-hypertensive ingredients is often hindered by inefficient extraction and untargeted hydrolysis. This study applies a rational, in silico-guided methodology to extract and generate Angiotensin-Converting Enzyme (ACE) inhibitory and antioxidant peptides from the commercial macroalga Gracilaria changii. To bypass harsh, denaturing alkaline conditions, algal proteins are recovered using a synergistic cellulase-and-ultrasound-assisted extraction (CUAE) at pH 5.0. Following structural validation, the crude protein is subjected to independent enzymatic hydrolysis utilizing Alcalase, Pepsin, Thermolysin, and Trypsin. These specific proteases were pre-selected through computational peptidomics designed to target the release of highly stable, proline-rich, and hydrophobic C-terminal motifs. Hydrolytic efficiency is quantified using the o-phthalaldehyde method, and the resulting fractions are screened in vitro for ACE-inhibitory and nitric oxide scavenging activities. By identifying the most biologically active enzyme-substrate pairing, this foundational screening enables downstream targeted LC-MS/MS sequencing and simulated gastrointestinal survival tracking, offering a streamlined pipeline for discovering novel cardiovascular functional ingredients.

Keyword: *Gracilaria changii, Protein Hydrolysates, Anti-Hypertensive, ACE-inhibitory, Enzyme Assisted Extraction*

BEYOND SWEET FLAVOR: METABOLOMIC PROFILING OF THE FUNCTIONAL COMPONENTS OF PHILIPPINE MUSCOVADO SUGAR

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Despite the global interest in authentic muscovado sugar as an alternative food and beverage sweetener, its natural product components remain insufficiently characterized from a functional food perspective. In this report, a metabolomics-guided analytical workflow was employed to investigate the chemical diversity of Philippine artisanal muscovado sugar. Untargeted metabolite profiling using liquid chromatography–high-resolution mass spectrometry (LC–HRMS) revealed a structurally diverse set of plant-derived metabolites, including the presence of multiple phenolic acids and flavonoid derivatives, representing key classes of redox-active natural products. Among the metabolites consistently detected across samples were chlorogenic acid, syringic acid, ferulic acid, caffeic acid, and vanillic acid. These phenolics are attributed with antioxidant, anti-inflammatory, antibacterial, and antihyperglycemic activities, underscoring their potential contribution to the health-promoting properties of muscovado. In addition, several flavonoid-derived metabolites, including schaftoside, swertisin, tricin-7-glucoside, orientin, and kaempferol-related derivatives were putatively identified, representing structurally diverse flavonoid frameworks known for their redox-modulating and anti-inflammatory bioactivities. Complementary gas chromatography–mass spectrometry (GC–MS) analysis identified several volatile metabolites, including furans, pyranones, pyrazines, and pyrroles that contribute to its characteristic aroma. These findings reveal that artisanal muscovado sugar contains a chemically diverse repertoire of phenolic and heterocyclic small molecules, highlighting its underexplored reservoir of structurally diverse bioactive metabolites.

Keyword: *muscovado sugar, functional food, metabolomics, mass spectrometry*

Molecular Design and Multi-Dimensional Valorization of Pumpkin Seed Protein: A Versatile Platform for Next-Generation Alternative Protein Systems

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To address protein sustainability, this study valorizes pumpkin seed protein (PSP) as a high-performance bio-based material. Derived from pumpkin seeds containing ~45% protein, PSP remains underutilized despite superior solubility and gelation. We systematically analyzed its major globulin, cucurbitin, employing physical induction for structural remodeling. By engineering PSP-alginate hydrogels as sustainable gelatin mimics, we successfully simulated gelatin-like rheology for 3D printing. Precision formulation tuning (2–6% PSP; 2–3% alginate) modulated matrix mechanics, increasing hardness and chewiness from 0.11 N to 1.46 N and 0.02 N to 0.99 N, respectively, significantly enhancing thermal stability and printing fidelity over animal gelatin. Beyond texturization, protein sequencing confirmed inherent Arg-Gly-Asp motifs in PSP, which mediate cell adhesion. This unique molecular feature positions PSP as a superior extracellular matrix for cell- based meat. Comparative analysis across 11 plant proteins revealed that PSP-coated microbeads exhibited exceptional cytoaffinity, stimulating a 17-fold proliferation of C2C12 cells within seven days. This performance was consistently validated across 3T3-L1 adipocytes and primary porcine myoblasts, matching animal gelatin efficacy. Ultimately, optimizing these macromolecular interactions transitions PSP from a processing byproduct into a functional cornerstone of the circular bioeconomy, directing next-generation sustainable food systems.

Keyword: *pumpkin seed protein, 3D printing, vegan gelatin, cell-based meat, sustainable food*

Comparative Analysis of Classical vs. Cell Pelleting Inoculation on Physicochemical Stability and Microbial Growth in Kumquat Fermentation

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Kumquat (Fortunella spp.), a member of the Rutaceae family, consumed with its peel, is a functional fruit exhibiting antioxidant activities due to its rich bioactive profile. However, studies on enhancing its functional properties through controlled lactic acid fermentation remain limited. This study aimed to evaluate the effects of fermentation time and two distinct inoculation methods, classical liquid culture (CLC) and cell pelleting (CP), on process kinetics during kumquat (F. margarita) fermentation using Lactiplantibacillus plantarum. Throughout the process, pH, total titratable acidity, and lactic acid bacteria (LAB) counts were analyzed in both fruit and liquid phases. The findings revealed that fermentation time and inoculation method were decisive factors in pH reduction and acidity accumulation. In all experimental groups, a significant decrease in pH and an increase in total acidity were observed, while LAB population exhibited an upward trend during the initial phase. Notably, the cell pelleting technique provided accelerated acidification kinetics under specific conditions. Variations in parameters between the fruit and liquid phases differed depending on diffusion rates and distinct metabolic activities. Consequently, kumquat fermentation with L. plantarum establishes a stable acidification profile, demonstrating that product quality can be directed via process optimization to contribute to next-generation functional fermented food strategies.

Keyword: *Kumquat, Lactic acid fermentation, Inoculation method, Functional food*

Carotenoid Degradation and Derived Volatile Formation during Long-term Tea Aging

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Carotenoids are important aroma precursors in tea, yet their transformation behavior and sensory contributions during long-term aging remain unclear. Here, carotenoid profiles and carotenoid-derived volatiles were systematically investigated in Tieguanyin (TGY) tea aged for 0, 5, 8, and 12 years. Using targeted UHPLC–APCI–MS/MS and HS-SPME/GC–MS analyses, 21 carotenoids and 15 carotenoid-derived volatiles were identified and quantified. Natural aging caused pronounced, time-dependent carotenoid depletion, with more than 99% loss after 12 years. Concurrently, most carotenoid-derived volatiles accumulated progressively, exhibiting high OAVs and strong positive correlations with aging duration. Comparison with β-carotene and lutein thermal degradation in an “in-leaf” model system revealed distinct mechanisms: natural aging favored the accumulation of upstream cleavage products, whereas thermal treatment induced rapid breakdown and preferential formation of downstream oxidation products, with β-carotene and lutein following different degradation pathways. Collectively, these findings provide mechanistic insight into the origin of carotenoid-derived volatiles in aged tea.

Keyword: *tea aging, carotenoids, carotenoid-derived volatiles, thermal degradation, UHPLC–APCI–MS/MS*

INCLUSION COMPLEXES OF TOCOTRIENOL RICH FRACTION: PRODUCTION AND CHARACTERIZATION OF THE PHYSICOCHEMICAL PROPERTIES

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Palm tocotrienol-rich fraction (TRF) is vitamin E derived from palm oil that contains tocotrienol (70-75%) and α-tocopherol (25-30%). It exhibits great potential as a functional ingredient. However, technical barriers limit its use as a functional ingredient. Tocotrienol is highly susceptible to oxidation. The aim of the study is to encapsulate TRF and to determine the physicochemical properties and stability of the resulting complexes. The highest yield (71.73 ± 0.86%) and encapsulation efficiency (54.73 ± 3.17%) were obtained at the maximum 0.05 g/mL β-cyclodextrin (β-CD). Molecular docking results suggest that vitamin E isomers and β-CD could form a mixture of full- and partial-inclusion complexes, with varying degrees of functional group being exposed. The FTIR result also supported that both the head (C-H stretch of chromanol ring, peak at 2922 cm-1) and tail of vitamin E (symmetrical CH2 bending and C=C stretch peak at 1451 cm-1, and asymmetrical CH2 at 1376 cm-1) isomers were included in β-CD's cavity. The inclusion complex of TRF is stable at 40˚C and can provide extra protection against oxygen. Storage under dark conditions is necessary to prevent light-induced degradation of the TRF.

Keyword: *encapsulation, tocotrienol*

Comparative Evaluation of Traditional and Modern Cooking Methods on the Microbiological Quality and Shelf-Life of European Sea Bass (Dicentrarchus labrax)

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The global food sector demands a comprehensive understanding of how distinct processing methods alter food safety and preservation. This study evaluates the impact of traditional (grilling, frying), modern (sous-vide, air-frying), and bioprocessing (fermentation) methods on the microbiological quality and shelf-life kinetics of European Sea Bass (Dicentrarchus labrax), compared to a raw control. Following processing, samples were stored at +4 °C for 28 days. Total Viable Aerobic Count (TVAC) and Coliform analyses were executed on days 0, 7, 14, 21, and 28 to monitor microbial dynamics and evaluate preservation efficacy. The objective was to contrast high-heat, low-temperature, and fermentation mechanisms in controlling microbial spoilage.

Analytical findings revealed that modern technologies, particularly air-frying and sous-vide, exhibited the highest efficacy in suppressing TVAC, maintaining exceptionally low loads throughout storage. Regarding coliform dynamics, all thermal interventions successfully eliminated the initial coliform load on Day 0 and established controlled, uniform growth kinetics below raw control margins until Day 28. Fermentation induced a distinct microbial stabilization after an initial dynamic phase, demonstrating robust hurdles against coliforms at storage onset. Consequently, these results demonstrate that the choice between traditional, modern, and bioprocessing methods fundamentally dictates the post-processing microbial safety and shelf-life stability of refrigerated European Sea Bass.

Keyword: *Processing methods, Sea bass, Shelf life, Microbiology*

ENHANCING THE EMULSIFYING PROPERTIES OF MEALWORM (TENEBRIO MOLITOR) PROTEIN THROUGH ENZYMATIC HYDROLYSIS

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Mealworm (Tenebrio molitor) protein is a promising sustainable food ingredient, but its application is limited by poor solubility and interfacial properties. This study investigated the effects of enzymatic hydrolysis on the structural, physicochemical, and emulsifying properties of mealworm protein. Mealworm protein hydrolysates (MPHs) were prepared using Alcalase at 0.5% and 1.0% for 15–60 min. SDS-PAGE and degree of hydrolysis (DH) analyses confirmed progressive protein degradation with increasing hydrolysis time. Circular dichroism (CD) and Fourier-transform infrared (FT-IR) spectroscopy revealed hydrolysis-induced changes in protein secondary structure. Intrinsic fluorescence increased under moderate hydrolysis conditions but decreased following extensive hydrolysis. Surface hydrophobicity decreased, whereas antioxidant activity measured by the ABTS assay increased with hydrolysis. MPHs exhibited improved emulsifying performance compared with native protein, producing emulsions with smaller droplet sizes and higher absolute zeta potential values. In addition, emulsions stabilized by moderately hydrolyzed proteins showed enhanced stability under environmental stress conditions. These results demonstrate that controlled enzymatic hydrolysis effectively improves the functionality of mealworm protein and highlights its potential as a sustainable emulsifier for food applications.

Keyword: *Tenebrio molitor protein, Enzymatic hydrolysis, Emulsifying properties, Protein hydrolysates*

Microclimate Dynamics in Bulk Grain Storage: Characterization of Temperature and Moisture Gradients in Godown Systems

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Grain storage practices vary significantly across the globe. While silo storage systems have been extensively studied, limited information is available on the microclimatic behaviour of stacked storage systems. This study investigated the spatial variation of temperature and moisture content within a commercial paddy stack consisting of 2,646 jute bags (≈40 kg each). Ten temperature–humidity sensors and six sampling probes were installed at different horizontal and vertical locations within the stack. Environmental parameters and grain moisture content were monitored at 6-hour intervals over six months.

Sensors located near the stack periphery exhibited greater thermo-hygrometric fluctuations due to direct exposure to ambient conditions and enhanced moisture exchange. In contrast, the upper mid-core region recorded the highest temperatures, indicating localised heat accumulation caused by restricted convective heat dissipation and grain respiration. The central core remained relatively stable, exhibiting lower temperature and humidity fluctuations. Coupled analysis of temperature and moisture profiles revealed strong thermo-hygrometric interactions, with warmer regions retaining higher moisture due to vapour entrapment and reduced diffusional losses. The results confirmed pronounced boundary-to-core gradients and heterogeneous microclimatic stratification within the stack, highlighting the need for location-specific monitoring strategies to improve grain quality preservation during storage.

Keyword: *Stacked storage; microclimate; grain health; driage; discolouration*

Consumer Acceptance and Safety of 3D-Printed Confectionery: Insights into Microbial Risks and Functional–Nutritional Quality

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The development of Three-dimensional (3D) food printing, has revolutionized the food industry and created new possibilities for personalized nutrition. This work investigated consumers perception, functional and nutritional attributes, and microbial safety of 3D-printed confectionaries. 3D-printed confectionaries are designed to incorporate functional ingredients such as vitamins, minerals, dietary fibres, bioactive compounds, and probiotics, enabling them to deliver targeted health benefits beyond basic nutrition. Additionally, the technology allows precise control over ingredient composition and portioning, facilitating the development of nutritionally enhanced, personalised products. Ingredient types suitable for 3D printing, their composition, structure, matrix interaction and characteristics are explored during pre-processing. Likewise, post-processing methods and their effects on the nutritional and health promoting properties of the developed 3D-printed confectionaries are highlighted in this work. Consumer acceptability of 3D-printed confectionaries is shaped by factors such as sensory appeal, perceived naturalness and safety, level of technological trust, and socio-demographic characteristics, which collectively affects acceptance and willingness to adopt these products. Although 3D-printed confectionaries show considerable promise through their ability to deliver tailored nutritional and functional benefits, however, their widespread adoption relies on maintaining microbial safety and overcoming consumer concerns regarding safety, quality, and trust.

Keyword: *3D printing, Confectionaries, pre-processing, post-processing methods*

Organic Acid Pre-Treatment As A Clean-Label Alternative To Sulfite In Osmotically Dehydrated Philippine Carabao Mango (Mangifera Indica L.)

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Sulfite preservatives are widely used in dried fruit processing to maintain product quality and safety. However, increasing sulfite sensitivity and growing demand for clean-label products drive the need for sulfite-free alternatives. This study evaluated organic acid pre-treatment as a substitute for sulfite in the production of non-sulfited osmodehydrated Philippine Carabao mango (Mangifera indica L.). Seven treatments were tested: 0.1% metabisulfite, untreated control, 1% ascorbic acid (AA), 1% citric acid (CA), and combinations of AA and CA. Physicochemical properties, color parameters (L*, a*, b*), moisture content, and microbial quality were analyzed. Acid-treated samples showed significantly lower pH values than the control ($p < 0.05$), with 1% CA producing the greatest acidity (pH 3.26). Total soluble solids ranged from 62–80 °Brix, with the untreated control showing the highest value ($p < 0.05$). Lightness values were comparable across treatments, while redness (a*) increased in acid-treated samples relative to the sulfite control. Moisture content ranged from 9–28%, with the untreated samples showing the highest level. Escherichia coli was below detectable limits (<10 CFU/g) in all samples, while aerobic plate counts varied among treatments. These findings demonstrate the potential of organic acid pre-treatment as a clean-label alternative to sulfite in osmodehydrated mango processing.

Keyword: *Philippine Carabao mango (Mangifera indica L.), sulfite alternative, organic acid pre-treatment, clean label preservative, dried fruit quality*

Quality of olive oils and olive bagasse oil and their use in thermal processes

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Olive oil is recognized due to its different properties, however, its most used form is in cold preparation, as there is still the belief that, once heated, olive oil would lose its beneficial properties to health and even form toxic substances. Thus, in order to assess the quality of olive oils and olive bagasse oil subjected to different temperatures and their use in thermal processes, the present study was developed at the Laboratory of Medicinal Plants, belonging to the State University's Department of Agronomy of Maringá. The following analyzes were performed when the oils reached temperatures of 10, 25 (room temperature), 140, 180, 220 and 260°C: acidity, peroxide index, iodine index and measurement of absorbance at 232 and 270 nm (ultraviolet). After the results obtained are compared with the standards of Codex Alimentarius, the Agência Nacional de Vigilância Sanitária, the Ministério da Agricultura, Pecuária e Abastecimento and the International Olive Council, it is concluded that even after heating, in most of the evaluated parameters, the oils remained in compliance with legislation, which can then be used in thermal processes.

Keyword: *Health, Heating, Legislation, Olive tree, Properties*

UNLOCKING THE ANTIDIABETIC POTENTIAL OF VIBURNUM OPULUS (EUROPEAN CRANBERRYBUSH) BARK: IMPACT OF EXTRACTION STRATEGIES ON ENZYME INHIBITORY ACTIVITY

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For centuries, Viburnum opulus (European cranberrybush) has been valued in traditional medicine for its broad therapeutic properties. Among the different plant parts, the bark stands out as a particularly promising source of bioactive compounds with analgesic, anti-inflammatory, diuretic, and antidiabetic potential. This study explored how different extraction strategies influence extraction yield and the inhibitory activity of V. opulus bark extracts against key carbohydrate-hydrolyzing enzymes.

Extracts were obtained using conventional and optimized enzyme-assisted extraction (EAE). Although EAE conditions were optimized to maximize extraction yield and total phenolic content, conventional ethanolic extract produced the highest yield and phenolic content. UPLC-MS analysis revealed a diverse phytochemical profile consisting mainly of flavanols, hydroxycinnamic acids, and iridoid glycosides.

The extracts were evaluated for their inhibitory activity against α-amylase and α-glucosidase, key enzymes involved in carbohydrate digestion and postprandial glucose regulation. The ethanolic extract exhibited the strongest inhibitory activity, with IC50 values of 1.17 ± 0.19 mg/mL and 65.63 ± 11.31 μg/mL, respectively. Kinetic studies demonstrated a mixed mode of inhibition for both enzymes. Additionally, the ethanolic extract showed antimicrobial activity against selected Gram-positive bacteria. These findings highlight V. opulus bark as a promising source of natural bioactive compounds with potential applications in antidiabetic formulations.

Keyword: *Viburnum opulus bark, α-amylase, α-glucosidase, tyrosinase*

Botanic Aspects Of The Leaves And Chemical Constituents In The Essential Oil From Two Varieties Of Basil (Ocimum spp) Grown In Brazil

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The screening of the biological activity aromatic plants used in folk medicine have been investigated for their possible therapeutic benefits, especially their essential oils and active compounds, being promising new sources of medicinal drugs. The leaves of two varieties of live specimens of Ocimum L., O. basilicum var. basilicum L. and var. thyrsiflora were botanical analyzed, essential oil extract by hydrodistillation, and constituents determined by GC-MS. The results of the GC-MS analysis for the O. basilicum var. Basilicum showed a predominance of linalool, α-muurolol, eugenol, 4-terpineol, and eucalyptol, as major constituents, whereas for the variety var. thyrsiflora, linalool, eugenol, α-muurolol, 4-terpinene, and germacrene D were found as majority compound.

Keyword: *Ocimum basilicum L., Essential oil, Natural products, Basil*

INNOVATIVE EXTRACTION PROCESS OF PLANT-DERIVED EXTRACELLULAR VESICLES: TECHNOLOGICAL AND SCALABILITY ASPECTS

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Plant-derived extracellular vesicles (PDEVs) have gained increasing attention as sustainable biological platforms of healthy components, but their application in the food and nutraceutical sector requires the unravelling of their functionality along with efficient and scalable processing technologies. Intrinsic and technological factors such as plant source and extraction parameters are affecting the final properties and functional performance of the vesicles. However, while the research in this field is growing, their production and application in the food sector is limited by low yields, variable purity, and inefficient processes that currently rely on time-consuming, energy-intensive ultracentrifugation processes.

This study evaluates the feasibility of Tangential Flow Filtration (TFF) as a scalable alternative to the conventional ultracentrifugation (UC), to produce extracellular vesicles from plant sources (carrots and hops) intended to be used as ingredient/additive for next-generation healthy foods and nutraceuticals. Process Yield, mass balance, and efficiency were evaluated. Antioxidant activity (ABTS, FRAP), total polyphenol content (TPC), size, concentration (NTA), and z-potential (DLS) were evaluated to assess functional and physical properties. Processing time, waste and by-product quantity were also determined to evaluate the feasibility of the application of the TFF for PDEVs extraction. Results support TFF as a sustainable, faster, scalable technology for producing plant-based vesicles.

Keyword: *Plant-derived extracellular vescicles, Extraction, Tangential Flux filtration, Carrots, Hops*

Submerged Fermentation of Tropical Fruit Residues as a Platform for Bioaroma and Carotenoid Production

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Brazil produces approximately 40 million tons of fruit annually, with more than half destined for processing, generating significant amounts of agro-industrial waste such as peels, seeds, stones, and pomace. These residues are rich in valuable compounds but are often discarded, highlighting the need for sustainable valorization strategies. This study investigated the production of natural bioaromas and carotenoids through submerged fermentation using graviola (Annona muricata) and açaí (Euterpe oleracea) residues as substrates. The volatile profile of the fermented products was evaluated after seven days of fermentation. Fermentation of graviola residue by Auriporia aurulenta resulted in the identification of 72 volatile compounds, with 3-octenol (30.07%) and D-limonene (10.68%) being the predominant compounds. Regarding carotenoid production, açaí residue showed greater potential, yielding 1.123 µg/g of carotenoids, compared to 0.363 µg/g obtained from graviola residue. The results demonstrate the feasibility of converting fruit-processing by-products into high-value compounds, contributing to waste reduction and the development of sustainable biotechnological processes.

Keyword: *Agro-industrial residues;, Biovalorization;, Natural aromas;, Carotenoid production;*

FROM WASTE TO WELLNESS: BLACKCURRANT POMACE AS A SOURCE OF BIOACTIVE INGREDIENTS FOR SKIN CARE APPLICATIONS

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Blackcurrant pomace, a major by-product of juice production, is a valuable source of bioactive compounds with potential applications in cosmetic and functional products. This study aimed to recover valuable constituents from blackcurrant pomace using conventional and innovative multi-step extraction techniques and to evaluate the biological activity of the obtained extracts. Total phenolic content (TPC) total procyanidin content, antioxidant capacity (DPPH, ABTS, FRAP, and ORAC assays), and anti-inflammatory activity were assessed. Response Surface Methodology (RSM) was applied to optimize pectin extraction conditions using enzyme-assisted and acid hydrolysis approaches.

Multi-step extraction significantly improved recovery yields, particularly with ethanol as the extraction solvent. The extracts exhibited strong antioxidant activity and high phenolic content, while significant anti-inflammatory activity was observed in the ethanol extract obtained by pressurized liquid extraction. UPLC-MS analysis enabled detailed characterization of the extract composition. Optimized enzyme-assisted extraction achieved a maximum pectin yield of 6.5%, while FTIR analysis confirmed a high degree of esterification.

Encapsulation studies were conducted to enhance the stability and applicability of the recovered compounds. SEM characterization and stability testing supported the development of a semi-solid skin formulation containing blackcurrant pomace-derived ingredients. These findings highlight blackcurrant pomace as a promising sustainable raw material for innovative cosmetic applications.

Keyword: *pro-inflammatory enzymes, black currant pomace, semi-skin formulations*

Production of volatile compounds by Saccharomyces cerevisiae from a lipid médium

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The biotechnological production of aromatic compounds by Saccharomyces cerevisiae was performed in a BioFlo/CelliGen 115 bioreactor for 120 h, using a medium containing polysorbate, oleic acid, anhydrous dibasic potassium phosphate, and magnesium sulfate. Volatile compounds were extracted by stir bar sorptive extraction (SBSE), using 5 mL samples in 20 mL vials with preconditioned PDMS Twister® (10 mm), under agitation at 725 rpm for 10 min at 25 ± 3 °C. Thermal desorption was carried out in a TDU coupled to a CIS (GC/MS), with the TDU ranging from 45 to 240 °C (60 °C·min⁻¹; 2 min) and CIS-4 reaching 250 °C (1 min; 12 °C·s⁻¹), operating in splitless and solvent vent modes, respectively. Chromatographic analysis (% area) showed a progressive decrease in oleic acid, from 82.98% (day 1) to 33.96% (day 6), indicating its use as the main carbon and energy source. Lactone production increased, especially γ-dodecalactone (0.00–30.58%), γ-nonalactone (0.16–1.42%), γ-decalactone (0.03–0.59%), γ-undecalactone (0- 0.199%), δ-dodecalactone (0-0,229%) and δ-decalactone (0.00–0.287%). These results indicate activation to acyl-CoA, followed by β-oxidation and lactonization. Additionally, part of the oleic acid undergoes hydration, while another fraction follows oxidative pathways, promoting carbon chain cleavage and formation of different fatty acids.

Keyword: *fermentation, Saccharomyces cerevisiae, volatile compounds*

CAROTENOIDS IN ACTIVE AND INTELLIGENT FOOD PACKAGING: A TECHNOLOGICAL PROSPECTION OF SUSTAINABLE INNOVATIONS

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The development of active and intelligent food packaging has gained increasing attention as a strategy to enhance food safety, extend shelf life, and reduce food waste. Natural pigments incorporated into biodegradable polymer matrices represent a promising approach to replace synthetic additives in packaging systems. Among these pigments, carotenoids stand out due to their dual functionality: as antioxidant and antimicrobial agents in active films and as pH-responsive colorimetric indicators for real-time freshness monitoring.

This study aimed to conduct a technological prospection on the use of carotenoids in active and intelligent food packaging, identifying trends in scientific literature and patent databases. Searches were performed in Web of Science, Scopus, WIPO, Espacenet, and INPI using keywords combining carotenoids, active packaging, intelligent packaging, biodegradable films, and freshness indicators.

The results revealed growing research on carotenoid-based films using biopolymeric matrices such as starch, chitosan, and gelatin, with applications in monitoring the freshness of meat, seafood, and vegetables. However, patent filings specifically addressing carotenoid-incorporated packaging remain limited compared to other natural pigments such as anthocyanins and curcumin. These findings indicate an emerging technological field with substantial innovation potential for developing sustainable, carotenoid-based packaging solutions for the food industry.

Keyword: *carotenoids, intelligent packaging, biodegradable films, food freshness indicators*

TECHNOLOGICAL PROSPECTION OF MICROBIAL CAROTENOID PRODUCTION FROM CRUDE GLYCEROL FOR NATURAL FOOD COLORANTS

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The demand for natural food colorants has increased significantly due to consumer preference for clean-label products and concerns regarding synthetic additives. Carotenoids are among the most important natural pigments used in food systems because of their coloring properties and antioxidant activity. Microbial production of carotenoids has emerged as a sustainable alternative to plant extraction, particularly when low-cost substrates such as crude glycerol, a by-product of biodiesel production, are used.

This study aimed to identify technological trends related to microbial carotenoid production from crude glycerol and evaluate their potential applications as natural food colorants. Patent searches were conducted in WIPO, Espacenet, and INPI databases using keywords associated with carotenoids, glycerol, microorganisms, and industrial by-products.

Eight patent documents were identified, involving yeasts, bacteria, and microalgae capable of producing β-carotene, lycopene, lutein, and other carotenoids. Several patents described the use of crude glycerol as a carbon source for microbial growth and pigment biosynthesis, demonstrating the viability of transforming industrial residues into value-added food ingredients.

The results indicate growing technological interest in microbial carotenoid production and highlight its potential to support sustainable manufacturing of natural food colorants, contributing to waste valorization, circular economy strategies, and innovative ingredient development for the food industry.

Keyword: *Crude glycerol, Carotenoids, Patents, Microbial production*

Thermal and Emulsification Processing of Spice Oleoresin: Physicochemical Behavior, Flavor Release, and Encapsulation in Oil-in-Water Systems

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The current study investigates the impact of thermal processing and emulsification strategies on the physicochemical behavior of a lipid-rich spice oleoresin blend, with emphasis on flavor release and emulsion stability in oil-in-water (O/W) systems. Thermal treatment influenced pungency and volatile composition, with total pungency increasing up to 120 °C due to concentration effects, followed by significant degradation at 150 °C. Headspace GC×GC-MS analysis revealed enhanced release of volatile compounds with increasing temperature, with up to 46 compounds detected at 90 °C, predominantly sesquiterpenes, reflecting the temperature-dependent release of lipophilic aroma constituents. Emulsification performance was evaluated using food-grade surfactants with varying hydrophilic–lipophilic balance (HLB). Tween 80 exhibited the highest oleoresin dispersibility (6.21 mg/mL) and superior emulsion stability, confirming its effectiveness in stabilizing lipid-rich dispersed phases. Optimal emulsion characteristics were achieved at 1% (w/v) oleoresin concentration. Encapsulation studies demonstrated that high-pressure homogenization significantly improved droplet size distribution, interfacial stability, and encapsulation efficiency (>86%) compared with high-shear homogenization, particularly with gum Arabic. These findings highlight the stabilization and delivery of lipophilic bioactives in aqueous systems, supporting the development of functional foods and advanced lipid-based delivery systems.

Keyword: *Spice Oleoresin*

Development of Probiotic Mead Using the Microbiota of Frieseomelitta varia Pollen

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The growing demand for functional fermented beverages in South America has stimulated the development of innovative products with health-promoting properties. In this context, mead represents a promising alternative for incorporating probiotic microorganisms. This study investigated the use of pollen from the stingless bee Frieseomelitta varia as a source of microorganisms for probiotic mead production.

Mead was produced from honey, water, F. varia pollen, and commercial yeast. After fermentation and maturation, the beverage was characterized through physicochemical, microbiological, chromatographic, and sensory analyses, including alcohol content, acidity, fermentability, volatile compounds, and microbial counts.

The fermentation process was successful, producing mead with alcohol content ranging from 8.5 to 8.8% (v/v) and apparent fermentation above 99%. Samples containing pollen exhibited lower acidity and improved sensory acceptance, characterized by yellow fruit notes and enhanced drinkability. GC–MS analysis revealed ethanol as the predominant volatile compound, accompanied by esters and higher alcohols associated with desirable aromas. Microbial counts exceeded 10^6 CFU mL^{-1}, meeting the minimum requirement for probiotic beverages. Microbiological isolation revealed a diverse community of fungi, yeasts, and fructophilic lactic acid bacteria, including Fructobacillus and Lactobacillus. These findings demonstrate the potential of F. varia pollen as a substrate for probiotic mead production and functional fermented beverages.

Keyword: *Mead, Probiotics, Fermentation, Pollen*

From Forest Seed to Chocolate Bar: Extraction and Modification of Mahua Oil as a Sustainable Cocoa Butter Equivalent

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The growing demand for sustainable fat sources has intensified interest in underutilized oil-bearing seeds such as mahua (Madhuca longifolia). This study developed an integrated approach to extract mahua oil, modify its lipid composition, and evaluate its performance in chocolate systems. Ultrasound-assisted extraction under optimized conditions (35 min, 35 °C) achieved 57% oil yield with >99% recovery, comparable to Soxhlet extraction, while producing oil with higher antioxidant capacity than conventional methods. The oil was fractionated at 4 °C, blended with 5% palm stearin, and subjected to a second fractionation, enriching symmetrical cocoa butter triacylglycerols (POS, SOS, POP). The final stearin contained 76% CB TAGs, exceeding regulatory benchmarks for cocoa butter equivalent (CBE). Mahua CBE exhibited melting characteristics and solid fat content similar to cocoa butter, with a compatible β_2 crystalline form, and showed blend compatibility up to 40% with Malaysian cocoa butter. Functional evaluation in dark compound chocolates (5–40% CBE) revealed acceptable particle size and rheological properties. Chocolates with up to 20% CBE showed increased hardness over 12 weeks, with no fat bloom observed. Sensory evaluation indicated the highest consumer acceptance at 10% CBE, highlighting mahua oil's potential as a sustainable lipid source for confectionery applications.

Keyword: *Mahua Oil, Oil extraction, Solvent fractionation, Cocoa butter equivalent, Chocolate*

DEVELOPMENT OF A MICROWAVE-ASSISTED CONTINUOUS VIBRO-FLUIDIZED BED DRYING SYSTEM FOR HIGH-VALUE SPICES

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Drying is a critical post-harvest operation for spices to ensure shelf stability, microbial safety, and retention of quality attributes such as colour, aroma, pungency, and bioactive compounds. However, conventional drying methods often result in prolonged drying duration, non-uniform moisture removal, quality deterioration, and high energy consumption. The present study aims to develop a microwave-assisted continuous vibro-fluidized bed drying (MA-CVFBD) system for high-value spices, with green chilli selected as a model spice. The proposed system integrates microwave pre-treatment with vibro-fluidized hot air drying to enhance heat and mass transfer, improve drying uniformity, and reduce overall drying time. The study includes the design and development of a laboratory-scale drying unit, evaluation of drying kinetics under varying operational parameters, and assessment of physicochemical and quality characteristics of dried products. Parameters such as temperature, air velocity, vibration frequency, feed rate, and microwave exposure will be optimized to achieve superior drying efficiency while preserving product quality. The developed technology is expected to provide an energy-efficient and scalable drying solution for spice processing industries, contributing to reduced post-harvest losses and improved product value retention.

Keyword: *Spice drying, Vibro-fluidized bed drying, Microwave-assisted drying, Post-harvest technology*

Chemical Diversity of Native Brazilian Vanilla Species and Their Differentiation from Commercial Vanilla Varieties

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The growing demand for natural vanilla has increased interest in alternative sources of this high-value spice. Although commercially important species such as Vanilla planifolia have been extensively studied, information regarding native Brazilian vanilla species remains limited.

Samples of Vanilla pompona, V. phaeantha, and V. bahiana obtained from different Brazilian producers were extracted using water (H_2O), 50% cereal alcohol (AC50), and 100% cereal alcohol (AC100). Volatile compounds were identified by gas chromatography–mass spectrometry (GC–MS).

GC–MS analysis revealed aroma-related compounds, including vanillin, 4-methoxybenzenemethanol, phenolic derivatives, and organic acids. Vanillin was the most frequently detected compound. The AC50 extraction yielded the highest number of identified compounds (n = 38), followed by AC100 (n = 31) and H_2O (n = 26), indicating greater extraction efficiency of the hydroalcoholic system. Differences in compound occurrence among samples suggest chemical variability between native Brazilian species and potential differentiation from widely commercialized vanilla varieties. Additional spectroscopic, chromatographic, and chemometric analyses are ongoing to further characterize these samples.

Native Brazilian Vanilla species exhibit distinct chemical profiles, highlighting their potential for authenticity studies, commercial valorization, and sustainable use of Brazilian biodiversity.

Keyword: *Vanilla sp., Chemical characterization, Analytical chemistry, Volatile compounds*

ASSOCIATION OF FOOD ENVIRONMENT AND HYPERTENSION RISK FACTORS IN DAR ES SALAAM, TANZANIA

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Background: Hypertension is increasing rapidly in sub-Saharan Africa due to urbanization, dietary transitions, and increasingly obesogenic food environments. In Tanzania, evidence linking urban food environments to hypertension risk remains limited.

Methods: A cross-sectional study was conducted among 333 adults (≥18 years) in four wards of Ilala Municipal Council. Sociodemographic characteristics, food outlet exposure, and food security indicators were collected using geocoded Maptionnaire surveys. Anthropometric measurements and blood pressure were assessed using WHO-standardized protocols. Descriptive statistics, chi-square tests, and multivariable logistic regression were used to identify predictors of hypertension.

Results: Participants were predominantly female (70.4%), middle-aged (50.1%), and of low household income (51.9%). Most participants (86.8%) were exposed to both healthy and unhealthy food outlets, while 59.8% reported eating outside the home. Hypertension prevalence was 49.6%, with 57.8% overweight or obese and about 60% exhibiting abdominal obesity. Hypertension was significantly associated with increasing age (AOR = 1.1; 95% CI: 1.0–1.1) and higher BMI (AOR = 2.3; 95% CI: 1.4–3.7).

Conclusion: Hypertension is highly prevalent among adults in low-income urban settings and is strongly associated with age and excess body weight. Routine screening, weight management, and healthier urban food environments are needed to reduce hypertension risk.

Keyword: *Hypertension, Urban food environment, Abdominal obesity, Non-communicable diseases*

TECHNOLOGICAL DESIGN OF A CONVENIENCE FOOD PRODUCT WITH MEAT AND VEGETABLES TO MEET NUTRITIONAL CLAIMS REQUIREMENTS

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The subject of the study was the development of a convenience food product – a fried, breaded meat and vegetable cutlet with a designed nutritional value (enabling a nutritional claims in accordance with EU/Reg.1924/06) for potassium, K, fiber, and vitamins A and B. Antioxidant protection was provided by polyphenols contained in vegetables. The variables studied were: the proportion of meat (60–75%) and vegetables (including carrots, peppers, and onions), and heat treatment: frying (180–195°C) and baking (120–200°C). The studies were conducted on both small and industrial scales. Sensory, chemical, and microbiological analyses were performed, as well as analyses of vitamins A, C, B, polyphenols, acrylamide (using HPLC methods), and oxidative stability (TBA and ABTS). In the small-scale studies, the products were characterized by high protein, vitamin B_6, and potassium content. Acrylamide levels decreased with increasing meat content but increased with higher frying temperatures (but the increase in TBA was smaller). In a large-scale study, good retention of vitamin A (140µg/100g) and B_5 (1.5mg/100g) and a good microbiological standard below 10^2CFU/g were achieved, which allows the use of nutritional claims in the product labeling.

This research was co-financed by the EU and National Center for Research and Development (Poland)POIR.01.01.01-00-0106/20project.

Keyword: *Convenience food, nutritional claims, meat and vegetable product*

ID: 1127

Engineering Stable Plant-Based Pickering Emulsions Using Mung Bean Protein Nanoparticles and Edible Oils

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Plant-based Pickering emulsions are emerging as sustainable platforms for the encapsulation and delivery of lipophilic bioactives; however, the influence of edible oil characteristics on emulsion stability remains poorly understood. This study explored the synergistic interplay between mung bean protein nanoparticles (MBNPs) and three plant-derived oils—mustard oil, watermelon seed oil, and rice bran oil—to engineer stable oil-in-water Pickering emulsions. The impact of oil properties, including viscosity, density, free fatty acid content, and fatty acid composition, on emulsion performance was systematically evaluated. MBNP-stabilized emulsions exhibited shear-thinning behavior, with enhanced rheological properties and stability as nanoparticle concentration increased from 0.5 to 2.5%. Lower MBNP concentrations resulted in reduced storage stability over 28 days and under varying pH conditions (3, 7, and 9), highlighting the importance of adequate interfacial particle coverage. Multi-response optimization using the Simple Least Squares Method identified rice bran oil with 2% MBNPs as the optimal formulation, achieving a desirability score of 0.812 based on particle size, zeta potential, free fatty acid content, and creaming stability. The optimized system demonstrated superior physicochemical stability, revealing the potential of MBNP-based Pickering emulsions as sustainable and efficient carriers for lipophilic bioactive compounds in functional food and nutraceutical applications.

Keyword: *Emulsion optimization, Plant-based oils, Pickering emulsion, Functional food delivery, Mung bean protein nanoparticles*

INVESTIGATING THE EVOLUTION OF GEL NETWORK INTERACTIONS DURING RIPENING AND THEIR IMPACT ON THE PROPERTIES OF A FERMENTED FABA BEAN PROTEIN-BASED CHEESE ANALOGUE

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The development of plant-based cheeses requires improved control of protein gelation and texture. Fermentation may enhance the functionality of legume proteins through proteolysis and subsequent modifications of the gel network, similarly to cheese ripening.

In this study, faba bean protein gels containing sunflower oil were fermented with lactic acid bacteria exhibiting different proteolytic activities (Lactococcus, Streptococcus, Lactobacillus, Lactiplantibacillus, and Lacticaseibacillus). After gelation and pressing samples were ripened at 12°C for 28 days. Structural and textural changes were monitored using microbial counts, OPA assay, SDS-PAGE, TPA, compliance tests, and dynamic rheology.

Proteolytic strains produced higher OPA values, confirming increased protein degradation during ripening. This proteolysis was associated with a 5–10% decrease in cohesiveness, indicating a reduced ability of the gel network to recover after deformation, a trend comparable to semi-hard cheese ripening. Longer ripening times also resulted in higher viscosity and shorter relaxation times, suggesting increased network mobility. Mechanical thermal analysis revealed modifications in tan(δ) linked to different structural bond in proteolyzed gels, indicating a shift toward more viscous behavior. These changes resulted from the formation of temperature-sensitive hydrogen bonds promoted by proteolysis. Overall, fermentation and ripening significantly modified gel structure and functionality, highlighting their potential for developing plant-based cheese analogues.

Keyword: *Faba bean, protein, gel, fermentation, Texture*

Vis–NIR Spectroscopy Coupled with Multimodel Machine Learning for Detecting Millet and Chili Adulteration in Black Pepper

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Black pepper is vulnerable to economically motivated adulteration with cheaper materials such as millet and chili powder. This study evaluated visible and near-infrared (Vis-NIR) spectroscopy coupled with multimodel machine learning to detect millet and chili adulteration in black pepper. Pure and adulterated samples were prepared at 1, 5, 10, 20, and 25% w/w, and spectra were scanned from 300 to 1100 nm. Principal component analysis (PCA) was used to examine spectral dimensionality, while artificial neural networks (ANNs), linear discriminant analysis (LDA), k-nearest neighbors (KNN), and partial least squares discriminant analysis (PLS-DA) were developed for six-class adulterant-specific and three-class inter-adulterant classification. Millet generated a low-dimensional, starch-associated signature, with 93.10% of the variance concentrated in PC1, whereas chili produced a more multidimensional response, distributed mainly across PC1 and PC2 due to pigment and compositional heterogeneity. In the combined framework, PC1 and PC2 explained 97.18% of the total variance, supporting clear separation of pure, millet-adulterated, and chili-adulterated samples. All classifiers achieved prediction accuracies above 94%, with ANN achieving perfect classification across datasets. These findings show that Vis-NIR spectroscopy can rapidly detect low-level black pepper adulteration and that the chemistry of adulterants can inform model selection for spice authentication.

Keyword: *Black pepper authentication, Vis–NIR spectroscopy, Machine learning, Food adulteration*

EXTENDING THE SHELF LIFE OF UNCURED FRESH SAUSAGE USING HERBAL EXTRACTS AND COLD PLASMA

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The aim of the research was to develop a technology to extend the shelf life of fresh, uncured pork sausages by adding herbal extracts and exposing them to cold atmospheric plasma. Aqueous extracts of dried herbs rosemary, thyme were added to the meat: (80-82% of the recipe). The second preservation method was cold plasma (1000W, distance from head=5-8 cm/time t=5' in small-scale ; while h=3-5cm/t=100-150sec. in large-scale experiment). Microbial counts, terpene levels by GC/MS, and polyphenol levels by HPLC were analyzed. Thyme extract was a rich source of thymol (31 µg/100 g) and rosemary in polyphenols (28 mg/kg). In a small-scale experiment, after treatment with extracts and cold plasma and storage of sausages, a reduction from 5.66 to 4.51–3.92 log CFU was achieved. In an industrial experiment, a significant reduction in microbial counts from 6.6 to 4.4 log CFU after 12 days of storage was achieved only after the combined treatment with thyme extract and plasma, while maintaining high levels of terpenes (35-control vs 32µg/100 g) and polyphenols (161vs152 mg/kg).This confirms the possibility of extending the shelf life of fresh sausages from 8-9 days to 12 days.

Research was co-financed by EU/National Center for Research and Development (Poland)-POIR.01.01.01-00-2259/20 project.

Keyword: *cold plasma, herbal extracts, fresh sausage, shelf life*

Effects of Pre-processing on the Dry Milling Fractionation of Pearl Millet and Cowpea: Challenges in Protein Separation

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Dry milling fractionation has long been employed to separate proteins from plant sources; however, interest in this technology has recently surged because it is a highly sustainable process requiring minimal energy and water. In this study, pearl millet (Pennisetum glaucum L. R. Br) and cowpea (Vigna unguiculata L.) were processed using a laboratory-scale combined impact mill and air fractionator under varying conditions. Prior to milling, the effects of debranning and germination pre-treatments were evaluated on pearl millet, while the effect of low-pH soaking was assessed on cowpea. The resulting fractions were characterized using particle size distribution, polarized light and electron microscopy, pasting viscosity, X-ray diffraction, calorimetry, and proximate composition. Results are discussed in light of the structural and physicochemical differences between this cereal and legume. Ultimately, cereals present a significant challenge for the separation of macroconstituents—especially protein—which is increasingly sought after to meet the growing global demand for sustainable, health-promoting food ingredients.

Keyword: *non-traditional grains, milling grains, funtional properties of flours, particle size distribution*

Nanoliposome Encapsulation of Sargassum Fusiforme Polysaccharides for Enhanced Bioavailability and Functional Skin Protection

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Marine-derived polysaccharides are promising bioactive macromolecules, but their high molecular weight limits transdermal delivery and functional efficacy. In this study, a sulfated polysaccharide from Sargassum fusiforme (DSFP, ～41 kDa) was encapsulated into nanoliposomes (DSFP@Nano) to enhance skin-targeted bioactivity. Results showed that DSFP@Nano exhibited nanoscale size, uniform distribution, negative surface charge, and preserved structural integrity. Stability assessment over 21 days demonstrated minimal changes in particle size, polydispersity, and surface potential, while contact angle measurements indicated favorable interactions with biological interfaces. In vitro and in vivo permeation studies further demonstrated that DSFP@Nano exhibited enhanced skin penetration and significantly improved the transdermal delivery efficiency of DSFP. DSFP@Nano improved anti-photoaging activity and reduced oxidative stress in skin cells compared with free DSFP. In vivo, topical application of DSFP@Nano preserved dermal collagen and mitigated UV-induced structural damage. These findings demonstrate that nanoliposome encapsulation effectively enhances the delivery and functional performance of high-molecular-weight polysaccharides, providing a versatile platform for the development of skin-targeted bioactive materials.

Keyword: *Sargassum fusiforme polysaccharide, nanoliposome, bioactive delivery, transdermal penetration, skin protection*

EFFECT OF BUTYLENE ADIPATE CO TEREPHTHALATE – PBAT ON THE PROPERTIES OF MULTICOMPONENT ACTIVE BIODEGRADABLE FILMS FOR THE ACTIVE PRESERVATION OF FRESH CHICKEN UNDER REFRIGERATION CONDITIONS

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Chicken retailing generates a high environmental impact due to the massive use of single-use plastics, aggravated by the lack of biodegradable alternatives that withstand the high moisture and microbial susceptibility of the product. This work evaluated an active packaging prepared by extrusion with PBAT, gluten, starch, gelatin, and chitosan, analyzing the effect of fiber orientation. Storage tests were conducted on chicken at 4 °C for 10 days to measure its preservation effectiveness.

The inclusion of 20% PBAT optimized barrier and mechanical properties, achieving the lowest insolubility (80.87 0.74 %) at 24 hours and the highest tensile stability after 86 hours under water (1.35 to 3.63 MPa). Likewise, this treatment presented the lowest WVTR (158.06 g/m^2 d) and QH2O (2248.76 g mm/m^2 atm d) values. However, only the films with 30% PBAT demonstrated microbiological inhibition against Salmonella and S. aureus.

It is concluded that PBAT improves the physical-mechanical performance of the multicomponent packaging at concentrations of 20% but requires 30% to activate the antimicrobial functionality of 1% chitosan, which is crucial for the preservation of refrigerated chicken.

Keyword: *food packaging, cold storage, poultry, shelf life*

ENHANCING OLIVE OIL RECOVERY THROUGH VACUUM-ASSISTED MALAXATION

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Improving extraction efficiency while maintaining high product quality is a key objective for the olive oil industry. Among the emerging technologies proposed to enhance process performance, vacuum-assisted malaxation has attracted increasing interest due to its ability to modify the physicochemical conditions of olive paste during processing.

This study evaluated the effect of a vacuum-assisted malaxation system (Booster) compared with conventional malaxation under industrial operating conditions. Trials were conducted on two olive cultivars, Carolea and Dolce di Rossano, and extraction performance was assessed through mass balance calculations and the determination of residual oil content in pomace.

The adoption of the Booster system resulted in a clear improvement in extraction performance for both cultivars. Compared with conventional malaxation, extractability increased by approximately 4 percentage points, while a reduction in residual oil losses in pomace was also observed. These results indicate a more efficient recovery of oil from the olive paste and a better utilization of the available oil fraction.

The findings demonstrate that vacuum-assisted malaxation can enhance the effectiveness of the extraction process by increasing oil recovery and reducing process losses. The technology therefore represents a promising solution for improving both the economic and environmental sustainability of modern olive oil extraction plants.

Keyword: *Olive oil processing, Vacuum malaxation, Extraction efficiency, Oil recovery*

FROM PINEAPPLE WASTE TO THERAPY: CHITOSAN-ENCAPSULATED BROMELAIN AND POLYSACCHARIDES FOR INTESTINAL ANTI-INFLAMMATORY DELIVERY

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Pineapple processing generates large amounts of underused by-products rich in bromelain, a proteolytic enzyme with known anti-inflammatory potential, and polysaccharides with prebiotic and gut-modulating properties. Chitosan-based system encapsulation emerges as a promising strategy to enhance stability, protect these bioactives from gastric degradation and promote targeted intestinal delivery.

In this study, pineapple stem residues were valorized by recovering bromelain (polyelectrolytic precipitation) and functional polysaccharides (thermal hydrolysis), which were co-loaded into chitosan microparticles by ionic gelation. The bioactives bioavailability throughout the gastrointestinal tract was assessed using the standardized INFOGEST protocol. Each GIT phase was characterized for proteolytic activity assay and protein content and the intestinal samples were tested for cytotoxicity and interleukin regulation.

The most promising results were obtained for the encapsulates containing pineapple polysaccharides and bromelain, showing no detectable oral/gastric activity but preserved 50-70% intestinal bromelain activity, confirming effective upper-GI protection and targeted release. Intestinal digesta were non-toxic at 20× for Caco-2 monolayer cellular line and a decrease in interleukin secretion was observed under stimuli, suggesting a down-regulation of epithelial inflammatory responses often associated with IBD.

These findings highlight a sustainable, pineapple-waste-based microencapsulation platform with strong potential for colon-targeted management of intestinal inflammation and microbiota-modulating functional foods.

Keyword: *pineapple by-products, bromelain, polysaccharides, anti-inflammatory effects, intestinal delivery*

PULSED ELECTRIC FIELD AS A NON-THERMAL STRATEGY TO IMPROVE OLIVE OIL EXTRACTABILIY AND QUALITY

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The olive oil industry is increasingly seeking innovative processing solutions able to improve extraction efficiency while preserving the nutritional and sensory quality of olive oil. Conventional approaches rely on longer malaxation times and higher temperatures, which may negatively affect product quality and process sustainability. In this context, Pulsed Electric Field represents a promising technology.

Tests were performed on Coratina olives using an industrial pilot-scale pulsed power generator based on solid-state Marx circuit technology. By modulating frequency (15-150Hz) and pulse length (8-30 μs), the study evaluated extraction efficiency, pomace oil retention, phenolic content and volatile compounds.

The results showed that PEF-assisted processing can support olive oil extraction, with differences among treatment conditions in terms of oil recovery, extractability and oil retention in pomace, providing useful insights into the mechanisms affecting extraction efficiency. Further evaluation of phenolic content and volatile compounds confirm a positive impact on the nutritional and sensory quality.

In conclusion, PEF represents a potentially more sustainable approach for EVOO production, achieving extractability values comparable to conventional processes without negatively affecting legal and sensory properties. Moreover, PEF technology enhanced the phenolic compounds content, which is closely related to the nutritional, antioxidant and sensory properties of olive oil.

Keyword: *Pulsed Electric Field, Extraction efficiency, Phenolic compounds, Non-thermal processing, Olive oil*

IMPROVING VANILLA CURING PROCESSES TO SUPPORT QUALITY, SUSTAINABILITY, AND ENTRY INTO HIGH VALUE INGREDIENT MARKETS

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Vanilla is a plant from the orchid family, native to Mexico, whose aromatic fruits have high commercial value. It is one of the most popular flavors worldwide and is used in a wide range of products, including confections, ice creams, foods, perfumes, and beverages. After undergoing the curing process, this pod is referred to as a vanilla bean. The first signs of fruit ripening are dehydration at one end, a change in color, and the formation of lateral splits. These factors aim to release the aroma and attract seed dispersers. In the artificial process, known as curing, the natural ripening of the fruits is interrupted before the lateral splits form. This process enhances chemical reactions that produce aromatic substances and prevents the formation of lateral splits, avoiding premature dehydration, contamination, and the loss of aromatic compounds. This study aims to investigate new approaches to the curing process to increase its efficiency and reduce costs, while comparing these alternatives with the traditional Bourbon and Mexican curing methods. The resulting data deepen knowledge of vanilla species and support future efforts in commercial valorization, and sustainable use, facilitating their entry into high-value natural ingredient markets.

Keyword: *Vanilla sp, curing process, aromatic substances*

PRO-ALM OGI: DEVELOPMENT OF AN INSTANT FERMENTED MAIZE–MILLET–ALMOND BREAKFAST MIX FOR IMPROVED NUTRITION, CONVENIENCE, AND SHELF STABILITY

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PRO-ALM OGI: DEVELOPMENT OF AN INSTANT FERMENTED MAIZE–MILLET–ALMOND BREAKFAST MIX FOR IMPROVED NUTRITION, CONVENIENCE, AND SHELF STABILITY

Traditional ogi is a fermented cereal porridge widely consumed across Nigeria and West Africa. Despite its popularity, conventional ogi is largely carbohydrate-based and provides limited protein and healthy fats. This study proposes Pro-Alm Ogi, an instant fermented maize–millet breakfast mix fortified with almond flour and blanched almond paste to enhance nutritional quality while preserving cultural relevance. The product integrates traditional fermentation with modern food engineering operations including controlled drying, particle size standardization, powder blending, and barrier packaging. Almond ingredients contribute plant protein, dietary fiber, and heart-healthy unsaturated fats, while millet improves micronutrient content and strengthens local agricultural utilization. The manufacturing process produces a low-moisture, shelf-stable powder reconstituted with hot water or milk. Consumer demand for convenient and nutritious breakfast options, particularly among students, workers, and families, supports market potential. Safety considerations include moisture control, microbial stability, and prevention of lipid oxidation using aluminum-laminated packaging. The product is expected to achieve a shelf life of 9–12 months under ambient-storage conditions. Pro-Alm Ogi demonstrates how almonds can be incorporated into a traditional African daily food specialty while improving nutrition, convenience, and commercial feasibility.

Thank you

Keyword: *Ogi, Almond flour, Fermentation, Functional Foods, Food Process Engineering*

BIOPRESERVATIVE ACTIVITY OF EXOPOLYSACCHARIDES PRODUCED BY LACTIC ACID BACTERIA FROM INDIGENEOUS FERMENTED FOODS ON THE SHELF LIFE OF CHERRY TOMATOES

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There has been increasing interest in natural alternatives to enhance food shelf life. Exopolysaccharides were extracted Lactic acid bacteria. The extracts were centrifuged at 6000 rpm for 30 minutes and precipitated overnight at 4°C using cold ethanol. The EPS samples were further purified using 14% trichloroacetic acid. The antimicrobial properties of the extracted EPS were tested against spoilage bacteria (Leuconostoc spp., Pseudomonas fluorescens, and Bacillus cereus) while antifungal properties of EPS were evaluated against selected spoilage fungi (Mucor spp., Aspergillus spp., and Penicillium spp. Biopreservative potential of the EPSs was evaluated by applying 0.2% and 1.8% concentrations of EPS extracts to fresh tomatoes via seed coating and observed for seven days. One-way ANOVA was used to determine the significance between treatment groups. Molecular identification of LAB isolates was carried out using 16S rRNA gene sequencing. The EPSs demonstrated strong antimicrobial activity, with inhibition zones of 27.20 ± 0.2 mm against Bacillus cereus and 19.0 ± 0.2 mm against Penicillium spp. Exopolysaccharides-treated tomatoes exhibited delayed spoilage symptoms until day 6 at 1.8% concentration, while the control group got spoilt after day 4. No significant difference was observed in EPS concentration after seven days of storage between the treatment and control groups ($p = 0.474$).

Keyword: *Lactic acid bacteria, Exopolysaccharides, antimicrobial properties, Biopreservative potential*

ANTIOXIDANT AND ANTI-INFLAMMATORY POTENTIAL OF MYAGROPSIS MYAGROIDES: AN INTEGRATED STUDY OF EXTRACTION DIVERGENCE, UNTARGETED DUAL-MODE UPLC-MS/MS, AND NETWORK PHARMACOLOGY

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An integrative approach was employed to evaluate how extraction divergence (30% vs. 80% ethanol) affects the antioxidant potency of the brown seaweed Myagropsis myagroides and elucidates its multi-target mechanisms against inflammatory pathways. Extracts were profiled using quantitative assays (TPC, DPPH, ABTS, FRAP) and untargeted dual-mode UPLC-MS/MS QTOF. Comparative metabolomics and Molecular Networking integrated quantitative data with in-silico bioactivity scores (PASS Online) into Cytoscape, followed by network pharmacology via SwissTargetPrediction and DisGeNET. Results showed significant divergence as 30% ethanol yielded superior phenolic content (1,737±13.23 mg PG/100g) and higher antioxidant capacity across all metrics. Untargeted UPLC-MS/MS mapped the chemical profile where 30% ethanol favored hydrophilic phenolics, whereas 80% ethanol enriched lipophilic constituents like sargaquinoic acid (SQA), MGDG, and fatty amides. Bioactive Molecular Networking coupled these variations with high predicted anti-inflammatory probabilities, predicting that M. myagroides metabolites systematically modulate core hub genes regulating inflammatory cascades. Coupling quantitative chemical divergence with dual-mode mass spectrometry and chemoinformatics accelerates marine natural product discovery, linking extraction chemistry directly to multi-target pharmacological insights.

Keyword: *Myagropsis myagroides, Untargeted metabolomics, molecular networking, Network pharmacology*

HYBRID MULTIPHYSICS MODELLING FOR SMART BAKING SYSTEMS

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Baking is a complex process (multiphase, multiphysics, dynamics changes) where the viscous dough is transformed into a semi-solid porous structure. However, dynamic changes during baking are still not fully understood. This study was to develop a mechanistic model that captures the transport phenomena and kinetic changes occurring during baking. The focus is on understanding the complex interactions between heat and mass transfer, deformation, and pore structure development. For a deeper understanding, a mechanistic model was developed, taking into account heat and multicomponent, multiphase mass transport. The coupled partial differential equations were solved to provide detailed insight into intricate dynamics (including the random microstructure) of baking. Kinetic models for describing the quality changes were developed. A hybrid modeling approach combining mechanistic and AI-driven was employed. The local temperature and average moisture content predictions agreed well with the experimental results for different conditions. The local temperature, average moisture content and quality parameters (texture predictions) agreed well with the experimental results for different conditions. A new mathematical was developed and implemented to describe the phenomena during baking. The new established model provides quantitative insight into heat, mass transfer, structure changes and quality evolution during baking, enabling process optimization for improved product quality.

Keyword: *Modelling, Multiphysics, Multiphase, Food Processing, mechanistic model*

INNOVATIVE EXTRACTION AND MICROENCAPSULATION STRATEGIES FOR HIGH-QUALITY SOLUBLE COFFEE PRODUCTION

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Coffee, Coffea arabica or Coffea canephora depending on the variety, belongs to the Rubiaceae family and is cultivated in tropical and subtropical climates. Coffee is one of the main commodities produced and consumed in Brazil, representing an important beverage in both the national and international markets (ABIC, 2024). Considering its economic, commercial, and traditional importance, this work aims to analyze the composition of coffee in different post-harvest processing methods and the influence of black, green and spicy beans on the final beverage and to develop an alternative extraction method, using column extraction, mocca pot, and filtered methods with different roast levels and potable water, in order to produce a microencapsulated soluble coffee in gummy form for various applications in beverages and the food industry. The final product is a high-quality coffee with preserved aroma, flavor, and volatile compounds, enhancing the overall consumer experience.

Keyword: *coffee, microencapsulation, post-harvest processing methods, aroma*

Profiling of Bioactive Components and In Vitro Evaluation of the Antioxidant Activity of Aratiles (Muntingia Calabura L.) Fruit as Affected by Heat Treatment

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Muntingia calabura L. is an economically important yet underutilized fruit in the Philippines. This study aimed to profile the bioactive components and evaluate the antioxidant capacity of M. calabura fruits as affected by steaming and water blanching. Freeze-dried fruit powders were analyzed for total phenolic content (TPC), total flavonoid content (TFC), total anthocyanin content (TAC), individual phenolics, vitamin C, and antioxidant activity using DPPH, ABTS/TEAC, and FRAP assays. Steaming (105 ± 5 °C for 5 min) significantly ($p < 0.05$) increased TPC and TFC by 20% and 4.35%, respectively. In contrast, water blanching (90 ± 5 °C for 2 min) yielded the highest vitamin C (1.33 ± 0.02 mg/g freeze-dried sample [FDS]) and TAC (0.0094 ± 0.0004 mg CGE/g FDS). Antioxidant capacity, measured by ABTS and FRAP, increased by 26% and 31%, respectively, after steaming, whereas unprocessed fruits exhibited the highest DPPH radical scavenging activity (100.91 ± 0.09 mg TE/g FDS). Most identified phenolic compounds increased after processing, with epicatechin as the predominant phenolic, accounting for approximately 61% and 65% of phenolics in steam-blanched and water-blanched samples, respectively. Overall, heat pretreatment, particularly steaming, enhanced the bioactive composition and antioxidant capacity of M. calabura fruits, supporting their potential as a functional food ingredient and an alternative sweetener.

Keyword: *Muntingia calabura L. Fruit, Bioactive compounds, Antioxidant activity, Steam blanching, Water blanching*

Oat beta-glucan as adjunctive nutritional therapy in active ulcerative colitis: clinical and inflammatory outcomes of a 28-day intervention

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Ulcerative colitis (UC) is a chronic inflammatory bowel disease in which conventional pharmacotherapy often fails to achieve full remission, prompting interest in dietary fibre-based adjuncts. This study evaluated a 28-day intervention with 100 mL of a 3% solution of highly purified (99.3%), low-molar-mass oat beta-glucan (OBG; 3 g/day) in two patients with active, de novo UC receiving standard pharmacotherapy. The OBG preparation was first confirmed non-cytotoxic in a 3D intestinal co-culture (Caco-2, HT29-MTX, THP-1) at 100–400 µg/mL. Clinical, endoscopic, haematological, biochemical and immunological parameters, plus faecal calprotectin, were assessed before and after intervention. Despite prior non-response to 3–6 weeks of mesalazine ± budesonide (LCAI 16 and 19), both patients reached remission after OBG: the Disease Activity Index fell from 5→0 and 8→1, and LCAI from 16→1 and 19→2. Faecal calprotectin dropped from 316 to <5 µg/g and from 2640 to 1 µg/g; CRP normalised in the male patient (9.4→<1 mg/L), with reduced IL-1β and increased anti-inflammatory IL-10. Endoscopy confirmed mucosal healing (Mayo 2→0) in the female patient. Remission persisted at one year, with no adverse effects. Purified OBG shows promise as a safe adjunctive functional-food therapy in active UC.

Keyword: *dietary fibre intervention, faecal calprotectin, mucosal healing, inflammatory bowel disease*

From recipe to production line: high-fibre and high-protein dry wafers developed in the VIVAFER project

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The VIVAFER project (NUTRITECH I programme, NCBiR, Poland) reformulated dry tortilla-type wafers — a base for many popular confectionery snacks — into nutritionally enhanced products. Candidate fibre and protein sources, including apple pomace, microcrystalline cellulose, inulin, pea ingredients, spirulina and edible-insect (cricket) flour, were screened through laboratory and pilot-plant baking. Only two formulations passed pilot testing and reached commercial readiness. The high-fibre wafer combined refined wheat flour with apple pomace, microcrystalline cellulose and inulin, achieving dietary fibre 31.3 g/100 g — over three-fold higher than market wafers (≤6.9 g/100 g). The high-protein wafer combined wheat flour with pea protein isolate and pea flour, achieving protein - 22.9 g/100 g (roughly double commercial products) and fibre - 20.3 g/100 g. Both met the low glycaemic index target (≤55 versus ~75 for standard wheat wafers) and consumer overall liking ≥4.0 (five-point scale). Composition was characterised by Kjeldahl (protein) and AOAC 992.16 (fibre); batter behaviour by Mixolab and rotational/Ford-cup rheology. Recipes were scaled on a prototype continuous baking line (≥70 kg/h). The programme shows that side-stream fibre and plant-protein ingredients can convert a high-glycaemic snack base into functional, vegetarian products with industrial feasibility.

Keyword: *functional snacks, dietary fibre enrichment, pea protein, apple pomace, low glycaemic index*

SCIENCE BASED EVIDENCE AND EVIDENCE BASED SCIENCE AND EMERGENCE OF NEWER FOOD SAFETY REGULATIONS

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Most of the innovations in the food industry today are driven by the combination of food ingredients with claims of a healthy diet. Either Process or Product-driven Innovation, the need for compliance with local Govt Regulations based on the category of foods and the CODEX guidelines needs to be strictly adhered to for the claims in such products. The more sustainable system is the Science-based evidence and Evidence-based science regulations, which give an edge over not just Healthy diets but safe, healthy diets. There is a gap after the initial scaling up of an Innovation on a knowledge-based regulatory framework for a nutritious and healthy diet. The startup innovators must be trained with food safety regulations at regular intervals and need renewal of this knowledge license for establishing the latest Food Safety standards, both on science and evidence-based approaches. This is important for a Sustainable, Nutritious, Safe and Healthy diet with the potential for the emergence of Newer Food Safety Regulations. What are the implications of such an approach? The epidemiological data on the existence of thousands of Traditional foods over several centuries is not understood (scientifically) and needs urgent attention for a sustainable Planetary, Precision, Nutritious and Healthy diet.

Keyword: *New Food Regulations approach, Science Based Evidence and Evidence based science, Traditional Foods Compliance, Innovations in Food Science and Technology*

Identification and characterization of new antimicrobial peptides derived from chicken, calf, and turkey blood cruors following their enzymatic hydrolysis and separation by EDUF using statistical approaches and in vitro tests

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Context: Cruor, the solid fraction of slaughterhouse blood, is a largely unexplored source of antimicrobial peptides (AMPs) for food biopreservation and the circular economy. While porcine and bovine cruor have been studied, poultry and veal remain particularly under-researched as AMP sources.

Methods: Hydrolysates of chicken, turkey, and veal cruor (pepsin, pH 3.0, 37°C, 30 min) were discolorized to remove heme and then fractionated by electrodialysis with an ultrafiltration membrane (EDUF) into cationic (P+), anionic (P−), and non-migrated (Feed) fractions. Fractions were characterized by RP-UPLC-MS/MS and evaluated in vitro against E. coli, L. ivanovii, Paecilomyces spp., and R. mucilaginosa. A PLS-DA (supervised multivariate analysis), applied per source and across all sources combined, guided the selection of 27 candidate peptides that were synthesized and individually tested.

Results: Thirteen new antifungal peptides, all derived from hemoglobin sequences, were confirmed, with MICs ranging from 0.0012 mM (Pep5, against Paecilomyces spp.) to 0.625 mM (R. mucilaginosa), which proved significantly more resistant. No antibacterial activity was detected under the tested conditions. Structure-activity analysis highlights the critical role of length, charge, amphipathicity, and conserved motifs (RYH, HGKKV). The EDUF approach coupled with multi-source PLS-DA proved particularly effective in identifying both species-specific sequences and those common among animal sources.

Keyword: *Antimicrobial peptides, Electrodialysis with ultrafiltration membranes (EDUF), Antifungal activity, Food biopreservation, Circular Economy*

EMERGENCE OF NEW GENERIC FOOD REGULATIONS FROM THE VAST POTENTIAL OF PERSONALIZED FOOD

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The emergence of Nutraceutics is not new to the world of Functional Foods. The role of Functional Foods is to maximise the Bioavailability and Bioaccessibility of established Bioactives in Functional foods. In the metabolic pathway, as the food passes through the gut, the role of gut microbiome is at an individual level, and its symbioses with functional foods are important to the individual's nutrition and health from such foods, especially with medicinal properties. This brings in the concept of Personalized Foods. It's not what we like to eat that can be termed as personalised food, but what the body needs at an individual level, linked to body response and the pharmacological activity of food or a combination of foods. **Therefore, as one personalizes food, the cumulative biological upper limits set by regulations across all foods consumed in a day become an important factor in defining the safety of Physiology-based Personalized Foods (PPF).** The expertise and knowledge of the complexity triangle of personalised food will still sit at the edge of regulatory issues of such biomolecules in different formulations consumed in a day. Global Organisations like IUFoST can address this issue from a holistic perspective across different Cultures and Regions globally.

Keyword: *Personalized Food, Neutraceutics, Emergence of New Food safety Regulations, Functional foods*

Effects of Genotype and Germination on FODMAP Composition in Wheat Cultivars

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FODMAPs (fermentable oligo-, di-, and monosaccharides and polyols) are short-chain carbohydrates. It is reported that FODMAPs such as fructans can trigger gastrointestinal symptoms in individuals with irritable-bowel-syndrome or non-celiac wheat sensitivity. Wheat is one of the sources of FODMAPs among cereals, and previous studies have shown considerable variation among wheat varieties. Germination can be used as a processing method to modify the complex carbohydrates. Thus, effect of germination on FODMAP composition was evaluated in twenty wheat cultivars.

Grains were soaked for 8 h and germinated at 21°C for 24 h. Following germination, samples were dried at 45°C for 48 h, milled into flour. Fructans, polyols, raffinose, glucose, fructose, and total FODMAP content were measured for both germinated and non-germinated samples. The combined effects of genotype and germination were assessed using ANNOVA, while cultivar-specific responses were analyzed by paired T-test.

Significant variation in FODMAP composition was observed among cultivars. Both genotype and germination treatment significantly influenced FODMAP components. Germination also significantly affected FODMAP composition; however, the response varied considerably between cultivars or genotypes. While reductions in some FODMAP fractions were observed, several cultivars showed increased concentrations of specific FODMAP components after germination. Further detailed results will be presented at the conference.

Keyword: *FODMAP, Wheat Genotype, Germination*

THE ASSOCIATIONS OF DIETARY PATTERNS WITH MUSCLE HEALTH AND FUNCTIONAL FITNESS IN THE HONG KONG HEALTHSPAN PROJECT

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Muscle health and functional fitness are essential for healthy aging, supporting daily functioning and independence, and may be influenced by diet. This study investigated the associations of dietary patterns with muscle health and functional fitness among community-dwelling middle-aged/older Hong Kong Chinese adults using the cross-sectional data from the Hong Kong Healthspan Project (n=636, 72% females, aged 45–88 years). Diet was assessed using a validated 60-item semi-quantitative food frequency questionnaire. Outcomes included appendicular skeletal muscle mass estimated by bioelectrical impedance analysis, handgrip strength, and functional fitness z-scores derived from senior fitness tests.

Three dietary patterns were identified using principal component analysis with eigenvalue of >1.5: “Plant-based proteins”, “Processed and Animal-based proteins” and “Sweet & Snacks”. After adjustment for sociodemographic and lifestyle factors, sex-specific multivariable linear regressions showed that higher adherence to “Plant-based protein” dietary pattern, predominantly rich in legumes, fungi, soy products, vegetables, nuts and seeds was significantly associated with higher functional fitness z-scores in females. No significant association of adherence to any other identified dietary patterns with measures of muscle health and functional fitness was found. Our finding suggested that community-dwelling middle-aged/older Hong Kong Chinese females consuming predominantly plant-based proteins instead of animal proteins had better functional fitness.

Keyword: *Dietary patterns; Muscle mass; Muscle strength; Functional fitness*

Protective Effects of Heat-Killed Lacticaseibacillus paracasei HY7017 on Gut Microbiota and Immune Function in Cyclophosphamide-Induced Immunosuppressed Mice

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Paraprobiotics have emerged as promising alternatives to live probiotics owing to their stability and potential health-promoting effects. This study investigated the protective effects of heat-killed Lacticaseibacillus paracasei HY7017 (Para-HY7017) on gut microbiota composition and immune function in cyclophosphamide (CTX)-induced immunosuppressed mice. Oral administration of Para-HY7017 alleviated CTX-induced intestinal damage, including colon shortening, and preserved intestinal barrier integrity. Gut microbiota analysis revealed that Para-HY7017 restored microbial diversity and enriched short-chain fatty acid (SCFA)-producing genera, including Roseburia, Ruminococcus, Eubacterium, and Oscillibacter. These changes were accompanied by increased fecal concentrations of acetate, propionate, and butyrate. Furthermore, Para-HY7017 significantly recovered CTX-induced reductions in serum immunoglobulins and immune-related cytokines. Protective effects were also observed in the spleen, where Para-HY7017 attenuated apoptosis, preserved tissue architecture, and improved Th1/Th2-associated immune responses. Collectively, these findings suggest that Para-HY7017 exerts immunoprotective effects by modulating gut microbial composition and metabolic activity, thereby enhancing intestinal barrier function and maintaining immune homeostasis. The results support the potential application of Para-HY7017 as a functional paraprobiotic for promoting gut and immune health under immunocompromised conditions.

Keyword: *Paraprobiotic, Lacticaseibacillus paracasei, Gut microbiota, Short-chain fatty acids, Immunosuppression*

Core-Shell Gel strategies Using Celluloses as a Probiotic Delivery System for Enhanced Gastrointestinal Stability

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Encapsulants should protect probiotics during gastrointestinal transit, enable controlled release, and facilitate their colonization in the intestine. In this study, bacterial nanocellulose (BNC) and a complex of pectin and microfibrillated cellulose (MFC) were selected as encapsulants to enhance the GIT stability and improve intestinal adhesion of probiotic Lactiplantibacillus plantarum CJLP 133. BNC was produced under optimized conditions and used as a core material with L. plantarum. The core was coated with a complex of pectin and MFC, which were shell materials. Due to the pH-sensitivity of the BNC-pectin/MFC, 60.03 ± 1.04% of L. plantarum was protected without release in simulated gastric fluid and then 87.02 ± 0.56% was released in simulated intestinal fluid. In addition, 92.80 ± 1.05% of the released L. plantarum adhered to HT-29 cells, which are the intestinal epithelial cells, because of increased hydrophobicity of coated L. plantarum. Auto-aggregation of encapsulated L. plantarum increased to 75.26 ± 0.63%, which is a property to build probiotic barriers to protect against pathogenic bacteria. Furthermore, the core-shell gels showed potential as prebiotics, enhancing the production of short-chain fatty acid such as lactic acid and propionic acid. Consequently, BNC-pectin/MFC core-shell gels can be utilized as a probiotic delivery system.

Keyword: *Probiotics, Bacterial Nanocellulose, Core-Shell Gels, Delivery system*

FULL UTILIZATION OF SABA BANANA (MUSA ACUMINATA × BALBISIANA COLLA) PEEL AND PULP FOR FUNCTIONAL FOOD PRODUCT DEVELOPMENT

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Green Saba banana peel is often discarded despite its potential as a source of dietary fiber and resistant starch. This study investigated the utilization of whole green Saba banana, including peel and pulp, for the development of a functional flour and its application in pandesal, a traditional Philippine bread roll. Green Saba banana flour with peel (GBF) was produced and modified through annealing under optimized processing conditions to enhance its functional properties. Annealing improved flour functionality and increased resistant starch content while maintaining high dietary fiber levels derived from peel inclusion. The resulting flour was incorporated into pandesal at varying substitution levels and evaluated for physicochemical, nutritional, microbiological, and sensory properties. Pandesal containing 20% annealed GBF achieved the best balance between nutritional enhancement and consumer acceptability. Banana flour incorporation increased moisture, ash, dietary fiber, and resistant starch contents while reducing non-resistant starch fractions compared with all-wheat bread. Although higher substitution levels produced firmer texture and lower loaf volume, sensory acceptability remained acceptable. All formulations met microbiological safety standards, supporting the practical application of annealed GBF in bakery products. These findings highlight annealed GBF as a promising ingredient for developing nutritionally enhanced bakery products.

Keyword: *Saba, green banana flour, annealing, pandesal, resistant starch*

UPCYCLED INSOLUBLE FIBROUS POLLOCK SKIN POWDER AS A NOVEL REINFORCING FILLER FOR SOY PROTEIN ISOLATE-BASED THREE-DIMENSIONAL FOOD PRINTING INKS

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Soy protein isolate (SPI) is promising for extrusion-based three-dimensional food printing, but SPI-only inks often lack structural integrity after deposition. This study evaluated upcycled pollock skin powder (PSP) as a structure-modulating reinforcing filler for SPI-based inks. A 20% (w/w) SPI ink served as control; PSP was superadded at 1, 3, and 5% (w/w, relative to base ink weight). Solubility testing confirmed its predominantly insoluble character, and confocal microscopy revealed elongated fibrous particles within the matrix. Increasing PSP reduced void fraction from 10.362% to 3.240%, supporting densification through physical space filling. PSP increased storage modulus and complex viscosity while preserving elastic-dominant shear-thinning behavior required for extrusion. In three-interval thixotropy testing, post-shear structural recovery increased from approximately 34% in the control to over 70% at 1–3% PSP, although it slightly decreased at 5%. Supplemented inks deposited more continuously and uniformly. Printed constructs showed increased hardness (0.63–1.16 N) without loss of cohesiveness, supporting improved post-deposition structural integrity. These findings demonstrate that insoluble fibrous PSP can physically reinforce SPI inks, providing a value-added route for marine by-product utilization in sustainable three-dimensional food printing.

Keyword: *Three-dimensional food printing, Reinforcing filler, Soy protein isolate, Marine by-product upcycling, Pollock skin powder*

Mechanistic Insights into the Conversion of Nephrotoxic Djenkolic Acid into Meaty Aroma Compounds in Djenkol Bean: Modulation by Ascorbic Acid and pH

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Djenkolic acid (DJK), the predominant sulfur-containing amino acid in djenkol bean, poses a nephrotoxic risk, yet its transformation during thermal processing and contribution to flavor remain poorly understood. This study examined whether its thermal conversion could be redirected toward desirable meaty aroma formation. A purified DJK/L-ascorbic acid (AsA) Maillard model was integrated with a thermally processed djenkol bean matrix. Volatile products were characterized by GC–MS and GC–MS-olfactometry, and key odorants were linked to sensory perception through descriptive analysis and multivariate statistics. Among 33 volatile organosulfur compounds identified in the model systems, DJK showed a profile distinct from other sulfur-containing amino acids, producing 1,3-dithiole and reaching its highest meaty and savory intensities at pH 2. Acidic conditions favored thiols, thiophenes, and cyclic organosulfides associated with meaty and roasted notes, whereas alkaline conditions promoted barley-like thiazoles. In the bean matrix, AsA redirected DJK conversion toward thiophenic Maillard products, reduced green and beany notes, and enhanced meaty, roasted, and caramel-like attributes. pH further regulated volatile abundance, chemical diversity, and DJK conversion. Together, these results provide mechanistic insight into DJK-derived aroma formation and define carbonyl and pH regulation as a strategy for directing a nephrotoxic sulfur precursor toward desirable flavors during djenkol bean processing.

Keyword: *Djenkolic acid, Maillard reaction, Volatile organosulfur compounds, Meaty aroma, Djenkol bean*

Cellulose Biofillers from Fruit Peels for Reinforcing Alginate-based Biodegradable Films for Fresh-Cut Vegetable Packaging

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The growing fresh-cut vegetable market and increasing restrictions on plastic packaging have intensified demand for biodegradable films with improved barrier performance. Although alginate (AL)-based films are promising, their high hydrophilicity and limited mechanical properties restrict practical application. To overcome these limitations, grapefruit (GF) peels were converted into highly dispersible cellulose biofillers via microwave-assisted betaine:lactic acid deep eutectic solvent, which selectively removed 82% of lignin. Under optimized process (90 °C, 0.5 h), GF biofillers exhibited a 1.6-fold higher water holding capacity than untreated GF biofillers and improved dispersion stability. Biofillers at different concentrations (0–20 wt%) were incorporated into AL matrices to evaluate structure–property relationships. The abundant hydroxyl groups in GF biofillers promoted intermolecular interactions and rearrangement, thereby contributing to enhanced mechanical and barrier properties. At the optimal loading of 15 wt%, the composite film achieved a tensile strength of 48 MPa without compromising elongation, along with reduced water vapor and oxygen permeability compared with neat AL. Shelf-life tests using fresh-cut vegetables showed that the 15 wt% GF biofillers-loaded film inhibited moisture loss and better maintained antioxidant activity and soluble solids content. Therefore, GF biofillers provide an effective route to enhance AL-based films and support their application in sustainable fresh-cut produce packaging.

Keyword: *Food packaging, Alginate-based films, Grapefruit peel, Deep eutectic solvent, Biodegradable packaging*

OPTIMISING COLD PLASMA-ACTIVATED MEDIA FOR MICROBIAL CONTROL

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Cold atmospheric plasma–activated media (PAM) has been shown to inactivate bacteria in water or simple buffered media. However, if inactivation occurs when bacteria are present in more complex media, such as those used for cellular agriculture, is unclear.

This study evaluated the antimicrobial efficacy of cold plasma against Escherichia coli ATCC 25922 and Mycoplasma species in DMEM/F-12 culture medium, for differing feed gas compositions (air, oxygen, nitrogen, helium, carbon dioxide) flow rates (0.1 to 3.0 L/min) and exposure times (10 – 1800 s). Bacterial numbers were assessed using standard plating methods.

The efficacy of cold plasma was strongly influenced by both gas composition and flow rate. Air plasma showed no inactivation at low flow rates, reaching a maximum reduction of 3.49 $\log_{10}$ CFU/mL at 1.0 L/min, after which efficacy declined. Oxygen plasma achieved more than a 3 $\log_{10}$ CFU/mL reduction across all tested flow rates. For the parameters tested, oxygen-based plasma was the most effective, showing a 3.91 $\log_{10}$ CFU/mL reduction, followed by air-based plasma (3.54 $\log_{10}$ CFU/mL).

These findings demonstrate, that in complex, such as those used in cellular agriculture, plasma/media interactions, necessitate the careful optimisation of plasma parameters to achieve effective bacterial inactivation.

Keyword: *Non-thermal technology, Cold atmospheric plasma, Antimicrobial activity, Novel food safety technology, Cellular agriculture*

COLD ATMOSPHERIC PLASMA- UNLOCKING NEW APPROACHES FOR CONTAMINATION CONTROL IN CELLULAR AGRICULTURE

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Microbial contamination of cell culture and growth media remains a critical challenge in cellular agriculture, affecting cell proliferation, morphology, gene expression, protein yield, and overall product quality. Conventional reliance on antibiotics to mitigate contamination introduces concerns regarding antimicrobial resistance, increases production costs, and reduces consumer acceptance.

Cold atmospheric plasma (CAP), a non-thermal ionised gas with established applications in biomedical sterilisation, is being assessed as a chemical-free approach for decontaminating / sterilising eukaryotic cell culture media, specifically, DMEM/F-12 basal media used for cultivated meat production without the use of antibiotics, thereby providing a preventive layer.

The study identifies critical thresholds for bacterial inactivation through optimisation of plasma discharge parameters in the culture media and determines the impact of treatment on meat cells viability, morphology, and functional integrity.

This work aims to support the development of scalable, antibiotic-free decontamination and protection strategies for cell-based food systems. The findings hold translational significance for establishing environmentally sustainable manufacturing practices in cellular agriculture, with broader implications for the food science, veterinary, and biomedical industries.

Keyword: *Cold atmospheric plasma, Food safety, Antimicrobial sterilisation, Non-thermal technologies, Cellular agriculture*

COMPARATIVE EFFECTS OF ADVANCED MICROWAVE AND SOUS VIDE PROCESSING ON MEAT IN-VITRO PROTEIN DIGESTIBILITY: INSIGHTS FROM MOLECULAR STRUCTURE ANALYSIS AND PEPTIDOMICS

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Thermal processing alters meat protein structures, which affects their nutritional quality and gastrointestinal digestibility. This study investigates the comparative impacts of rapid, high-temperature microwave (MW) processing and low-temperature, long-duration sous vide (SV) cooking on the molecular structure, peptidomic profile, and protein digestibility of meat. Structural analysis revealed that MW induced significantly higher myofibrillar protein surface hydrophobicity due to the intense disruption of hydrogen bonds. In contrast, SV cooking promoted the formation of larger protein aggregates. Both treatments caused a shift in secondary protein structures, marked by a decrease in α-helices and an increase in β-sheets and aggregated strands.

Despite these distinct molecular modifications, overall in vitro protein digestibility at the end of the gastrointestinal phase showed no significant difference between the SV and MW treatments. However, LC-MS/MS peptidomics uncovered varying digestion kinetics during the gastric phase. MW caused higher oxidation of specific amino acid residues (methionine and tryptophan), altering pepsin cleavage sites and generating a greater proportion of higher molecular weight peptides (2001-4000 Da) compared to SV. While MW and SV distinctly modify meat proteins and alter gastric digestion kinetics, the efficiency of small-intestinal pancreatic enzymes resulted in the same level of overall protein digestibility at the end of digestion.

Keyword: *Microwave technology, protein in-vitro digestibility, sous vide processing, peptidomics, protein structure*

Mechanism of Cold Plasma-Induced Cellulose-Based Hydrogel Coupled with Graphene Oxide for Intelligent Regulation of Fruit and Vegetable Packaging Humidity

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Continuous physiological and metabolic activities during postharvest storage of fruits and vegetables induce dynamic changes in the humidity of packaging microenvironments, leading to quality deterioration such as condensation-induced water accumulation or dehydration-induced shriveling. Developing cellulose-based functional hydrogels capable of intelligently regulating humidity is therefore of significant scientific and practical interest. In this project, abundant cellulose is selected as the starting material, and a cold plasma-induced oxidative microenvironment is employed to trigger functional group transformation and molecular chain rearrangement. The study aims to elucidate how cold plasma generates active sites on cellulose, promotes intermolecular crosslinking, and drives hydrogel network formation. Graphene oxide is subsequently introduced to provide interfacial regulation and facilitate conductive network construction, enabling the fabrication of humidity-responsive cellulose-based hydrogels without chemical initiators. The effects of graphene oxide on microstructure, moisture adsorption behavior, electrical response, and environmental adaptability will be systematically investigated. In combination with fruit and vegetable storage conditions, the structure–function relationships among material architecture, humidity sensing, and preservation performance will be clarified. This project seeks to reveal the regulatory mechanism linking cold plasma-induced molecular activation, interfacial assembly, and structure-dependent humidity response, providing a theoretical and technological basis for green and intelligent packaging applications.

Keyword: *Cold plasma, Hydrogel, Humidity response, Graphene oxide, Cellulose*

Do PEF-induced compositional differences persist during storage? Integrated metabolomics and chemometric profiling of bottled Merlot wines from PEF-treated grapes

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Pulsed electric fields (PEF) pre-treatment can enhance extraction during red winemaking; however, its influence on post-bottling wine stability remains underexplored. This study investigated whether PEF-induced compositional differences in Merlot wines persist during storage using an integrated metabolomics and chemometrics approach. Merlot grapes were treated at commercial scale with varying high-intensity electric field strengths (33.1–41.5 kV/cm) and specific energy inputs (4.70–49.40 kJ/L) prior to maceration. Wines produced from untreated and PEF-treated grapes were bottled and stored at 4°C, 25°C, and 45°C for up to 150, 120, and 56 days, respectively. Targeted profiling of phenolics using high-performance liquid chromatography with diode-array detection (HPLC-DAD), together with colour and oenological analyses, was combined with untargeted volatile fingerprinting by headspace solid-phase microextraction coupled with gas chromatography–mass spectrometry (HS-SPME/GC-MS), followed by multivariate data analysis to identify storage-related changes and discriminant markers. Storage was associated with reduced monomeric anthocyanins, colour dulling, increased phenolic acids, and losses of esters and acetates, while elevated temperature accelerated degradation pathways, including hydrolysis, anthocyanin cleavage, and furan formation. Distinct storage responses among PEF treatments indicate that pre-fermentation processing history influences post-bottling chemical evolution. This approach provides a robust framework for assessing stability and optimizing emerging processing technologies in winemaking.

Keyword: *Pulsed electric fields, Red winemaking, Storage stability, Metabolomics, Chemometrics*

3-Decen-2-one Loaded Zein-Hydroxypropyl Methylcellulose Coating to Delay Sprouting and Greening in Potato Tubers

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Greening and sprouting reduce the marketability of potato tubers during postharvest storage. This study investigated zein–hydroxypropyl methylcellulose (HPMC) edible coatings loaded with 3-decen-2-one for delaying greening and sprouting in potatoes stored at 22 °C and 75% RH under 12 h daily light exposure for 2 weeks. The zein–HPMC coating containing 3-decen-2-one effectively inhibited greening and sprouting, reducing the sprouting index from 90% to 27%, while significantly lowering the respiration rate from 28.27 to 10.88 mg CO_2/kg/h after 2 weeks ($p < 0.05$). No significant differences ($p > 0.05$) were observed in firmness, weight loss, or Brix value compared with uncoated potatoes. Scanning electron microscopy showed uniform distribution of zein particles on potato peel surfaces, and coating transmittance ranged from 20% to 30%. Headspace gas chromatography demonstrated that 3-decen-2-one release increased with relative humidity. At 20 °C and 75% RH, the coating released 0.0048 mg/mg of 3-decen-2-one after 2 h, while the concentration on potato surfaces reached a maximum after approximately 3 h. These results suggest that zein–HPMC edible coatings loaded with 3-decen-2-one can effectively suppress greening and sprouting while maintaining potato quality during retail storage.

Keyword: *Gas chromatography, Respiration rate, Release, Headspace, Light transmittance*

Short-Chain Carbohydrates Produced from Brown Seaweed Through Acid and Fenton Depolymerization

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Acidic polysaccharides from brown seaweed, including alginate and fucoidan, are widely used as thickening and prebiotic agents in food applications, and their functionality can be enhanced by partial degradation. This study compared product profiles from acid and Fenton depolymerization. Molecular weight shifting patterns of alginate and fucoidan prepared by acid and Fenton treatment were analyzed by size-exclusion chromatography. Composition, degree of polymerization (DP), and linkage of short-chain carbohydrates were also assessed. Fenton degradation effectively depolymerized alginate and fucoidan, reducing viscosity and yielding degradation patterns distinct from those of acid hydrolysis. Fenton-degraded alginate showed a rapid decrease in viscosity and molecular weight with reduced uronic acid content, while acid hydrolysis caused a slower decline in both properties. For fucoidan, both treatments rapidly reduced viscosity; however, Fenton degradation produced a smaller shift in molecular weight and a lower deoxy-sugar content, whereas acid hydrolysis caused a larger drop in molecular weight but reduced the organic sulfate content. An enzyme-assisted liquid chromatography-tandem mass spectrometry approach revealed degraded products, linkage patterns, and sulfate positions in short-chain carbohydrates. Overall, the degradation method influences the physicochemical properties of the products, informing controlled modification of brown seaweed polysaccharides for industrial applications.

Keyword: *seaweed polysaccharide, alginate, fucoidan, acid hydrolysis, Fenton degradation*

CANNED MANGO IN SYRUP PROCESSING USING AGITATED-TYPE RETORT

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The primary purpose of thermal processing is to achieve commercial sterility while preserving product quality. This study aimed to enhance the safety and quality of canned mango in syrup processed using an agitated-type retort. The most heat-resistant microorganism in mango in syrup, Bacillus coagulans (D-value of 1.87 min at 100 °C and a z-value of 17.11 °C), was identified through thermal death time studies and were used to compute the thermal process schedule. A full factorial design was applied to evaluate the effects of syrup concentration and retort rotation speed on processing time and quality attributes, including color (L*, a*, b*), texture, vitamin C content, and sensory acceptability. Results indicated that syrup concentration was the dominant factor influencing lightness, texture, and sensory acceptability, whereas rotation speed primarily affected processing time and vitamin C retention. Multi-response optimization using a desirability criterion of at least 80% identified optimal conditions of 10–50 °Bx syrup concentration and 19.2–35.0 rpm rotation speed. Under these conditions, thermal processing time was reduced by 30–80% while maintaining desirable product quality. In conclusion, agitated retort processing improved heat transfer and reduced processing time of canned mango in syrup.

Keyword: *mango, agitated-type retort, thermal processing, safety, quality*

Enhancing 3D Printing Performance via Conjugation of Soy Protein Isolate and High-Methoxyl Pectin

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Extrusion-based 3D food printing requires inks that shear-thin for smooth extrusion and rapidly rebuild a self-supporting structure after deposition. Soy protein isolate (SPI) is a promising plant-protein, but SPI-only inks show reduced printability due to unstable high-shear flow at high solids and insufficient shape fidelity at lower solids. SPI–high methoxyl pectin (HMP) conjugates were produced via a wet-heating Maillard-type reaction (pH 7.5, 90 °C, 2 h) and compared with native SPI, heat-treated SPI, and a physical SPI–HMP mixture. Conjugation was supported by increased UV–Vis browning indices (A304 and A420) and FT-IR band-shape changes in the carbohydrate fingerprint region, accompanied by improved pH-dependent solubility. Rheological tests of inks (15–25% solids) showed elastic-dominant behavior (G′>G″) and shear-thinning for all samples; however, native SPI and the physical mixture exhibited abrupt viscosity drops at high shear rates, suggesting macroscopic flow instabilities, whereas the conjugate maintained a smooth, continuous viscosity decay and faster post-shear structural recovery. Printing trials using cylindrical and lattice constructs confirmed the highest shape fidelity for the conjugate at 25% solids, while 15% solids were below the buildable threshold for all formulations. Overall, SPI–HMP conjugation offers a clean-label route to tune structure–rheology–printability relationships and expand the printing window of protein-rich SPI inks.

Keyword: *3D food printing; Soy protein isolate; High-methoxyl pectin; Conjugation; Printability*

FROM TRADITIONAL YAM TO FUNCTIONAL FLOUR: MAXIMIZING RESISTANT STARCH IN PHILIPPINE YAM FLOUR USING RESPONSE SURFACE METHODOLOGY

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Dioscorea spp., widely known as 'yams,' serve as a staple crop in tropical and subtropical regions. In the Philippines, it is often consumed as an alternative source of carbohydrates and is commonly utilized as an ingredient in making desserts. Beyond its food applications, it possesses vital properties that support digestive health and aid in metabolic regulation. With rapidly expanding demand for functional foods in the global market, this study optimized the processing parameters of Philippine yam flour through Response Surface Methodology to maximize its resistant starch (RS). A selected Dioscorea alata L. cultivar was utilized to evaluate the interactive effects of two key processing variables: autoclaving time (15–45 min) and cooling time (12–48 h); both significantly influenced RS content ($p < 0.05$). Prolonged exposure to autoclaving followed by extended cooling periods promoted starch gelatinization and retrogradation, respectively, resulting in higher RS formation. Overall, the findings suggest that autoclaving with subsequent cooling is an effective strategy for enhancing the properties of yam flour and expanding its application as a functional food ingredient.

Keyword: *Philippine yam flour, process optimization, resistant starch, functional foods, Dioscorea alata L.*

Active chitin eutectogels from solvent-directed reconstruction for sustainable food packaging

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Chitin is an abundant structural polysaccharide with strong potential for sustainable food-packaging, but its dense hydrogen-bonding and crystalline structure make it difficult to process into robust and functional materials. Here, we report an active chitin eutectogel prepared by solvent-directed reconstruction in a tea polyphenol/glycerol deep eutectic solvent. Instead of inducing rapid water-driven precipitation, the eutectic solvent regulates chitin chain reassociation, promotes ordered α-chitin crystalline junctions, and introduces reversible chitin–solvent hydrogen bonds. This dual physical network gives the eutectogel high tensile strength, toughness, puncture resistance, and durability under repeated deformation, without chemical crosslinking or synthetic reinforcement. The retained tea polyphenol/glycerol phase further provides antibacterial, antioxidant, moisture-regulating, and anti-freezing functions. As a container-covering packaging film, the chitin eutectogel preserved cherries, litchi, and cherry tomatoes by moderating water-vapour exchange, reducing oxidative-stress indicators, and maintaining carbon- and redox-related metabolic features, while avoiding the excessive sealing effect of polyethylene films. The material also showed reduced ice-mediated adhesion to frozen foods. This work demonstrates a solvent-programmed strategy to convert natural chitin into mechanically robust and active packaging films for sustainable fresh-produce and cold-chain applications.

Keyword: *Chitin, Eutectogel, Deep eutectic solvent, Mechanical robustness, Sustainable food packaging*

IDENTIFICATION OF DIAGNOSTIC INDICATORS USING GENOMIC TOOLS TO SUPPORT DECISION-MAKING IN CHEDDAR CHEESE RIPENING

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Lactic acid bacteria (LAB) used as starter culture (SLAB) in Cheddar cheesemaking shape flavour and texture. Non-starter microbiota (NSLAB), originating from milk and the cheesemaking environment, can contribute to typicity, but some NSLAB species can cause defects. Early quantitative quality assessment of ripening can prevent economic and cheese losses. This study aimed to identify genomic indicators predicting cheese quality using ratios of beneficial and deleterious LAB. Microbiological (metabarcoding, qPCR) and physicochemical composition of 112 rapid-aging Canadian Cheddars of varying intensity (mild, medium, old) and quality were analyzed.

Cheddar composition was within the expected ranges. Ripening time and proteolysis significantly affected cheddar conversion, while intensity was driven by bacterial richness and pH. Cheese pH strongly shaped bacterial abundance and community structure ($P<0.01$). Overall diversity remained low due to SLAB dominance. NSLAB, particularly Lactobacillaceae, appeared in medium and old cheeses and may serve as quality indicators.

This work will allow for the development of early detection tools for Cheddar cheeses with a low ripening potential and will assist cheesemakers in their decision-making process to improve and maintain high cheese quality. Future analysis of Cheddars showing quality defects will further validate and will reinforce the predictive power of our approach.

Keyword: *Cheddar, Metagenomics, Quality*

HEAVY-METAL CONTAMINATION AND HUMAN HEALTH RISKS ASSOCIATED WITH CONSUMPTION OF MILK SHARK (RHIZOPRIONODON ACUTUS) FROM DIGHA, WEST BENGAL, INDIA

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Shark-meat is consumed worldwide as a valuable source of animal protein. Since sharks occupy higher trophic levels in marine food-system, they are prone to accumulating toxic heavy-metals, posing potential risks to human-health. Considering India's prominent role in global shark-fishery and export market, evaluating the safety of shark-derived food is of growing importance. This study investigated the levels of cadmium (Cd), lead (Pb), and chromium (Cr) in edible muscle tissue of Rhizoprionodon acutus (N=60), collected from Digha, West Bengal, India. Concentrations were measured by Atomic-Absorption-Spectrophotometry with analytical quality verified using DORM-4 certified reference material. Risk assessment was calculated to determine the potential human-health risks associated with consuming shark-meat. The study revealed that mean concentrations of Cd, Pb, and Cr to be 6.55 mg/kg, 31.26 mg/kg, and 6.65 mg/kg wet weight (w.w.) respectively. These values exceed the permissible limit recommended for consumption (WHO/FAO 1989), of Cd and Pb. While human-health risk assessment suggests significant non-carcinogenic risk on consumers, as target hazard quotient (THQ>1) were above safety limit for all analysed metals. However, carcinogenic-risk assessment was found to be negligible for all analysed metals. These findings highlight the importance of routine monitoring, informed consumption advisories, and strengthened seafood safety measures for global consumers.

Keyword: *Shark-meat, Food-system, Risk, Human-health, Seafood*

A COMPARATIVE STUDY ON THE INFLUENCE OF DIFFERENT POST-PROCESS THERMAL TREATMENTS ON THE STABILITY OF SUNFLOWER WAX-BASED OLEOGELS

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Oleogelation is an oil structuring approach that transforms liquid oil into semi-solid systems using low concentrations of oleogelators, mimicking the textural and rheological properties of shortening, and is regarded as a healthier alternative. Conventional method of high oil load oleogel preparation results in oiling out during storage. In this study, microwave (MW) and infrared (IR) heating, as post-process thermal treatments, were explored to evaluate the influence of the melting and recrystallization approach on stability enhancement. Sunflower wax-based oleogels were developed using groundnut oil and chia seed oil by heating the raw materials separately to 80℃, followed by mixing the molten wax and oil at 600 rpm for 30 min. MW and IR heating were done to overnight-set oleogels. The impact of cyclic melting and recrystallization on the stability of wax-based oleogels was evaluated using various characterization techniques. Oscillatory rheological analysis confirmed the formation of elastic solid-like gels (G'>G"). MW treatment reduced the oil loss from 3.76±1.43% to 0.85±0.02% and 4.79±0.23% to 0.45±0.63% in chia seed and groundnut oil oleogels, respectively. XRD confirmed the orthorhombic perpendicular subcell structure of the crystals, while microstructural analysis revealed reductions of up to 66% in porosity and 65% in crystal size following post-processing treatments.

Keyword: *wax-based oleogel, stability, thermal treatment, post-processing, crystal network*

STUDY ON THE THERMO-OXIDATION COMPOUNDS FORMED DURING CONTINUOUS DEEP FRYING OF PALM OLEIN: AN EMERGING FOOD SAFETY CONCERN

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The continuous deep frying of food materials leads to thermal and oxidative degradation of the oil, which significantly affects the quality and safety of fried foods. This study involved continuous deep frying of cassava chips in palm olein at 180 °C for 80 frying cycles. Subsequently, oil samples were collected every 20th frying cycle and categorised as POF (Fresh), PO1 (1st cycle), PO20 (20th cycle), PO40 (40th cycle), PO60 (60th cycle), and PO80 (80th cycle). The TPM, PV, AV, and FFA were assessed with respect to frying cycles. The GC-MS revealed the formation of saturated fatty acids by the breakdown of linoleic acid. The VOC's were identified using an e-nose, including alcohols, aldehydes, ketones, acids, esters, furans, and Maillard-derived heterocyclic compounds. Multivariate analyses, including PCA, PLS-DA, VIP scoring, and heatmap correlation, effectively differentiate the frying stages and oxidation severity in samples. The HPLC analysis of acrylamide and HMF indicates a substantial increase in their concentrations at frying cycles. At the 80th frying cycle, oil exhibited HMF and acrylamide contents of 17.100 µg/L and 2.507 µg/L, respectively. Thus, the accumulation of toxic compounds from the 1st to 80th frying cycles may significantly affect the safety and quality of palm olein.

Keyword: *Deep frying, Palm olein, E-nose, Lipid degradation, Food safety*

AN INTEGRATED AUTOMATED DISPERSIVE LIQUID-LIQUID MICROEXTRACTION WORKFLOW FOR VOLATILE ANALYSIS OF JAPANESE MANDARIN JUICES

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Japanese mandarins have attracted increasing interest for their appealing appearance, distinctive aroma and characteristic taste. Volatile analysis remains challenging because of matrix complexity, multiclass composition and a wide compound dynamic range, where trace key odourants coexist with high-abundance terpenes. This study developed an integrated automated dispersive liquid-liquid microextraction workflow for volatile analysis of four aromatically distinct Japanese mandarin juices: Iyokan, Ponkan, Shiranui and Unshiu mikan. A model citrus beverage was first used to optimise extraction conditions while minimising biological variability. The final workflow used 7.5 mL sample, 500 µL dichloromethane, methanol as dispersive solvent (dichloromethane:methanol, 1:2), 25 °C extraction, no sodium chloride addition and 0.1 g anhydrous sodium sulfate preloaded in a glass vial insert for in-sequence dehydration. Under these conditions, relative standard deviations were controlled below 5.60% for representative volatile compounds. To reduce interference from pigments and co-extracted matrix components in real juice extracts, graphitised carbon black cleanup was incorporated after extraction as part of the automated workflow. This integrated approach enabled miniaturised automated extraction, dehydration and cleanup, providing a robust sample-preparation strategy for multiclass citrus volatiles and trace aroma compounds in complex fruit juice matrices, with potential extension to broader food flavour analysis.

Keyword: *Citrus volatiles, Japanese mandarin, Automated sample preparation, Dispersive liquid-liquid microextraction, Graphitised carbon black*

EFFECT OF CITRUS FIBER ON EMULSION STABILITY OF BATTER AND QUALITY OF DEEP-FRIED BREADED SHRIMP

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The emulsion stability of batter significantly affects the quality of fried breaded shrimp. Citrus fiber (CF), a natural ingredient with thickening and emulsifying properties, may serve as a clean-label alternative to conventional emulsifiers such as sucrose fatty acid esters (SE). This study investigated the effects of CF on batter emulsion stability and fried shrimp quality. A control batter was prepared using wheat flour, oil, and water, while SE (S-1170 and P-1570) and CF (CF-Z and CF-P) were evaluated as treatments. Results showed that CF produced smaller oil droplets and higher zeta potential after homogenization, indicating enhanced emulsion stability. CF-Z exhibited the highest oil-holding capacity. Compared with SE, CF increased batter viscosity and reduced density, polydispersity index, and oil droplet size. CF-containing batters also demonstrated superior thermal stability (60–80°C) and freeze–thaw stability. In fried shrimp, CF improved batter adhesion, reduced frying and moisture losses, and enhanced the brightness of fried shrimp by slowing down excessive browning. Furthermore, CF caused longer time to accumulate total polar compounds in frying oil, extending oil usability. Overall, citrus fiber can effectively substitute synthetic emulsifiers, improving batter stability, fried shrimp quality, and frying oil performance while supporting clean-label product development.

Keyword: *Citrus fiber, Emulsion stability, Batter properties, Fried shrimp, Clean-label ingredients*

Digestive Stability, Anti-inflammatory Activity, and Gut Microbiota Modulation of Sorghum 3-Deoxyanthocyanidins

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3-Deoxyanthocyanidins (3-DAs) from sorghum are unique bioactive compounds with high potential for functional food and biomedical applications. To advance their high-value utilization, this study systematically evaluated the in vitro digestive stability, anti-inflammatory capacity, and colonic fermentation characteristics of sorghum 3-DAs. Simulated gastrointestinal digestion revealed that 46.59% of 3-DAs were absorbed in the small intestine, while 53.41% reached the colon for microbial fermentation. Purified 3-DAs significantly suppressed the release of TNF-α and IL-6 in LPS-stimulated dTHP-1 cells, confirming potent anti-inflammatory activity. During fecal fermentation, 3-DAs increased microbial community richness but reduced overall diversity. Notably, the beneficial genus Megamonas expanded from 1.83% to 20.07%, whereas the pathogenic Escherichia-Shigella group declined from 21.97% to 5.33%. A total of eight short-chain fatty acids (SCFAs) were produced, with acetic acid reaching 538.82 μg/mL, indicating 3-DAs promoted SCFA biosynthesis by modulating SCFA-producing bacteria. Correlation analysis confirmed that 3-DAs-enriched functional bacteria such as Faecalibacterium prausnitzii were positively correlated with SCFA production, while Escherichia coli showed a negative correlation. These findings highlight the gut health-promoting properties of sorghum 3-DAs and support the high-value transformation of sorghum and its by-products.

Keyword: *Sorghum, 3-Deoxyanthocyanidins, Simulated digestion, Anti-inflammatory activity, In vitro fermentation*

Advanced Hydrophobic Modification Strategies for Biopolymer Films: Experimental Insights into Mechanical and Barrier Properties

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Hydrophobic modification is a crucial strategy to overcome the intrinsic water sensitivity of biopolymer films. To address this, an experimental approach was developed to design a highly hydrophobic micro/nanocoating on a gelatin (G) matrix reinforced with tannic acid-modified nanohydroxyapatite (THA). The low surface energy coating comprised nano-ZnO, stearic acid (SA), and (3-aminopropyl) triethoxysilane (APS) (NAS), where APS functioned as a vital interfacial bridge. This bridging significantly enhanced adhesion to the hydrophilic substrate, achieving > 95% remaining area in cross-cut adhesion tests. The resulting G-THA/NAS composite exhibited exceptional water resistance with a water contact angle of 150.4°. Additionally, it demonstrated robust mechanical properties, including a tensile strength of 7.6 MPa and an elongation at break of 292.7%. The hydrophobically modified film also provided excellent UV-shielding (0% transmittance at 200 nm), 78.8% DPPH radical scavenging activity, and antimicrobial inhibition zones of 15.0 mm against Escherichia coli and 16.5 mm against Staphylococcus aureus. Finally, despite the robust surface modifications, the composite maintained full biodegradability, showing a 100% degradation rate after 15 days in natural soil. Based on those multifunctional properties, the G-THA/NAS film was successfully applied as a liquid packaging material.

Keyword: *Hydrophobic modification, Gelatin nanocomposite, Interfacial adhesion, Surface coating, packaging film*

DEVELOPMENT AND CHARACTERIZATION OF A FUNCTIONAL GNETUM GNEMON MOUSSE FOR ELDERLY INDIVIDUALS: ANTIOXIDANT, ANTI-INFLAMMATORY, AND NUTRITIONAL EVALUATION

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This study aimed to develop a functional nutritional product for the elderly using Gnetum gnemon Linn leaf powder (GGLP). Fresh leaves were dried, processed into powder, and evaluated for total phenolic content (TPC), antioxidant and anti-inflammatory activities, phenolic compounds, nutritional value, and sensory properties. Among the extracts, hot-water extract containing 8% GGLP (GGLP-HE) exhibited the highest bioactive properties.

GGLP was subsequently incorporated into a protein-rich liquid mousse formulated to provide approximately 20% protein, 30% fat, and 50% carbohydrate, with a texture classified as IDDSI Level 3 (moderately thick). Among all formulations, GGLP-M8 (8% GGLP) demonstrated the highest TPC and antioxidant activity while maintaining acceptable color and chlorophyll content. The formulation significantly enhanced cell viability and inhibited nitric oxide production, indicating anti-inflammatory potential. HPLC analysis identified caffeic acid, p-coumaric acid, and gallic acid as the predominant phenolic compounds.

The nutritional profile of GGLP-M8 showed a macronutrient ratio of 27.3:16.4:56.4, comparable to commercial medical nutrition products. Sensory evaluation revealed good overall acceptance (6.62±1.94). These findings suggest that GGLP-M8 is a promising functional nutritional product for older adults, with potential to support immune health. Further in vitro and in vivo studies are recommended to confirm its efficacy.

Keyword: *Gnetum gnemon Linn, antioxidant, anti-inflammation, sensory quality*

HIGHLIGHTING AND DETECTING MOLD AND MECHANICAL DAMAGE DEFECTS IN CITRUS FRUITS USING UV-FLUORESCENCE IMAGING AND YOLO11

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Citrus fruits suffer substantial postharvest losses due to fungal infections and mechanical damage. Early decay and minor injury detection of these visually inconspicuous defects on citrus fruits remains challenging in postharvest quality control. This study proposes an innovative non-destructive detection system combining UV-fluorescence imaging and advanced YOLO11 deep learning to detect early or inconspicuous defects, including fungal infections (green mold, blue mold, and sour rot) and mechanical damage (bruising and puncture). Research revealed that when fungal infection or mechanical damage ruptures the oil glands in citrus peel, the essential oils rich in polymethoxyflavones released from defective regions emit bright yellow-green fluorescence under 365 nm UV-light illumination. Among the evaluated YOLO variants, YOLO11n demonstrated superior performance with 0.939 precision, 0.933 recall, and 0.969 mAP@0.5, effectively localizing and classifying both healthy and defective fruits across diverse citrus varieties. The high-quality fluorescence imaging data create nearly ideal conditions for detection—uniform dark backgrounds with bright defect signals—enhancing detection capability and enabling deep learning models to achieve superior accuracy. This UV fluorescence-YOLO11 framework provides a low-cost, high-quality, explainable, and readily deployable solution for automated citrus quality inspection, potentially reducing significant postharvest losses in the global citrus supply chain.

Keyword: *Freshness classification, Non-destructive monitoring, Citrus essential oil, Postharvest defects in citrus fruits, Early decay*

INTEGRATED SURVEILLANCE AND COLD PLASMA CONTROL OF MAIZE-BORNE FUNGI AND MYCOTOXINS

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Maize is susceptible to contamination by toxigenic fungi during harvest, drying, and storage, leading to quality deterioration, mycotoxin accumulation, and potential health risks. Because fungal communities and contamination patterns vary among production regions, region-specific hazard identification and control are required. Cold plasma is an emerging non-thermal technology that generates reactive oxygen and nitrogen species capable of damaging fungal cells and modifying mycotoxin structures with limited thermal effects on food quality. In this study, a cold plasma-based intervention strategy was applied to control grain-associated molds and their mycotoxins. Plasma treatment effectively inactivated representative Aspergillus and Fusarium species, accompanied by morphological disruption, membrane damage, and intracellular leakage. It also promoted the degradation of both Aspergillus-associated and Fusarium-associated mycotoxins, including aflatoxin B_1, deoxynivalenol, zearalenone, and fumonisins. Meanwhile, fungal communities in maize from major production regions across China were investigated through community profiling, culture-dependent isolation, and molecular identification. Preliminary results revealed marked regional differences, with Fusarium identified as a dominant and risk-associated genus. Representative Fusarium proliferatum isolates were further selected to evaluate plasma inactivation and fumonisin degradation.

Keyword: *Maize, Cold plasma, Molds, Mycotoxins, Decontamination*

PREVENTIVE EFFECTS OF PARA-PROBIOTIC LACTIPLANTIBACILLUS PLANTARUM HY7714 IN AN ULTRAVIOLET B-INDUCED SKIN PHOTOAGING MOUSE MODEL

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Ultraviolet B (UVB) irradiation generates reactive oxygen species in skin tissue, driving extracellular matrix (ECM) degradation, inflammatory cascades, and ultimately photoaging. Parabiotics, defined as non-viable probiotics containing bioactive cellular components such as peptidoglycan, lipoteichoic acid, and exopolysaccharides, have recently had attention for their immunomodulatory properties and gut homeostasis-maintaining effects despite thermal inactivation. In this study, we investigated whether para-probiotic Lactiplantibacillus plantarum HY7714 (para-HY) confers photoprotection comparable to its probiotic counterpart (pro-HY) in a UVB-induced photoaging mouse. Mice were subjected to UVB irradiation for 6 weeks with concurrent oral administration of pro-HY or para-HY. Para-HY significantly reduced wrinkle depth and roughness in silicone replica analysis, decreased transepidermal water loss, and restored hydration. Histological analysis also revealed decreased epidermal thickness, and skin barrier function was markedly improved in the para-HY group. Molecular analyses showed decreased senescence marker p53 as well as lipid peroxidation (MDA), upregulation of antioxidant enzymes (NRF2, HO-1, SOD, GPx, CAT), downregulation of ECM-degrading MMPs (MMP2, MMP9, MMP13), suppression of NF-κB/MAPK-mediated inflammatory signaling, and reduced pro-inflammatory cytokines (IL-1β, IL-6, TNF-α). These findings suggest that para-HY exerts anti-photoaging effects through coordinated antioxidant, anti-inflammatory, and ECM-protective mechanisms, suggesting parabiotics as a viable alternative to probiotics for skin photoprotection.

Keyword: *Photoaging, Parabiotics, Probiotics, Gut-Skin axis*

ANNEALING-INDUCED CHANGES IN THE PASTING, THERMAL, STRUCTURAL, AND DIGESTIBILITY PROPERTIES OF GREEN SABA BANANA FLOUR WITH PEEL

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Green Saba banana flour with peel (GBF) is a promising functional ingredient due to its high resistant starch content and the nutritional benefits of banana peel. However, information on the effects of annealing on its functional, structural, and digestibility properties remains limited. This study investigated the impact of annealing on the pasting, thermal, structural, and simulated in vitro digestibility characteristics of GBF. Flour produced under optimized processing conditions was annealed at 82% moisture content, 65°C, and 16 h. Annealing significantly increased pasting temperature, peak viscosity, trough viscosity, and final viscosity while decreasing breakdown and setback viscosities ($p < 0.05$), indicating enhanced thermal stability and paste strength. Thermal analysis showed increased gelatinization temperatures, suggesting molecular reorganization within starch granules. FTIR analysis revealed greater short-range molecular order and double-helical organization, while SEM observations confirmed preservation of starch granule integrity after annealing. Annealed GBF exhibited lower starch hydrolysis, hydrolysis index, and estimated glycemic index, together with a marked increase in resistant starch content. These findings demonstrate that annealing effectively improved the functional and nutritional properties of GBF, highlighting its potential as a sustainable ingredient for the development of resistant starch-enriched and low-glycemic food products.

Keyword: *Green saba banana flour, annealing, resistant starch, digestibility, pasting properties*

Physicochemical, Structural and Nutritional Properties of Termite Mushroom-Fortified Tofu and Its Antioxidant Activity During In Vitro Digestion

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Termitomyces albuminosus is a wild edible mushroom with potential application as a functional food ingredient; however, its influence on tofu quality remains insufficiently understood. This study investigated soy tofu fortified with freeze-dried T. albuminosus mushroom powder (TMP) at 1.5, 3, and 5% (w/w) using two incorporation approaches: direct addition and soybean replacement. The fortified tofu samples were evaluated for yield, colour, texture, microstructure, molecular interactions, rheological properties, proximate composition, mineral content, and antioxidant activity in fresh, cooked, and in vitro digested forms. TMP incorporation generally reduced yield, lightness, hardness, cohesiveness, and chewiness, particularly under higher replacement levels. These changes were associated with protein network disruption, coarser gel structures, and protein–polysaccharide phase separation. Nevertheless, all formulations maintained viscoelastic gel behaviour, with G′ exceeding G″. The 1.5% replacement treatment best preserved tofu structure and texture, indicating a suitable balance between quality retention and fortification. Meanwhile, 5% replacement provided the greatest nutritional enhancement, increasing calcium and iron contents while maintaining high crude protein levels (above 47%). TMP also improved antioxidant activity, with the highest bioaccessibility observed after intestinal digestion. Thus, TMP fortification offers a promising strategy for developing nutritionally enhanced tofu.

Keyword: *termite mushroom, tofu, soy protein aggregation, antioxidant accessibility, in vitro digestion*

Transforming Spent Coffee Grounds into Multifunctional Ingredients: Integrated Development of Polysaccharide–Protein Composite Carriers and Phenolic-Based Bioactives

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Spent coffee grounds (SCG) are one of the most abundant food-processing byproducts worldwide and represent an underutilized resource rich in both structural biopolymers and bioactive phytochemicals. In this work, the phenolic-enriched fractions were first recovered and stabilized through the fabrication of β-cyclodextrin-based nanocomposites using a machine learning-guided optimization approach, while the remaining part was further subjected to alkaline extraction to obtain endogenous polysaccharide–protein composite nanoparticles (CPP NPs) as a bioactive delivery system. The optimized CPP NPs exhibited favorable physicochemical properties, enhanced flavor encapsulation efficiency, improved aroma retention during storage, and promoted flavor complexity during thermal processing, making them efficient carrier materials for flavor encapsulation and controlled release, while they themselves showed significant bioactivity, such as anti-aging effects, giving them great potential as multifunctional carriers. On the other hand, the phenolic-rich nanocomposites provided antioxidant and antimicrobial activities suitable for oral-care and nutraceutical applications. Overall, the recovered CPP and phenolic fractions demonstrated complementary functionalities, enabling the conversion of SCG into multifunctional food and health-related ingredients.

This integrated extraction approach maximizes the utilization of SCG components, minimizes waste generation, provides a sustainable pathway for transforming SCG into a source of multifunctional biomaterials and bioactive ingredients for food and health-related applications.

Keyword: *Polysaccharide–Protein Composite, Spent Coffee Grounds, Phenolic compounds, nanocarrier*

DEVELOPMENT OF A LOW-COST CULTURE MEDIUM FOR THE COMMERCIAL PRODUCTION OF PORPHYRIDIUM CRUENTUM AS A SOURCE OF PHYCOERYTHRIN

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Porphyridium cruentum is a commercially valuable red marine microalga. This study aims to optimise culture conditions for P. cruentum production and biomass valorisation. Nutrient optimisation studies showed that sodium nitrate as a nitrogen source improved culture performance by 25–65% relative to alternative sources, while adjusting the N:P molar ratio to 20:1 increased biomass productivity by 24% and reduced phosphorus requirements. Medium recirculation was evaluated as a water-saving strategy; however, accumulation of extracellular organic matter and bacterial proliferation increased viscosity and turbidity, ultimately limiting biomass yields and highlighting the need for targeted pre-treatment prior to recirculation. Respirometry assays identified optimal cultivation conditions at 31.2 °C and pH 7.7. Beyond production, the distinctive mineral profile of P. cruentum was exploited for food applications, enabling the development of iron-enriched crackers as a functional food. These findings provide an integrated and scalable framework for the sustainable cultivation and full valorisation of P. cruentum.

Keyword: *Porphyridium cruentum, water consumption, phycoerythrin, sustainability, functional food*

BIOREFINERY VALORISATION OF PORPHYRIDIUM PURPUREUM BIOMASS

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Porphyridium purpureum is a red marine microalga with considerable biotechnological potential. This work presents two complementary downstream processing strategies for comprehensive valorisation, both initiated by ultrasound-assisted cell disruption, followed by pH-driven isoelectric solubilisation and precipitation of the soluble fraction, yielding a B-phycoerythrin-rich fraction of reagent-grade purity (A_{565}/A_{280} = 1.7) suitable for food-colouring applications. The resulting insoluble fraction was then processed via two alternative routes: (i) a second cycle of isoelectric solubilisation and precipitation, delivering a protein-rich fraction with high emulsifying capacity and stability at pH 8, with residuals further demonstrating plant biostimulant activity, improving the seedling vigour index of cucumber (Cucumis sativus) by up to 58% relative to distilled water and outperforming gibberellic acid; and (ii) aqueous enzymatic hydrolysis, where amylase achieved the highest degree of hydrolysis (60% after 6 h), yielding a peptide-rich fraction (25.9 g protein·100 g^{-1} dry biomass) with antioxidant activity evidenced by ORAC and DPPH assays. Subsequent extraction of the remaining pellet enabled recovery of chlorophyll a-rich fraction with reducing capacity (FRAP), which offered potential as a natural colourant in liquid food matrices. Together, these strategies demonstrate an integrated zero-waste biorefinery approach for P. purpureum biomass.

Keyword: *Porphyridium purpureum, protein extraction, enzymatic hydrolysis, biorefinery, phycoerythrin*

GENOTYPIC CHARACTERIZATION OF THE MICROBIOTA OF TENGBA

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Tengba, a traditional fermented paste made from freshwater crabs, salt, and aged rice of Besao, Mountain Province, Philippines, has never been studied. Here, molecular identification techniques, including DNA extraction, PCR amplification, and gene sequencing, were employed to investigate the microbial diversity of tengba, identifying eight genera (Acinetobacter, Alcaligenes, Bacillus, Lysinibacillus, Millerozyma, Myroides, Staphylococcus, and Starmerella) across 17 microbial isolates. The community was dominated by Bacillus, known for flavor enhancement and preservation, together with minor strains such as Acinetobacter and Staphylococcus that perform secondary fermentative functions. Phylogenetic discrepancies were observed for strains N03, G01, and M02, revealing mismatches between phylogenetic trees and bioinformatics data. N05 and G06 yielded polymorphic profiles with divergent bidirectional BLAST hits. Furthermore, the isolation of M03 phylogenetically linked to Alcaligenes suggests that non-canonical, proteolytic pathways may co-exist alongside Bacillus-driven fermentation. These variations hint at the possibility of novel species arising from the unique freshwater-crab substrate. As the first study to investigate tengba's microbial diversity, this research highlights a rich ecosystem of bacteria and yeasts shaping tengba's distinct flavor, aroma, and safety. By bridging cultural tradition with modern science, the findings underscore the importance of active research on traditional foods for both preserving heritage and advancing food science.

Keyword: *Tengba, Freshwater Crab Fermentation, 16S rRNA Sequencing, ITS Sequencing, Microbial Diversity*

Mechanisms of Polysaccharide-Driven Lubrication: A Rheological and Tribological Evaluation in Simulated Oral Environments

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It has been proposed that the saliva bio-interface possesses a functionally diverse, multi-layered microstructure, wherein boundary lubrication is essential for the sensory perception of food during oral processing. Understanding macromolecular interactions within simulated oral environments provides critical pathways to optimize texture of foods and lubricated mouthfeel. Experimental analyses demonstrate that polysaccharide concentration and molecular weight heavily influence lubrication behavior. For instance, high-molecular-weight konjac glucomannan (KGM) efficiently separates contact surfaces at an overlap concentration of 0.28 %, creating a rigid adsorption film with a high elastic modulus of 94.04 kPa. In composite formulations, incorporating diverse polysaccharides into whey protein isolate (WPI) matrices reveals that ionic charge fundamentally dictates interfacial tribology. Specifically, cationic chitosan generates a highly stable, low-friction barrier through strong electrostatic binding with anionic salivary mucins at pH 5.0. This charge-driven interaction dramatically reduces overall friction coefficients to < 0.425, with the initial friction dropping from 0.405 to 0.268 upon saliva addition, significantly outperforming neutral KGM and anionic carrageenan systems. In conclusion, the precise structural and ionic tuning of dietary polysaccharides offers advanced strategies for optimizing the sensory and textural properties of functional food colloids.

Keyword: *Oral tribology, Polymer entanglement, Electrostatic interactions, Boundary lubrication, Whey protein isolate*

PROCESS OPTIMIZATION AND LIFE CYCLE ASSESSMENT OF ADVANCED EXTRACTION PROCESSING TECHNOLOGIES FOR ARGEMONE OCHROLEUCA SEED OIL

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Argemone ochroleuca is a non-edible, drought-tolerant oilseed with potential as a renewable lipid feedstock for fuels and bio-based materials, supporting process innovation and sustainable processing. This study evaluates advanced extraction technologies by integrating response surface methodology with cradle-to-gate life cycle assessment to compare Soxhlet and supercritical carbon dioxide extraction routes for Argemone ochroleuca seed oil. Central composite designs were applied to optimise food processing variables, temperature and extraction time for Soxhlet and pressure for supercritical carbon dioxide, while quantifying oil yield and energy demand. Optimised Soxhlet conditions delivered higher oil yield (47.6 percent) than supercritical carbon dioxide extraction (42.2 percent), with both pathways producing oils of comparable physicochemical properties, fatty acid profiles, and thermal stability, indicating that process choice does not markedly affect fuel-relevant quality attributes. Life cycle environmental impacts, normalised to 1 kilogram of oil and characterised using the ReCiPe 2016 midpoint method, showed substantially lower climate change, terrestrial acidification, and freshwater ecotoxicity impacts for optimised Soxhlet extraction. Electricity supply and solvent-related operations were identified as environmental hotspots. Overall, the work demonstrates how integrating process engineering optimisation with life cycle assessment advances process innovation and contributes to sustainable processing when selecting environmentally robust extraction technologies for emerging bio-based products.

Keyword: *Argemone ochroleuca, Soxhlet extraction, supercritical carbon dioxide, life cycle assessment, sustainable food processing*

QUALITATIVE PHYTOCHEMICAL SCREENING OF SELECTED SRI LANKAN FRUIT BIOWASTES: A PRELIMINARY ASSESSMENT OF VALORIZATION POTENTIAL

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Fruit processing biowastes are abundant, underutilized sources of bioactive compounds with significant potential for valorization into value-added products. This study screened the phytochemical profiles of three commonly available fruit biowastes: banana peel (Musa spp.), orange-peel (Citrus sinensis), and mango (Mangifera indica) seed and seed coat. Samples were dried at 40°C and 60°C and extracted using ethanolic extraction (EE), room-temperature aqueous extraction (RAE), and hot-water aqueous extraction (HAE) methods for qualitative phytochemical analysis. Qualitative tests revealed the presence of steroids, cardiac glycosides, phenols, flavonoids, terpenoids, and quinones across all biowastes and extraction types, with lower phenolic and flavonoid intensities in banana peel extracts. Tannins and coumarins were prominent in mango seed and orange-peel extracts but largely absent in banana peel. Tannins were detected only in EE and absent in RAE and HAE. Anthraquinones were detected only in HAE of banana peel, and absent in all other extracts. Phlobatannins and phytosterols were absent in all samples. These findings indicate that mango seed and orange peel biowastes possess broader bioactive profiles than banana peel, highlighting their potential as sources of natural bioactive compounds for value-added applications. This preliminary assessment demonstrates valorization potential of underutilized fruit processing by-products within Sri Lanka's fruit processing industry.

Keyword: *bioactive compounds, fruit biowaste, phytochemical screening, secondary metabolites, valorization potential*

Circular Approach for Transforming Tapioca Biomass into Sustainable Food Packaging Materials

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The current study focused on upcycling tapioca biomass materials for the extraction of cellulose fibres and development of paper packaging material. The edible variety of cassava “Sree Harsha” was chosen for the study and the raw material having 72% moisture content was dried below 10% for further treatments. The cellulose, hemicellulose, and lignin contents of the biomass were 41.94%, 12.92%, and 12.10%, respectively, making it suitable for paper production. Sodium carbonate at 10%, 15% and 20% were used as the delignifying agent and hydrogen peroxide as the bleaching agent. Also, the FTIR spectrum of the cellulose fibre exhibited C-O and O-H bands at wavenumbers 1030-1050 cm^{-1} and 3300-3400 cm^{-1}, respectively, confirming the retention of characteristic cellulose functional groups. The following characteristics of the developed paper were assessed: physical properties such as thickness, grammage and colour value; functional properties such as oil holding capacity, water holding capacity, Cobb index and percentage water absorbance; and mechanical properties such as tearing strength, tensile strength and bursting strength. The research demonstrates how the conversion of cassava plant waste contributes to a sustainable economy by providing low-cost and eco-friendly alternative to wood-source paper packaging materials.

Keyword: *Sustainable packaging, Tapioca biomass, Alkali treatment, Cellulose fibre, Paper-based food packaging*

Sustainable Bioprocessing of Natural Pigments via Pulsed Electric Fields and Their Application in Green Nanotechnology

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The study investigated the effect of pulsed electric field processing, a non-thermal extraction technique, on enhancing the recovery of natural pigments from Caesalpinia sappan wood, a food-grade botanical, followed by their utilization in the green synthesis of silver nanoparticles. A Box-Behnken experimental design was employed to optimize the effects of electric field strength (10-25 kV/cm), pulse width (75-150 μs), and treatment duration (5-15 min) on pigment extraction efficiency. The plant extract is rich in flavonoids(21.59mg QE/g), phenolics (7.72mg GAE/g), betacyanin(119.2mg/100g), betaxanthin(115.10mg/100g), and lycopene(9.51mg/100g). Optimization of PEF treatment condition resulted in significantly enhanced extraction of pigments, with an increase of 9.93% total phenolic content of mg GAE/g, 54.42 % Quercetin equivalent total flavonoid content. Formation of silver nanoparticles from the extract was initially confirmed by the visual colour difference and a characteristic surface plasmon resonance peak at 422nm, and was subjected to comprehensive physicochemical characterization. The integration of PEF-assisted extraction of bioactive compounds and green nanoparticle synthesis demonstrates a sustainable bioprocessing platform for the efficient utilization of plant-derived pigments for food packaging applications.

Keyword: *Pulsed electric field, Plant pigments, Green synthesis, Silver nanoparticles*

Rational Design and AI-duided Evolutionary Engineering of Cas12j-8 for Rapid Fluorescence Detection of Cronobacter sakazakii in Dairy Products

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Cronobacter sakazakii is a critical foodborne pathogen in powdered infant formula and dairy products, causing severe neonatal meningitis. CRISPR-Cas12 systems offer programmable isothermal detection, but most effectors require elevated temperatures, limiting field deployment. Here, we engineered Cas12j-8 through rational design and AI-directed evolution to enhance its trans-cleavage activity at ambient temperature for detection.

Structural alignment of Cas12j-8 with mesophilic orthologues identified key residues governing low-temperature activity. Saturation mutagenesis at Q195, guided by conservation analysis, was coupled with EVOLVEpro—a deep learning-based fitness prediction platform—to iteratively evolve variants with improved ambient temperature trans-cleavage kinetics. The top variant, EVOCas12j-8, showed substantially enhanced fluorescence versus wild-type. Using RPA with phosphorothioate-modified primers and T7 exonuclease, double-stranded amplicons were converted to single-stranded DNA for Cas12j-8 recognition. The assay detected Cronobacter sakazakii in spiked dairy samples at ambient temperature with no cross-reactivity against common dairy-borne pathogens.

This work demonstrates the synergy of rational design and AI-driven protein evolution in tailoring CRISPR effectors for food safety diagnostics.

Keyword: *Cas12j-8, Engineering, Cronobacter sakazakii, dairy safety, nucleic acid detection*

Decoding Consumer Sentiment Toward Edible Insects using AI Approaching

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Monitoring consumer sentiment is crucial for the market adoption of novel alternative proteins like edible insects. However, analyzing large-scale consumer reviews is often hindered by the prohibitive costs of manual annotation and severe class imbalance in real-world feedback. This study presents a cost-effective, data-centric Artificial Intelligence (AI) framework tailored for the food industry, evaluating consumer perceptions through 4,616 online reviews of edible insect products in Korea. We compared machine learning (ML) algorithms with advanced transformer models using automated clustering-based labeling and hybrid resampling strategies to overcome data imbalance. While heavyweight transformer models excelled under ideal conditions, they proved highly sensitive to label noise in automated, practical scenarios. Conversely, a well-calibrated ML pipeline (e.g., CatBoost) utilizing hybrid resampling demonstrated remarkable robustness (Macro F1 0.69). This approach effectively matched or surpassed resource-intensive transformers, requiring only a fraction of the computational power and manual labor. For food scientists and product developers, this study demonstrates that optimized ML frameworks offer a highly viable, sustainable tool for real-time monitoring of consumer acceptance. This data-centric approach democratizes large-scale market analysis, enabling the rapid and efficient evaluation of emerging food trends without demanding immense technical resources.

Keyword: *Consumer perception analysis, Artificial intelligence, Sentiment prediction models, Machine learning, Large Language Models*

MILD FRACTIONATION OF PEA GLOBULINS AND THEIR CONCENTRATION USING ULTRAFILTRATION

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Modification of the vicilin-to-legumin (V:L) ratio in pea protein isolate enables tailoring of its functionality for different food applications. In this work, we developed a mild fractionation approach based on selective precipitation to alter the V:L-ratios of pea globulins where more native structures are preserved in the solution phase throughout the process without undergoing isoelectric precipitation. The effect of pH and ionic strength on solubility of legumin and vicilin was investigated systematically. It was found that the solubility of vicilin is independent of ionic strength across the pH of 3-9, while the solubility of legumin increases with increasing ionic strength, especially between pH 4-5. This provided the foundation to obtain pea protein solutions with different V:L-ratios (0.5-15), which were then concentrated by 4 times using a 10kDa membrane. The V:L-ratios did not have significant impact on the filtration performance of pea globulin concentration. However, mechanistic fouling modeling suggested that higher abundance of legumin led to increase cake growth in long term filtration, while more vicilin facilitated early-stage pore blockage. Membrane fractionation of legumin and vicilin was examined in single-protein systems at different pH (4.5, 5.2, 5.5) using a 300 kDa membrane, achieving a high selectivity of 22 at pH 4.5.

Keyword: *Process innovation, Membrane technology, Plant protein fractionation*

Effect of LED Light Sources on the Growth Rate and Lipid Composition of Chlorella sorokinian at Low-Temperature Stress

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Chlorella sorokiniana is a freshwater microalga rich in proteins, carbohydrates, lipids, chlorophyll, and carotenoids. Its lipid profile includes polyunsaturated fatty acids (PUFAs) including α-linolenic acid, EPA and DHA, additionally phytosterols, making it a choice for cultivation and health supplement production. Traditionally, Chlorella cultured in outdoor open ponds, climate change and temperature fluctuations alter Chlorella growth, leading to discrepancies in yield and products quality. This study shifted cultivation indoors using LEDs to precisely deliver specific wavelengths under a low-temperature condition (15°C), aimed to investigate the growth performance and active compounds content of Chlorella. The results indicate that while the growth rate at 25°C is significantly higher than at 15°C, no pronounced differences in growth rates were observed between LED and fluorescent lighting. Under 15°C with LED, the fatty acid profile shifted from saturated $C_{16:0}$ to PUFAs. The levels of total PUFAs and α-linolenic acid were significantly higher than cultured under fluorescent lighting or at 25°C. In conclusion, although the LED light did not enhance growth at low temperature, combination of low-temperature stress with precise LED wavelengths effectively promotes PUFAs synthesis and ω-3 fatty acid formation, which provides great potential as a plant-based ω-3 fatty acid source for the vegan food industry.

Keyword: *Chlorella sorokiniana, Low-temperature stress, LED wavelengths, Polyunsaturated fatty acids (PUFAs), ω-3 fatty acids*

Biphasic co-encapsulation of piperine and curcumin in O/W emulsions stabilized by 4-α-glucanotransferase-modified potato starch for enhanced bioaccessibility and dysphagia-oriented delivery

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Piperine and curcumin are hydrophobic bioactives with diverse health-promoting properties, and piperine can enhance curcumin bioavailability when co-administered. However, their poor aqueous solubility and instability limit their biological efficacy. This study developed a biphasic co-encapsulation system to simultaneously incorporate piperine and curcumin into both the oil and aqueous phases of an oil-in-water (O/W) emulsion. Both compounds were loaded into oil droplets, while additional amounts were incorporated into the aqueous phase through inclusion complexation with 4-α-glucanotransferase-modified starch (GS) containing cyclic glucans. Compared with the control emulsion (EM), the biphasic systems increased the total loading of piperine (16.11–19.42%) and curcumin (2.69–6.76%). Following in vitro digestion, EM/GS exhibited the highest bioaccessibility of both compounds. GS-mediated inclusion complexation significantly improved gastrointestinal retention, indicating enhanced stabilization of the bioactives during digestion. EM/GS also showed moderate viscosity (195.39 mPa·s) and residual volume (5.70 mL) in a syringe flow test, suggesting its potential as a nectar-like formulation with improved swallowing safety. These findings demonstrate a promising strategy for high-loading, dysphagia-oriented delivery of hydrophobic bioactives in food applications

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Keyword: *Piperine, Curcumin, Inclusion complex, Emulsion, Bioaccessibility*

APPLICATION OF HYBRID TEXTURED VEGETABLE PROTEIN WITH COCONUT DIETARY FIBER IN PLANT-BASED SAUSAGE: A PRELIMINARY STUDY

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The increasing demand for plant-based meat alternatives has driven interest in novel textured vegetable proteins (TVP). This study investigated the application of hybrid textured vegetable protein (hTVP) using soy protein isolate (SPI) and coconut dietary fiber (CDF) in plant-based sausage. Five hTVP samples were prepared through cold extrusion by varying the SPI:CDF ratio (70:30, 90:10, 80:20) and moisture content (60%, 65%, 70% wet basis) to analyze water-holding capacity (WHC), oil-holding capacity (OHC), rehydration capacity (RHC), rehydration yield (RHY), and bulk density (BD). Results showed no significant differences ($p > 0.05$) in WHC (3.69–4.00 g H2O/g TCP) among samples. In contrast, significant differences ($p < 0.05$) were observed among treatments for OHC (2.01–2.54 g oil/g hTVP), RHC (1.05–1.17 g/g), RHY (105.28–123.52%), and BD (0.32–0.44 g/L). Compared to commercial TVP, hTVP samples exhibited significantly higher OHC and BD, but lower RHC and RHY. Furthermore, evaluation revealed that sausages formulated with 90:10 SPI:CDF ratio and moisture content of 60% and 70% possess the most desirable sensory characteristics by minimizing fiber-induced grittiness. The findings from this study demonstrate the viability of utilizing SPI and CDF in developing high-quality, texturized protein matrices for plant-based sausage applications subject to further optimization.

Keyword: *plant-based sausage, virgin coconut oil, coconut dietary fiber, hybrid textured vegetable protein, soy protein isolate*

SYNERGISTIC NEUROPROTECTIVE EFFECTS OF VITAMIN D AND GANODERMA LUCIDUM POLYSACCHARIDES IN EPILEPSY: EVIDENCE FROM IN VIVO AND IN VITRO MODELS

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Epilepsy is characterized by neuronal hyperexcitability, calcium dysregulation, neuroinflammation, and progressive neuronal injury. Long-term antiepileptic drug treatment is often associated with adverse effects, including vitamin D deficiency. Vitamin D and Ganoderma lucidum polysaccharides (GLP) have each demonstrated anti-epileptic properties; however, their combined therapeutic potential remains unclear. This study integrated findings from acute mouse epilepsy models, previous GLP investigations, and a magnesium-free neuronal epileptiform model to evaluate their complementary mechanisms and synergistic effects.

GLP significantly improved epileptic behaviour, reduced seizure discharge frequency, suppressed intracellular calcium overload, inhibited extracellular signal-regulated kinase and nuclear factor kappa B signalling, and increased calcium/calmodulin-dependent protein kinase II alpha and Caveolin-1 expression. Vitamin D pretreatment in pentylenetetrazole- and kainic acid-induced epilepsy models reduced seizure frequency, delayed seizure onset, improved electroencephalographic abnormalities, and alleviated hippocampal neuronal injury through modulation of calcium-sensing receptor, phosphatase and tensin homolog, autophagy, and guanine nucleotide-binding protein beta-1/Ras signalling pathways.

In differentiated SH-SY5Y cells, combined GLP and Vitamin D treatment produced the greatest reduction in calcium overload and the strongest improvement in cellular metabolic activity. These findings suggest that GLP and Vitamin D act through complementary molecular pathways and exert synergistic neuroprotective effects, supporting their potential as a novel nutritional strategy for epilepsy management.

Keyword: *Vitamin D, Ganoderma lucidum polysaccharides, Epilepsy, Calcium signalling, Neuroprotection*

DOCOSAHEXAENOIC ACID REVERSES APOLIPOPROTEIN E4-ASSOCIATED LIPID RAFT DYSFUNCTION AND RESTORES MITOCHONDRIAL HOMEOSTASIS IN THE AGING BRAIN

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Apolipoprotein E4 is the strongest genetic risk factor for late-onset Alzheimer's disease and is associated with disrupted membrane lipid homeostasis, neuroinflammation and mitochondrial dysfunction. This study investigated whether long-term docosahexaenoic acid supplementation remodels brain lipid rafts and restores mitochondrial function in apolipoprotein E4 homozygous mice.

Female apolipoprotein E3 homozygous and apolipoprotein E4 homozygous knock-in mice were fed either a control or docosahexaenoic acid-enriched diet for up to 12 months. Brain lipid raft and non-lipid raft fractions were analysed using integrated lipidomics and proteomics.

Apolipoprotein E4 mice showed a distinct pathological lipid raft signature, characterised by enrichment of sphingomyelin, ceramides and sulfatides, together with increased neuroinflammatory markers. Docosahexaenoic acid supplementation increased omega-3 polyunsaturated fatty acids within lipid rafts, reduced arachidonic acid and attenuated sphingolipid accumulation, with stronger effects in apolipoprotein E4 mice. Multi-omic analysis further showed restoration of mitochondrial pathways related to oxidative phosphorylation and cellular energy metabolism.

These findings suggest that docosahexaenoic acid selectively remodels pathological lipid raft architecture and improves mitochondrial homeostasis in the apolipoprotein E4 brain, supporting precision nutrition strategies for Alzheimer's disease prevention.

Keyword: *Docosahexaenoic acid, Apolipoprotein E4, Lipid rafts, Mitochondrial function, Alzheimer's disease*

INFLUENCE OF BOILING AND FRYING ON STARCH DIGESTIBILITY, SUGAR PROFILE AND ACRYLAMIDE FORMATION IN MOZAMBICAN SWEET POTATO VARIETIES

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Sweet potato (Ipomea batatas L.) is an important food crop in tropical countries. Nevertheless, thermal processing can modify starch digestibility, sugar composition, and the formation of process-induced contaminants such as acrylamide. Information on how different sweet potato varieties respond to boiling and frying remains limited, particularly for cultivars grown in Mozambique. This study evaluated the influence of processing on starch digestibility, sugar profile, and acrylamide formation in four sweet potato varieties (Lilas, Secai, Nsatimuni, and Sumaia).

Samples were analyzed in boiled and fried forms for moisture content, sugars (mono- and disaccharides), in vitro starch digestibility, and acrylamide concentration. Differences in the composition were noted after processing. Boiling increased moisture content, while frying caused substantial moisture loss. The magnitude of these changes varied among varieties, with Sumaia and Nsatimuni showing greater moisture retention. Sumaia consistently presented the highest sugar concentration. Boiled samples generally showed higher sugar release, particularly maltose, than fried samples. Acrylamide concentrations varied markedly among varieties, ranging from approximately 90 to 3,708 µg/kg DW.

The study shows that the interaction between processing method and varietal characteristics influence starch degradation, sugar release, and acrylamide formation, providing valuable information for selecting varieties and processing conditions.

Keyword: *Sweet potato, Starch digestibility, Sugars, Acrylamide, Thermal processing*

ULTRASOUND-ASSISTED SOY PROTEIN ISOLATE/PURITY GUM ULTRA COMPLEX NANOPARTICLES FOR CONTROLLED DELIVERY OF BORAGE SEED OIL AND PEPPERMINT OIL BLENDS

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This study aimed to co-encapsulate borage seed oil and peppermint oil blends within ultrasound-assisted complex nanoparticles stabilized by soy protein isolate and purity gum ultra at different ratios. Among the formulations, the soy protein isolate to purity gum ultra ratio (1:3) showed the best performance, with a zeta potential of −33.27 mV, polydispersity index of 0.14, and the highest encapsulation efficiency (81.38 %). Fourier transform infrared spectroscopy and molecular docking showed that hydrophobic interactions, electrostatic attraction, and hydrogen bonding were the main mechanisms involved in nanoparticle formation. X-ray diffraction confirmed structural changes caused by varying biopolymer ratios, while thermogravimetric analysis showed that the optimized formulation had the lowest weight loss, indicating improved thermal stability. Morphological analysis revealed spherical particles with two distinguishable layers, confirming successful coating of purity gum ultra on the droplet surface. The optimized nanoparticles also showed enhanced antioxidant activity, progressive release, and prolonged release of co-encapsulated oils during in vitro digestion. These findings demonstrate that ultrasound-assisted plant protein and polysaccharide complex nanoparticles are promising delivery systems for improving the stability, controlled release, and functional performance of bioactive oils in functional foods and nutraceutical applications.

Keyword: *Borage seed oil, Peppermint oil, Complex nanoparticles, Structural interaction mechanisms, Controlled delivery*

Probiotic Biotransformation of Beetroot (Beta vulgaris L.) for the Development of Next-Generation Functional Foods

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Beetroot (Beta vulgaris L.) is a valuable source of betalains, phenolic compounds, and dietary nitrates with recognized health-promoting properties. However, the limited bioavailability and stability of these bioactive constituents restrict their utilization in functional food applications. This study investigated probiotic fermentation using Lactobacillus plantarum as a strategy to enhance the nutritional and functional potential of beetroot juice. The probiotic strain demonstrated efficient growth in a beetroot-based substrate and facilitated the biotransformation of native phytochemicals into more bioaccessible metabolites. LC–MS analysis revealed the formation of novel bioactive compounds, including p-coumaric acid and 4-vinylphenol, which were absent or detected at lower concentrations in unfermented juice. Fermentation significantly enhanced antioxidant properties, with DPPH radical scavenging activity of 67.81%, reducing power of 0.474, ascorbate auto-oxidation inhibition of 80.14%, ABTS radical scavenging activity of 85.89%, and FRAP value of 211 µM. Improved antidiabetic activity was also observed, with maximum inhibition of α-amylase (72.75%) and α-glucosidase (85.91%) in pasteurized fermented beetroot juice. To improve consumer acceptability and practical application, the fermented juice was successfully incorporated into gummy formulations. The results demonstrate that probiotic fermentation effectively enhances the bioactive profile, antioxidant capacity, and antidiabetic potential of beetroot, supporting its application in the development of innovative functional foods.

Keyword: *Beetroot, Probiotic Fermentation, Functional Foods, Lactobacillus plantarum, Bioactive Metabolites*

A ZERO-WASTE BIOREFINERY FRAMEWORK FOR EDIBLE SPIRULINA: FROM PILOT-SCALE CULTIVATION TO HIGH-VALUE FUNCTIONAL INGREDIENTS

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This research developed sustainable, pilot-scale Limnospira platensis (Spirulina) production processes in southern Spain, addressing industry challenges like high water footprints and contamination. Optimizing culture depth and dilution rates increased biomass productivity by 45%, yielding a 60% protein content with excellent techno-functional properties. To enhance sustainability, freshwater was substituted with seawater, which only caused a minor 10–15% productivity drop while maintaining high nutritional quality. Medium recycling challenges caused by contaminating microalgae were successfully mitigated using ultrafiltration.

Adopting a zero-waste biorefinery approach, protein isolates were enzymatically hydrolyzed to generate bioactive peptides with antioxidant, antihypertensive, and antidiabetic properties. These isolates were incorporated into pasta, boosting protein content by 25% and enhancing the amino acid profile. Furthermore, stable natural pigments were extracted using natural deep eutectic solvents for beverage applications. Finally, the residual biomass was repurposed into agricultural biostimulants, improving root development by 60%. This work establishes a versatile, low-impact framework for Spirulina production aligned with bioeconomy principles.

Keyword: *Functional foods, Limnospira platensis, Cyanobacteria, Bioactive peptides, Biorefinery*

SUSTAINABLE SEAWATER PRODUCTION OF CHLORELLA SOROKINIANA: FROM ADAPTIVE LABORATORY EVOLUTION TO AI-MONITORED PILOT-SCALE VALIDATION

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This study evaluates a sustainable seawater cultivation strategy for the microalga Chlorella sorokiniana to reduce freshwater use in food production. Initial lab trials minimized nutrient usage by 85%, though recycling exhausted media reduced productivity. To overcome this, adaptive laboratory evolution successfully acclimated the microalga to seawater, triggering beneficial changes in its morphology, pigments, and biochemical profiles (amino acids, fatty acids, and volatiles). When scaled up to 3.5 m^3 tubular pilot reactors, the seawater-adapted cultures showed greater robustness, delaying biofouling from 17 to 37 days. Metagenomic analysis confirmed a healthier microbial ecosystem with fewer contaminants. To maintain culture purity, an AI-driven systemwas trained and used deep learning to accurately identify and isolate contaminants. Downstream processing was improved by optimizing mechanical cell disruption to save energy. Finally, characterization of the resulting biomass revealed potent antioxidant and antimicrobial properties, alongside strong agricultural biostimulant activity that favorably modulated soil rhizosphere microbes. Overall, this integrated process provides a commercially viable, freshwater-saving framework for producing high-value C. sorokiniana biomass.

Keyword: *Photosynthesis, Protein, Renewable biomass, Microalgae, Freshwater reduction*

BACTERIAL SAFETY OF STREET-VENDED READY-TO-EAT FRUITS AND FOOD SAFETY KNOWLEDGE, ATTITUDES, AND PRACTICES OF VENDORS IN MANILA: A CORRELATIONAL STUDY

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Street-vended ready-to-eat (RTE) fruits pose public health risks due to the lack of a heat-killing step and exposure to environmental pollutants. A gap remains in understanding how vendor knowledge, attitude, and practices (KAP) translate to bacterial safety in high-traffic areas. This study aimed to evaluate the bacterial contamination levels of RTE watermelons and pineapples in Quiapo and Divisoria and determine their relationship with vendor KAP. Following a descriptive cross-sectional design, 52 fruit samples were collected from 26 vendors. Bacterial quality was assessed via total viable count (TVC), total coliform count (TCC), and VITEK 2 identification. A KAP survey was administered, and data were analyzed using independent sample t-tests and correlational analysis. Nineteen bacterial species were presumptive, predominantly Enterobacter cloacae (21.1%) and Klebsiella pneumoniae (11.6%). Mean TVC (4.85 $\log_{10}$ CFU/g) and TCC (4.19 $\log_{10}$ CFU/g) exceeded Philippine FDA safety thresholds, despite good vendor knowledge (96.2%) and safe practices (92.3%). Watermelons exhibited higher contamination than pineapples. Positive attitudes (92.3%) correlated negatively with TVC but showed no significant correlation with TCC. The study reveals a distinct Knowledge-Practice Gap, proving individual KAP is insufficient against systemic environmental factors. Food safety strategies toward interventions addressing fruit-specific susceptibility, resilient opportunistic pathogens, and urban sanitation are vital.

Keyword: *Attitudes, Food Safety, Knowledge, Ready-To-Eat Fruits, Bacterial Contamination*

When food goes bad: studying biofilm formation to reduce food spoilage and extend shelf life

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Up to 30% of all food produced for human consumption worldwide is wasted, with microbial spoilage being a key contributor. Spoilage microorganisms colonize food surfaces and form biofilms throughout the food supply chain. While previous studies have largely focused on single-species biofilms, native food microbiomes are complex multispecies communities, and the mechanisms underlying their interactions during spoilage remain poorly understood.

Here, we aim to obtain a detailed molecular understanding of spoilage biofilm development by native microbial communities on chicken breast. We employ a range of approaches, including full-length 16S rRNA sequencing, metabolomics, fluorescence microscopy, and phenotypic assays. Our results have characterized the chicken microbiome at species-level resolution and associated metabolome throughout the spoilage process. Microscopic analyses revealed extensive biofilm formation accompanied by tissue degradation. Notably, chicken spoilage biofilms exhibited pillar-like tunnel structures that penetrated the tissue and were frequently associated with extracellular DNA (eDNA).

We are currently investigating whether this eDNA is host- and/or microbe-derived and determining the relative abundance of different eDNA conformations (e.g., Z-DNA). We are also developing synthetic communities to facilitate mechanistic studies of community interactions and biofilm development. Our long-term aim is to develop interventions targeting spoilage biofilms to increase food shelf-life and reduce food waste.

Keyword: *Food spoilage, Biofilm development, Extracellular DNA, Multispecies biofilms, Microbiome dynamics*

Ultrasound-Assisted Fish Oil Emulsions Linking Formulation, Stability and In Vitro Digestion

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Omega-3 fatty acids are essential nutrients with multiple health benefits. Fish oil is one of the richest sources of these compounds; however, it's highly susceptible to oxidation, limiting its stability in food systems. Emulsification is widely used to encapsulate and protect fish oil. Nevertheless, conventional high-shear methods provide limited control over droplet size distribution (DSD), which critically influences emulsion performance. In this study, fish oil emulsions were developed using ultrasound-assisted processing to evaluate the influence of formulation and processing variables on stability and in vitro digestion by varying pectin concentration, ultrasound amplitude, and fish oil content. Fresh and stored emulsions at different temperatures (4 °C, 25 °C, and 40 °C) were characterised in terms of DSD, ζ-potential, rheology, microstructure, oxidative stability, creaming index and in vitro digestion. The findings showed that increasing pectin concentration significantly reduced droplet size, with the smallest mean droplet diameter reaching 0.59 μm, while decreasing fish oil concentration significantly decreased lipid oxidation, with a minimum value of 8.08±0.29 mg MDA equivalents/L emulsion. All emulsions remained highly stable, with ζ-potential values between −45 and −62 mV. These results demonstrate the importance of optimizing formulation and processing conditions to produce stable emulsions for improved omega-3 fatty acid delivery.

Keyword: *droplet size distribution, oxidative stability, creaming index, small intestinal phase*

MODIFIED MARAMA BEAN CONCENTRATE AS AN ALTERNATIVE TO GLUTEN PROTEIN

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Marama bean is a climate-smart crop, gluten-free and can grow in the Kalahari Desert. Marama bean protein has been shown to exhibit viscoelastic properties, although not as pronounced as those of gluten proteins in wheat. The objective was to determine the effect of laccase enzyme with tannic acid on the rheological properties of dough made from Marama bean concentrate. Dough from modified Marama bean with tannic acid and laccase enzyme showed a higher linear viscoelastic range compared to the control. Dough from the modified protein exhibited higher storage and loss moduli for frequency sweep compared to the unmodified protein, indicating a greater degree of molecular entanglement. In creep–recovery tests, dough from modified protein with 0.5% laccase, combined with tannic acid, showed a similar recovery to vital gluten. Structural analysis showed an increase in α-helices, β-sheets, and β-turns. Liquid chromatography- mass spectroscopy showed the formation of di-tyrosine crosslinks in modified proteins. In conclusion, tannic acid in combination with laccase can produce Marama protein dough with viscoelastic properties similar to those of vital gluten, resulting from secondary structural changes and dityrosine cross-links. These changes in the rheological properties showed good potential in gluten-free bakery applications.

Keyword: *molecular entanglement, laccase, tannic acid, viscoelasticity*

Beyond nutrient loss: how processing modulates the digestibility and citotocity properties in a model food system

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Despite the rising interest in unconventional raw materials, their selection often overlooks how processing and food matrix interactions modify their in natura characteristics. This study investigated how these interactions influence the functional, nutritional, and cytotoxic properties of pupunha (Bactris gasipaes) flour in cookies. Four treatments were evaluated: freeze-dried (FDF), cooked/freeze-dried (CFDF), convection-dried (CDF), and cooked/convection-dried (CCDF). Analyses included bioactive compounds, cytotoxicity (ISO 10993), and in vitro digestion (INFOGEST 2.0). Results showed C-CDF had the highest phenolic content (5.31 mg GAE/g), while C-CCDF presented the highest carotenoids (23.36 mg βCA/100 g). Baking and fruit pretreatments significantly influenced fiber content and bioactive retention. Notably, C-CCDF exhibited selective cytotoxicity against PANC-1 cancer cells, a novel finding for processed pupunha products. In vitro digestion revealed that high initial bioactive content does not guarantee high bioaccessibility; C-FDF demonstrated superior phenolic release despite lower initial levels. These findings reinforce that food processing serves as a strategic tool to modulate nutrient release and enhance functional quality—such as selective anticancer potential—rather than merely causing nutrient loss.

Keyword: *food process, modulation, nutritional, model food, digestinbility*

INDUSTRY MOTIVATIONS AND FUTURE PATHWAYS FOR HIGHER-VALUE UTILISATION OF PELAGIC FISH PROCESSING SIDE-STREAMS IN FRANCE, NORWAY AND POLAND

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Pelagic fish processing generates nutrient-rich side-streams, but higher-value utilisation requires industrial readiness and viable upgrading pathways. This study examined motivations and planned pathways for improving side-stream utilisation over the next five years through a CAWI survey of 37 enterprises in France, Norway and Poland. Among companies generating side-streams, 63% agreed that they intend to improve side-stream utilisation, making declared readiness the starting point for valorisation. Main motivations were environmental benefits (81%), higher revenues and corporate image (69% each), and reduced disposal costs (63%). Future pathways differed by implementation model. In-house options focused on traditional food applications and established non-food routes, consistent with lower technological barriers and operational capacities. Outsourced pathways were more associated with advanced food and non-food applications, including recovery of nutritional or bioactive compounds, suggesting that specialised partners may enable higher-value uses where in-house capabilities are limited. Upcycling is driven by sustainability and business motives, but implementation depends on scalable routes and cooperation models.

This research was funded in whole within the Up4Food project (Upcycling side-streams for sustainable and healthy ingredients and new food concepts) by National Science Centre, Poland, project registration no. 2023/05/Y/HS4/00121, through the JPI HDHL Joint Programming Initiative „A Healthy Diet for a Healthy Life”.

Keyword: *pelagic fish, side-streams, zero-waste, circular economy, upcycling*

CHARACTERIZATION OF THE PHYSICOCHEMICAL PROPERTIES OF THE CARRIER AGENT-OPTIMIZED MICROENCAPSULATED SAPINIT POWDER

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It has become an interest to utilize seasonal Philippine wild raspberry or 'Sapinit' (Rubus rosifolius Sm.) to produce a shelf-stable product. Microencapsulation through spray drying is a promising technology to improve stability and functionality of fruit powders. In this study, the physicochemical properties of microencapsulated sapinit powder produced using an optimized carrier agent combination of 2.25% gum Arabic and 22.75% maltodextrin were characterized. Morphological analysis revealed semi-spherical particles with smooth to moderately wrinkled surfaces attributed to the buckling behavior during drying. Mean particle size was 5.40 ± 2.15 μm which classified the powder as microcapsules. The sapinit powder exhibited excellent flowability with an average bulk density of 0.43 g/mL, tapped density of 0.47 g/mL, Hausner ratio of 1.09, and Carr's compressibility index of 9.17%. It had a moisture content of 4.52 ± 0.06% and water activity of 0.228 ± 0.008. Color analysis showed high lightness (L* = 83.56 ± 0.19), low redness (a* = 6.28 ± 0.03), and hue angle of 1.11 ± 0.01, producing a pinkish to light red powder. The results of this study demonstrated that microencapsulation by spray drying with gum Arabic and maltodextrin produced sapinit powder with desirable microstructure, stable physicochemical properties, and a retained red hue.

Keyword: *Sapinit, raspberry, fruit powder, physicochemical properties*

EVALUATION OF THE EFFECT OF DIFFERENT PROCESSING METHODS ON COLOR CHARACTERISTICS AND PHYTOCHEMICAL PROPERTIES OF SAPINIT

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It has become an interest to utilize seasonal Philippine wild raspberry or 'Sapinit' (Rubus rosifolius Sm.) to produce a shelf-stable product. In this study, the effect of different processing methods on the color characteristics and phytochemical properties of sapinit was evaluated. Solid sapinit samples showed higher lightness, redness, and chroma compared to liquid sapinit samples. Freeze-dried pulp retained color close to fresh sapinit with a* ranging from 24.73 to 25.99 while spray drying increased L* (83.56 ± 0.19) and hue angle (1.11 ± 0.0014) but with reduced redness and chroma. Phytochemical analysis revealed that freeze-dried pulp had the highest total phenolic content of 421.77 ± 5.54 mg GAE/g while pulping solids had the lowest (33.68 ± 0.33 mg GAE/g). Spray drying reduced both anthocyanin and phenolics content. Among the liquid samples, commercial sapinit juice drink showed higher anthocyanin of 10.26 ± 0.10 mg C3G/g and phenolics of 220.34 ± 4.57 mg GAE/g than the sapinit liquid mixture (3.18 ± 0.05 mg C3G/g and 43.20 ± 1.51 mg GAE/g, respectively). This study indicates that freeze-drying best preserved sapinit's bioactive compounds while spray drying compromises its retention despite producing stable powders. Selecting the appropriate processing method is essential to balance product stability, color quality, and phytochemical retention in sapinit-based products.

Keyword: *Sapinit, raspberry, color characteristics, total phenolic content, total anthocyanin content*

SHEAR-INDUCED STRUCTURING OF GELLAN GUM: INFLUENCE OF MOLECULAR STRUCTURE AND CONDITIONS

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High-acyl (HA) gellan gum has been observed to form gel-like structures under isothermal high-shear processing in the absence of heating or added ions. The role of molecular structure and the conditions under which this occurs remain unclear. This study investigates how molecular structure and different conditions govern shear-induced structuring.

HA and low-acyl (LA) gellan gums were subjected to fixed high-shear processing at ambient temperature and varying concentrations. Additional experiments were conducted using ι-carrageenan and agar as reference systems with contrasting molecular structures and dispersion behaviours. Structure formation was evaluated using visual assessment and rheological analysis, including frequency and amplitude sweeps, to determine gel-like behaviour.

LA gellan showed concentration-dependent structuring, with weak gel-like behaviour characterised by $G' > G''$ at higher concentration, whereas HA gellan formed comparable structures at lower concentration. In contrast, ι-carrageenan formed homogeneous solutions, while agar remained poorly dispersed, consistent with self-association. These results suggest that such behaviour depends on achieving an appropriate dispersion state, which is influenced by molecular structure. Furthermore, within gellan systems, the degree of acylation alters the critical concentration required for structuring.

Ongoing work further examines how degree of acylation influences other critical conditions, including shear, that determine the onset of structuring.

Keyword: *gellan gum, shear-induced, isothermal*

FREEZE-DRYING MICROENCAPSULATION OF FINGER LIME EXTRACTS WITH CANOLA MEAL PROTEIN AND INULIN IMPROVES BIOACTIVE STABILITY DURING IN VITRO DIGESTION

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Finger lime (Citrus australasica) is a native Australian citrus rich in vitamin C and flavanones, but these bioactives degrade readily during digestion. Ultrasound-assisted extraction yielded a finger lime extract (FLE), which was freeze-dried into a powder, then microencapsulated by freeze-drying with canola meal protein (CMP) and inulin (In). Freeze-dried peel–pulp powder (PPP) and its CMP–In mixture (CMP:In:PPP), prepared without prior extraction, served as benchmarks. Encapsulation lowered water activity (0.13–0.23) and moisture content (3.1–4.6% w/w). Scanning electron microscopy revealed layered matrices embedding the bioactives, and FTIR confirmed hydrogen bonding and amide interactions between wall materials and bioactive compounds. Samples underwent standardised INFOGEST 2.0 static in vitro digestion, and vitamin C, naringin, and naringenin were quantified by HPLC–PDA across the oral, gastric, and intestinal phases. The encapsulated CMP:In:FLE (0.5:0.5:1) retained 94% naringin, 92% naringenin, and 37% vitamin C at the intestinal phase, compared to 69%, 64%, and 6% for the unencapsulated extract. At an equivalent wall-material ratio, the non-extracted benchmark CMP:In:PPP delivered lower bioactive content and weaker vitamin C retention (24%), confirming that prior extraction followed by freeze-dried microencapsulation maximises the content and stability of finger lime bioactives, supporting their use as functional ingredients that valorise citrus and canola by-products.

Keyword: *finger lime, freeze-drying, microencapsulation, bioaccessibility*

Engineering Hybrid Plant–Dairy Protein Gels for Sustainable Food Systems: Insights into Structure–Function Relationships and Protein Replacement Strategies

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The transition towards sustainable food systems has accelerated interest in plant proteins as alternatives to animal-derived proteins. However, achieving the functionality required for structured food applications remains a major challenge. This study investigated the structure–function relationships of representative plant proteins (soy, pea, lentil, and chickpea) and dairy proteins (whey protein isolate and casein micelles) under different pH conditions, with emphasis on gelation behavior and protein interactions.

Plant and dairy proteins exhibited distinct functional characteristics, including differences in solubility, interfacial properties, water-holding capacity, and gel-forming ability. Protein functionality was strongly influenced by both protein source and pH, reflecting variations in molecular interactions and aggregation mechanisms. To enhance plant protein performance, hybrid plant–dairy systems were engineered using thermal treatment and microbial transglutaminase (MTGase). Targeted structuring significantly improved gel strength, water retention, and microstructural uniformity. Notably, MTGase-mediated crosslinking enabled replacement of up to 25% of casein with lentil protein while maintaining comparable gel functionality.

These findings provide new insights into protein gelation and demonstrate the potential of hybrid protein systems for developing sustainable, structure-driven food products.

Keyword: *Plant proteins, Dairy proteins, Hybrid protein systems, Gelation, Sustainable food systems*

Application of Artificial Intelligence in Food Safety and Quality Control

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Artificial intelligence technology plays a key role in food safety quality control, production efficiency improvement, and industrial intelligence. Based on an in-depth analysis of the demand for online detection in food processing, we developed an intelligent detection system that integrates the sensing principles of multiple physical fields such as light, sound, electricity, and magnetism. This system achieves real-time and precise monitoring of key components such as protein, fat, and moisture during the processing, effectively ensuring product quality stability, nutritional balance, and texture consistency. At the same time, this technology significantly enhances the level of automation on production lines, reduces labor costs, and decreases raw material waste through precise process control, thereby strengthening the market competitiveness of products. Moreover, the deep application of artificial intelligence technology enhances food companies' ability to respond to market demand fluctuations and food safety risks, promoting the transformation and upgrading of the food industry towards information technology and intelligence.

Keyword: *Artificial intelligence, Food safety, Quality control*

Analysis of Proteinaceous Components and Bioactivities in the Boiled Extract of Skipjack Tuna Sawdust

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During the manufacturing process of seafood using frozen skipjack tuna, cutting yields sawdust as a byproduct. The collected sawdust is utilized as materials for dashi base after being boiled at 92°C for 10 minutes. The boiled extract is discarded 4t/day as waste but may contain components such as proteins and peptides. Previous studies report that fish muscle is a rich resource for collagen and imidazole dipeptides, which exert anti-inflammatory, ACE-inhibitory, and antioxidant activities. Therefore, to utilize the boiled extract from frozen skipjack tuna sawdust, we aimed to determine its amino acid and imidazole dipeptide contents and evaluate its bioactivities. While histidine was the most abundant free amino acid in the extract, the peptide-form of histidine was not detected. Glycine, the most abundant amino acid in peptide-form, accounted for 35.2% and hydroxyproline 6.1% in the extract. A collagen subunit pattern was clearly shown in the extract by SDS-PAGE. Carnosine and anserine in the extract were 11.6 and 300.9 nmol/mL, respectively. The TEAC of the extract was 39.1 nmol TE/mL, and its anti-inflammatory activity showed a dose-dependent increase. These results demonstrate the boiled extract from frozen skipjack tuna sawdust contains bioactive peptides and could be a source for functional foods.

Keyword: *Skipjack tuna, Imidazole dipeptides, Collagen*

ICE-BINDING PROTEINS FROM WHEATGRASS FOR THE APPLICATION IN YEAST DOUGH

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Ice-binding proteins (IBPs) modulate ice formation and inhibit ice recrystallization, but with little industrial application in food products so far. In frozen baked goods, ice recrystallization leads to damage to the gluten network, reduced yeast vitality, and a loss of quality.

Wheatgrass was cultivated under various growth and cold acclimation conditions to obtain IBPs. Additionally, the presence of IBPs in a protein-rich byproduct from starch production was investigated. Therefore, the inhibition of ice recrystallization of frozen sucrose solutions was investigated for a period of eight days at -12 ºC. Samples containing non-acclimated wheatgrass extract showed no inhibition of the recrystallisation, which was comparable to the recrystallization process of sucrose solution used as a control. In contrast, ice recrystallisation inhibition activity was detected in five different samples of cold-acclimated wheatgrass that had undergone acclimations of five and ten days. In addition, ice recrystallisation was inhibited in the samples of the by-product from the starch production. The corresponding images were qualitatively analyzed due to their complexity by comparing crystal images. For quantitative results, an automated image analysis using machine learning-based tools was implemented, showing promising results. This method will be validated using a subset of images in which crystals were manually outlined.

Keyword: *ice-binding proteins, ice recrystallisation, frozen baked goods*

Research Progress on the Application of Emerging Food Technologies in the Field of Food Allergy

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In China, food safety issues are attracted great attention due to its importance in some major national strategies. Food allergies are one of the major food safety issues, which seriously affect human health. The FAO reports that 3%-10% of the world's population are suffering from food allergies. The number of people with food allergies has increased rapidly in recent years due to the changes in the environment and people's diet and the use of antibiotics, and other factors. Studies have reported that more than 90% of food allergies are caused by eight major allergens. In the medical field, there is no effective treatment for food allergies except for voiding those food allergens. This study outlines the current status and challenges of food allergy research, and introduces research results such as new food desensitization technology, allergen detection technology, probiotics and intestinal immunity, and desensitization food development, as well as future development trends. The conduct of this research will improve the research level of theories related to food allergy and health management, be conducive to the development of the hypoallergenic food industry, and provide a strong guarantee for the health and safety of people prone to allergies.

Keyword: *Food Allergen, Novle Food Processing Technology, Thermal Processing, Green Technology, Allergenicity*

Evaluation of UV Energy Transfer and Energy Efficiency in Flow-Through Systems for Liquid Food Treatment

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Ultraviolet (UV) treatment is a non-thermal technology for the inactivation of microorganisms, particularly in liquid foods. Accurately quantifying UV energy input in flow reactors remains a major challenge when assessing treatment performance. Simplified UV dose metrics often fail to adequately reflect reactor geometry, flow conditions and spatial intensity distributions.

This study evaluates the suitability of different UV dose definitions for describing effective UV energy input and compares the microbial inactivation and electrical energy efficiency of low-pressure mercury (LP-Hg) lamps and UV light-emitting diodes (LEDs). Experiments were conducted in a turbulent flow reactor using wavelengths of 254 nm (LP-Hg), 265 nm (LED) and 295 nm (LED) in model solutions with different absorption coefficients.

Dose derived from the nominal power output of the radiation sources ($D_{nom.}$) was compared with radiometric measurements ($D_{rad.}$) and iodide/iodate actinometry ($D_{act.}$). Saccharomyces cerevisiae (strain D576) served as the model microorganism, and non-linear inactivation kinetics were described using the Weibull model. The results demonstrate that actinometric dosimetry is essential for accurately determining UV energy input in flow-through systems. Although the highest microbial inactivation was achieved at 265 nm, the LP-Hg lamps showed higher electrical energy efficiency

Keyword: *UV Dosimetry, UV-LED, Energy Efficiency, Iodide/iodate actinometry, Saccharomyces cerevisiae*

RATIONAL DESIGN AND AI-GUIDED EVOLUTIONARY ENGINEERING OF CAS12J-8 FOR RAPID FLUORESCENCE DETECTION OF CRONOBACTER SAKAZAKII IN DAIRY PRODUCTS

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Cronobacter sakazakii is a critical foodborne pathogen in powdered infant formula and dairy products, causing severe neonatal meningitis. CRISPR-Cas12 systems offer programmable isothermal detection, but most effectors require elevated temperatures, limiting field deployment. Here, we engineered Cas12j-8 through rational design and AI-directed evolution to enhance its trans-cleavage activity at ambient temperature for detection.

Structural alignment of Cas12j-8 with mesophilic orthologues identified key residues governing low-temperature activity. Saturation mutagenesis at Q195, guided by conservation analysis, was coupled with EVOLVEpro—a deep learning-based fitness prediction platform—to iteratively evolve variants with improved ambient temperature trans-cleavage kinetics. The top variant, EVOCas12j-8, showed substantially enhanced fluorescence versus wild-type. Using RPA with phosphorothioate-modified primers and T7 exonuclease, double-stranded amplicons were converted to single-stranded DNA for Cas12j-8 recognition. The assay detected Cronobacter sakazakii in spiked dairy samples at ambient temperature with no cross-reactivity against common dairy-borne pathogens.

This work demonstrates the synergy of rational design and AI-driven protein evolution in tailoring CRISPR effectors for food safety diagnostics.

Keyword: *Cas12j-8, EVOLVEpro, Cronobacter sakazakii, dairy safety, ambient temperature nucleic acid detection*

Optimization of Mixing Ratio for Textured Vegetable Protein Using Soybean and Sesame Protein Isolates Enriched with Methionine and Arginine

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This study used a mixture experimental design to optimize the ratio of soybean meal protein isolate (SMPI), sesame meal protein isolate (SeMPI), gluten, and starch for producing textured vegetable protein (TVP) enriched in methionine and arginine, and evaluated the textural and physical properties of TVP under each formulation. The methionine and arginine contents were 344.06 and 1,002.54 mg/100g for SMPI, and 773.28 and 1,674.85 mg/100g for SeMPI, respectively, both higher in SeMPI. Regression analysis showed quadratic models were appropriate for all response variables—hardness, springiness, chewiness, gumminess, cohesiveness, compression force, cutting force, and puncture force ($p<0.05$). Increasing protein content tended to increase hardness, chewiness, gumminess, and compression force, while higher starch content reduced overall textural strength. Multi-response optimization yielded an optimal desirability value (D) of 0.8048, with 43.61% protein, 17.68% gluten, and 38.70% starch most closely resembling the control, chicken breast; under this formulation, the blended protein contained 541.02 mg/100g methionine and 1338.70 mg/100g arginine. These results suggest that blending SMPI and SeMPI can produce TVP with excellent texture while compensating for amino acids deficient in soy protein, enabling production of TVP with a higher amino acid score.

Keyword: *mixture design, textured vegetable protein(TVP), sesame meal protein isolate(SeMPI), soy meal protein isolate(SMPI), amino acid*

IDENTIFYING A PHYSICOCHEMICAL WINDOW FOR SUSTAINABLE PROTEIN RECOVERY FROM BARLEY AND DEFATTED OAT USING ULTRASOUND-ASSISTED DEEP EUTECTIC SOLVENTS

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Sustainable recovery of protein-rich fractions from cereal resources is essential for advancing circular food systems. This study investigated ultrasound-assisted protein extraction from barley and supercritical-carbon-dioxide-defatted oat using choline chloride–glycerol deep eutectic solvents (DES). A Box–Behnken experimental design was employed to evaluate the effects of solvent molar ratio (1:1–1:3), water content (20–50%), and ultrasound treatment time (5–25 min). Solvent conductivity, viscosity, density, and pH were characterized to explore physicochemical drivers of extraction performance. The extraction process recovered 10.35–17.51% and 3.03–4.84% soluble protein from defatted oat and barley, respectively. The highest yield was obtained using a 1:3 choline chloride:glycerol ratio, 35% water, and 15 min ultrasound treatment. Response surface analysis identified that solvent molar ratio and water content significantly influenced extraction efficiency. Ultrasound-assisted DES-system enhanced recovery by approximately 129% and 33.3% relative to phosphate buffer and non-ultrasound extraction processes, respectively. Extraction efficiency did not increase continuously with decreasing viscosity. Maximum solubilization occurred in an intermediate physicochemical region characterized by moderate viscosity (9.74 mPa·s) and conductivity (17.86 mS/cm), suggesting a balance between solvent structural stability and mass-transfer enhancement. These findings demonstrate a physicochemical design window for sustainable functional protein recovery and provide guidance for circular biorefinery process design.

Keyword: *Circular biorefinery, Deep eutectic solvents, Functional protein recovery, Green extraction, Ultrasound-assisted extraction*

BEYOND BIODEGRADATION: NATURAL DEEP EUTECTIC SOLVENT RECONSTITUTION OF MANDARIN PEEL PECTIN AND POLYMETHOXYFLAVONES INTO WATER-REPROCESSABLE ACTIVE PACKAGING FILMS

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Most biodegradable packaging materials are engineered to disintegrate after use, whereas their recovery and reprocessing pathways remain insufficiently considered. Here, we report a COSMO-RS-guided strategy for constructing water-reprocessable active packaging films from mandarin peel, in which pectin and polymethoxyflavone (PMF)-rich phenolics are reconstituted into a unified material platform. A food-grade betaine:glycerol natural deep eutectic solvent (NADES) was selected through experimental screening and COSMO-RS (Conductor-like Screening Model for Real Solvents) evaluation, providing molecular-level insight into the preferential solvation of mandarin peel phenolics. Following response surface optimization, the total phenolic content reached 17.25 ± 0.16 mg GAE/g dry weight. Beyond extraction, the same NADES extract was directly incorporated into pectin without solvent removal, functioning as a plasticizer and hydrogen-bond network builder that reinforced the pectin/phenolic architecture. The resulting films exhibited enhanced flexibility, reduced water vapor permeability, excellent UV-shielding performance, antibacterial activity against Staphylococcus aureus and Escherichia coli, and effective preservation of cherry tomatoes. Importantly, the dynamic pectin/NADES network enabled water-phase recovery and remolding while retaining mechanical performance. This work demonstrates a closed-loop design principle for biodegradable packaging that integrates COSMO-RS-guided green extraction, single-source biomass reconstitution, active food preservation, and aqueous reprocessability.

Keyword: *Natural deep eutectic solvent, Polymethoxyflavones, Water reprocessability, COSMO-RS, food packaging film*

COLD PLASMA-INITIATED PREPARATION OF BAGASSE CELLULOSE POROUS HYDROGEL AND ITS APPLICATION IN FRUIT PRESERVATION

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Cold plasma (CP), as an emerging non-thermal food processing technology and advanced oxidation technique, holds substantial potential for modifying biological macromolecules in food. In this study, sugarcane bagasse cellulose was used as the raw material, and CP technology was employed as a substitute for chemical initiators to prepare a dual-crosslinked acrylic acid (AA)/bagasse cellulose (BC) porous hydrogel (AA/BC). The structural and environmental response properties of the hydrogel were systematically investigated. The AA/BC hydrogel was further utilized as a functional carrier to encapsulate citral (C), forming an inclusion complex (AA/BC-C), and its controlled-release and antimicrobial performances were evaluated. Additionally, graphene oxide (GO) was incorporated to fabricate a humidity-sensing hydrogel (AA/BC/GO), and its humidity response level, dynamic sensitivity, and hysteresis performance were examined. By integrating the unique advantages of citral and GO, a humidity-triggered, visually detectable, slow-release green antimicrobial preservative (AA/BC/GO-C) was developed, enabling fruit freshness assessment without opening the packaging. This study provides a novel strategy and pathway for the modification of biological macromolecules in food and their intelligent application in food preservation.

Keyword: *Cold plasma, Bagasse cellulose, Slow release, Humidity response, Bacteriostatic preservation*

SEQUENTIAL APPLICATION OF COLD PLASMA IN CHICKEN BREAST: IMPROVEMENT OF MEAT TENDERNESS AND BACTERICIDAL MECHANISM AGAINST HISTAMINE-PRODUCING RAOULTELLA SP.

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The feasibility of plasma-activated lactic acid solution (PALA) combined with dielectric barrier discharge (DBD) plasma treatment in chicken breast was evaluated. Results indicated that sequential plasma treatments slowed down the increase in the pH value and TVB-N value of meat during storage. Moreover, PALA treatment weakened the lipid oxidation triggered by DBD plasma treatment. Furthermore, centrifugal loss and shear force of chicken breast in the PALA-DBD group were reduced by 2.88% and 19.4%, respectively, and the myofibril fragmentation index was significantly increased compared to the control group, and PALA treatment increased free water content. Microbiological analyses showed that PALA-DBD treatment disrupted the cell membrane integrity of Raoultella sp., induced oxidative stress and reduced the activity of antioxidant enzymes (catalase and superoxide dismutase), led to the degradation of bacterial proteins and the disruption of α-helical structure.

Keyword: *Plasma-activated lactic acid, Dielectric barrier discharge, Tenderness, Antibacterial mechanism*

APPLICATION OF DIELECTRIC BARRIER DISCHARGE PLASMA: A TECHNIQUE FOR REDUCING MICROORGANISMS, IMPROVING ANTIOXIDANT CAPACITY, AND INHIBITING SOFTENING OF WINTER JUJUBE

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Postharvest deterioration of winter jujube, characterized by peel browning, textural softening, and microbial proliferation, was addressed using in-package dielectric barrier discharge (DBD) plasma technology. Through Box-Behnken design optimization (voltage: 93 kV, treatment time: 99 s, frequency: 92 Hz), storage-induced changes in microbial count, visual characteristics, antioxidant capacity, and cell wall-degrading enzymes were systematically evaluated. Results indicated the optimized treatment reduced the total viable bacteria and mold/yeast count by 1.64 and 0.87 lg CFU/g, decreased the decay rate by 12 % by day 35, delayed peel browning onset by 7 days, and enhanced antioxidant compound levels (including vitamin C, phenols, and flavonoids) by 16 % - 40 %. Mechanism analysis revealed approximately 25 % reductions in $O2^{\bullet-}$ and H_2O_2 levels, accompanied by 44 % - 206 % activation of catalase, superoxide dismutase, and ascorbate peroxidase. Simultaneously, the malondialdehyde content declined by 29 % by day 42. Additionally, plasma treatment suppressed polygalacturonase (19 %), pectin methylesterase (16 %), cellulase (16 %), and β-galactosidase activities (27 %), thereby significantly increasing the hardness (12 %) and pectin content (13 %) during post-storage. These synergistic effects validate the translational value of cold plasma for industrial-scale winter jujube preservation, necessitating that future research should focus on industrial adaptation and synergy of the technology.

Keyword: *Cold plasma, Winter jujube, Microorganism, Antioxidant metabolism, Peel browning*

FABRICATION OF AN INNOVATIVE GELATIN/POLYVINYL ALCOHOL/VANILLIN AEROGEL CONTAINING D-LIMONENE NANOSTRUCTURED LIPID CARRIERS AND ITS PRESERVATION EFFECTS ON STRAWBERRIES

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Strawberries are highly perishable fruits owing to their susceptibility to physical damage and fungal infection**.** In order to extend shelf life of strawberries, a novel gelatin/polyvinyl alcohol/vanillin (Gel/PVA/Van) aerogel incorporated by nanostructured lipid carriers (NLCs) containing antimicrobial D-limonene (DL) was prepared and applied as active packaging for strawberries. The results showed that NLCs might be encapsulated in the aerogels in the form of attachment to the aerogel skeleton, and there were non-covalent interactions between NLCs and other components of the aerogels. Due to the introduction of NLCs containing strongly hydrophobic lipid phase, the water vapour sorption capacity of aerogels decreased, and yet appropriate addition of NLCs contributed to enhancing the thermal stability of aerogels. Besides, the aerogels with 20% NLCs added showed obvious inhibitory effect on the growth of E. coli and B. cinerea, and strawberries in this aerogel packaging group exhibited significantly lower natural disease incidence and malondialdehyde content related to oxidative damage and membrane damage. Consequently, the Gel/PVA/Van aerogel containing DL-loaded NLCs with antimicrobial activity has promising applications in the active packaging field of postharvest strawberries.

Keyword: *Gelatin/polyvinyl alcohol/vanillin aerogel, Nanostructured lipid carriers, Antimicrobial activity, Strawberry preservation, Active packaging*

DIELECTRIC BARRIER DISCHARGE COLD PLASMA-INDUCED STRUCTURAL MODIFICATION OF HAZELNUT PROTEINS TO REDUCE IMMUNOREACTIVITY AND ENHANCE DIGESTIBILITY AND FUNCTIONAL PROPERTIES

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As a green, non-thermal food processing technology, dielectric barrier discharge cold plasma (DBD-CP) offers significant advantages over conventional thermal methods, which can efficiently modify protein structures without causing unwanted denaturation or nutrient loss. In this study, DBD-CP treatment was applied to hazelnut proteins (HNP) to reduce their allergenic potential while simultaneously improving protein quality and functional properties. Circular dichroism analysis revealed that DBD-CP treatment altered the secondary structure of peanut proteins, particularly α-helix and β-sheet configurations. Increased ultraviolet absorption and reduced intrinsic fluorescence confirmed the exposure of hydrophobic groups. DBD-CP generated reactive oxygen species that degraded proteins and damaged conformational epitopes, leading to hydrophobic quenching and reduced antibody recognition. Consequently, the IgG- and IgE-binding capacities of DBD-CP-treated HNP decreased by 96.31% and 66.24%, respectively. Notably, DBD-CP treatment also enhanced digestibility and functional properties, with the rapid disappearance of high molecular weight proteins and foaming capacity increasing from 105.8% to 178.35%. Overall, these results demonstrate that DBD-CP is a highly effective, residue-free, and low-energy approach for significantly reducing the immunoreactivity of major hazelnut allergens while improving their techno-functional attributes.

Keyword: *Dielectric barrier discharge cold plasma, Hazelnut protein, Immunoreactivity, Digestibility, Foaming capacity*

EFFECT OF ULTRASOUND PROCESSING ON GERMINATION, NUTRITIONAL QUALITY AND ENZYME ACTIVITY IN MUNG BEAN SPROUTS

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Growing global population and consumer interest in health-promoting foods have intensified the demand for sustainable and nutrient-dense foods. Although legumes offer high nutritional value and low environmental impact, their utilization is limited by poor digestibility and the presence of anti-nutritional factors. Germination is an effective strategy to improve nutrient bioavailability and enhance the nutritional quality compared to ungerminated seeds. Ultrasound (US) has recently emerged as a promising technology for enhancing germination and nutritional quality in legume sprouts. This study evaluated the effect of US on the germination, nutritional quality and enzyme activity of mung beans (Vigna radiata). Seeds were treated with US (40 kHz, 110 W, 1:10 (w/v) solid-to-liquid ratio) up to 60 min and germinated for 96 h. Germination percentage was initially higher (up to 36 h) in the group treated with US for 60 min compared to other US treatments and control. US treatment did not significantly affect protein content. However, a biphasic response was observed in free phenolic content, radical scavenging activity and peroxidase activity. Compared with control sprouts, US-60 min and US-1 min increased free phenolic content by 26.0% and 10.2%, respectively, while US-5 min resulted in 17.3% decrease, highlighting the importance of treatment duration.

Keyword: *Antioxidant capacity, Enzyme activity, Germination, Mung beans, Ultrasound*

Interconnected plant-based meat and fat analogues via double-network emulsion gels

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A plethora of reasons, including cost, nutrition and variety, have been identified as hindrances to plant-based meat's (PBM) proliferation into our diets. Particularly, whole-cut meat or steak-like analogues are rare in mass market products. In the few products available, the fat component, which is essential to the enjoyment of meat, was notably absent.

Thus, we developed a novel formulation based on native and modified wheat gluten (WG) and curdlan gum (CUD) to mimic animal adipose tissue for whole-cut PBM. A double-network emulsion gel of up to 45% oil was formed via shear- and heat-induced gelation of WG and CUD. Synergistic relationships between WG and CUD improved freeze-thaw stability (~13%), water-holding capacity (+6.6%), texture (+259% in hardness), and gel strength of the emulsion gel. Furthermore, a mockup whole-cut PBM was prepared showing the successful fusion of the fat component to a lean "muscle" component, as confirmed by CLSM imaging. The mockup sample maintained structural integrity and showed meat-like browning after pan-cooking. This was done by exploiting the formation of disulfide bonds and intermolecular interactions between glutenin molecules. With these findings, this formulation enables the creation of more competitive PBM contenders to animal meat.

Keyword: *Emulsion gel, Plant-based meat, Texturisation, Food rheology*

Forty-Year Transition of Elderly Nutritional Health and Advancement of Elderly-Friendly Food Industry in China

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This study intends to elaborate the 40-year evolution of nutritional status, nutrient deficiency characteristics, chronic disease patterns, and the development of the age-adapted food industry among Chinese elderly, so as to support innovative upgrading of geriatric food and healthy aging. **Method** Based on authoritative academic literature and official academic works accessible via PubMed and CNKI from 1980 to 2020, this research summarizes the evolutionary rules of elderly nutrition, chronic diseases and the supporting food industry. **Results** In the past four decades, elderly overt malnutrition has decreased significantly, while micronutrient deficiencies still widely exist. The prevalence of major metabolic chronic diseases in the elderly has maintained a growing trend. The domestic elderly-friendly food industry has expanded steadily but is deficient in precise, age-specific nutritional product design. **Conclusion** This study reveals the dual nutritional dilemma of partial nutritional deficiency and chronic disease burden in Chinese seniors, highlighting the necessity of integrating nutritional health theories with food industry innovation to advance high-quality elderly food development.

Keyword: *Elderly, Nutritional status transition, Food industry, Healthy aging, Elderly-friendly food*

Zero waste virgin coconut oil processing through upcycling (VC0-UP): a biocircular economy framework

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The virgin coconut oil (VCO) industry in the Philippines generates huge amounts of agro-industrial by-products annually, including coconut husks, mature coconut water, coconut skim milk and coconut residue. These materials, often discarded as waste, represent a massive, untapped resource. In the face of escalating environmental challenges, upcyclling these by-products is imperative. This paper presents a biocircular economy framework for the VCO industry.The coconut fruit is composed of five major components, yet only the meat is used for VCO extraction. Coconut husks are rich in lignocellulosic compounds which can be a source of dietary fiber. Mature coconut water is a nutrient-rich liquid with higher mineral content than tender coconut water. Its antioxidant potential makes it a promising functional beverage. Coconut skim milk contains protein which are highly digestible and rich in essential amino acids making it an ideal source of plant-based proteins. Coconut residue or spent meal is traditionally used as animal feed and can be repurposed into dietary fiber and as a substrate for single-cell proteins from microorganisms. Upcycling of VCO processing wastes can contribute to environmental stewardship, social justice, and economic empowerment making it a viable model for food biocircular economy.

Keyword: *zero waste, upcycling, biocircular economy, virgin coconut oil*

ULTRASOUND-ASSISTED SALT EXTRACTION OF FUNCTIONAL PROTEINS FROM OILSEED PRESS CAKES FOR SUSTAINABLE FOOD INGREDIENT DEVELOPMENT

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Valorization of oilseed press cakes as functional food ingredients supports sustainable and resource-efficient food systems. This study investigated ultrasound-assisted salt extraction (UASE) using 0.5 M sodium chloride as a mild, food-compatible strategy for enhancing protein release from hemp, flax, and rapeseed defatted press cakes under native pH conditions. A full factorial design was used to evaluate the effects of ultrasound intensity (approximately 8–44 W/cm²) and treatment time (2–20 min) on protein extraction performance, emulsifying properties, and foaming behavior. The extraction response was strongly biomass-dependent. Compared with conventional salt extraction, UAE significantly increased soluble protein concentration by approximately 23% in hemp and 76% in rapeseed, whereas no significant improvement was observed for flax. Ultrasound treatment had no significant effect on extraction volume across the investigated biomasses. Functional properties varied among the biomasses, with rapeseed showing the greatest emulsifying activity and flax showing the greatest emulsion stability. These findings demonstrate that the effectiveness of UASE is highly biomass-dependent and highlight its potential as a food-compatible strategy for valorizing oilseed processing side streams into functional protein ingredients. Additional functionality assessments, amino acid composition analysis, and life cycle assessment of the whole process are underway.

Keyword: *Ultrasound-assisted salt extraction, Oilseed press cake, Protein extraction, Techno-functional properties, Sustainable food ingredients*

OPTIMIZATION OF SOLVENT-BASED OIL EXTRACTION FROM MIXTURES OF GRAPE AND MAQUI BIOWASTE PRETREATED WITH HIGH HYDROSTATIC PRESSURE

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Grape and maqui biowaste byproducts of the food industry, consisting of skins and seeds, they are rich sources of bioactive compounds and functional vegetable oils, and their extraction helps reduce food waste. The objective was to determine the optimal conditions for solvent-based oil extraction from mixtures of País grape and maqui biowaste pretreated with high-pressure hydrostatic processing (HPP). The variables considered were their physicochemical composition, yield, and antioxidant capacity. A simplex-lattice mixture design was used for grape waste (GP) and maqui waste (MP) residues in the following proportions: GP100%, GP 75%:MP25%, GP50%:MP50%, GP25%:MP75%, MP100%. HPP was applied at a pressure of 600MPa for 5/10 minutes. Solvent extraction using hexane was then performed. Variables such as yield, total polyphenols, antioxidant capacity (DPPH, ORAC), color, and quality indices were analyzed. The oils obtained from the GP75%:MP25% and GP50%:MP50%, at 600 MPa/10 minutes, yielded the highest yields (20%;18%) and best-preserved antioxidant activity, showing DPPH values of (281.61±3.4 and 264.91±9.9µgTE/ml) compared to the control. Likewise, they exhibited greater stability (lower acidity and peroxide indices) and a better colorimetric profile, yielding high-quality functional oils with superior antioxidant properties, greater oxidative stability, and potential for application in the food industry

Keyword: *Biowaste oils, maqui waste, grape waste, bioactive compounds, high-pressure processing*

A-MAIZE-ing Waste: A Biocircular Economy Framework for the Philippine Corn Industry

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Corn (Zea mays L.) is a major agricultural commodity in Southeast Asia, including the Philippines, where production reached 8.31 million metric tons (MMT) in 2025. While corn kernels are the primary economic product, large quantities of agricultural residues are often underutilized or disposed of through open-field burning, landfilling, or other low-value applications, resulting in environmental impacts and resource inefficiencies. This paper presents a biocircular economy framework for valorizing corn production residues into value-added food ingredients and bio-based products. Among these by-products, corncobs account for approximately 18–20% of harvested ear biomass, generating an estimated 1.5–1.7 MMT annually in the Philippines. Rich in cellulose, hemicellulose, dietary fiber, and phenolic compounds, corncobs show potential as functional food ingredients, prebiotic fiber sources, and fermentation substrates. Corn husks (5–10% of residue biomass) can be converted into biodegradable food packaging and fiber-based materials, while corn silk (~2%) contains bioactive compounds suitable for functional foods. The proposed framework integrates food-grade valorization, biomaterial development, and circular resource recovery pathways to maximize value extraction from corn residues while minimizing waste generation. By transforming agricultural by-products into valuable resources, the framework supports sustainable food production and the transition toward a circular bioeconomy in the Philippine corn industry.

Keyword: *corn by-products, circular bioeconomy, agricultural waste valorization, sustainable food systems, zero-waste*

Effect of Grain Composition on Growth and Cordycepin Production of Cordyceps militaris Cultivated on Various Food Crops

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Cordyceps militaris is a functional mushroom valued for its bioactive compound, cordycepin. This study investigated the effects of various food crops on fungal growth and cordycepin production to identify suitable substrates for value-added functional foods. C. militaris was cultivated for 49 days on cereals, legumes, and sesame seeds. Fruiting bodies developed successfully on cereals and sesame seeds, whereas little or no fruiting body formation was observed on legumes. Cordycepin was detected in both fruiting bodies and cultivated substrates, with concentrations varying according to substrate type. Fruiting bodies grown on cereals contained 120–250 μg/g dry weight of cordycepin, while the corresponding substrates contained 30–100 μg/g. Sesame-based substrates produced substantially higher levels, reaching 450–570 μg/g in fruiting bodies and 110–160 μg/g in substrates. Legume-based substrates accumulated 150–250 μg/g of cordycepin in the substrates despite limited fruiting body production. Nutritional analysis indicated that the carbohydrate-to-protein ratio influenced fruiting body formation, whereas higher lipid content was associated with increased cordycepin production. These findings demonstrate that substrate composition significantly affects both the growth and functional quality of C. militaris and highlight mushroom cultivation as an effective strategy for enhancing the functional value of food crops.

Keyword: *Cordyceps militaris, Cordycepin, Functional food, Food crops, Substrate composition*

Ultrasonication-Assisted Osmotic Membrane Distillation of Orange Juice: Flux Behavior and its Quality Evaluation

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Osmotic Membrane Distillation (OMD) is a low temperature membrane process driven by vapour pressure differences across a hydrophobic membrane and is suitable for concentrating thermally sensitive foods. However, its application is constrained by concentration polarization at the membrane boundary layer, leading to reduced permeate flux and process efficiency. The primary objective of the study was to study the flux in OMD through ultrasonic process intensification, using orange juice as a food system. Previous studies on ultrasound-assisted (US) membrane processes have predominantly employed external ultrasonic bath systems, where acoustic energy is indirectly transmitted to the membrane module. In contrast, the present study introduces a modified configuration in which a 28 kHz, 60 W ultrasonic transducer was directly integrated into a plate-and-frame membrane module having an area of 0.011m^2. Direct coupling was designed to improve cavitation efficiency and boundary layer disruption at the membrane surface. Orange juice quality was retained, with Total Soluble Solids increasing to 19.6 °Brix, while density (1.05 g/cm^3) and titratable acidity (1.25 g/100 mL) remained the same. Retention of vitamin C (654 mg/L) and total polyphenols (822 mg/L) was observed under US-OMD conditions. Results demonstrate that direct ultrasonic integration offers enhanced mass transfer compared to OMD.

Keyword: *Osmotic Membrane Distillation, Ultrasonication assisted OMD (US-OMD), Osmotic agents, Concentration polarization.*

Immunostimulatory Potential of Honey, Beeswax, and Propolis from Three Stingless Bee Species on Human Peripheral Blood Mononuclear Cells (PBMCs)

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This study evaluated the immunostimulatory effects of honey, beeswax extract, and propolis extract obtained from three stingless bee species: Tetragonula pagdeni Schwarz, Geniotrigona thoracica Smith, and Heterotrigona itama Cockerell. Human peripheral blood mononuclear cells (PBMCs) were isolated from blood samples and cultured in 96-well plates. The cells were treated with honey, beeswax extract, or propolis extract at concentrations of 10 and 100 µg/mL. Concanavalin A (ConA, 10 µg/mL) was used as a positive control. Cell proliferation was determined after 24, 48, and 72 h using the MTT assay.

The results showed that PBMCs treated with honey and beeswax extracts exhibited reduced proliferation after 48 and 72 h, with cell viability decreasing to below 80% at both tested concentrations. In contrast, propolis extracts from all three stingless bee species significantly enhanced PBMC proliferation. At 24 h, propolis extract from G. thoracica at 10 µg/mL produced the highest proliferative response (752.02 ± 17.85%), followed by H. itama (666.76 ± 16.31%) and T. pagdeni (520.18 ± 14.79%). These values exceeded that of the positive control, ConA (420.00 ± 10.76%). The findings indicate that stingless bee propolis possesses strong immunostimulatory activity and may serve as a promising bioactive ingredient in functional foods, pharmaceuticals, and cosmetic products.

Keyword: *stingless bee, propolis, PBMCs, immunostimulatory activity, MTT assay.*

DIGESTIVE HEALTH AS A DRIVER OF PLANT-BASED DAIRY ALTERNATIVE CONSUMPTION: EVIDENCE FROM MULTI COUNTRIES SURVEYS

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Plant-based dairy alternatives (PBDA) have gained popularity worldwide. This ongoing research aims to investigate the consumption patterns, motivations and perceptions associated with PBDA across multiple countries, with a particular focus on the perceived digestive and health benefits.

The research is based on data from two large cross-sectional online surveys including 42,000 adults from 14 countries. The second surveyed 2,501 regular plant-based drink (PBD) users in the USA, UK and Germany and evaluated agreement with 113 product-benefit statements.

Preliminary findings suggest that PBDA are no longer a niche product category with more than half of consumers (n=23,034/42,000) across 14 countries reporting consumption. Adoption was highest among Generation Z and Millennials and among individuals with allergies. Health was considered among the primary drivers for consumption. Digestive comfort emerged as a particularly important perceived benefit. More than 80% of PBD users perceived these products as easy to digest, light on the stomach and naturally lactose-free.

These findings demonstrate the growing global relevance of PBDA and highlight digestive comfort as a key factor influencing consumer adoption. The results will inform product development, consumer communication, and public health nutrition strategies, with full findings to be presented at the conference.

Keyword: *Plant-Based Dairy Alternatives, Functional Foods, Digestive Health, Precision Health, Gut Health*

Divergent Coevolutionary Fates of Environmental Phages and Escherichia coli: Implications for Phage-based Biocontrol in Food Safety

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Bacteriophages represent a promising alternative to antibiotics for controlling foodborne pathogens, yet the long-term stability of phage biocontrol efficacy remains unclear. This study isolated and sequenced 32 genetically diverse bacteriophages from a broad range of environmental samples, capturing substantial diversity in phage genotype and host range. These phages were used to establish long-term experimental coevolution lines with Escherichia coli. Three distinct evolutionary outcomes were observed: complete bacterial clearance, phage extinction due to the emergence of adsorption-resistant mutants, and stable phage–bacteria coexistence through reciprocal coevolution. Coevolved phages demonstrated significantly enhanced killing efficiency against ancestral wild-type bacteria, while coevolved bacteria exhibited elevated resistance to ancestral wild-type phages, consistent with arms-race dynamics. These results indicate that phage–host coevolution substantially alters both phage infectivity and bacterial resistance over time, with direct implications for the design and long-term deployment of phage-based interventions in food safety applications. Accounting for coevolutionary dynamics may be critical for maintaining biocontrol efficacy against foodborne pathogens across extended application periods.

Keyword: *Phage resistance, Escherichia coli, Coevolution, Arms-race dynamics*

Plasma Metabolomics Identifies Metabolite Mediators Linking Protein Intake To Cardiometabolic Risk Factors In Singapore Adults

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Despite evidence linking dietary protein intake to cardiometabolic health, the underlying metabolic pathways remain underexplored. Using metabolomics, this study investigated whether plasma metabolites mediate associations between protein consumption and cardiometabolic risk factors (CRFs) in Singapore adults.

In this cross-sectional study, 237 adults (52 ± 17 y) provided fasting plasma samples for untargeted metabolomics profiling by UPLC-QTOF-MS/MS. Three-day food records were collected to assess protein intake by quantity, source, and food groups. CRFs included anthropometry, glycaemic, lipid-lipoprotein, blood pressure, and kidney function measures. Metabolites significantly associated with both dietary protein intake and CRFs underwent further mediation analysis. All analyses were adjusted for demographic, lifestyle, and dietary covariates, with significance defined as false discovery rate < 0.05.

Mediation analyses revealed five unique metabolites significantly mediating associations between dietary protein intake and body mass index (BMI). They were putatively identified as lysophosphatidylcholines (LPCs) – LPC(16:0), LPC(17:0), LPC(18:1), LPC(18:2), and LPC(22:6). The LPCs partially mediated inverse associations of weight-adjusted total, plant-derived, and grain-derived protein intake with BMI, accounting for 4.7-25.4% of total effects. No significant metabolite-mediated associations between protein intake and other CRFs were observed.

Overall, these findings suggest that lipid metabolism may represent a metabolic pathway linking dietary protein intake and adiposity.

Funding: Bezos Earth Fund

Keyword: *Dietary Protein, Plasma Metabolomics, Cardiometabolic Risk Factors, Mediation Analysis, Cross-Sectional*

APPLICATION OF BIOACTIVE MUNG BEAN PROTEIN HYDROLYSATE IN A HIGH-PROTEIN VEGAN SOUP

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Mung bean protein hydrolysate (MBPH) is a plant-based protein ingredient with demonstrated bioactive and anti-inflammatory properties. This study developed and optimized a high-protein vegan mushroom soup enriched with MBPH and evaluated its physicochemical properties and consumer responses. A vegan mushroom soup formulation was optimized using a D-optimal mixture design by varying the proportions of shiitake mushroom (25–35%), coconut milk (30–40%), and water (15–30%). Eight formulations generated from the mixture design were evaluated using a 9-point hedonic scale (n = 50), and the optimal formulation was selected based on overall liking. The optimal formulation, consisting of 25.05% shiitake mushroom, 37.70% coconut milk, and 27.25% water, was subsequently fortified with MBPH at 0, 2, 4, and 6% (w/w). Among the tested formulations, the 2% MBPH sample achieved the highest overall liking score (7.26 ± 0.47). Consumer acceptance testing of the selected 2% MBPH formulation (n = 200) yielded an overall liking score of 7.08 ± 1.02, a consumer acceptance rate of 97.5%, and a purchase intent of 92.5%. The final MBPH-enriched vegan soup contained 19.87% protein. These findings support the application of MBPH as a functional ingredient in high-protein plant-based foods.

Keyword: *mung bean; protein hydrolysate; functional ingredient; plant-based protein; vegan soup*

A FOOD-GRADE HYDROGEL FOR TARGET-TRIGGERED BACTERIOPHAGE DELIVERY IN FOOD BIOCONTROL

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Bacteriophages (phages) are natural, host-specific antimicrobials that lyse target bacteria without promoting antibiotic resistance, offering a green alternative to chemical preservatives. However, when applied in free form, phages disperse from target sites and lose activity, lacking controlled, localized delivery and limiting antimicrobial efficacy. Hydrogel encapsulation can enable controlled, localized release, but conventional hydrogels rely on glutaraldehyde crosslinking, which is toxic and unsuitable for food contact. In this study, we developed a food-grade hydrogel crosslinked through a Schiff-base reaction between carboxymethyl chitosan and oxidized sucrose, a food-safe crosslinker replacing glutaraldehyde. Fast, mild gelation preserves phage viability during encapsulation. Two phages — Fish2, targeting Pseudomonas, a major spoilage organism of chilled foods, and PYO^{sa}, targeting Staphylococcus, a foodborne pathogen — were loaded. A high phage load was encapsulated with viability and infectivity retained, and release was sustained. Notably, the target bacteria, particularly Pseudomonas, accelerated hydrogel degradation and phage release. The released phages self-replicated on their host, enabling self-amplifying, on-site targeted delivery, and showed promising antimicrobial efficacy against bacterial host in vitro. By coupling food-grade materials with target-triggered release, the platform opens a safe, on-demand route to phage biocontrol for antimicrobial coatings and active packaging.

Keyword: *Bacteriophage, Phage delivery system, Food-grade hydrogel, Food biocontrol, Encapsulation*

LOW-COST AND VERSATILE SCAFFOLD TECHNOLOGY FOR SUSTAINABLE CULTIVATED MEAT PRODUCTION

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Cultivated meat has emerged as a promising strategy to improve food security and reduce reliance on conventional livestock production. However, scalable cultivated meat production remains limited by the high cost of specialised chemical differentiation media required to drive efficient tissue maturation, particularly for cultivated muscle and fat components. Herein, we present a low-cost and versatile scaffold-based platform for cultivated meat production. The approach uses edible three-dimensional scaffolds to encapsulate stem cells and provide a tunable microenvironment for differentiation into adipogenic or myogenic lineages. By controlling scaffold material composition, geometry, and stiffness, the platform is designed to support cell confinement, lineage maturation, and the formation of structured cultivated fat and muscle prototypes. The scaffold architecture can also be adapted to modulate texture and organoleptic properties relevant to cultivated meat products. Importantly, the fabrication strategy is compatible with scalable processing approaches, offering a potential route to reduce reliance on expensive differentiation media while simplifying downstream harvesting. Prototypes of cultivated fat and muscle structures were successfully generated, demonstrating the feasibility of the platform for producing structured cellular components for cultivated meat. This work highlights scaffold-enabled differentiation as a scalable and potentially cost-effective strategy for advancing sustainable cultivated meat manufacturing.

Keyword: *Cultivated meat, Cellular agriculture, Edible scaffolds, Stem cell differentiation, Scalable food processing*

SUITABILITY OF POST-CONSUMER RECYCLED PLASTIC AS A FOOD CONTACT MATERIAL

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Post-consumer recycled (PCR) plastics frequently exhibit persistent odours that restrict their use in high-value applications like food packaging. Characterising these trace-level odorants within complex matrices is analytically challenging. In this study, a series of chromatographic approaches were applied to systematically resolve, identify and quantify odoriferous compounds in PCR plastics.

1D-GCMS-O was used to locate aroma-active regions of PCR plastic. Extensive co-elution observed in 1D-GCMS-O prompted the application of heart-cut multidimensional gas chromatography–mass spectrometry-olfactometry (H/C MDGC–MS-O), which enabled selective isolation of overlapping aroma-active regions and improved compound identification confidence. Finally, comprehensive two-dimensional gas chromatography-flame ionization detection/time-of-flight mass spectrometry (SPME-GC×GC-FID/TOFMS) coupled with a quantification standard-on-fibre approach provided simultaneous quantification and structural elucidation of aroma compounds in complex recycled plastic matrices.

Results showed that dozens of volatiles remain in plastic after recycling. A successive, monotonic reduction of the solid sample mass was demonstrated to be a robust and satisfactory approach for performing Aroma extract dilution analysis (AEDA) for solid polymer samples. Another central methodological outcome was the successful adaptation of standard-on-fibre approach for solid polymer samples. The proposed workflow provides a robust analytical framework for odour control and quality assessment in plastic recycling industry.

Keyword: *Recycled plastic, solid phase microextraction, olfactometry, quantification, gas chromatography*

From Molecular Perception to Formulation Redesign: A Data–Knowledge Dual-Driven Flavor Foundation Model and Distributed Agent Paradigm

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Flavor connects food molecular composition, human sensory perception, and consumer choice. Traditional flavor science relies on instrumental techniques (GC–MS, GC–O) and sensory methods (QDA, consumer testing), however, a persistent disconnect separates the chemical and sensory domains. High-throughput flavoromics generates vast molecular profiles but cannot explain masking, synergy, or nonlinear perceptual effects; sensory panels provide human-relevant anchors but are limited by small samples, high cost, bias, and population heterogeneity. Artificial intelligence has opened new pathways, but isolated predictive models remain insufficient to bridge chemical and perceptual spaces. A distributed agent paradigm is proposed, orchestrated by a multimodal flavor foundation model serving as a central coordination hub, with multiple specialized agents collaboratively executing domain-specific tasks.The foundation model fuses chemical profiles, sensory scores, textual reviews, food knowledge graphs, and tool-calling capabilities, directing agents to perform cross-modal mappings: from chemical features to sensory descriptors, from sensory targets to formulation redesign, from consumer commentary to trend forecasting, and from individual preferences to personalized recommendations. Data-driven flavoromics, knowledge-driven sensory intelligence, pairwise preference learning, flavor knowledge graphs, foundation models, and agent architectures are systematically examined, and key challenges including model validation, data standardization, food regulation, interpretability, and open ecosystem development are further discussed.

Keyword: *Flavor foundation model*, *Distributed agent paradigm*, *Cross-modal mapping*, *Sensory perception*, *Data–knowledge dual-driven*

SHELF-LIFE PREDICTION AND DEGRADATION KINETICS OF ANTHOCYANINS IN OPTIMIZED PURPLE-FLESHED SWEET POTATO FLOUR

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The conversion of purple-fleshed sweet potato into flour offers a sustainable solution to reduce post-harvest losses while producing a functional ingredient rich in anthocyanins. This study optimized flour production to maximize anthocyanin retention, antioxidant activity, and desirable color attributes. Response Surface Methodology (RSM) was applied to evaluate the effects of pressure-cooking time and drying temperature, with Analysis of Variance (ANOVA) confirming reduced cubic and quadratic models for most responses. The optimal condition —pressure-cooking for 5 minutes and drying at 50.364 °C—yielded flour with high anthocyanin content and acceptable color stability. Shelf-life prediction was conducted using degradation kinetics and the Arrhenius approach. Anthocyanin degradation was modeled as a first-order reaction across accelerated storage temperatures, with rate constants and activation energy determined to describe temperature dependence. Q_{10} analysis supported extrapolation to ambient conditions, estimating approximately one year of anthocyanin stability at 30 °C, with a Q_{10} value of ~4, comparable to other flour products. The optimized process demonstrates efficiency and scalability, providing a foundation for commercial production and encouraging adoption of purple-fleshed sweet potato as a value-added crop for functional food applications.

Keyword: *Anthocyanins, Purple-fleshed sweet potato flour, Shelf-life prediction, Process optimization*

Protein Composition And Postprandial Amino Acid Bioavailability Of Biscuits Fortified With Autoclaved And Fermented Brewers' Spent Grain In Individuals With Metabolic Syndrome

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Brewer's spent grain (BSG) is a sustainable fibre- and protein-rich brewing byproduct that can be repurposed to fortify bakery products. Fermentation of BSG with Rhizopus oligosporus may further improve its protein quality, but improvements in amino acid (AA) bioavailability in humans remain unvalidated. Therefore, this study evaluated the protein composition and postprandial AA bioavailability of fermented BSG (FBSG) biscuits in individuals with metabolic syndrome (MetS).

Control, autoclaved BSG (ABSG) and FBSG biscuits were prepared, with ABSG and FBSG replacing 30% of wheat flour. Biscuit AA composition was quantified and AA score (AAS) was calculated. Postprandial AA bioavailability was assessed across 120 minutes in a double-blind crossover study, where fifteen individuals with MetS consumed 90g of each biscuit type in separate randomised visits.

ABSG and FBSG biscuits had significantly higher total and essential AA contents than Control biscuits. Incorporation of FBSG improved AAS, particularly for lysine from 0.19 in Control to 0.81 in FBSG biscuits. However, postprandial total and essential AA iAUC, time-to-peak, and peak concentrations did not differ between interventions. Overall, FBSG improved protein composition of biscuits but its consumption did not affect acute circulating AA bioavailability in this population.

Funding: Ministry of Education, Singapore and Bezos Earth Fund.

Keyword: *Brewer's Spent Grain, Fermentation, Amino acid bioavailability, Protein quality, Metabolic syndrome*

Consumer Acceptability and Sensory Drivers of 'Rajah 4' and 'Lakan 1' Cassava Flour-Based Products: A Comparative Sensory and Textural Study from Traditional Cassava Cake to Modern Flatbreads

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Replicating the viscoelasticity of wheat gluten is a key challenge in gluten-free bakery science. This study investigated the sensory drivers and consumer acceptability of high-quality cassava flour (HQCF) based products from 'Rajah 4' and 'Lakan 1' cultivars. HQCF was formulated into traditional cassava cakes and 100% wheat-replacement flatbreads and pancakes. Traditional cakes were evaluated using descriptive quality scoring and a 9-point hedonic scale for consumer acceptability. The 100% wheat-replacement formulation for flatbreads and pancakes were profiled using Rate-All-That-Apply (RATA) methodology, which was correlated with instrumental Texture Profile Analysis (TPA) for hardness, springiness, and cohesiveness. Traditional cakes achieved moderately high consumer acceptability scores, earning top marks for moisture retention and mouthfeel. For the flatbreads and pancakes, RATA mapping successfully profiled the sensory characteristics of 'Rajah 4' and 'Lakan 1'-based formulations. 'Lakan 1'-based formulations were driven by softness and tenderness, maintaining lower instrumental hardness. Conversely, 'Rajah 4' imparted distinct chewiness and structural robustness, exhibiting a higher peak force. Despite lacking gluten, both cultivars yielded flatbreads and pancakes with favorable tear-resistance and structural integrity that met consumer expectations. Bridging objective texture metrics with consumer-led RATA profiling establishes 'Rajah 4' and 'Lakan 1' flours as distinct and texturally viable alternatives in modern gluten-free baking.

Keyword: *Sensory Science, Consumer Acceptability, Rate-All-That-Apply, Texture Profile Analysis, Cassava Flour*

AI ENABLED OPTIMISATION OF FRUIT WASTE DERIVED NANOCELLULOSE: KINETIC MODELLING OF BIOSYNTHESIS FOR CIRCULAR FOOD PACKAGING

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Environmental sustainability in food systems requires high-performance packaging sourced from renewable, circular materials. This study valorised industrial fruit waste into standardised fermentation media for Komagataeibacter xylinus by modulating sugars, protein, soluble solids, pH and titratable acidity to standardise media composition. Bacterial growth was monitored over 48 h using blank-corrected optical density at 600 nm, and kinetics in four fruit-waste media and a conventional control were described with a modified Gompertz model. The model provided robust fits, with low residual errors (root mean square error ≤ 0.05) and bias factors close to unity (0.95–1.11), indicating no systematic overprediction or underprediction. Fruit-waste formulations supported markedly higher maximum specific growth rates than the control (approximately 0.28 per hour versus 0.034 per hour), although with longer lag phases, demonstrating that optimised waste-derived media can enhance exponential growth once cells acclimatise. These kinetic outputs were integrated into a Bayesian optimisation framework to identify supplemented medium compositions and process conditions that maximise cellulose productivity and yield, thereby enabling data-efficient, artificial intelligence-guided bioprocess design targeting improved barrier performance and antibacterial activity. Bacterial cellulose films were characterised using scanning electron microscopy, atomic force microscopy, and Fourier transform infrared spectroscopy to evaluate nanofibril architecture, surface roughness and chemical structure.

Keyword: *Sustainable Nanocellulose, Food Packaging, Circular Economy, Bioprocess Design, AI-Optimisation*

Current Aspects of Quality and Safety Assurance in Radiation Processing of Low-Moisture Foods

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Radiation processing, especially electron beam treatment, is an effective method for reducing microbial contamination in low-moisture foods, including dried fruits, spices and nuts. However, its practical application requires scientifically justified technological regulations defining dose ranges, critical quality and safety indicators, and monitoring points during storage.

Low-moisture foods cannot be considered automatically safe, since Salmonella, spore-forming bacteria, yeasts, molds and toxigenic fungi may persist for long periods despite low water activity. Therefore, irradiation regimes should be validated separately for each product matrix. For dried fruits, the main control indicators include microbial contamination, mycotoxins, color stability and preservation of biologically active compounds. For spices, attention should be paid not only to microbial safety, but also to essential oils, carotenoids, antioxidant activity and color parameters. For nuts, the key limiting factor is lipid oxidation, assessed by peroxide value, malondialdehyde, antioxidant activity and signs of rancidity.

A multistage monitoring scheme at 0, 1, 3, 6 and 12 months makes it possible to evaluate both the immediate decontamination effect and the stability of quality during storage. Thus, safety assurance should be based on a matrix-specific approach combining microbiological validation, physicochemical control and organoleptic assessment.

Keyword: *radiation processing, electron beam, low-moisture foods, food safety*

INFLUENCE OF CONTINUOUS AND CYCLIC HYDROTHERMAL ANNEALING ON THE THERMAL, PASTING, MORPHOLOGICAL, AND STRUCTURAL PROPERTIES OF BEAN STARCH

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Bean starch was physically modified by annealing at 50 °C under continuous (CANN) and cyclic (RANN, 24 h intervals) treatment regimes. The effects of annealing on starch properties were evaluated by differential scanning calorimetry (DSC), rapid visco analysis (RVA), Fourier-transform infrared spectroscopy (FTIR), X-ray diffraction (XRD) and morphological analysis (FEG-SEM). DSC results showed increased gelatinization temperatures after treatment. Conversely, gelatinization enthalpy decreased from 13.11 J/g in native starch to 7.89–9.39 J/g in annealed samples, indicating structural reorganization and enhanced thermal stability. RVA analysis revealed reductions in peak viscosity (from 1245 to 776–922 cP), final viscosity, setback, and breakdown values, as well as an increase in pasting temperature from 79.55 °C to 93.70 °C, demonstrating greater resistance to heat and shear. X-ray diffraction results suggest that native bean starch exhibits a C-type diffraction pattern, with characteristic peaks at 15 °, 23 °, and a double peak between 17 ° and 18 ° (2ϴ). Morphological analysis showed the appearance of fissures and pores on the granule surface after annealing. FTIR spectra exhibited no significant changes in characteristic absorption bands, confirming that no chemical modifications occurred. Overall, annealing promoted structural and functional changes that improved the thermal and technological stability of bean starch.

Keyword: *Physical modification, Thermal properties, Pasting properties, Pulse starch*

Radurization: A Digital System for Remote Monitoring and Traceability in Food Irradiation

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The “Radurization” platform is a digital system for remote monitoring, certification and traceability of products treated with ionizing radiation. Its development reflects the need to replace paper-based control with digital verification of processing parameters for each batch.

The system includes three main components: validation of irradiation procedures, remote monitoring of technological parameters, and digital traceability with the issuance of a certificate and a unique QR code. During processing, the platform records the minimum and maximum absorbed doses, conveyor speed, parameters of the radiation-technological facility, the number of processed units and other data affecting product safety and quality. This makes it possible to detect deviations promptly, prevent insufficient irradiation and avoid excessive doses that may impair quality.

Pilot implementation at a radiation processing centre in Dubna in 2024–2025 confirmed the effectiveness of the system. Audit nonconformities decreased by 41%, incident investigation time was reduced by 3.9 times, sanitary nonconformities caused by failure to achieve the effective dose decreased by 49%, and quality-related nonconformities caused by exceeding the maximum dose decreased by 21%. The volume of defective products delivered to customers was reduced to zero.

Thus, “Radurization” creates a data-based model of sanitary control and evidence-based confirmation of irradiated food safety.

Keyword: *food irradiation, radiation processing, food safety*

DETERMINATION OF BIOTIN CONTENT IN VEGETABLES AND MUSHROOMS COMMONLY CONSUMED IN KOREA

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This study investigated the biotin content of vegetables and mushrooms commonly consumed in Korea using high-performance liquid chromatography coupled with immunoaffinity column cleanup extraction. A total of 47 samples, including various processing conditions, were analyzed. Among vegetable samples, dried eggplant showed the highest biotin content at 10.97 μg/100 g, followed by dried gourd (4.18 μg/100 g), dried balsam pear (3.57 μg/100 g), and dried ripe pumpkin (3.41 μg/100 g). The lowest biotin content was observed in boiled ripe pumpkin, with a concentration of 0.38 μg/100 g. Among mushroom samples, dried oak mushroom cultivated on tree logs had the highest biotin content (2.99 μg/100 g), whereas steamed oak mushroom had the lowest content (1.55 μg/100 g). Across all samples, drying generally increased biotin concentrations, whereas boiling and steaming tended to reduce biotin levels. The validated HPLC method showed good linearity, repeatability, and reproducibility for biotin determination in vegetable and mushroom matrices. These findings provide useful data for food composition databases and dietary biotin intake assessments in Korea.

Keyword: *Biotin, immunoaffinity column, vegetables, mushrooms, food composition database*

PROGRAMMING THE LIFE CYCLE OF BIODEGRADABLE FOOD PACKAGING THROUGH A PECTIN/POLY(LACTIC ACID) MULTILAYER ARCHITECTURE

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Biodegradable food packaging often faces a fundamental paradox: the material must resist moisture during service, yet remain susceptible to water or biological media after disposal. Here, we developed a life-cycle-programmed multilayer film that decouples these conflicting requirements through spatially organized material functions. The film consists of a hydrophilic, pectin-based inner layer, a hydrophobic poly(lactic acid) (PLA) outer layer, and a reversible dynamic interface formed via hydrogen bonding.

During food-packaging service, the PLA layer acts as a moisture-shielding skin, suppressing swelling of the hydrophilic inner layer while maintaining wet stability, barrier performance, and mechanical property retention. After use, water activates the pectin phase through cut edges, defects, or environmental exposure, disrupts the dynamic interface, and enables controlled layer separation. More importantly, the acidic microenvironment provided by pectin/DES is designed to promote preferential scission of PLA chain ends at the interface, providing a mechanistic route for post-use disassembly rather than uncontrolled fragmentation.

We integrate DFT verification of two mechanisms: terminal versus internal ester-bond cleavage in PLA chains, and PLA–tannic acid–pectin interfacial binding to demonstrate the structure-stability-recyclability relationship. This work introduces a programmable multilayer strategy for sustainable food packaging that shifts biodegradable plastics from passive degradation toward designed end-of-life recovery.

Keyword: *PLA, pectin, life-cycle-programmed, end-chain scission, acidic microenvironment*

Effects of coconut-chickpea protein ratio on the physico-chemical properties of a novel hybrid plant-based milk alternative

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Virgin coconut oil (VCO) processing generates coconut skim milk (CSM), a protein-rich by-product that remains largely underutilized. However, the application of coconut protein concentrate (CPC), derived from CSM, in plant-based milk alternative (PBMA) remains largely unexplored. This study evaluated the effects of CPC and chickpea protein isolate (ChPI) formulations on the physicochemical properties (i.e., pH, total soluble solids or TSS, viscosity, and color) of the resulting novel hybrid PBMA (hPBMA). Using a two-factor mixture design, a total of ten (10) runs were generated to examine the effects of various levels of CPC and ChPI on the physicochemical properties of hPBMA with a target of 2 g of protein per 100 mL. The significant models generated were verified using selected combinations of the protein ingredients. Results showed that hue, chroma and TSS were significantly ($p < 0.05$) affected by the combination of CPC and ChPI. ChP has more influence on the chroma while CPC had greater impact on both the hue angle and TSS of the hPBMA. Verification experiments in general, revealed that all models were valid.. These findings provide formulation strategies for incorporating CPC into PBMA, supporting environmentally responsible food innovation.

Keyword: *valorization, coconut protein concentrate, chickpea protein concentrate, hybrid plant-based milk alternative*

Food Safety and Agricultural Practices: A Study of Fresh Local Produce in The Sultanate of Oman

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This study investigates the safety and quality of agricultural products in the Sultanate of Oman. With increasing consumer awareness of food safety, there is a need to evaluate hazards associated with locally produced fresh produce. The study combines laboratory analyses with assessments of farming and market practices across four agricultural governorates representing approximately 77% of Oman's agricultural production.

To date, 159 samples have been collected from farms and markets and analysed for pesticide residues, heavy metals, and microbiological contamination. Preliminary results showed that 16 samples (10.1%) were non-compliant due to pesticide residues, while 9 samples exhibited microbiological contamination. All microbiological non-compliance cases were detected in market samples, whereas no microbiological contamination was observed in farm samples. In contrast, pesticide residue non-compliance was identified in samples from both farms and markets. No heavy metal non-compliance was detected in any analysed samples.

These findings suggest that post-harvest handling, transportation, storage, and market practices may contribute to microbiological contamination of produce, while pesticide management remains a challenge at the production level. The study is ongoing and aims to analyse 1,000 samples by 2027. Additional results will be available by the IUFoST World Food Congress 2026, providing an updated assessment of local produce safety.

Keyword: *Food Safety, Fresh Produce, Pesticide Residues, Microbiological Contamination, Agricultural Practices, Local Produce, Oman.*

SYNERGISTIC ANTIFUNGAL ACTIVITY OF GREEN-SYNTHESIZED ZINC OXIDE NANOPARTICLES AND LIMNOPHILA AROMATICA ESSENTIAL OIL AGAINST ASPERGILLUS NIGER

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Fungal contamination, particularly mycotoxin production, such as aflatoxin and ochratoxin A from Aspergillus species, represent major food safety hazards in cereal-based products. Plant-derived essential oils have demonstrated notable antifungal potential as one promising mitigation approach. Limnophila aromatica (Lam.) Merr., widely recognized for its antimicrobial and antifungal properties, was selected in this study, and its essential oil was extracted using solvent-free microwave-assisted extraction (SFME) to improve yield and quality. Concurrently, zinc oxide nanoparticles (ZnO NPs) were synthesized via green synthesis, known for conferring broad biological activities. This study aimed to investigate the synergistic antifungal potential of combining of Limnophila aromatica essential oil with green-synthesized ZnO NPs. Samples were characterized using GC-MS, FTIR, UV-Vis, SEM, TEM, XRD, and TG/DTA, and antifungal activity was evaluated via the agar well diffusion method. Green-synthesized ZnO NPs (average particle size of 61 nm) loaded with Limnophila aromatica essential oil at a loading capacity 14% exhibited stronger antifungal activity against Aspergillus niger (inhibition zone: 15 ± 2.0 mm) compared to ZnO NPs alone (5 ± 0.5 mm) and essential oil alone (10 ± 1.0 mm). These findings suggest that this combination as a promising natural antifungal agent for a food safety application.

Keyword: *Antifungal activity, Limnophila aromatica essential oil, Zinc oxide nanoparticles, Synergistic effect, Green synthesis*

Effect of pH-Induced Treatment on the Structural and Functional Properties of Corn Silk Protein and Characterization of Emulsion-Templated Oleogels

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In this study, corn silk protein was extracted via alkaline solubilization-acid precipitation, and its structural and functional properties were systematically modulated through pH adjustment (pH 3-11). Scanning electron microscopy revealed that natural corn silk protein exhibited a uniformly distributed sub-spherical particle structure with a diameter ranging from 1.5 to 1.6 μm, while secondary structure analysis indicated that β-sheet and β-turn were the dominant conformations. Fourier transform infrared spectroscopy and fluorescence spectroscopy revealed that strong alkaline conditions (pH 11) induced structural unfolding and enhanced the protein's conformational flexibility, thereby improving interfacial properties. Consequently, C11 exhibited significantly enhanced solubility, emulsifying activity, and emulsifying stability index compared to native corn silk protein and other groups, resulting in enhanced emulsion stability. Corn silk protein-based oleogels with various water-in-oil volume ratios were prepared using an emulsion-template method (oven-drying at 40 ^{o}C for 24 h). At a W/O volume ratio of 3/7, corn silk protein formed a relatively uniform protein network that effectively entrapped and stabilized the oil phase, resulting in an oleogel with a soft-solid structure, enhanced hardness, and superior oil-holding capacity (98%). This study preliminarily demonstrated the feasibility of extracting proteins from corn silk and subsequently using them to prepare corn silk protein-based oleogels.

Keyword: *Plant Protein, Corn Silk, Oleogel, Emulsion-template, Sustainability*

MICROWAVE-ASSISTED ENZYMATIC HYDROLYSIS PROCESSING MODULATED ALLERGENIC POTENTIAL AND FUNCTIONAL PROPERTIES OF COW MILK CASEIN

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Cow milk allergy has exhibited a marked increase in global prevalence, especially among infants and young children. Microwave-assisted enzymatic hydrolysis (MAEH) processing, as a burgeoning food compound processing, has emerged in the field of reducing allergenicity by food processing. This study employed molecular docking, bioinformatic tools, and molecular dynamics simulations to predict the linear and conformational epitopes of four caseins in the cow milk. Subsequently, artificial intelligence tools were utilized to design specific enzymes and carried out MAEH processing. The effect of MAEH processing on the allergenicity of cow milk casein were evaluated using in vitro simulated digestion, a cell degranulation model, a BALB/c mice allergy model, and serological methods. Furthermore, the structural mechanism by which MAEH processing affects casein were explored through multi-spectroscopic techniques combined with machine learning. Some of the results revealed 2 linear epitopes and 1 conformational epitope of αS1-casein and αS2-casein, 4 linear epitopes and 1 conformational epitope of β-casein, 3 linear epitopes of κ-casein. This study will provide scientific guidance for the development of hypoallergenic dairy products.

Keyword: *Food allergy, Food processing, Artificial intelligence, Structure, Food safety*

ADVANCING THE QUALITY OF PLANT-BASED MILK ALTERNATIVES THROUGH PULSED ELECTRIC FIELD (PEF) PROCESSING

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This study aimed to evaluate the application of PEF as a pasteurisation alternative strategy and its impact on the quality of oat and almond beverages.

Challenge tests were performed using model spoilage microorganisms, applying between 10-24 kV/cm, 20-130 kJ/L, and 16-522 µs. Predictive modelling tools were used to describe the non-linear microbial inactivation kinetics. The characterisation tests included colour, rheology, volatile composition (GC-MS), and bioactive content (UV-Vis). Following consumer-based hedonic and descriptive analyses, multivariate statistical methods (CA, MFA) were applied to integrate the instrumental with sensory findings.

Overall, ≥5 log CFU/mL of Lactiplantibacillus plantarum reduction was achieved by applying 20 kV/cm, 120 kJ/L, 122 µs in oat drinks and 24 kV/cm, 130 kJ/L, 119 µs in almond drinks. PEF did not significantly alter the physicochemical properties of the original beverages. The volatile profiles were largely maintained and found to be more abundant than in similar commercial UHT products. Regardless, the sensory profile and consumer preference appeared to be influenced more heavily by the starting formulation rather than the decontamination technique.

The findings confirmed the anti-microbial efficacy of PEF with minimal effects on product quality, positioning the technology as part of an innovative toolkit for the development of next-generation plant-based foods.

Keyword: *Plant-based, Novel processing, Preservation, Food quality*

Impact of PROP taster status on food preferences and neophobia toward alternative proteins of Filipino adults: initial findings

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Shifting to alternative protein sources is key to promoting sustainable and healthful diets amid growing climate and diet-related challenges. Consumer acceptance is a crucial driver of this transition, and individual differences in taste perception, such as 6-n-propylthiouracil (PROP) taster status, may shape food preferences and openness to novel protein foods.

This study examined the relationship between 6-n-propylthiouracil (PROP) taster status, food preferences, and food and food technology neophobia toward alternative proteins among Filipino adults (n = 50). Participants were classified as non-tasters (n = 8), medium tasters (n = 27), or supertasters (n = 15) using a PROP test strip, and completed a structured questionnaire via QualtricsXM.

Results indicated no statistically significant association between PROP taster status and food preferences or neophobia ($p > 0.05$). However, a marginal trend suggested that certain PROP groups (i.e., medium and supertasters) may exhibit higher neophobia, indicating that heightened sensory sensitivity may act as a subtle barrier to alternative protein adoption.

These findings demonstrate that sensory perception influences consumers' willingness to adopt alternative proteins. A clear understanding of the determinants of food choice and consumption patterns is therefore essential for developing evidence-based strategies that facilitate sustainable dietary transitions.

Keyword: *PROP taster status, sustainable diets, alternative proteins, food neophobia, food technology neophobia*

COLLOIDAL AND FUNCTIONAL PROPERTIES OF SKIM MILK AND FABA BEAN PROTEIN HYBRID EMULSION SYSTEMS

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The growing demand for plant-based proteins is often constrained by their inferior functional performance compared to dairy proteins. Hybrid systems employing partial substitution of dairy with plant proteins offer a promising approach to address this challenge. In this study, five fat-filled milk emulsions were formulated using skim milk (SM) and faba bean protein concentrate (FBPC) at ratios of 100:0, 75:25, 50:50, 25:75, and 0:100 and viscosity, zeta potential, physical stability, and foaming properties were evaluated. At 30°C, viscosity increased significantly ($p < 0.05$), from 23.0 to 34.2 mPa·s with increasing FBPC content. All emulsions exhibited negative zeta potential values (-25.0 to -31.8 mV at pH 6.8), which became increasingly negative with higher FBPC inclusion. Accelerated stability analysis revealed reduced stability at higher FBPC levels, with increased separation rates (1.83-7.95 %/h), greater sedimentation (0-5.02 mm), and reduced resistance to creaming, indicating altered protein interactions in the continuous phase. Foaming capacity improved with increasing FBPC content, whereas foam stability decreased significantly, likely due to structural differences and reduced availability of sulfhydryl groups. Overall, partial substitution of SM with FBPC significantly influences colloidal stability and functionality, providing insights for sustainable dairy-plant hybrid formulations.

Keyword: *diary-plant hybrids, zeta potential, viscosity, physical stability, foaming properties*

Understanding the controlled oral break-down of meat and their vegetarian analogues- an in-vitro approach

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Over the past decade, plant-based alternatives to meat products have gained attention. These products can be classified as isotropic systems (ex. sausages), whose properties are independent of direction, and anisotropic systems (ex. plant protein extrudates), which exhibit direction-dependent fibrous structures. Despite advances in formulation and structuring technologies, plant-based products are perceived as different from animal-based meat. Understanding how these products break down during oral processing may help explain such differences.

In this study, an artificial masticator capable of applying controlled mastication sequences (number, force, shear, and saliva flow) was used to evaluate controlled breakdown of chicken and vegetarian analogues (chunks and sausages). An artificial saliva containing mucin, α-amylase, and buffer was prepared to simulate saliva. Mastication numbers of 5, 10, 15, 20, and 25 and saliva flow rates of 1.5 and 3 mL/min were selected based on an initial in vivo study.

Results showed that bolus firmness remained stable during mechanical mastication alone, whereas addition of saliva caused a progressive decrease in firmness. Particle-size analysis revealed decreasing particle size and increasing particle numbers with mastication, although chicken chunks exhibited greater bolus agglomeration. Confocal microscopy showed gradual fat release in chicken samples, while vegetarian analogues contained readily available fat throughout mastication.

Keyword: *Food structure, Oral processing, Texture perception, Meat analogues*

CARRIER-FREE NANOPARTICLES CO-ASSEMBLED FROM BIOACTIVE OLEANOLIC ACID AND FLAVONOIDS: INTERACTION MECHANISMS, IMPROVED BIOACTIVITY, AND SAFETY EVALUATION

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Carrier-free nanoparticles offer a promising strategy for improving the physicochemical and functional performance of bioactive small molecules without introducing additional excipients. In this study, co-assembled nanoparticles of oleanolic acid with wogonin or baicalein were fabricated by ultrasound-assisted antisolvent precipitation. Spectroscopic, physicochemical and molecular dynamics analyses revealed that hydrophobic interactions and hydrogen bonding contributed to nanoparticle formation. Compared with oleanolic acid-wogonin nanoparticles, oleanolic acid-baicalein nanoparticles exhibited smaller particle size, narrower size distribution and higher thermal stability, demonstrating that subtle flavonoid-structural differences significantly affected nano-system properties. Functionally, oleanolic acid-baicalein nanoparticles showed stronger antioxidant ability, as confirmed by higher radical scavenging activities of oleanolic acid-baicalein nanoparticles compared with oleanolic acid-baicalein nanoparticles. Both nanoparticles inhibited β-hexosaminidase release from RBL-2H3 cells, suggesting anti-allergic potential. Cytotoxicity and hemolysis assays further indicated preliminary cytocompatibility and hemocompatibility. Overall, this study provides mechanistic insights into the co-assembly of bioactive small molecules and offers a carrier-free strategy for developing poorly water-soluble phytochemicals as functional food nanomaterials.

Keyword: *Oleanolic acid, Carrier-free nanoparticles, Antioxidant ability, Anti-allergic potential, Cytocompatibility*

Highly Sensitive Detection of Wheat Allergen Gliadin Using an Electrochemical Biosensor for Food Safety Monitoring

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Gliadin, a major allergenic component of wheat gluten, poses significant health risks to sensitive individuals and has become a major concern in food safety management. In this study, an electrochemical biosensor was developed for gliadin detection by combining a hydrogen-bonded organic framework probe (HOF-101-H2@Thi) with a catalytic hairpin assembly (CHA) amplification strategy. Through the mutual recognition between the target and the aptamer, recognition of gluten proteins was converted into identification of complementary DNA (cDNA). Following magnetic bead-assisted separation and enrichment, the released cDNA initiated the CHA reaction, resulting in electrochemical signal amplification. Under optimized conditions, the biosensor exhibited a linear response to gliadin concentrations ranging from 5 to 1000 ng/mL, with a detection limit of 52 pg/mL. The proposed method was further applied to the analysis of real food samples, yielding recoveries of 97.57%-105.00% and relative standard deviations of 2.73%-5.68%. These results confirm the reliability and accuracy of the proposed biosensor for gliadin determination in complex food matrices. By employing different aptamers, the sensing strategy may be adapted for the detection of other food safety-related targets, providing a basis for the development of electrochemical methods for food safety analysis.

Keyword: *Gliadin, Food allergen, Electrochemical biosensor, Food safety analysis*

THE TOXIC GLOW: SCREENING FOR ILLEGAL COLOUR ADULTERATION IN COMMERCIAL TURMERIC POWDER WITHIN THE SRI LANKAN MARKET

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Turmeric powder, a staple spice derived from the Curcuma longa rhizome, is valued in Sri Lankan cuisine for its distinct colour and flavour. Despite strict prohibitions against added coloring matter in the Sri Lankan Food Regulations 1989, color adulteration remains a public health concern. This study investigated the prevalence and types of artificial colorants in commercially available turmeric powder across Sri Lanka. Thirty random samples (40% branded, 60% non-branded/loose) were collected from four provinces during 2025. Using ascending paper chromatography with an ammonia: water (1:99) solvent system, extracted colors were compared against standard food dyes by calculating retention factors. Analysis revealed a 17% overall adulteration rate. Notably, non-branded loose samples accounted for 80% of the adulterated cases, whereas branded samples accounted for 20%. Artificial colorants including tartrazine, carmosine, and sunset yellow were identified in loose samples either individually or combined, while only tartrazine was detected in the contaminated branded sample. These findings confirm a significant presence of illegal color adulteration in the market, predominantly in unbranded packages. Immediate regulatory intervention and continuous random market surveillance by health authorities are essential to mitigate these public health risks and ensure food safety.

Keyword: *Color adulteration, paper chromatography, Sri Lanka, turmeric powder*

EFFECTS OF PRETREATMENTS ON THE PHYSICOCHEMICAL PROPERTIES AND PROXIMATE COMPOSITION OF VACUUM FREEZE-DRIED MAKAPUNO COCONUT (Cocos nucifera var. makapuno))

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This study evaluated the effects of sodium metabisulfite (SMS) and steam blanching (SB) on the physicochemical properties and proximate composition of vacuum freeze-dried Makapuno coconut. Samples were treated with 0.05%, 0.1%, and 0.2% SMS or subjected to 3- and 6-minute SB prior to freeze-drying. Weight loss was highest in 6-minute SB samples. Compared to the control, TSS was significantly higher in SMS-treated samples (3.03-3.09 °Brix) and was not significantly different in SB-treated samples. The pH values were near neutral. Higher SMS concentrations resulted in significantly higher lightness values (93.84-95.47). SB-treated samples showed significantly lower lightness values than the control. SMS-treated samples showed no significant difference in browning index compared to the control. Longer SB time showed a significantly higher browning index (3.13-3.75) compared to the control and a significantly higher total chroma compared to SMS-treated samples. Proximate composition showed no significant changes, with fat (61.73%-64.07%), fiber (2.51%-5.62%), and nitrogen-free extract (21.05%-24.66%). Lipid oxidation was significantly lower in SMS-treated samples (9.19-11.54 MDA eq.), with 0.2% SMS showing optimal value, and was not significantly different in SB-treated samples compared to the control. Overall, 0.2% SMS had optimal color and oxidative stability, while 3-minute SB lowered moisture content and obtained optimal proximate composition.

Keyword: *Freeze-dried, Makapuno coconut, Physicochemical, Sodium metabisulfite, Steam blanching*

Not All Plant Proteins Extrude Alike: Machine Learning-Guided Prediction and Optimisation of Texture in Chicken Breast Analogues

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High-moisture extrusion of plant proteins into fibrous meat analogues is largely empirical, with few frameworks linking ingredient physicochemical properties to texture outcomes. Here, we present a machine learning approach that identifies ingredient drivers of fibrous texture formation and optimises processing conditions to achieve a chicken breast-like texture.

Soy, pea, wheat gluten, and mung bean were characterised across eleven physicochemical properties, including protein content, solubility, water- and oil-holding capacity, emulsifying capacity and activity, gelling capacity, fat content, particle size, and viscoelastic behaviour at critical concentration ratios (CCR 1% and 100%). Extrusion trials were conducted across a range of processing parameters, with texture benchmarked against chicken breast via Texture Profile Analysis (hardness) and anisotropy index (ANI) as an indicator of fibrous structure.

Correlation analysis identified consistent ingredient predictors of hardness across extrusion conditions. Building on this, a machine learning classifier achieved a cross-validated ROC-AUC of 0.825 and a test AUC of 0.73 (average precision: 0.88). Bayesian optimisation yielded candidate parameter sets targeting chicken breast-like texture (hardness: 46.6 N; ANI: 1.5), enabling computational ingredient screening prior to extrusion trials. This AI-assisted framework provides a scalable, data-driven route to accelerate plant protein evaluation for sustainable meat analogue development globally.

Keyword: *High-moisture extrusion, Plant protein, Texture, Physicochemical properties, Machine learning*

Decoding the Smoky Flavor of Smoked Lapsang Souchong Tea

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Smoked Lapsang Souchong tea (SLST) is renowned for its distinctive smoky aroma and low bitterness, yet the cross-modal interactions governing this profile remain unclear. This study hypothesizes that pinewood-derived smoky volatile compounds (SVs) noncovalently interact with endogenous bitter tea polyphenols (TPs), impeding bitter taste receptor activation. Using sensomics, 15 key odorants were identified, highlighting the migration of pinewood-derived guaiacol and α-terpineol during smoking. Sensory and calcium imaging assays demonstrated that smoking significantly reduced bitterness and attenuated TAS2R14 receptor activation by up to 60%. This reduction was driven by both the degradation of bitter phenolics and direct receptor inhibition by key SVs (guaiacol, p-cresol, and α-terpineol). Computational chemistry (DFT, SAPT) and NMR confirmed that these SVs form stable noncovalent complexes with TPs, primarily driven by hydrogen bonding and π-π stacking. At the receptor level, molecular dynamics and single-molecule force spectroscopy (AFM) revealed that SVs destabilize TP-TAS2R14 binding, reducing orthosteric binding free energy and adhesion forces via steric hindrance. Conclusively, this study first elucidates the cross-modal bitterness suppression mechanism of smoky aromas via noncovalent molecular complexation and receptor modulation. These findings provide novel theoretical insights into flavor perception and offer a scientific basis for optimizing traditional smoking processes in complex food systems.

Keyword: *smoky flavor, bitterness modulation, flavor compound cross-modal interactions, bitter taste receptor, DFT*

LOW METHOXYL PECTIN GELATIN SCAFFOLDS FOR ANIMAL FAT TISSUE MIMICS

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Animal adipose mimics based on oleogels often require high-temperature dissolution of organogelators, which may accelerate oil oxidation, whereas emulsion gels commonly form opaque raw-fat-like structures due to strong light scattering from oil droplets. We developed a scaffold-based structured adipose mimic using low-methoxyl pectin from 观音叶（Premna microphylla Turcz，PMT) and Type A gelatin. Gelatin–PMT pectin mixture, which was further treated with transglutaminase and freeze-dried to give porous scaffolds. The fat tissue mimics were obtained by infusing olive oil followed by treatment with Ca（II）-which chelates with pectin. Increasing PMT pectin concentration promoted oil entrapment, with the 1.0% PMT pectin formulation reaching 33 ± 1.5% oil content. Confocal laser scanning microscopy showed that olive oil was embedded throughout the porous gelatin–pectin scaffold, forming an oil-filled network that resembled the microstructure and semi-transparent appearance of cooked porcine adipose tissue. Differential scanning calorimetry and temperature-sweep rheology indicated that the dual enzymatic–ionic crosslinked network maintained viscoelastic and thermal stability during heating. This scaffold-based strategy overcomes key limitations of conventional emulsion gels and oleogels, offering a new route to structured adipose tissue mimic with improved visual realism, oil retention, and cooking stability.

Keyword: *Fat tissue mimic, Pectin, Scaffold*

PREPARATION OF SELF-POWERED STERILIZATION PACKAGING FILM AND RESEARCH ON SUSTAINABLE ANTIBACTERIAL PRESERVATION

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Microorganisms are a major cause of food spoilage. Traditional thermal and chemical sterilization methods significantly compromise the nutritional texture and sensory properties of agricultural products, and may also lead to chemical residue issues. Physical sterilization, on the other hand, relies on large, expensive external equipment and consumes substantial energy. Disrupting the proton-coupled electron transport chain in microbial cell membranes—thereby blocking the core process of microbial energy metabolism—enables a broad-spectrum attack on most bacteria and fungi attached to food by targeting their energy source. To address the challenge of inhibiting and controlling foodborne pathogens, this study developed a sustainable antimicrobial packaging film based on moisture-induced self-generated electricity. The mechanism of continuous self-power generation and charge accumulation was thoroughly investigated, utilizing the high humidity within the food packaging as the sole energy source. Furthermore, the study elucidated how charge regulation disrupted microbial respiratory chain electron transfer and ATP energy metabolism, and analyzed the denaturation mechanism of key microbial life structures by charge-catalyzed reactive oxygen species (ROS). Through an interdisciplinary integration of materials science, food science, electrochemistry, and microbiology, the moisture-induced self-powered packaging film achieves humidity regulation, energy conversion, and efficient, long-term, green, and sustainable antimicrobial preservation throughout the real-world food supply chain.

Keyword: *Moisture power generation, Charge regulation, Proton coupling electron transfer respiratory chain, Sterilization packaging film, Sustainable antibacterial preservation*

Pretreatment route governs subcritical water extraction of chickpea protein: recovery, structure, and surface properties

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Subcritical water extraction (SWE) is an emerging solvent-free route for recovering plant proteins, yet the influence of the processing state prior to SWE remains unexamined. This study determined how three starch-removal pretreatments (alkaline, acidic, and enzymatic) govern the subsequent SWE of chickpea protein. Defatted flour was pretreated and extracted with subcritical water at 110-150 °C for 10-20 min, then characterised for recovery, purity, secondary structure, and physicochemical properties. The pretreatment route was the dominant determinant of outcome. The alkaline route was most favourable with 130 °C for 10 mins, yielding 54.96% recovery, 74.46% purity, and 67.59% solubility at pH 7, while retaining the 2S albumin fraction. Preserved secondary structure with reduced surface hydrophobicity and increased ζ-potential excluded thermal unfolding and gross aggregation, indicating that SWE acted at the tertiary and quaternary levels through soluble-aggregate compaction, offering improved functionality with reduced acid–base consumption.

Keyword: *Chickpea protein, Subcritical water extraction, Pretreatment, Protein secondary structure, Physicochemical Properties*

IMPACT OF PULSED ELECTRIC FIELD PROCESSING ON CONSUMER PERCEPTION OF BEEF EATING QUALITY

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The tenderness, juiciness and flavour of beef are important determinants of consumer satisfaction and purchasing behaviour. Pulsed electric field (PEF) processing has been promoted as a green technology capable of improving the eating quality of lower-value meat cuts; however, consumer-based sensory evidence on PEF-treated beef remains limited.

This study used untrained consumers (n=128) to evaluate and compare the perceived tenderness, juiciness, flavour and overall liking of PEF-treated and untreated beef samples.

The beef samples differed significantly in perceived tenderness, flavour and overall liking ($p < 0.05$). PEF-treated beef samples were significantly more tender and scored higher in overall liking, which suggests that PEF treatment improved their eating quality. Preliminary cluster analysis was used to explore underlying consumer perceptions based on the treatment and sensory attributes. This study demonstrates that PEF processing has the potential to improve key quality attributes in beef, including tenderness, juiciness, flavour and overall liking.

Keyword: *Pulsed electric field, beef eating quality, consumer sensory, consumer perception*

From Ultra-Processed Concept to Health-Oriented Food Evaluation: A Matrix–Nutrient Interaction Framework

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The NOVA classification of ultra-processed foods (UPFs) has advanced public health research on the relationship between food processing and chronic diseases. However, it primarily categorizes foods based on the degree of processing, conflating processing itself with health outcomes, while overlooking the key drivers of diet-related risk, namely, the synergistic effects of high nutrient load and impaired food matrix integrity. To address this limitation, we propose a health outcome–oriented two-dimensional framework that decouples digestive characteristics into two independent axes. The X-axis quantifies nutrient load (free sugars, saturated fats, and sodium) based on an improved nutrient density model. The Y-axis measures matrix digestion release rate using the standardized INFOGEST 2.0 in vitro digestion model, reflecting how food structure influences the release of risk-associated nutrients during early small intestinal digestion. Through a 3×3 interaction matrix, foods are classified into different risk zones, ranging from low risk (low nutrient load, slow release) to high risk (high nutrient load, rapid release), with an optional high-sodium alert. This framework provides guidance for front-of-pack labeling (FOPL), tiered health taxes, and matrix-focused product development, promoting a shift in food innovation from purely nutrient formulation to structural design, thereby helping to mitigate the burden of diet-related non-communicable diseases.

Keyword: *Ultra-processed foods, health-oriented classification, nutrient load, matrix digestive kinetics*

From Shape-Changing Foods to Responsive Food Materials: Towards Programmable Texture Evolution

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Shape-changing foods have emerged as a novel class of food materials capable of undergoing programmed structural transformations in response to external stimuli. Our previous work demonstrated the feasibility of fabricating edible structures that transform into predetermined shapes through controlled hydration, establishing a foundation for dynamic food design. However, existing studies have largely focused on geometric transformation, while broader opportunities for responsive behaviour in food materials remain underexplored.

This work proposes a framework for Responsive Food Materials, extending shape-changing foods beyond structural change towards programmable evolution of texture and functionality. Building upon principles of food structuring and hydrocolloid engineering, we introduce the concept of “texture trajectory”, which describes the predictable evolution of textural properties under environmental triggers such as moisture, temperature and mechanical stress.

Using shape-changing foods as a model system, we discuss how responsive design principles may be applied to adaptive texture development, colour-texture coupling and consumer-interactive food products. This framework shifts food design from static optimisation towards programmable material behaviour and highlights new opportunities for food structure engineering, texture design and next-generation food innovation.

Keyword: *Responsive Food Materials, Shape-Changing Foods, Texture Trajectory, Food Structuring, Hydrocolloid Engineering*

Indigenous Knowledge, Processing Practices, and Food Safety of Edible Insects in Tanzania

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Edible insects contribute to food security, nutrition, and livelihoods in sub-Saharan Africa, yet evidence integrating indigenous knowledge with food safety remains limited. This study documented edible insect diversity, cultural utilisation, traditional processing practices, and microbiological safety across Tanzania. Data were collected through geo-referenced ethnographic methods. Traditional harvesting, processing, and preservation practices were documented, while microbiological analyses evaluated the safety of processed insect product samples. More than 40 edible insect taxa from six taxonomic orders were documented from 29 ethnic groups. Consumption was influenced by culture, seasonality, ecological availability, and sensory preferences, with 82% of respondents reporting feeding insects to children under five years. Wild harvesting predominated, and 30.9% of respondents reported consuming insects raw. Processing methods included dry toasting, frying, boiling, smoking, and sun-drying. Thermal processing effectively eliminated major foodborne pathogens, including Salmonella spp., Escherichia coli, and Listeria monocytogenes. Although most products met East African Standards (EAS 1186:2023), some sun-dried and toasted products showed elevated microbial loads associated with inadequate drying, handling, and storage practices. Indigenous knowledge supports the safe utilisation of edible insects in Tanzania. Strengthening hygienic handling, drying technologies, and HACCP-based practices could enhance food safety, commercialisation, and sustainable integration of edible insects into future food systems.

Keyword: *Edible Insects, Indigenous knowledge, Food safety, Traditional foods*

PHYSICOCHEMICAL, PASTING AND THERMAL PROPERTIES OF ENZYMATICALLY MODIFIED RICE STARCH

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Native rice starch possesses limited functional and thermal stability, restricting its industrial applications.This study investigated the effects of alpha-amylase and gluco-amylase modification on the physicochemical, pasting, and thermal properties of rice starch. Rice starch was enzymatically modified under controlled processing conditions at hydrolysis times of 30, 40, and 60 min. The modified starches were evaluated for functional properties, amylose and amylopectin contents, pasting characteristics, and thermal behaviour using differential scanning calorimetry. Enzymatic modification significantly ($p < 0.05$) affected the functional, pasting, and thermal properties of rice starch. Gluco-amylase treatment enhanced hydration-related properties, with water absorption capacity reaching 30.91% after 40 min of hydrolysis, while swelling power and solubility were highest under the same treatment condition. Amylose content decreased with increasing alpha-amylase treatment duration, whereas amylopectin content increased correspondingly. Starch treated with gluco-amylase for 30 min exhibited the highest peak viscosity (116.00 RVU), indicating improved thickening potential. Enzymatic modification also altered gelatinization characteristics, with starch treated with alpha-amylase for 60 min exhibiting the highest peak gelatinization temperature (82.86 °C).Overall, gluco-amylase enhanced hydration properties, while alpha-amylase exerted greater effects on starch degradation and thermal behaviour, demonstrating the potential of enzymatic modification for tailoring rice starch functionality for diverse food and industrial applications.

Keyword: *Rice starch, Enzymatic modification, Alpha-amylase, Gluco-amylase, Pasting properties.*

Marigold Flower Color Extract as a Clean-Label Modifier to Enhance Techno-Functional Properties of Broccoli Flower Proteins

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University of Georgia / Dept. of Food Science & Technology

The growing demand for sustainable, clean-label plant proteins necessitates innovative strategies to overcome their poor techno-functional properties that limit their food applications. This study investigated the use of marigold color extract (MCE), a phytochemical-rich floral by-product, to enhance the functionality of broccoli flower protein (BFP) — an underutilized sustainable protein source. BFP–MCE complexes were formulated at varying concentrations (0–4%, v/v) and characterized using Fourier transform infrared spectroscopy, scanning electron microscopy, and functional property assays.

Infrared spectroscopy revealed concentration-dependent structural transitions, with α-helix content declining from 50.3% to 28.4% and β-sheet content increasing from 22.1% to 34.2%. Microscopic analysis confirmed transformation from porous aggregates to dense, cohesive protein networks. These structural modifications translated into substantial functional improvements: foaming capacity (14.85% to 69.24%), foam stability (6.12% to 42.03%), emulsifying activity index (23.14 to 76.16 m^2/g), and antioxidant activity (41.23% to 65.34%). Reduced surface hydrophobicity indicated enhanced protein–water interactions. Metabolomic profiling of MCE identified flavonoids, phenolic acids, and sesquiterpenes as compounds mediating noncovalent protein interactions through hydrogen bonding, hydrophobic interactions, and electrostatic attraction.

This research presents a sustainable, waste-valorizing approach to producing functional plant protein ingredients, contributing to global clean-label food innovation goals.

Keyword: *Broccoli flower protein, Marigold color extract, Plant protein functionality, Clean-label, Waste valorization, Sustainable food systems*

Integration of Digital Tools in New and Novel Food Product Development Education

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New and novel food product development (NPD) is a multidisciplinary endeavor that requires students to synthesize knowledge from flavor science, sensory evaluation, and formulation strategy. This study describes the integration of FlavorStudio and RedJade — professional-grade flavor formulation and sensory evaluation platforms — into FDST 4250/6250 (New and Novel Food Product Development), which enrolled 20 undergraduate and graduate food science students in the University of Georgia Food Science and Technology program.

FlavorStudio was used to support flavor and digital product development concept and formulation decision-making, while RedJade enabled structured sensory panel design and consumer preference analysis. Qualitative evaluation through student reflections, focus group discussions, and faculty observations revealed markedly improved student engagement and a stronger capacity for creative, evidence-based product ideation. Students across both program levels reported greater conceptual clarity in navigating the NPD pipeline from ideation to sensory validation.

Both tools were associated with heightened creative thinking and more industry-relevant project outcomes. Faculty noted richer classroom discussions and improved quality of final NPD portfolios. Challenges included initial software familiarisation and the need for structured onboarding. These findings underscore the value of integrating industry-standard digital tools in food science education to better prepare graduates for innovation-driven roles in the global food industry.

Keyword: *Food product development, FlavorStudio, RedJade, Sensory evaluation, Digital education, Food science pedagogy*

EXTRACTION AND PURIFICATION OF BIOACTIVE COMPOUNDS FROM MICRO/MACROALGAE AND HAIRY ROOT CULTURES FOR FUNCTIONAL FOODS

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Health and wellness have been on high in the priority of individuals as well as Nations, especially after recent pandemic-COVID 19. Bioactive compounds, by virtue of their medicinal and nutritional properties, are finding increased applications in functional and health foods. Our group has been working in the downstream processing of several biomolecules from micro and macroalgae. For instance, C-phycocyanin could be extracted, with highest reported purity of 5.22 and 66% recovery from Spirulina platensis (wet biomass), and also from dry biomass with a yield, purity and extraction efficiency of 44.5 mg g^{-1}d.b, 2.0 and 93% for C-PC and 29.93 mg g^{-1}d.b, 0.89, and 75% for A-PC, respectively. Extraction of betalains from Amaranthus, and R-phycoerythrin from Gracilaria corticata (1.2 mg/g dw R-phycoerythrin yield with 86% extraction efficiency, the highest reported from dry biomass). Green extraction methodologies are being developed employing aqueous two-phase systems, and natural deep eutectic solvents (with a yield of 79.68 ± 4.81 mg/100 g FW betalains from Amaranthus). Further, applications of external fields resulted in a 3.7-fold increase in betalains yield, reaching 306.72 mg/100 g FW and millifluidics could achieve 93.6% R-phycoerythrin recovery within 4.51 min, compared to 76% in batch extraction, demonstrating process intensification and enhanced extraction efficiency.

Keyword: *Functional-foods, Process Integration, Micro/Macro algae, Hairy root culture,, Acoustic bioreactor*

SENSORY AND VOLATILE FLAVOR PROFILE OF PHILIPPINE WILD RASPBERRY [RUBUS ROSIFOLIUS (SM.)] PUREE AS INFLUENCED BY LACTIC ACID FERMENTATION

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Lactic acid fermentation can modify fruit flavor through the production and transformation of volatile compounds. This study evaluated the effects of fermentation by Lactiplantibacillus plantarum on the sensory and volatile flavor profile of Philippine wild raspberry [Rubus rosifolius (Sm.)] puree. Quantitative Descriptive Analysis (QDA) was conducted using a trained sensory panel (n = 12), while gas chromatography–mass spectrometry (GC–MS) was employed to identify volatile flavor compounds in unfermented and fermented samples. Sensory evaluation showed that both samples were characterized by sweet and sour tastes, berry flavor, and astringent mouthfeel. Fermentation decreased bitterness and the woody and fresh notes detected in the unfermented puree. In contrast, the fermented puree exhibited new sensory attributes, including peppery and herbal notes and a heavier mouthfeel. Qualitative GC–MS analysis identified caryophyllene, humulene, and α-farnesene in the fermented puree, suggesting their contribution to the observed sensory changes. The emergence of these compounds coincided with the development of novel flavor attributes while maintaining the characteristic fruity profile of the berry. Overall, lactic acid fermentation enhanced the sensory profile of Philippine wild raspberry puree, highlighting its potential as a flavor-modifying process for the development of innovative fruit-based products with differentiated sensory characteristics.

Keyword: *Rubus rosifolius, lactic acid fermentation, descriptive sensory analysis, flavor profile, volatile compounds*

DIELECTRIC BARRIER DISCHARGE COLD PLASMA ALLEVIATED THE IMMUNOREACTIVITY OF EGG WHITE PROTEINS WITH IMPROVED DIGESTIBILITY AND FUNCTIONAL PROPERTIES

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Rising global egg allergies in children call for effective strategies to utilize egg protein. Cold plasma (CP) is emerging as a novel food processing technology capable of reducing allergenicity while enhancing protein quality and functionality. A study on dielectric barrier discharge CP-treated egg white protein (EWP) found that after 30 minutes of treatment, the immunoglobulin G(IgG)-binding capacity significantly decreased by approximately 20%, and in vitro digestibility improved. This reduced immunoreactivity was linked to structural changes in EWP, including a 6.5% decrease in α-helix content and a 2.5-fold increase in surface hydrophobicity. These structural changes, driven by the oxidation of peptide amino groups and amino acid residues, were validated through multispectral analysis and surface hydrophobicity measurements. CP treatment also improved functional properties, increasing foaming capacity by 140% and emulsifying capacity by 8.03%, which greatly expands its value-added applications in the food industry. Moderate oxidation unfolded EWP, exposing more protease-accessible sites to enhance digestibility, while excessive CP led to protein aggregation and reduced functionality. As a green and sustainable technology, CP shows promise in reducing the immunoreactivity of egg allergens and improving nutritional quality, playing a pivotal role in developing food formulations.

Keyword: *Food allergy, Cold plasma treatment, Egg white protein, IgG-binding capacity, Structure changes*

MODERN EXTRACTION AND FRACTIONATION TECHNIQUES FOR THE RECOVERY OF FUNCTIONAL NUTRIENTS FROM THE AGRI-FOOD PROCESSING SIDE-STREAMS AND WASTE: PROS AND CONS

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Numerous modern extraction/fractionation techniques have been developed during the last few decades. Among them, supercritical CO_2 ($scCO_2$-E), pressurized liquid (PLE), ultrasound (UAE), and microwave (MAE) assisted extraction techniques have been widely tested for the recovery of bioactive compounds and other nutrients from the initial raw materials and processing by-products. We applied these technologies to develop biorefining schemes for berry, hemp, and botanical side-streams. $scCO_2$-E effectively recovers lipophilic constituents, while PLE is an effective method for more polar compounds. The UAE and MAE may generate additional products and/or improve process efficiency. Therefore, biorefining schemes become highly flexible and can be designed to accommodate upscaling and to meet the target properties of ingredients intended for use in functional foods and nutraceuticals. However, novel techniques, while offering advantages, also have disadvantages that hamper wider implementation on an industrial level. For instance, the main advantages of $scCO_2$-E in such cases stem from the properties of the solvent and the solvent-free products obtained. However, high capital investments, primarily due to the cost of high-pressure equipment, are likely the most significant disadvantage to the industrial upscaling. The pros and cons of high-pressure and other technologies will be discussed using selected case studies of biorefining various by-products.

Keyword: *Recovery of nutrients, By-products, Extraction technologies*

INCREASING THE SUSTAINABILITY OF THE SMALL FRUIT SECTOR: INNOVATIVE PROCESSING USING A ZERO-WASTE APPROACH

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Small fruits, which are commonly called berries, accumulate large amounts of health-beneficial phytochemicals and other nutrients. Many of them also possess excellent flavor and can be consumed fresh. On the other hand, berries are highly perishable fruits, and therefore, the biggest fractions of their harvests are processed into longer shelf-life products. Traditionally, berry processing generates large amounts of by-products, which, although rich in bioactive compounds, are often used inefficiently or discarded as waste, leading to the loss of valuable nutrients and environmental pollution. Therefore, there is an urgent need to develop new strategies to enhance the sustainability and economic efficiency of this rapidly evolving agri-food sector. Over the last decade, we have developed various zero-waste-based biorefining schemes to recover valuable ingredients from berry juice and puree processing side streams, mainly pomace. For this purpose, modern methods such as supercritical CO_2 and pressurized liquid extraction, ultrasound, and enzyme-assisted extraction/fractionation were applied in a downstream cascade-processing approach for 15 different small fruit species. Several flexible biorefining schemes were developed and tested at both laboratory and pilot scales using optimized processing parameters. Depending on the desired specifications, the technologies enable the production of numerous ingredients (2-10) for functional foods, nutraceuticals, and other applications.

Keyword: *Small fruits, Sides-streams, Biorefining, zero-waste approach, health-beneficial nutrients*

FROM FLUID TO SPOONABLE GEL: SHEAR-INDUCED STRUCTURING OF HIGH-ACYL GELLAN FOR ADAPTIVE FOOD TEXTURES

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Food texture design often relies on hydrocolloid systems that require heat treatment, cooling, or ionic activation to develop structure, which may limit rapid or point-of-use preparation. This study investigated a shear-induced high-acyl gellan system as a cold-process route for generating spoonable food textures, with a focus on its structure formation and transition behaviour.

High-acyl gellan dispersions were prepared in aqueous systems and subjected to controlled shearing without thermal activation. The resulting structures were characterised using rheological measurements and qualitative stress screening under acidic and ionic conditions.

Controlled shearing transformed the initially fluid dispersion into a spoonable semi-gel with viscoelastic behaviour. Rheological analysis confirmed structure formation after shearing, while stress screening showed marked weakening under acidic and ionic conditions. These findings suggest that the system exhibited a narrow but distinctive structuring window, which may be suitable for texture-transitioning applications.

This work demonstrates a rapid shear-induced structuring pathway for high-acyl gellan, enabling fluid-to-gel texture conversion without heat. Its environmental sensitivity suggests potential for low-ionic, point-of-use applications such as spoon-fed hydration gels, swallowing vehicles, or model systems for transient hydrocolloid structuring, where temporary structure is desired rather than long-term stability.

Keyword: *high-acyl gellan, shear-induced structuring, adaptive texture*

ANTIOXIDANT PEPTIDES FROM FERMENTED WHEY: SCREENING, PEPTIDOMICS, AND IN SILICO INSIGHTS

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Whey, a nutrient-rich byproduct of cheese production, remains underutilized and poses environmental challenges when improperly discarded. This study investigated controlled fermentation as a valorization strategy to enhance the functional properties of whey, with emphasis on antioxidant activity and peptide-level mechanisms. A panel of lactic acid bacteria, comprising mono- and mixed-culture systems, was initially screened for growth and fermentation performance in a whey-based matrix. The resulting fermentates were evaluated for antioxidant capacity using 2,2-diphenyl-1-picrylhydrazyl (DPPH) and 2,2′-azino-bis (3-ethylbenzothiazoline-6-sulfonic acid) (ABTS) radical scavenging assays. Cultures exhibiting superior antioxidant activity were selected for in-depth characterization using liquid chromatography–mass spectrometry (LC–MS)-based peptidomics. Comparative profiling against unfermented whey revealed distinct peptide signatures associated with fermentation, including sequences predicted to possess antioxidant bioactivity. The selected sulfur-containing peptide (NIPPLTQTPVVPPFLQPEVMG) from the biplot analysis was further analyzed by in silico molecular docking, which indicated favorable interactions with the hydroxyl radical, suggesting a plausible mechanism for radical scavenging. The findings demonstrate that strategically selecting fermentation cultures, particularly mixed microbial systems, enhances whey's antioxidant potential. This study provides mechanistic insights into fermentation-driven functional improvement and supports the application of peptidomics and computational approaches in the development of value-added functional dairy ingredients.

Keyword: *Whey, Peptidomics, Antioxidant Peptides, Fermentation*

Engineered Porosity Facilitates Diffusion-Driven Enzymatic Tenderization of High-Moisture Plant-Based Meat Analogs

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This study investigated a post-processing strategy to improve tenderness through enzymatic marination using Neutrase and evaluated the influence of porosity on treatment effectiveness. Porous and non-porous soy-based extrudates were immersed in enzyme solutions for varying durations, with water immersion serving as a control. Porous extrudates showed markedly higher proteolysis, and exhibited more extensive degradation, indicating that internal porosity facilitates enzyme penetration. Microscopic and imaging confirmed that enzymatic treatment disrupted both surface and internal structures , while water immersion primarily resulted in hydration-related effects. Texture analyses demonstrated that enzymatic tenderization produced the largest reductions in Warner-Bratzler shear force in porous samples , indicating improved tenderness. In contrast, non-porous extrudates showed significant decreases in hardness and chewiness. Water uptake and mass transfer analyses further showed that porous extrudates exhibited faster diffusion and hydration compared with non-porous samples. A diffusion model was developed to describe water transport during marination and to predict moisture penetration over time. Overall, the results demonstrates that engineered porosity can be used as a structural design strategy to enhance enzyme penetration, accelerate mass transfer, and improve the effectiveness of enzymatic tenderization in high-moisture extruded plant-based meat analogs.

Keyword: *Plant-based meat, gas injection, mass transfer, enzymatic marination, effective diffusivity*

FUNCTIONAL MODIFICATION OF TRADITIONAL WARANKASHI CHEESE: EFFECTS OF SOURSOP JUICE ON COMPOSITION AND ANTIOXIDANT ACTIVITY.

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Warankashi cheese is a highly perishable traditional dairy product due to its high moisture content and susceptibility to lipid oxidation. This study investigated the effect of incorporating soursop (Annona muricata) juice (0–20%) on the compositional, antioxidant, physicochemical, and sensory properties of warankashi. Cheese samples were produced by coagulation using Calotropis procera and analysed using standard analytical procedures. Soursop inclusion significantly influenced ($p < 0.05$) all measured parameters. Moisture content increased (54.89–60.91%), while crude fat (22.75–19.60%) and protein (15.72–14.67%) decreased as soursop concentration increased, reflecting dilution of milk solids. Antioxidant activity (DPPH: 25.93–80.16%; ABTS; Fe^{2+} chelation) improved at moderate inclusion levels (5–10%), corresponding with higher phenolic and flavonoid contents, but declined at higher concentrations. Lipid oxidation indices decreased markedly (peroxide value: 0.57–0.18 meq/kg; acid value: 0.68–0.20 mg KOH/g), indicating enhanced oxidative stability. A reduction in pH (6.00–4.58) and changes in texture parameters (reduced hardness and cohesiveness) were also observed. Sensory evaluation identified 10% soursop inclusion as optimal. Moderate incorporation of soursop (5–10%) enhanced antioxidant properties and sensory quality of warankashi. Additional preservation strategies are required to achieve meaningful shelf-life improvement.

Keyword: *Warankashi, soursop, antioxidant activity, dairy fortification*

Valorisation of Nut Processing Coproducts: Opportunities and Challenges

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Global nut production (including tree nuts and peanuts) has steadily increased over the past decade. As an essential raw material for the food processing industry—spanning confectionery, chocolate, bakeries, beverages, and oils—nut harvesting and processing generate massive quantities of diverse coproducts. These primarily include husks, hard shells, brown skins, and defatted meals. Currently, the application of these coproducts is limited to low-value uses: husks for natural fertilizers, hard shells for bakery heat sources and activated carbon, brown skins for poultry bedding, and defatted meals for livestock feed. This presentation provides an overview of how to maximize the value of these nut coproducts for food, nutraceutical, and pharmaceutical applications through sustainable extraction technologies. Studies report that these agricultural coproducts are actually rich sources of diverse polyphenolic compounds, dietary fibres, proteins, and bioactive peptides. By utilizing sustainable extraction methods, these valuable components can be converted into functional, value-added ingredients that promote better human health and well-being. Ultimately, upcycling these bioactives is of great importance. It not only minimizes industrial waste but also actively supports a circular economy while unlocking new health and functional food applications.

Keyword: *Nuts*, *Upcycling*, *Valorisation*, *Coproducts*,

CHEMICAL CROSSLINKING OF PEA LEGUMIN AND K-CASEIN WITH GENIPIN

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The development of hybrid protein systems is essential to meet increasing global protein demand while improving food sustainability and nutritional quality. This study investigated hybrid mixtures of pea legumin (11S globulin) and κ-casein and their modification through genipin crosslinking. Protein systems with varying legumin: κ-casein ratios (30:70, 50:50, and 70:30) were treated with 5 mM and 10 mM genipin. The physicochemical and structural properties of the control and crosslinked samples were characterised using particle size analysis, zeta potential, FTIR spectroscopy, SDS-PAGE, DSC, and fluorescence microscopy. Additionally, interfacial and macro-functional performance was examined through rheology, emulsification, and foaming properties. The results demonstrated that protein ratio significantly influenced the structural organisation of the mixtures, with increasing legumin content leading to larger particle sizes and enhanced intermolecular interactions while the 50:50 system showed optimal functional characteristics. Genipin crosslinking further modified these systems, where 5 mM genipin promoted effective crosslinking and structural ordering, while 10 mM genipin primarily induced aggregate growth without increasing crosslinking efficiency. The effects of genipin were also dependent on protein composition, with distinct behaviours observed in casein-rich, balanced, and legumin-rich systems. Overall, initial protein ratio and crosslinker concentration dictate the functional and structural performance of sustainable plant–dairy protein hybrids.

Keyword: *Hybrid proteins, Legumin, kappa casein, Genipin, Crosslinking*

LOOP-MEDIATED ISOTHERMAL AMPLIFICATION (LAMP) ASSAY TO DETECT VIBRIO INFECTIONS IN FISH

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A bacterial detection method for detecting Vibrio parahaemolyticus in biological samples derived from fish using loop-mediated isothermal amplification (LAMP) was developed. Vibrio parahaemolyticus is a Gram-negative, rod-shaped bacterium prevalent in marine environments. It is known to be the leading cause of seafood-borne bacterial gastroenteritis worldwide, typically associated with the consumption of raw or undercooked seafood. The thermolabile hemolysin encoded by the tlh gene is commonly used as a species-specific marker for the detection of total V. parahaemolyticus, and the thermostable direct hemolysin encoded by the tdh gene is responsible for regulating virulence factor and serves as a marker for pathogenic V. parahaemolyticus. In this study, the primers were designed along with the development of LAMP assay. Results showed that the assay developed can accurately identify V. parahaemolyticus in spiked fish and market samples. Conventional detection methods such as bacterial culture and conventional polymerase chain reaction are effective but time-consuming and require expensive equipment. Thus, there is a need for a sensitive method to detect total and pathogenic V. parahaemolyticus in fish to understand the apparent and actual risks in fish consumers and prevent economic losses. This study addresses food sustainability and security.

Keyword: *loop mediated isothermal amplification, molecular diagnostics, Vibrio, food safety*

Characterization and Sensory Quality of Air Fried Snacks from Orange Fleshed Sweet Potato and Palm Weevil Larva Composite Flours

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Malnutrition remains a significant challenge in Sub-Saharan Africa. Developing nutrient-dense snacks from locally available foods offers a practical strategy to improve dietary quality. Orange-fleshed sweet potato (OFSP) is rich in fibre and micronutrients, while palm weevil larva is a valuable source of protein that may help address protein-energy malnutrition. Composite flours of OFSP and palm weevil larvae were formulated at ratios of 90:10, 80:20, 70:30, 60:40, and 50:50. Air-fried snacks were produced and evaluated for proximate composition, micronutrient content, colour, texture, and sensory attributes using standard laboratory methods. The snacks containing 90% OFSP and 10% palm weevil larva flour (DB1) exhibited the highest levels of protein, fibre, fat, and ash, with appreciable amounts of iron, calcium, and phosphorus. Increasing palm weevil flour inclusion reduced lightness, redness, and yellowness values. All samples demonstrated desirable textural properties. Sensory evaluation showed that DB1 received the highest ratings for colour, taste, flavour, texture, and overall acceptability, with a mean score of 7.65. Conclusively, nutritious and acceptable air-fried snacks can be produced using OFSP and palm weevil larva flour, with 10% palm weevil substitution providing the best balance of nutritional quality and consumer acceptability.

Keyword: *Orange Fleshed Sweet Potato, Palm Weevil Larva, Composite Flour, Air Frying, Snack*

POLYCYCLIC AROMATIC HYDROCARBONS IN CACAO PRODUCTS: PROFILES AND ASSOCIATED HEALTH RISKS

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Cacao products including cacao mass, cocoa butter, cocoa powder, and chocolates are globally consumed dietary staples. The high-heat processing required to manufacture these products can induce the formation of polycyclic aromatic hydrocarbons (PAHs) — ubiquitous organic pollutants known for their carcinogenic, mutagenic, and teratogenic properties. This study synthesized available literature to document PAH levels across various cacao products, focusing on Philippine samples. A Philippine cacao sample showed benzo[a]pyrene (BaP) and ∑PAH 4 concentrations of 160 µg/kg fat and 167 µg/kg fat, respectively. While these values exceed European Union maximum limits, they remain below levels reported in certain African countries. For the Philippine cacao mass, a deterministic health risk assessment using BaP levels revealed negligible non-cancer and cancer risks, with hazard quotient (HQ < 1) and incremental life cancer risk (ILCR < 10E-06), respectively. However, localized safety concerns were seen in infants and preschoolers using their [∑PAH 4] that resulted to margin of exposure (MOE < 10,000).

Keyword: *polycyclic aromatic hydrocarbons, cacao products, health risk assessment*

VACUUM MICROWAVE DRYING ENHANCES PORE FORMATION AND REDUCES OFF-FLAVOR COMPOUNDS IN EDIBLE CRICKET

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Consumer acceptance of edible insects is often limited by undesirable aroma. This study evaluated the effects of vacuum microwave drying (VMW) on the structural characteristics and volatile compounds of edible cricket (Acheta domesticus), focusing on the relationship between structural modification and off-flavor characteristics.

Crickets were dried by hot-air drying (HA), microwave drying (MW), or VMW. Structural characteristics were analyzed by X-ray micro-CT, and volatile compounds were determined by SPME-GC-MS/MS and PLS-DA. Additionally, whole and slurry samples were compared to evaluate the influence of structure on volatile characteristics.

Drying-rate constants were 0.023, 0.337, and 0.240 min^{-1} for HA, MW, and VMW, respectively. VMW increased the total internal pore volume from 84,667 mm^3 in HA to 137,819 mm^3, corresponding to a 63% increase. Consistent with these structural differences, PLS-DA clearly differentiated volatile profiles among drying methods. Hexanal, a major off-flavor compound, decreased from 1.68 g^{-1} to 0.35 g^{-1}. Furthermore, grinding before drying reduced off-flavor compounds in HA, whereas little difference was observed between whole and slurry samples under VMW. These results suggest that VMW suppresses structural collapse and alters volatile profiles, with structural preservation during drying contributing to reduced off-flavor compounds.

Keyword: *edible insect, Vacuum microwave drying, Volatile compounds, Micro-CT, Off-flavor*

EFFECT OF FORTIFICATION WITH SOYBEAN CONCENTRATE ON HEMATOLOGICAL AND SERUM ANTIOXIDANTS ACTIVITIES OF EXPERIMENTAL RATS FED WITH A DOUGH MEAL PRODUCED FROM ACHA (DIGITARIA EXILIS).

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EFFECT OF FORTIFICATION WITH SOYBEAN CONCENTRATE ON HEMATOLOGICAL AND SERUM ANTIOXIDANTS ACTIVITIES OF EXPERIMENTAL RATS FED WITH A DOUGH MEAL PRODUCED FROM ACHA (DIGITARIA EXILIS)**.**

Ogbuele, Onyemechi Chinedu, Nwabueze, Titus Ugochukwu and Ubor, Stella Chigozie

Dough meals are getting global appeal, but their consumption is limited by health implication and nutritional deficiencies (Akinjayeju et al., 2020). Soybean fortified dough meal from Acha which is an underutilized crop that is loaded with nutrients, gluten free and reported to have low glycemic index will be an upgrade to other dough meals (Chinyenge et al., 2015).

Two varieties of Acha were processed into flour, while the soybeans were processed to soybean concentrate flour. The dough meal samples were formulated by blending the Acha flour and the soybean concentrate using three different ratios. The hematological and serum antioxidants activities of the experimental rats fed with the composite flour samples.

The results obtained for MCV, MCH, MCHC in this study showed that the animals fed with the diets are not at risk of anemia. Also, the results from the serum antioxidant activities studied showed increase activities as the inclusion level of soybean concentrate increases especially in the brown Acha- based dough meal samples.

Keyword: *Dough meals, Food fortification, Underutilized cereals crops, Functional foods, Low-glycemic foods*

Food Processing Levels and Exposure-to-Food-Processing Descriptors in the New Food Intake Classification

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Several nominal food classification approaches, such as the Nova classification, were introduced to emphasise the impact of processing on nutrition and health. Their processing-related arbitary categories lack ordinal scaling and provide no measurable extent of processing vs. nutritional or health impact. Scaling of the extent or level of food processing (FPL) from 'zero' physical treatments to processing of physically and chemically transformed formulation ingredients provides an objective means for the ordinal classification of processing. On the other hand, corresponding processed food categories can be scaled to relate the level or extent of processing to nutritional or health outcomes and beyond. Furthermore, an ordinal scaling of the FPL-based processed food intake (PFI) can be used to derive PFI descriptors that quantify the exposure to processing from foods, meals and diets using 0 to 4 scaling. The FPL-PFI framework separates food processing from formulation, i.e., the PFI descriptors exclude the nutritional or health outcomes resulting from ingredients or additives. Although food processing impact on nutritional value could be expressed from the difference resulting from processing, e.g., as NRI 9,3, such data may remain limited. The FPL-PFI framework provides an objective but simple classification standard for future research and applications.

Keyword: *Food Processing, Processing Level, Processed Food, Food Classification, Processing Classification, Exposure to Processing, Food and Health*

SCALING UP TRADITIONAL DETARIUM SENEGALENSE FRUIT PROCESSING THROUGH THE LICKA'S PULPER-REFINER TECHNOLOGY

Nafissatou Diop *

Université Rose Dieng France Sénégal

Detarium senegalense, commonly known as Ditax in Wolof, is a highly popular forest fruit in Senegal, widely appreciated for its green pulp and its exceptionally high vitamin C content (up to 2%)1. In the main Ditax production areas, particularly in the Saloum Islands, income generated from Ditax processing plays a key role in financing girls' education. However, the complex structure of the fruit makes its processing challenging.

Traditional processing is labor-intensive and time-consuming, involving several unit operations after pounding: dilution, mixing, sieving, and refining. For a standard 10 kg batch, four successive sub-batches of 2.5 kg must be processed at approximately 71 mortar strokes per minute, achieving a throughput of only 2.4 kg per minute2,3.

To overcome these constraints, we developed the patented Licka'S pulper-refiner technology in Senegal4. This equipment performs all traditional processing steps in a single operation, processing the same 10 kg batch within 90 to 150 seconds. This locally developed innovation makes semi-industrial and industrial-scale Ditax transformation achievable for the first time. Further studies are underway to optimize processing parameters, including water-to-fruit ratio (0.3–0.5 L/kg for refined pulp; up to 4 L/kg for nectar formulation) and their effect on extract Brix value.

Keyword: *Detarium senegalense; Ditax; Pulper-refiner technology; Traditional food processing; Scaling-up; Fruit pulp extraction; Food processing innovation; Senegal*

ULTRASOUND-ASSISTED EXTRACTION OF BIOACTIVE ANTIOXIDANT COMPOUNDS FROM Chaetomorpha linum (O.F. Müller) Kützing (1845)

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Antioxidants play a crucial role in protecting food systems against oxidative damage. Although synthetic antioxidants are widely used in the food industry, their toxic and carcinogenic effects have raised safety concerns. Consequently, natural antioxidants from marine organisms, particularly seaweeds, are increasingly explored as safer alternatives. Previous studies have demonstrated that advanced extraction techniques can enhance the recovery of these antioxidant compounds from seaweeds, supporting the development of functional food ingredients. However, these techniques have focused on well-known species, while other species, including Australian Chaetomorpha linum, remain underutilised due to limited knowledge of their bioactive compounds. To date, no studies have investigated ultrasound-assisted extraction (UAE) for the recovery of bioactive compounds and antioxidant activity from C. linum. Therefore, this study aimed to extract bioactive compounds from C. linum using UAE and evaluate total polysaccharides, total phenolic content, total flavonoid content, and antioxidant activity. Antioxidant capacity was evaluated using 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging, 2,2′-azinobis-(3-ethylbenzothiazoline-6-sulfonic acid) (ABTS) radical cation decolorisation, and Oxygen Radical Absorbance Capacity (ORAC) assays. Results revealed that C. linum extracts contained significant levels of phenolic compounds, polysaccharides, and flavonoids, along with antioxidant activity, highlighting the potential of C. linum as a source of bioactive compounds for functional food ingredient development.

Keyword: *Antioxidant activity, C. linum, phenolic compounds, polysaccharides, ultrasound*

Assessment of Allergen Cross-Contact from Reused Cooking Media in Retail and Foodservice

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USFDA

Cross-contact with gluten and food allergens during frying and breading reuse presents a significant, often overlooked risk in retail and foodservice settings. This study evaluated contamination levels and assessed risk reduction strategies for gluten and allergen transfer through reused frying oil and breading mixtures.

Ten batches of breaded shrimp were fried in soybean oil, which was then reused to fry gluten-free foods to assess gluten cross-contact through oil reuse. Separately, 20 batches of shrimp and cod were breaded, and the same breading mixture was reused to coat seafood-free foods to evaluate seafood allergen transfer. Post-treatment mitigation strategies, such as sifting reused oil and breading mixtures, were examined.

Reuse of frying oil resulted in measurable gluten transfer to gluten-free foods, with concentrations exceeding the 20 µg/g threshold for “gluten-free” labeling. Shrimp and cod proteins accumulated in reused breading mixtures and were transferred to seafood-free foods. Cod cross-contact exceeded the WHO reference dose for fish-allergic individuals. Although sifting reduced allergen residues, it did not eliminate cross-contact risk.

These findings highlight gluten and allergen transfer during oil and breading reuse and underscore the importance of dedicated systems and cooking media for allergenic foods to reduce cross-contact risk.

Keyword: *Allergen, Cross-contact, Risk assessment*

Internet of things (IoT) ultrasound extraction of proteins from sugar beet leaves

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Sugar beet (Beta vulgaris L.) is an important crop used for sugar production, generating large amounts of agricultural waste, particularly leaves, during cultivation and processing. These leaves are rich in proteins and other bioactive compounds that can be valorized for sustainable applications. High-power ultrasound (US) was integrated with IoT-based monitoring hardware and cloud software to improve and control protein extraction from sugar beet leaves. Water was used as the extraction solvent at a water-to-leaf ratio of 50:1. Ultrasound-assisted extraction was performed at 100% amplitude for 9 min and compared with conventional thermal extraction at 40 ºC for 9 min.

Protein yield was determined using Bradford and Lowry colorimetric assays. The ultrasound-treated sample showed significantly higher protein recovery compared to the thermally treated sample. The US-treated extract achieved approximately 50 mg BSA eq./g d.m. using the Bradford method and more than 60 mg BSA eq./g d.m. using the Lowry method. In comparison, thermal extraction resulted in lower protein contents of approximately 33 mg and 46 mg BSA eq./g d.m., respectively. The results demonstrate that ultrasound-assisted extraction combined with IoT monitoring can enhance protein recovery from waste.

This research was funded by the Croatian Science Foundation through the DEEP project (HRZZ-IP-2022-10-2207).

Keyword: *internet of things, ultrasound, extraction, leaves waste*

THE PROPERTIES OF PROTEIN HYDROLYSATE FROM NORTH PACIFIC KRILL (Euphausia pacifica) AS INFLUENCED BY MAIILARD REACTION

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Utilization of the potential protein resource from North Pacific krill for producing bioactive products has not been focused considerably. Thus, this research aimed to produce Maillard reaction product derived from North Pacific krill protein hydrolysate. Maillard reaction between protein hydrolysate and glucose (2:1, w/w) was conducted under various heating times and temperatures to determine its impact on physicochemical properties of the resulting Maillard-reacted protein hydrolysates. The results demonstrated that the antioxidant activity of Maillard-reacted protein hydrolysates was significantly enhanced compared to the initial protein hydrolysate. Particularly, the highest DPPH radical scavenging activity (87.99%) of Maillard-reacted protein hydrolysate was found at heating condition of 95°C and 4 hours. Concurrently, the loss of amino groups reached its highest level (28.87%) under this condition. Furthermore, the bioactive properties of Maillard-reacted protein hydrolysate were generally stable throughout a wide pH range, although it showed a slight sensitivity at pH 4. These findings exhibited that Maillard reaction could effectively improve antioxidant activity of protein hydrolysate, and Maillard-reacted protein hydrolysate had high stability under various pH conditions. Hence, Maillard-reacted protein hydrolysate prepared from North Pacific krill represented a promising bioactive ingredient for incorporation into functional food systems.

Keyword: *Antioxidant activity, enzymatic hydrolysis, Maillard reaction, pH, protein hydrolysate*

EVALUATING THE FUNCTIONALITY OF A RAPID ON SITE COLORMETRIC DEVICE FOR DETECTION OF SUDAN IV DYE ADULTRATION IN PALM OIL

Promise Ogbonna *

National Agency for Food and Drug Administration and Control.

Adulteration of palm oil with Sudan dyes has become an entrenched practice among traders, hence the need to develop a portable on-site detection device to curb the menace.

The samples were extracted with ethanol individually to obtain a supernatant colour, and HPLC was used to confirm their concentrations in PPM

The supernatant colour of the ethanolic extracts from adulterated oils exhibited an orange-red colour with a red crown at the meniscus, and the intensity increased with the Sudan IV concentrations ranging from 14.24 to 92.66 ppm, while the unadulterated samples showed golden yellow with zero ppm in a confirmatory test with HPLC (2)

The result shows that over 50% of palm oil sold in Nigerian markets may be adulterated with Sudan dyes, and that it can be unmasked using a portable, rapid on - site ethanol extraction and colorimetric device, especially at the point of sale.

1. Kola-Ajibade Ibukun R.; Olusola Augustine. O (2021), Prevalence of Azo Dye Adulterated Palm Oil in Ondo State (Nigeria) and Toxicological Effects on Liver, Kidney, and Testicular Tissues of Albino Rats. Journal of Food Science and Toxicology, Vol 5, NO 4:268

2 Maoka T, (2020) Carotenoids as natural functional pigments. Journal of Natural Medicine 74:1–16

Keyword: *Palm Oil, Sudan iv, Adulteration, Colorimetric, Detection*

SPRAY DRYING AND EVALUATION OF PHYSICOCHEMICAL AND RECONSTITUTION PROPERTIES OF PINEAPPLE (Ananas comosus var. Smooth Cayenne) JUICE POWDER

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University of the Philippines Los Banos (UPLB), Institute of Food Science and Technology (IFST)

Pineapple (Ananas comosus 'Smooth Cayenne') is a nutrient-rich tropical fruit, and its conversion into powder yields a convenient, shelf-stable product. This study spray-dried and characterized pineapple juice powder by evaluating the effects of inlet temperature and maltodextrin concentration on its physicochemical and reconstitution properties. Fresh pineapple juice was mixed with maltodextrin (10%, 15%, and 20%), pasteurized, and spray-dried at 120°C, 150°C, and 180°C. Both powder and drying yields significantly increased with higher maltodextrin concentrations, with the highest values obtained at 150°C and 20% maltodextrin. Increasing both temperature and maltodextrin concentration significantly decreased moisture content, total titratable acidity, and Vitamin C levels. The powder remained acidic, and total soluble solids rose with higher maltodextrin. Color analysis showed high lightness and reduced yellowness with higher maltodextrin. Bulk and tap density, viscosity, and solubility time reflected acceptable reconstitution properties, while compressibility and the Hausner ratio indicated fair to good flowability. Overall, 150°C and 20% maltodextrin provided the best balance of yield, quality, and stability for pineapple juice powder production. These findings provide insights into the optimization of spray-drying conditions for pineapple juice powder.

Keyword: *Pineapple juice powder, spray drying, maltodextrin, physicochemical properties, reconstitution properties*

HIDDEN RISKS ON THE PLATE: HEALTH RISK ASSESSMENT OF HEAVY METALS IN URBAN- AND RURAL-FARMED VEGETABLES IN THE PHILIPPINES

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Levels of mercury (Hg), arsenic (As), cadmium (Cd), chromium (Cr), and lead (Pb) were measured in frequently consumed vegetables in the Philippines and their associated health risks were assessed. Using atomic absorption spectrophotometry, Hg was found at the method detection limit (MDL: 0.004 mg/kg), As: <MDL (0.009) to 0.09 mg/kg, Cd: <MDL (0.007) to 0.03 mg/kg), Cr: <MDL (0.03 to 0.30 mg/kg, and Pb: <MDL (0.06) to 0.29 mg/kg. The total metal content in the samples followed the order: Pb>Cr>As>Cd>Hg. All % recoveries and %RSDs were well within the AOAC recommendations. Single factor ANOVA demonstrated a significant difference ($\alpha = 0.05$) between urban and rural sites. Assessment of non-carcinogenic risk by combined impact of all metals (Hazard Index, HI) indicated no concern (<1) for both adults and children for Hg, Cd, Cr and Pb except for As in taro and red chili (HI: 1.2 – 1.9) from specific sites. The carcinogenic risk by Target Cancer Risk (TCR) assessment was >10E–5 (USEPA limit) for As (1.8E-4 to 7.9E-4) and Cr (1.2E–4 to 1.2E-3) exposing potential risk from long-term consumption of contaminated vegetables. Continued monitoring and further research are recommended.

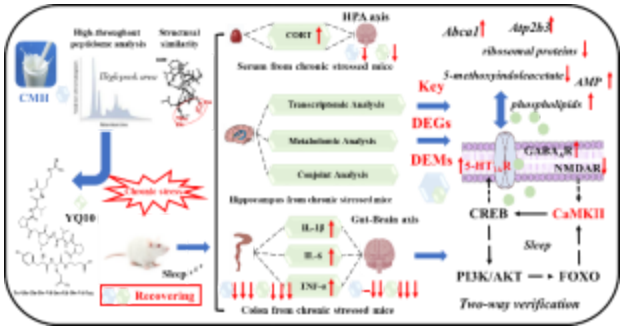
Keyword: *trace metals, urban farming produce, atomic absorption spectrophotometry, carcinogenic risks, non-cancer risks*

Multi-omics Analysis Reveals the Potential Sleep-Enhancing Peptide from Milk Casein Hydrolysate and Its Synergic Mechanism via Regulating the Key Hub CaMKII Pathway in Chronic Stressed Mice

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The casein hydrolysate (CMH) was proved to exert strong sleep-enhancing effects by vital amino acid metabolisms, GABAergic system and cAMP signalling pathway in our previous study. Whether it existed novel active peptide in CMH and its underlying synergic mechanism remain unknown. This study aims to explore novel potent sleep-enhancing peptide in CMH and to systematically investigate its underlying mechanisms by multi-omics analysis. Our results showed many potent sleep-enhancing Tyr-based peptides were released by CMH. Considering potential structural features and contents, YQEPVLGPVR (YQ10) was screened, which significantly prolonged sleep duration and recovered corticosterone level. Moreover, ten crucial DEGs and DEMs were revealed by the omics analysis. YQ10 might regulate CaMKII and neuroinflammatory pathways to communicate with GABAergic and cAMP signalling pathway, particularly regulating CaMKII, IL-1β and IL-6, which was validated by vital factors/protein expressions and antagonist experiments. These findings could provide theoretic basis to explore potential sleep-enhancing mechanisms of Tyr-based peptides.



Keyword: *Casein peptides, chronic stress, sleep, mechanism, calmodulin-dependent protein kinase II (CaMKII), multiple omics.*

Cricket Protein Hydrolysate-Derived Peptides Attenuate Microglial Inflammatory Activation via IL-6–Associated STAT3 Signaling

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Nanyang Technological University

Microglial activation contributes to neuroinflammation through cytokine-mediated signaling, including the IL-6–JAK–STAT3 axis. Food-derived peptides are emerging as immunomodulatory components, yet the active sequences and mechanisms within peptide-rich hydrolysates remain unclear. Here, we investigated the anti-inflammatory activity of cricket protein hydrolysate (CPH) in LPS-stimulated BV2 microglial cells using transcriptomics, LC–MS/MS-based peptidomics, molecular simulation, and targeted peptide validation. CPH reduced LPS-induced pro-inflammatory cytokine production, nitric oxide release, and oxidative stress. Transcriptomic analysis showed that CPH broadly attenuated inflammatory signaling pathways, including TNF, Toll-like receptor, NOD-like receptor, IL-17, and JAK–STAT signaling. JAK–STAT signaling was further examined because CPH reduced IL-6 production, altered Jak/Stat gene expression, and attenuated JAK–STAT-related gene sets. Peptidomic analysis identified abundant short-chain CPH-derived peptides, from which selected candidates were synthesized for validation. Several peptides reduced IL-6 secretion, ROS accumulation, microglial activation, and STAT3 phosphorylation. Mechanistic assays suggested that most active peptides acted upstream by suppressing LPS-induced IL-6 production rather than directly blocking acute IL-6-induced STAT3 phosphorylation. These findings support CPH as a source of immunomodulatory peptides targeting microglial inflammatory signaling.

Keyword: *cricket protein hydrolysate, microglia, neuroinflammation, STAT3*

From large scale to small scale and back again: designing food from first principles

KARIN SCHROEN *

Wageningen University

Although we are able to produce food at very large scale, the underlying mechanisms may be less well understood. In this presentation, I will highlight how measurements that are done at the right size and time scale are instrumental in designing food structures. I will use examples from our work with microfluidic devices that highlight protein functionality at submillisecond time scales, and how this relates to stability of food emulsions. For that we have designed a number of dedicated techniques that I will showcase.

Furthermore, I will take things even one step further, and connect to how food structure influences digestion, and how this can contribute to nutritional value. More specifically, I will report on digestion of emulsions, how coalescence plays a very large albeit unrealised role in this, and how we brought these insights toward specific emulsion structure design that allows us to direct oil digestion.

The insights that we obtained at small scale allow us to rethink large scale processes in industry, and also processes as they occur in a human being, thus directly contributing to food production that is inherently more sustainable and contributing to health.

Keyword: *processing, microfluidics, health, emulsion, protein functionality*

EFFECT OF BLEEDING METHODS ON MICROBIOLOGICAL QUALITY, TEXTURAL PROPERTY AND OXIDATIVE STABILITY OF REFRIGERATED ASIAN SEABASS SLICES

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Bleeding is a potential method for improving fish quality by removing blood, which acts as a pro-oxidant and nutrient source for microbial growth. However, the effects of different bleeding methods on the quality of stored fish remain unclear. This study investigated the effects of gill-cut (GC) and water perfusion (WP) bleeding methods on microbiological quality, lipid and protein oxidation, texture, and fishy odor development in Asian seabass slices stored at 4 ℃ for 12 days. Both GC and WP sample had lower heme iron content than unbled (UB) samples. Moreover, both bleeding methods lowered total viable count (TVC) and psychrophilic bacterial count (PBC), while GC sample showed lower microbial growth than WP at the end of storage. Higher peroxide value (PV) and thiobarbituric acid reactive substances (TBARS) were observed in UB samples, whereas bled samples had better oxidative stability. Protein oxidation was also delayed in GC and WP samples, evidenced by lower carbonyl and higher sulfhydryl contents during storage. GC samples also showed lower total volatile base (TVB-N), trimethylamine (TMA), fishy odor intensity, and better texture retention. Overall, gill-cut bleeding method was more effective than water perfusion in maintaining quality and extending the shelf life of refrigerated Asian seabass slices

Keyword: *Heme iron, Shelf life, Gill cut, Water perfusion, Lipid oxidation*

Leveraging Machine Learning Models and SERS Technology for the Detection of Pesticides in Fresh Produce

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To address the food safety and environmental risks associated with agricultural pesticide contamination, this study combines surface-enhanced Raman spectroscopy (SERS) with novel transformer-based machine learning architectures (SERSFormer and updated SERSFormer-2.0). Gold-silver core-shell nanoparticles (average diameter 21.44 ± 4.02 nm) were synthesized as high-performance substrates to acquire robust Raman spectra. The model utilizes a multi-task learning approach featuring convolutional neural network (CNN) embedders, a weight-shared multi-head self-attention transformer encoder, and task-specific feature representation and output layers. This framework enables simultaneous rapid qualitative identification and precise quantitative estimation of multiple mixed contaminants. SERSFormer successfully classified a control group and five pesticides with 98.4% accuracy, predicting concentrations with an R^2 score of 0.849. The enhanced SERSFormer-2.0 achieved near-perfect simultaneous multi-label classification and regression performance (accuracy = 0.999; F1 score = 0.992; precision = 0.990). Furthermore, the mechanisms behind spectral dominance among mixed pesticides were elucidated. These findings demonstrate the machine learning model's robustness and exceptional reliability, showcasing its immense potential for real-time, mixed-contaminant detection to enhance food safety and regulatory practices across the agricultural and food industries.

Keyword: *Artificial intelligence, Pesticide, Machine learning, Detection, Produce*

RHEOLOGICAL, TRIBOLOGICAL, AND SPREADABILITY PROPERTIES OF CAROTENOID-ENRICHED BIGELS

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[2] University of Minho

Pequi (Caryocar brasiliense Camb.) is a native Brazilian fruit, widely appreciated for its sensory characteristics and high content of bioactive compounds, particularly carotenoids. These carotenoids have potential applications in structured food systems, but their use is limited by hydrophobicity and chemical instability. In this study, bigels were developed as hybrid hydrogel–oleogel systems. Pequi carotenoids were incorporated into the oleogel phase (beeswax/lecithin/sunflower oil) at 24 μg g^{-1}. Hydrogels phase used xanthan gum and agar. Bigels with 60% and 80% oleogel (OG) were produced by homogenization. Steady shear confirmed non-Newtonian shear-thinning behavior (Herschel–Bulkley, R^2>0.99). At 60% OG, carotenoid-enriched bigels showed lower shear stress than carotenoid-free bigels; the opposite trend occurred at 80% OG. Higher OG ratio (80%) reduced shear stress and viscoelastic moduli (G′>G″), indicating a softer structure. After 7 days the bigels exhibited good rheological stability. Tribology showed low friction coefficients for 80% OG bigels, suggesting effective lubrication. Spreadability tests revealed that at 60% OG, carotenoids caused no textural differences. At 80% OG, carotenoid-free bigels exhibited higher firmness and consistency than carotenoid-enriched ones, suggesting interference with beeswax crystallization. Cohesiveness remained unchanged. Overall, carotenoid-enriched bigels offer tunable structural, lubrication, and textural properties for fat replacement and lipophilic bioactive delivery.

Keyword: *Carotenoids, bigels, Pequi, bioactive delivery*

DEVELOPMENT OF NUTRIENT DENSE MULTI MILLET AND RICE FLAKES NUTRI BARS ENRICHED WITH STABILIZED RICE BRAN

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The present study focused on the development of a nutrient-dense multi-millet and rice flakes based nutribar enriched with stabilized rice bran as a functional, fiber-rich snack. The growing demand for convenient and health-promoting foods has intensified interest in nutrient-dense millets and the effective utilization of underexploited agro-industrial byproducts. Incorporation of rice flakes and diverse millets enables the successful integration of traditional grains into modern food formulations. Rice bran, the most nutritionally concentrated fraction of rice obtained during milling, is a rich source of dietary fiber, essential micronutrients, B-vitamins, antioxidants, and nutraceutical compounds such as γ-oryzanol. In this study, nutribars were formulated using rice flakes, whole-grain rice and millet pops, nuts, and seeds, imparting desirable crispness, texture, and flavor. A low-calorie, sugar-free sweetener was used along with FOSS 65, which enhanced dietary fiber content and served as a binding agent to provide structural integrity. Thermally stabilized rice bran was incorporated at three levels (6%, 9%, and 12%). Sensory evaluation indicated that the nutribar containing 12% stabilized rice bran achieved the highest overall acceptability. The developed nutribar demonstrated improved nutritional attributes, including enhanced protein, dietary fiber, essential minerals, and B-vitamins, highlighting its potential as a value-added functional snack for health-conscious consumers.

Keyword: *Multi millets, Rice flakes, Stabilized rice bran, Nutribar, Functional foods*

SUSTAINABLE PRODUCTION OF ROASTED OILS: RATIONAL MODULATION OF PRECURSOR FORMATION TO AVOID OVER-ROASTING OPERATIONS

Xuebing Xu *

Wilmar (Shanghai) Biotechnology Research and Development Center Co. Ltd.

The production of roasted edible oils traditionally relies on intensive thermal processing to generate characteristic aroma and flavor compounds. However, excessive roasting often results in increased energy consumption, nutritional degradation, lipid oxidation, and the formation of undesirable contaminants such as polycyclic aromatic hydrocarbons, and excessive carbonyl compounds. This study proposes a sustainable strategy for roasted oil production through the rational modulation of precursor formation pathways and processing conditions, aiming to achieve desirable sensory attributes while minimizing over-roasting operations. The approach focuses on controlling the generation and composition of key flavor precursors, including reducing sugars, free amino acids, and peptides, through targeted pretreatment technologies such as enzymatic hydrolysis, controlled fermentation, moisture regulation, and mild thermal conditioning. By optimizing precursor availability and reaction kinetics, Maillard reaction pathways can be directed more efficiently toward the formation of desirable roasted aroma compounds under reduced thermal intensity. This strategy enables improved flavor generation efficiency, lower processing temperatures and times, enhanced oxidative stability, and reduced formation of harmful thermal contaminants. The proposed concept provides a scientific framework for developing sustainable roasted oil processing technologies with improved product quality, energy efficiency, and health-related attributes.

Keyword: *Roasted oils, sustainable processing technology, Maillard reaction, rational design of precursor formation, characteristic flavor*

Enhancing Pork Freshness Prediction via RGB-to-Hyperspectral Reconstruction under Varying Led Illuminations

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Low-cost RGB imaging is attractive for food freshness monitoring, but its limited spectral information constrains prediction accuracy. This study proposes an illumination-guided RGB-to-hyperspectral reconstruction strategy for nondestructive pork freshness assessment under varying LED conditions. Chilled pork samples stored for 0–7 days were analyzed using total volatile basic nitrogen (TVB-N) as the target indicator. Spectral correlation and SHAP analyses revealed that the most freshness-relevant information was concentrated in the 500–600 nm region and was most strongly captured by the green channel. Based on this insight, RGB-to-hyperspectral reconstruction was evaluated under eight LED illuminations using four machine learning models. The results show that illumination governs reconstruction effectiveness by controlling which spectral cues are encoded in RGB signals. Light sources with stronger spectral overlap with the key 500–600 nm range preserved more chemically relevant information, constrained the inverse mapping more effectively, and yielded more accurate downstream prediction. Yellow illumination provided the optimal balance between sensitivity to freshness-relevant wavelengths and signal stability. Under this condition, the multilayer perceptron reconstruction model achieved TVB-N prediction performance (R^2 = 0.9411, RMSE = 0.2568 mg/100 g) comparable to ground-truth hyperspectral data. These findings provide a practical, low-cost route to hyperspectral-level freshness evaluation using RGB imaging.

Keyword: *Hyperspectral reconstruction, Illumination effects, Machine learning, Nondestructive detection, Pork freshness*

Peptidomics-Guided Discovery of Cricket Hydrolysate Peptides that Suppress Microglial Inflammatory Responses

XINYUE QI * **, HUI YE**

Nanyang Technological University

Neuroinflammation driven by microglial activation contributes to neuronal dysfunction and is regulated by cytokine-linked signaling, including the IL-6–JAK–STAT3 axis. Food-derived peptides are emerging as immunomodulatory components, yet the active sequences and mechanisms within peptide-rich hydrolysates remain difficult to define. Here, we evaluated cricket protein hydrolysate (CPH) for anti-inflammatory activity in LPS-stimulated BV2 microglial cells and integrated transcriptomics with peptidomics and targeted peptide validation. CPH reduced inflammatory outputs and reversed an LPS-induced JAK–STAT transcriptional signature (GSEA), with decreased expression of Jak2 and Stat1/2/3. LC–MS/MS-based peptidomics identified CPH-derived peptides, and seven candidates were synthesized for functional screening. Multiple peptides decreased LPS-induced IL-6 secretion, oxidative stress, and STAT3 activation (pSTAT3/STAT3). Mechanistic classification using washout and IL-6 bypass assays indicated that most peptides do not inhibit acute IL-6–induced STAT3 phosphorylation, supporting an upstream mode of action involving suppression of IL-6 production; consistent with this, selected peptides reduced Il6 mRNA under LPS stimulation. Together, these findings establish a sequence-resolved framework to link insect-derived peptides to microglial inflammatory signaling and support CPH as a promising functional ingredient source for immunomodulatory peptide discovery.

Keyword: *cricket protein hydrolysate, bioactive peptides, microglia, neuroinflammation*

Microstructure-dependent mixed-lubrication behaviour of whey protein-stabilised water-in-water emulsions under soft contacts

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Dextran/polyethylene oxide (D/P) water-in-water (W/W) emulsions stabilised by whey protein isolate (WPI) were investigated as a model soft material system to examine how phase-separated microstructure influences lubrication under soft-contact conditions. Using soft tribology under physiologically relevant conditions, WPI-stabilised W/W emulsions were compared with protein-free W/W systems and non-phase-separated controls. WPI-containing systems showed markedly lower friction coefficients in the mixed-lubrication regime than their protein-free counterparts. The lowest friction was observed for phase-separated emulsions containing both WPI and D-rich droplets. Increasing dextran concentration, and thus the D-rich droplet volume fraction, led to a further reduction in friction. In contrast, WPI solutions without phase-separated structure provided only limited friction reduction, indicating that protein addition alone was insufficient to reproduce the lubrication response of the emulsions. These results show that lubrication performance is governed not simply by composition, but by the coupling between continuous-phase viscosity, interfacial stabilisation, and dispersed-phase microstructure. The findings support a texture- and rheology-guided interpretation of lubrication in W/W emulsions, in which WPI contributes most effectively when incorporated into a phase-separated structure rather than as a bulk soluble additive. This work provides a basis for designing structured aqueous soft materials with improved lubrication properties.

Keyword: *Water-in-water emulsions, whey protein, soft contact lubrication*

SUSTAINABLE UNDERUTILIZED PLANT RESOURCES FOR GUT MICROBIOTA TARGETED PREBIOTIC DEVELOPMENT

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Sabaragamuwa University of Sri Lanka

Gut microbiota-targeted prebiotic development using sustainable, underutilized plant resources represents a promising strategy to improve host health through dietary modulation. While inulin is widely used as a commercial prebiotic, its cost and limited accessibility necessitate the exploration of locally available alternatives. This study investigated selected plant resources using two approaches: (i) extraction of inulin-rich fractions from palmyra (Borassus flabellifer), garlic (Allium sativum), and sweet potato (Ipomoea batatas), and (ii) evaluation of fibre-rich flours derived from sweet potato, banana pseudo stem, jackfruit, and sugarcane residues.

Inulin was extracted using aqueous extraction followed by ethanol precipitation, while flours were produced through drying and milling. Structural characterization using Fourier Transform Infrared Spectroscopy confirmed functional groups associated with fermentable carbohydrates. Flour yield varied across substrates, indicating differences in processing efficiency.

Prebiotic activity was assessed using Lacticaseibacillus rhamnosus in MRS broth via optical density (OD600) and pH reduction. Palmyra and garlic extracts, and yellow sweet potato flour, showed comparable or enhanced microbial growth relative to commercial inulin, while sugarcane residue flour showed limited fermentability, likely due to lignocellulosic constraints.

These findings demonstrate the potential of underutilized plant materials in Sri Lanka as sustainable prebiotic ingredients for functional food development.

Keyword: *Prebiotic, Gut microbiota, Inulin, Underutilised plant sources, Sustainable foods*

CLIMATE CHANGE EFFECTS ON MARINE FOOD RESOURCES: OPPRTUNITIES AND CHALLENGES

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Climate change is altering the marine environment as a human food source through shifts in seawater chemistry, and with opposite impacts on plants and fish. Rising carbon dioxide concentrations and ocean warming have created new physicochemical environments for the marine biota. Changes in abundance, distribution, food value, and modifications of marine biota have affected global food security. Marine macroalgae, with annual consumption rate of 37.8 million tons, is a rich source of macronutrients and micronutrients. Macroalgae exhibit a carbon-sequestration capacity almost double that of terrestrial plants, supported by rapid growth rates under elevated temperatures. Macroalgae remove estimated 4.7 million tons of carbon dioxide annually, placing them as a climate-resilient food source. In contrast, marine fauna poses negative effects from climate induced changes in seawater chemistry, hindering coral and exoskeleton formation of marine crustaceans. Marine fish exhibit diminished sensory and immune capacities, reduced growth, and impaired behaviour, migrating towards warming polar regions. The stressors caused by oceanic climate change effects have disrupted fish community structure, and reduced their genetic diversity, limiting the availability of food-fish in quality and quantity. While flora under climate change effects on oceans show a positive impact, the fauna exhibits negative impact on food security.

Keyword: *Climate change, Global Food Security, Marine flora, Marine fauna*

Title: Enhancing Child Nutrition and Food Safety in the Child and Youth Care Centres (CYCCs): Post-Implementation Insights from KwaZulu-Natal, South Africa

Mumsy Chibe *

University of South Africa

It is the responsibility of Child and Youth Care Centers to feed vulnerable children & youth nutritious meals. In residential care, meal quality is compromised by poor menu planning, inconsistent food safety procedures, and lack of understanding of nutrition. In two registered CYCCs study assessed the post-implementation of structured guidelines on child nutrition, food preparation, food safety, and healthy eating. Ten months intervention using qualitative, uncontrolled pre- and post-implementation design was used. Participants were selected through purposive sampling; care workers and child and youth care managers. Online focus groups were used to gather data, then thematically analysed. Measures of dependability, confirmability, and credibility were used to improve trustworthiness. Three main themes emerged from the findings: guidelines' applicability, contribution to bettering food service practices, and information acquired through application. Participants reported improvements in appropriate portioning, safe food handling, hygienic procedures, balanced menu planning, and suitable storage. The guidelines' multilingual style improved usability. Recommendations resulted in quantifiable improvements in daily procedures, although some recipe execution was limited by financial constraints. Care workers' knowledge and behaviour can be positively impacted by organised, contextually relevant nutrition and food safety guidelines. CYCC policies and providing continuous training, residential care facilities may improve food safety compliance & outcomes.

Keyword: *Food safety, Food handlers, Nutrition, Food handling, Hygiene practices*

Enhancing Agro-ecological Resilience through Organic Pesticide Training and Digital Integration: A Case Study of Women Farmers in Gwagwalada, Nigeria

Michael Oke *

Michael Adedotun Oke Foundation / Federal Capital Territory Agricultural Development Programe

Introduction: Conventional agriculture in Nigeria increasingly relies on toxic pesticides, including dimethoate and chlorpyrifos. While providing short-term financial viability, these chemicals induce environmental instability and pose severe public health risks, including oncological and reproductive concerns. This study evaluates an agro-ecological intervention for fifty women farmers in Gwagwalada, Abuja, aimed at enhancing food safety and sustainable pest management.

Methodology: A participatory approach was utilized, incorporating hands-on demonstrations of botanical pesticide formulations. Participants were trained in preparing neem-based extracts and onion-urine mixtures, using surfactants like cooking oil to optimize foliar adhesion. The study further explored the integration of Artificial Intelligence (AI) and drone-based monitoring to track crop health and environmental variables, including solar radiation and precipitation.

Results: Findings indicate that localized organic training significantly improves technical competence while reducing production costs. While organic products currently face pricing challenges, the growing demand for food safety necessitates a formal regulatory framework.

Conclusion: Combining indigenous organic practices with AI-driven precision agriculture effectively bridges the productivity gap. Empowering women through these vocational extensions secures the food supply and establishes a scalable model for agro-ecological sovereignty and chemical-free food systems in Nigeria's Federal Capital Territory.

Keyword: *Women Farmers, Agro-ecology, Botanical Pesticides, Artificial Intelligence, Food Safety, Nigeria.*

Potato Partnerships and Private Sector Investment in Enhanced Bagging and Distribution Systems: A Case Study of Abuja, Nigeria

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Michael Adedotun Oke Foundation / Federal Capital Territory Agricultural Development Program

Introduction: Nigeria is a leading Sub-Saharan potato producer, yet yields remain low at 3.1 tonnes/hectare. The sector is severely limited by antiquated post-harvest handling and bagging frameworks that fail to meet global standards for shelf-life and marketability.

Methodology: Grounded in Value Chain Analysis and Public-Private Partnership (PPP) theory, this study evaluates the impact of private investment on mid-stream logistics. A multistage random sampling approach was used across Abuja, utilizing structured questionnaires and visual documentation with 50 wholesalers and retailers to compare traditional "open-mesh" bagging against modern containerization.

Results: Findings indicate that current bagging systems cause significant mechanical damage and physiological weight loss during transit. While global markets utilize ventilated, retail-ready packaging, Nigeria’s reliance on oversized, non-standardized bags hinders industrial scalability and creates a critical supply-demand gap in the Federal Capital Territory.

Conclusion: To achieve global competitiveness, this study advocates for a transition to innovative, breathable container systems. We propose a "Potato Partnership" model to incentivize private sector manufacturing of standardized packaging. Enhancing these distribution systems is vital for post-harvest loss reduction, food security, and integrating Nigeria into the global potato ecosystem.

Keyword: *Bagging, Potatoes, Value Chain, Post-harvest Loss, Private Sector Investment, Nigeria.*

NOVEL W/O/W DOUBLE EMULSION-BASED GELLED PROBIOTIC MICROCAPSULES FOR NON-DAIRY CHEESE APPLICATION

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While the market for plant-based dairy alternatives is expanding rapidly, most products mainly focus on the sensory attributes of traditional dairy items and lack functional fortification, such as the incorporation of probiotic bacteria. The objective of this study was to develop and optimize novel water-in-oil-in-water (W/O/W) double emulsion-based gelled microcapsules for Lactobacillus rhamnosus GG (LRGG) using a soy protein isolate (SPI) (3.0 – 6.0 % w/w) and sodium alginate (SA) (0.5 – 2.0 % w/w) composite with Ca^{2+} cross-linking, specifically targeted for non-dairy cheese applications. Using Response Surface Methodology (RSM) under 3^2 full factorial design, their effects on physical, textural, and functional properties were systematically evaluated. The results revealed that SA concentration exponentially enhanced gel firmness and particle size (D50) through robust calcium cross-linking, resulting in > 0.96 of R^2 in optimized RSM models. In contrast, SPI played a crucial role in providing protection against the simulated gastrointestinal (GI) fluids during digestion testing. Response surface plots and multi-response optimization were also performed based on the simulated restrictions and parameters on plant-based cheese analog applications. Ultimately, this study demonstrates that the optimized SPI-SA system bridges the gap between biological protection and product designs, advancing plant-based cheese from a sensory substitute to a functional, health-promoting alternative.

Keyword: *Probiotic microencapsulation, Plant-based cheese analog, Lactobacillus rhamnosus GG, water-in-oil-in-water emulsion (W/O/W), Response surface methodology (RSM)*

Biofilm Survival of Listeria monocytogenes after High-Pressure Processing: Implications for Food Safety

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Listeria monocytogenes is a major foodborne pathogen that persists in food processing environments due to its strong biofilm-forming ability. The bacterium readily colonizes food-contact and packaging surfaces and can withstand standard sanitation. High-pressure processing (HPP) may affect not only survival but also stress adaptation and virulence.

This study evaluated the effects of sublethal HPP (200 and 400 MPa for 5 min) on biofilm formation and gene expression. Strains from serogroups IIa and IVb were tested. Biofilms were developed on stainless steel (SS304), PET, and PP. Viable cells and biomass were measured, and expression of nine virulence- and stress-related genes was analyzed by qPCR.

HPP reduced biofilm viability and biomass in a pressure-dependent manner, with stronger effects at 400 MPa (~5 $\log_{10}$ CFU/cm²). SS304 supported higher biofilm formation than PET and PP. Genes flaA and sigB were strongly affected, while most virulence genes were downregulated. IVb strains showed stronger stress responses, indicating possible serogroup-specific adaptation.

Project funded under the designated subsidy of the Minister of Science and Higher Education Republic of Poland, task entitled: The Research Network of Life Sciences Universities for the Development of the Polish Dairy Industry – Research Project.

Keyword: *Listeria monocytogenes, HPP, biofilm*

Reformulating traditional phutu pap by partially replacing normal maize with nixtamalized maize.

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Boiled white maize meal pap is a starch-rich dish central to the food culture defining Southern African food systems. However, apart from its monotonous consumption being the major contributor to undernutrition and micronutrient deficiencies, it takes a long time to prepare, making it less convenient. This study aimed to develop a nixtamalized maize product that was consumer-acceptable and Just-About-Right (JAR). Sensory evaluation was conducted with a panel of 100 participants aged 18-65 years, selected via convenience sampling. Dried phuthu pap product was developed using nixtamalized yellow and white maize. Phuthu pap from nixtamalized and non-nixtamalized yellow and white maize meal had non-JAR ratings for all attributes and unacceptable penalty scores. A new product was then developed by replacing portions of commercial maize meal with nixtamalized white maize meal at varying percentages (25%, 50%, and 75%). The 25% blend showed some improvements, but still needed a better taste. Further trials focused on adjusting the salt concentrations (0.3%, 0.4%, and 0.5%). Phuthu pap with 0.5% salt concentration achieved the highest JAR scores (>75%) for appearance, taste, and mouthfeel, making it the most successful product developed in the study. Thus, proving that integrating a heritage-based nixtamalization process into modern food systems is possible.

Keyword: *Food culture, nixtamalized maize meal, phuthu pap, sensory analysis, consumer panel*

REFRAMING FOOD SCIENCE EDUCATION FOR SUSTAINABLE FOOD FUTURES: CURRICULUM, MINDSET, AND PROFESSIONAL FORMATION

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Undergraduate food science and technology education must prepare graduates to respond to complex food system challenges, including food safety, food security, public health, sustainability, technological change, and industry transformation. This presentation reflects on how undergraduate curricula can be reframed to move beyond technical content delivery toward the development of systems thinking, professional responsibility, innovation mindset, and sustainability-oriented decision-making. Drawing from the Philippine and Southeast Asian context, the presentation will discuss the importance of aligning undergraduate curriculum design with real-world food system needs, regulatory expectations, industry practice, and societal concerns. It will also highlight the role of undergraduate education in shaping the professional identity of future food scientists and food technologists as contributors to safe, nutritious, acceptable, accessible, and sustainable food systems. Digital tools, including artificial intelligence and immersive learning environments, will be considered not as replacements for foundational food science education, but as purposeful tools for enhancing student learning, engagement, and applied problem-solving. The presentation aims to contribute to the discussion on future-ready undergraduate food science education that balances scientific rigor, technological innovation, contextual relevance, and human-centered responsibility.

Keyword: *Education, Curriculum, Sustainability, Systems thinking*

Verification of the Analytical Method for 14 Types of Phthalates in Food Using GC-MS

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Phthalates are substances widely used as plasticizers and can migrate into the environment and food, potentially leading to human exposure. In particular, as concerns regarding their potential risks as endocrine disruptors continue to be raised, the importance of analyzing and monitoring phthalates in food is steadily increasing.

In this study, a GC-MS (SIM mode) method was applied to monitor 14 phthalates(DEP, DIBP, DBP, DPP, ATBC, DHP, BBP, DEHA, DEHP, DCHP, DnOP, DEHTP, DINCH, DINP, DIDP, TOTM) in food, using separate pretreatment for fatty and non-fatty samples.

The 14 types of phthalates exhibited excellent linearity ($R^2 \geq 0.99$). The precision of the analytical method was ensured, with recovery rates ranging from 70% to 120% and a Relative Standard Deviation (RSD) of 15% or less. Additionally, the Limit of Detection (LOD) was set at levels of 0.03–0.208 mg/kg, respectively. In addition, I participated in the FAPAS proficiency test and confirmed satisfactory results within Z-score 2 for DEHP and DIBP.

Application to real food samples detected several phthalates, indicating possible contamination from packaging and processing. These results demonstrate that the established GC-MS method is suitable for reliable determination of phthalates in food and can support future food safety monitoring and risk assessment.

Keyword: *Phthalates, Method Validation, GC-MS*

Transforming Food Engineering Education through International Challenge-Based Learning: The SHIFT Experience

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The increasing complexity of global food systems requires new educational models that integrate sustainability, digital transformation, innovation, and interdisciplinary problem-solving into Food Engineering curricula. This work presents the SHIFT – Strategic Synergies in Agro-Food Blended Intensive Program, an international educational initiative jointly developed by Universidade Católica Portuguesa (Portugal), Alma Mater Studiorum – Università di Bologna (Italy), and the University of Zagreb (Croatia).

The program involved 24 students from 10 countries and combined six weeks of online collaborative learning with an intensive on-site experimental week in Portugal. Multicultural student teams developed challenge-based projects focused on the valorization of food products and agro-food by-products through sustainable and innovative approaches. Activities integrated design thinking, entrepreneurship, digital tools, laboratory experimentation, sensory analysis, industrial visits, reflective learning, and collaborative project management.
Student projects included developing sustainable food products from grape pomace, spent coffee grounds, seafood by-products, and artichoke residues. The projects integrated circular economy principles, sensory acceptability, and potential industrial applicability, enabling students to translate theoretical concepts into practical Food Engineering solutions.

Student reflections and feedback revealed high levels of engagement, critical thinking, intercultural collaboration, and systems-oriented problem-solving, confirming the achievement of the proposed learning objectives related to innovation, sustainability, teamwork, and future food systems competencies.

Keyword: *Challenge-based learning, Food Engineering education, Sustainable food systems, Circular economy, Blended learning*

GRAPE POMACE FLOUR AS A SOURCE OF NUTRIENTS AND PHENOLIC COMPOUNDS

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Grape pomace from juice production consists mainly of skins, seeds, and residual pulp. It retains numerous nutrients and functional compounds and exhibits antioxidant, anti-inflammatory, and antimicrobial properties, making it attractive for food and pharmaceutical applications. These properties are governed by the grape variety and the processing method used to obtain the juice. The BRS Violeta grape, a hybrid cultivar derived from Vitis labrusca, is widely used for juice production. This study aimed to characterize BRS Violeta pomace obtained from juice processing. The material was collected from an industry in Brazil (9°17'15.8"S, 40°52'39.9"W), dried at 50 °C, milled, and processed into flour. The flour was analyzed for moisture, protein, fiber, minerals, fatty acids, and total phenolics. The pomace showed 8.89% moisture, 7.81% protein, 49.5% fiber, 5.71% minerals, 2.89% fatty acids, and 49.36 mg/g of total phenolics. These results indicate that BRS Violeta pomace flour is a rich source of nutrients, making it a promising ingredient for high-fiber foods or as a dietary fiber supplement. In addition, it may enhance the bioactive properties of other food products due to the presence of phenolic compounds, many of which are associated with health benefits, thereby contributing to a circular economy.

Keyword: *grape byproduct, phenolic compounds, BRS Violeta grape, circular economy*

EFFECT OF MAILLARD REACTION PRODUCTS FORMATION AND IRON COMPLEXATION ON PHYSICOCHEMICAL AND STRUCTURAL PROPERTIES OF CASEINATE-GLUCOSE AND CASEINATE-LACTOSE SYSTEMS.

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The Maillard reaction (MR) has attracted increasing attention due to its ability to modify protein functionality and generate Maillard reaction products (MRPs) with metal-chelating properties. This study investigated the effect of MRPs formation and iron (Fe) complexation on the physicochemical and structural properties of caseinate–glucose and caseinate–lactose systems. Sodium caseinate dispersions (5%, w/v) were mixed with glucose or lactose at caseinate ratios of 1:1, 1:2, and 1:3 (w/w), adjusted to pH 7.5, and thermally treated at 100 °C for 45 min. Ferrous sulphate was subsequently incorporated at concentrations of 5, 10, and 15 mM. MR progression and Fe complexation were evaluated using pH, colour, particle size, ζ-potential, turbidity, UV–Vis spectroscopy, OPA assay, SDS-PAGE, and FTIR analyses. Thermal treatment significantly accelerated MR progression, resulting in reduced pH, increased browning intensity, elevated absorbance at 294 and 420 nm, and enhanced glycation degree. Caseinate-glucose systems exhibited greater MR progression than caseinate–lactose systems due to higher reactivity and lower steric hindrance of glucose. Increasing sugar concentration further intensified glycation and physicochemical modifications. Fe complexation modified electrostatic interactions and colloidal stability. Overall, glucose-based systems demonstrated superior glycation and Fe-complexation potential, highlighting their potential application as functional Fe delivery matrices in dairy-based fortification systems.

Keyword: *Maillard reaction, Iron Fortification, Caseinate-sugar systems, Dairy fortification, Glycation*

INTEGRATED PRESSURIZED FLUID PROCESSING WITH ULTRASOUND FOR VALUE-ADDED PRODUCTS OF AGRI/FOOD BY-PRODUCTS

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Huge amounts of by-products from the Agri-Food industry are generated worldwide yearly. Research in my laboratory has intensified on the use of pressurized fluids and high-intensity ultrasound (HIUS) for the extraction, reaction and particle formation of value-added compounds from by-products. In one example, anthocyanins were obtained from cranberry pomace using pressurized fluids and HIUS. Pressurized ethanol (100%) recovered maximum anthocyanins (3.01–4.21 mg Cy3GE/g) at 40–120°C/50 bar, with high concentrations of galactosides and arabinosides obtained in 5 min, while glucosides were obtained after 20-30 min. Maximum total phenolic content (42.48 mg GAE/g) was obtained with pressurized 30% ethanol at 140°C/50 bar. Using HIUS, the choline chloride+glycerol mixture yielded 0.77 mg Cy3GE/g of total anthocyanins while the glucose+lactic acid mixture achieved total phenolic content of 21.9 mg GAE/g. In another example, phenolic acid was reacted with flax oil triglycerides using lipase enzyme in supercritical CO_2 (SC-CO_2) media at 85-345 bar, 40-80^{o}C up to 52.5 h. Optimum reaction conditions for maximum yield of enzymatic synthesis of phenolic lipids (58%) were 215 bar and 80°C for 27.5 h. Overall, the integration and intensification of processes using clean emerging technologies such as SC-CO_2, pressurized liquid, and HIUS allowed us to valorize Agri-Food by-products.

Keyword: *By-products, Processing, Supercritical CO2, Pressurized fluids, Value-added products*

MICROENCAPSULATION OF PHENOLIC-RICH EXTRACT FROM DEFECTIVE COFFEE BEANS BY IONIC GELATION

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Microencapsulation is a strategy for incorporating phenolic compounds into food products, protecting them against heat and oxidation while modulating sensory attributes such as color and flavor. This study evaluated the microencapsulation of a phenolic-rich extract from defective coffee beans by ionic gelation. The hydroalcoholic extract was obtained from a blend of defective coffee beans (85%) and green coffee beans (15%) and contained 180.86 μg GAE/mg of total phenolic compounds. Microparticles were produced by ionic gelation combined with atomization using double emulsions (W/O/W) and different wall material compositions: cassava starch at 2% or 4% and modified starch at 2%. An additional assay was performed by adding starch directly to the extract as an adsorbent. Particle mean diameter, encapsulation efficiency, phenolic release over 180 min, and morphology by optical microscopy were evaluated. The average encapsulation efficiency was approximately 30%, with no significant difference among formulations. The formulation containing 4% cassava starch showed the smallest particle diameter and the lowest phenolic release over time (185.39 μm; 12 μg GAE/mg). Non-gelatinized starch granules were observed when starch was added directly to the extract. Overall, 4% cassava starch showed the most suitable properties for encapsulating phenolic-rich extract from defective coffee beans.

Keyword: *Byproducts, Phenolic compounds, Microencapsulation*

MICROBIAL FERMENTATION OF WHEY PERMEATE AS A CIRCULAR APPROACH FOR VALUE GENERATION AND METAL RECOVERY

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Whey permeate, a dairy co-product generated in large volumes, remains underutilized despite its high organic content. Within sustainable food systems, its valorization represents a key strategy aligned with circular economy and zero-waste approaches. This study investigated the anaerobic fermentation of whey permeate using a mixed microbial consortium, focusing on process otimization, organic acid production, and further application of the fermented medium for metal recovery. Fermentation was carried out for 6 days, with pH monitored throughout the process and lactose consumption and production of organic acids quantified by HPLC. The process resulted in efficient lactose conversion (98%) and progressive acidification, evidencing active microbial metabolism. A multi-component organic acid profile was obtained (lactic acid of 74%, butyric acid of 17% and propionic acid of 9%). In food systems, these compounds are technically relevant for acidification, preservation, and flavor development. The fermented medium was further applied in ultrasound-assisted leaching of lithium-ion battery waste (200 W, 40 kHz, 2.5 h, 70 °C, 50 g/L), achieving Li and Co recoveries of 76.8% ± 0.35% and 70.1% ± 0.27%, respectively. These findings demonstrate a circular route for converting a dairy co-product into value-added acids metabolites for resource recovery within and beyond food systems.

Keyword: *Circular economy, Metal recovery, Microbial fermentation, Organic acids, Whey permeate*

EXTRACTION, ENCAPSULATION AND VALORISATION OF BITTER ORANGE (CITRUS AURANTIUM) JUICE AND POMACE AS NATURAL PRESERVATIVE FOR SWEET ORANGE JUICE

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Bitter orange (Citrus aurantium), often wasted due to astringency, may have preservation potential. This study evaluated alginate-encapsulated extracts from cold-macerated bitter orange pomace (BCE), ultrasound-assisted bitter orange pomace extracts (BUE), freeze-dried bitter orange juice powder (BJE), and their unencapsulated counterparts (BC, BU, and BJ, respectively) for sweet orange juice preservation.

GC-MS identified proline (7.98% in BC), terpenes (18.71% in BU), and pyrazine (7.41% in BJ), all with minimum inhibitory concentration of 100 mg/mL. Sodium alginate (3% w/v) encapsulation retained flavonoids (11.98 mg/g in BCE), phenolics (0.78 mg/g in BUE), carotenoids (3.70 mg/g in BJE), vitamin C (25.50 mg/100g in BJE), and DPPH radical scavenging activity of 80.02% in BUE. Sweet orange juice incorporated with BJE and BCE at 1:10 (w/v), and stored at 4^{o}C, showed pH, Brix, titratable acidity, taste, and overall acceptability comparable to the control. Bitter orange treatment inhibited fungal growth in sweet orange juice up to Day 5 (BU, BJ, BJE) or Day 7 (BC, BCE, BUE), while control sweet orange showed fungal growth from Day 2 (1.37×10^2 CFU/mL) with low bacterial counts.

Bitter orange shows promise as a natural preservative for sweet orange juice, enabling waste valorisation and shelf-life extension in fruit beverages.

Keyword: *Bitter orange, Fruit juice preservation, Natural preservatives, Alginate encapsulation, Waste valorisation*

Functional Properties of Bioactive Polysaccharides Edible Flowers

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Polysaccharides represent a major carbohydrate fraction in edible flowers and are increasingly recognized as potential functional food ingredients; however, their compositional variability and structure–function relationships remain poorly understood. This study systematically investigates the chemical composition, structural characteristics, and functional properties of polysaccharides extracted from broccoli (Brassica oleracea var. italica), hibiscus (Hibiscus sabdariffa), marigold (Calendula officinalis), and rose (Rosa centifolia) by alkaline treatment. The extracted fractions contained 52.7–65.2% carbohydrates, along with varying levels of protein and ash, indicating co-extraction during alkaline processing. Fourier transform infrared spectroscopy (FTIR) identified characteristic functional groups, while scanning electron microscopy (SEM) revealed distinct morphological features among samples. X-ray diffraction (XRD) patterns confirmed predominantly amorphous structures with contributions from residual crystalline salts. Functional properties varied significantly across samples, with swelling capacity (6.43–12.61 mL/g), water-holding capacity (2.59–8.09 g/g), and oil-holding capacity (1.86–3.57 g/g). Hibiscus polysaccharides exhibited reduced functional performance, associated with differences in bonding characteristics and compositional features. These findings establish clear composition–structure–function relationships and highlight the influence of compositional factors, including protein content, uronic acid presence, and residual salts, on functional behavior. The results support the potential application of edible flower polysaccharides as value-added functional ingredients in food systems.

Keyword: *Polysaccharides, Edible flower, X-ray diffraction, Hibiscus sabdariffa, Calendula officinalis*

Volatile profile and sensory characterisation of Manipueira Selvagem, an emerging Brazilian wild-fermented cassava beer

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Manipueira Selvagem is an emerging Brazilian wild beer style brewed with manipueira, a fermentable cassava liquor (Manihot esculenta), and fermented by wild yeasts and lactic acid bacteria. This study investigated associations between volatile compounds and sensory descriptors in three commercial samples (A, B and C) with distinct sensory profiles. Volatile compounds were analysed by GC-MS in triplicate and expressed as relative peak area (%). Sensory evaluation was performed by trained panellists using structured scales for aroma, flavour, taste, mouthfeel and overall quality. Principal Component Analysis of 35 volatile compounds explained 71.8% of total variance and clearly separated the samples. Sample A (overall score 88.3) showed higher levels of ethyl hexanoate (14.2%) and ethyl octanoate (10.7%), together with 4-ethylphenol and 4-ethylguaiacol, associated with fruity ester and Brettanomyces-like funky descriptors. Sample B (82.3) presented higher diethyl succinate and woody-animalic characteristics. Sample C (44.7) exhibited the highest ethyl butyrate concentration and the greatest perception of butyric off-flavour. Results suggest that fruity ethyl esters and volatile phenols positively contribute to the sensory identity of Manipueira Selvagem, while atypical fermentation compounds may discriminate lower-quality products.

Keyword: *Manipueira Selvagem, cassava beer, wild fermentation, Brazilian craft beer, sensory analysis*

LIFE CYCLE ASSESSMENT OF DRYING AND PROTEIN EXTRACTION FROM DUCKWEED BIOMASS ASSISTED WITH ULTRASONIC TECHNOLOGY

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In recent years, duckweed has increasingly been recognized as a promising alternative protein source, and duckweed protein concentrate has been authorized by the European Commission as a novel food. However, the environmental implications of duckweed protein processing, particularly across different drying and extraction routes, remain insufficiently understood. This study applied life cycle assessment (LCA) to evaluate and compare the environmental impacts of fresh duckweed drying, protein extraction from fresh biomass, and protein extraction from dried biomass. The aim was to identify environmental hotspots across different processing pathways and explore improvement opportunities through scenario analysis. Results showed that, for fresh duckweed drying, fluidized-bed drying (FBD) achieved the lowest global warming impact, at 6.0×10^{-2} kg CO_2 eq. For protein extraction, ultrasound-assisted enzymatic extraction from dried duckweed (UAE) and ultrasound-assisted extraction from fresh duckweed (USE) showed the lowest global warming impacts within their respective routes, at 0.82×10^{-2} and 3.10×10^{-2} kg CO_2 eq, respectively. Scenario analysis demonstrated that improving process energy efficiency and electricity supply can substantially reduce environmental burdens. Overall, this study provides a life-cycle-based framework for comparing duckweed processing technologies and supporting more sustainable protein production pathways.

Keyword: *Duckweed, Protein extraction, Ultrasound-assisted processing, Life cycle assessment, Drying*

Digital and Spectroscopic Innovations for Sustainable Food Quality Control under Food Industry 4.0

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The digital transformation of modern food processing under the Food Industry 4.0 framework has intensified the demand for smart sensing technologies capable of delivering accurate and robust predictions of raw food quality attributes. Spectroscopic techniques, particularly near-infrared (NIR) spectroscopy, have become widely used for non-destructive quality assessment. However, predictive model performance is often constrained by data scarcity, class imbalance, and challenges in acquiring high-quality spectral signals. These limitations are especially evident in milk quality monitoring, where accurate prediction of urea, protein, lactose, and somatic cell count remains difficult. To overcome these challenges, a Spectral Transformer Network was developed for the generation of synthetic NIR spectra from raw milk samples and their reference biochemical components. The generated spectra closely matched real data, achieving Pearson correlations ≥ 0.99 and maximum mean discrepancy values as low as 0.0019. When used for data augmentation, the synthetic spectra improved predictive performance across all milk quality attributes. These findings demonstrate that transformer-based generative modelling can enhance prediction accuracy and model robustness in scenarios with limited spectral data.

Keyword: *spectroscopy, generative AI, milk quality, modelling*

Influence of oak aging on the sensory profile and temporal perception of 80% cocoa bean-to-bar chocolate

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The maturation of chocolate in contact with wood has emerged as a promising strategy to enhance sensory complexity in bean-to-bar products. This study evaluated the influence of oak aging on the sensory profile of two 80% cocoa chocolates: a conventional dark chocolate and an oak-aged counterpart. Sensory analyses were conducted with 12 panelists using intensity scaling and Temporal Dominance of Sensations (TDS). Attributes including woody, roasted, toasted, nutty, fruity, floral, and raisin notes were evaluated through structured intensity scales and dynamic temporal perception. Statistical analyses included ANOVA, Tukey HSD, SNK, and Principal Component Analysis (PCA). The oak-aged chocolate showed greater woody perception and higher persistence of complex sensory attributes throughout consumption. TDS curves demonstrated sustained dominance of woody notes during the entire tasting period, accompanied by moderate raisin and toasted perceptions in the final stages. In contrast, the non-aged 80% chocolate exhibited stronger roasted and toasted dominance, with nutty characteristics emerging during consumption. PCA indicated close association between roasted and woody attributes, while fruity and floral notes remained less influential. Results demonstrate that oak maturation modifies both static and temporal sensory perception, contributing to increased complexity and persistence in high-cocoa chocolates.

Keyword: *cocoa aroma, wood maturation, Temporal Dominance of Sensations, Bean-to-bar chocolate, oak aging*

Valorisation of cocoa pod side streams to improve nutritional, sustainability and economic aspects of chocolate confectionery

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Background - Chocolate confectionery production faces nutritional, environmental and socio-economic challenges present in the conventional cocoa value chain. Considering the so far wasted cocoa pod for possible side-stream valorisation, made us identify great potential in using the cocoa pod husk endocarp and the cocoa fruit pulp juice as valuable, functional ingredients which, when coupled allowed for the use of synergistic benefits in new cocoa-based products.

Objective - Our development goal was to develop a Whole Cocoa Fruit Chocolate (WCFC) for which the sweetening and bulking properties of conventionally (up to 50%) added sugar from sugar beet or sugar cane were replaced by a functionally structured combination of the Cocoa Pod Husk Endocarp (CPHC) and a Cocoa Pulp Juice Concentrate (CPJC) which was denoted as Cocoa Gel (CG).

Methods - A processing technology was developed which enabled the generation of a gel-forming suspo-emulsion structure with CPJC droplets in cocoa butter pickering-stabilized and networked by micronized CPHC fibre particles, with the latter supporting CPJC-water immobilization by swelling. Technologically a novel two step shear stress controlled dispersing / mixing procedure was successfully introduced.

R**esults** - Resulting chocolate confectionery products were successfully tested for their premium sensory characteristics and their processability in industrial production environments.

Keyword: *whole cocoa fruit chocolate, cocoa pod husk and pulp juice valorisation, pickering suspo-emulsion gel processing*

Impact of process parameters on the 3D printability of heat-acid coagulated milk protein gels

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3D food printing offers a transformative approach to personalized dairy-based nutrition by customizing sensorial profiles. This study investigated eight heat-acid coagulated milk gel formulations by varying fat content (1.5%, 6.0%), coagulants (citric acid [CA], glucono-δ-lactone [GDL]), and temperatures (70°C, 90°C). Rheological testing confirmed that all samples exhibited shear-thinning behavior, with the storage modulus (G') consistently exceeding the loss modulus (G"). A loss factor (tan δ) near 0.3 indicated a predominantly elastic nature, ensuring the necessary balance between extrudability and structural stability. Water holding capacity for all samples was also evaluated to be above 80% for all samples. Using a modified extrusion-based 3D printer, line printing accuracy was evaluated. Statistical analysis via ANOVA and Fisher's LSD test revealed that coagulant type ($p = 0.0175$) and temperature ($p = 0.0022$) significantly impacting accuracy, while fat content did not. The optimal formulation utilizing citric acid, 1.5% fat, and 70°C, achieved a peak mean accuracy of 95.84%. Furthermore, the shape fidelity after 3D printing was evaluated for the optimized formulation to evaluate its ability to maintain intended dimensions and shape, with a value exceeding 95%. This confirms that milk gels, with optimized yield stress and elastic modulus, can produce highly precise, stable dairy food constructs.

Keyword: *3D printing, Personalized food, Additive manufacturing*

SURVEY OF COMMERCIAL COCOA QUALITY USING MAILLARD REACTION PARAMETERS

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Cocoa is a nutrient-dense food with well-documented beneficial properties. The consumption of minimally processed cocoa provides bioactive compounds associated with cardiovascular, neurological health, and mood modulation. Among cocoa products, cocoa powder is one of the most widely used, both directly and as an ingredient in food formulations.

Cocoa processing includes fermentation, drying, and spray drying, during which multiple chemical reactions occur. Among them, the Maillard reaction plays a central role. This non-enzymatic browning process involves reducing sugars and amino groups from amino acids, peptides, or proteins. Its progression can significantly alter the chemical and physicochemical properties of cocoa, leading to the formation of compounds not present in the raw material. Furosine is commonly used as a marker of early Maillard reaction stages, while hydroxymethylfurfural (HMF), formed through hexose dehydration, is associated with intermediate stages. In this study, early Maillard progression was assessed by quantifying furosine and HMF, while advanced stages were evaluated through absorbance at 420 nm in commercial cocoa powders with ≥70% cocoa content.

The results show that these markers, individually or combined, are reliable indicators of cocoa quality. They also enable retrospective evaluation of processing intensity and conditions, providing insight into the technological history of cocoa products.

Keyword: *quality, bioactivity, furosine, HMF, browning*

Upcycling Coffee Cascara into Instant Beverage Ingredients: A Sustainable Approach for By-Product Valorization

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Coffee cascara (coffee husk), a major by-product of coffee processing, represents an underutilized resource with significant potential for food applications. This study aimed to explore the upcycling of coffee cascara into value-added ingredients for instant beverage formulations. Cascara extracts were processed using standardized feed solutions (25% total solids) and converted into powder under controlled drying conditions (inlet temperature 160 °C), improving stability and shelf life. The results indicate that the incorporation of carrier materials enhances encapsulation efficiency and promotes the retention of bioactive compounds, particularly phenolics and caffeine. This approach supports the valorization of coffee by-products and contributes to circular economy strategies by reducing waste and enabling the development of functional ingredients. The findings highlight the potential of coffee cascara as a sustainable ingredient for innovative instant beverage applications within emerging food systems.

Keyword: *Coffee cascara, Instant beverages, Upcycling, By-product valorization, Circular economy*

IDENTIFICATION OF CONGENERS IN IRISH WHISKEY MATURING IN DIFFERENT TYPES OF CASKS

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Whiskey, an increasingly popular alcoholic beverage, has a distinct flavour shaped by its raw materials and production processes. Water and cereals such as barley are the primary ingredients, and production is generally well standardised, with mashing, fermentation, distillation, and maturation as the key steps. Among these, maturation has a notable impact on shaping whiskey flavour, as most of its distinctive flavours arise from additive, subtractive, and chemical interactions between new-make spirits and wood-derived compounds. This study addresses the gap in understanding the chemical transformations responsible for whiskey flavour development by identifying biomarkers of maturation.

An Ultra-High-Performance Liquid Chromatography (UPLC) coupled with a Diode Array Detector (DAD) method was optimised to determine maturation congeners in whiskey matrices, offering shorter analysis times than conventional High-Performance Liquid Chromatography (HPLC). Irish whiskey samples maturing in three types of casks were analysed within the first six months to compare their congener profiles.

The method was validated for linearity, detection limits, accuracy, and precision, successfully identifying and quantifying 15 maturation congeners, including vanillin, ellagic acid, gallic acid, and vanillic acid. Whiskey samples maturing in ex-sherry casks had significantly higher concentrations of congeners than those in ex-Bourbon, highlighting the influence of prior seasoning on whiskey flavour.

Keyword: *cask congeners, whiskey maturation, UHPLC-DAD, flavour*

Sustainability Gaps in Intelligent and Active Food Packaging: A Global Patent Landscape Analysis

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The increasing demand for safe, high-quality, and sustainable food products is driving innovation in food packaging systems. Intelligent and smart packaging technologies, capable of monitoring and interacting with food, have emerged as key solutions to improve food quality, extend shelf life, and reduce losses along the supply chain. This study aimed to analyze the global innovation landscape of intelligent food packaging with a focus on environmental impact and sustainability. A systematic technological prospecting was conducted using major patent databases, including Espacenet, Derwent Innovation Index, PATENTSCOPE, and Orbit Intelligence, covering the period from 1987 to June 2025. Keywords related to smart packaging were combined with sustainability terms and IPC/CPC classifications. The results revealed a significant decrease in patent filings when environmental and sustainability criteria were applied, highlighting a gap between technological innovation and sustainable packaging development. The findings emphasize the need to integrate environmentally sustainable solutions into intelligent packaging to reduce food waste and support circular economy strategies in global food systems.

Keyword: *Intelligent food packaging, Sustainable packaging, Food waste reduction*

A genotype-based assessment of physicochemical properties, cooking quality, and starch digestibility of rice under soil salinity stress

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A continuous increase in salt stress due to global warming poses a major threat to rice yield and quality. Given that the quality attributes and nutritive values of cooked rice are predominantly determined by starch's properties and structure, this crucial factor has been largely overlooked over the years. Therefore, the present research aims to understand the correlation of qualitative traits of various rice genotypes cultivated at different salinity levels in the Sundarban region, West Bengal, India. A total of 14 rice varieties, including 3 landraces, 6 salt-tolerant, and 3 salt-sensitive varieties, were collected from four different places in the Sundarban, and their physicochemical, functional, and in vitro starch digestibility properties were analysed to determine a correlation between salinity stress level and rice quality. The results show that grain dimensions, starch content, pasting temperature, and setback value varied among genotypes, but no significant effects were observed on colour or amylose content. Further alterations in cooked rice texture and digestibility have also been observed among the rice genotypes, but these changes were not prominent at different salinity levels. Overall, our results demonstrate that genotype-specific variations in rice quality and nutrition are more pronounced than the salinity levels of cultivated land.

Keyword: *Rice, Soil salinity, In-vitro digestibility, Amylose content, Cooked rice texture*

Fungal Solid-State Fermentation of Food Waste for the Development of Functional Ingredients

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Fungal solid-state fermentation allows for sustainable valorisation of food industry waste and by-products, producing protein rich biomasses with enhanced amino acid profile. Additionally, this biomass exhibits improved bioactivity, with fermentation reported to enhance antioxidant capacity, as well as antimicrobial, antidiabetic and antihypertensive potential. This study seeks to evaluate the effectiveness of solid-state fermentation in enhancing the potential of food waste for the development of functional ingredients.

B-grade cereals and legumes, including rice, soy and lupin pomace, were fermented using Aspergillus species, with unfermented substrates as controls. Extracts were prepared through methanolic extraction. Antioxidant capacity was assessed via total phenolic and flavonoid content, and antioxidant activity assays including FRAP, DPPH, ABTS and ORAC. Antimicrobial activity was evaluated via disc diffusion and MIC methods, while antidiabetic and antihypertensive potential were assessed using α-amylase and ACE inhibition assays.

Fermentation was found to increase the overall antioxidant capacity, with significant increases observed in both phenolic and flavonoid content. Initial analysis of antidiabetic activity identified moderate level of α-inhibition in both the fermented and unfermented substrates, ranging from 22 to 31%. This study demonstrates the effectiveness of solid-state fermentation and emphasises its potential for food waste valorisation in the development of new sustainable functional foods.

Keyword: *Fermentation, Bioactivity, Functional food, Valorisation*

An Investigation of the Effect of Food Waste Diets on the Bioactivity of Hermetia illucens and Tenebrio molitor Larvae for Functional Food Applications

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There is growing interest in Hermetia illucens (Black soldier fly) and Tenebrio molitor (Yellow mealworm) larvae as sustainable, novel food sources. These insects have demonstrated high resource efficiency and reduced environmental impact, showing strong potential for sustainable, scalable food applications. They are rich in bioactive compounds, with reported antioxidant, antimicrobial and antidiabetic effects. These species were screened to evaluate their suitability for functional food applications.

Larvae were reared on diets consisting of bakery and dairy waste, alongside control diets of chicken feed and wheat bran. Larvae extracts were prepared through methanolic extraction. Antioxidant capacity was assessed via total phenolic and flavonoid content, and antioxidant activity assays including FRAP, DPPH, ABTS and ORAC. Antimicrobial activity was evaluated via disc diffusion and MIC methods, while antidiabetic and antihypertensive potential were assessed using α-amylase and ACE inhibition assays.

Higher antioxidant capacity was seen in the waste substrate diets, with significant increases in TPC, TFC, FRAP and DPPH activity observed. Initial analysis of antidiabetic activity also identified an increase in α-amylase inhibition in both species, ranging from 7 to 20%. These findings demonstrate that incorporating food industry waste into insect diets can enhance bioactive properties, promoting waste valorisation and development of sustainable, functional ingredients.

Keyword: *Insects, Bioactivity, Functional foods, Valorisation*

Pigments from Rhodotorula mucilaginosa to increase quality and functionality of fermented chickpea based hummus

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Microbial pigments are typically produced during the stationary growth phase of yeasts, bacteria, and fungi, with pigment yield being directly proportional to biomass accumulation. Microorganisms suitable as natural food colorant sources should exhibit key characteristics such as broad substrate utilization, tolerance to environmental fluctuations, and non-toxicity. In addition, sustainable extraction processes must be considered to ensure industrial applicability. This study focuses on the pigment-producing yeast Rhodotorula mucilaginosa, known for synthesizing pigments with diverse chemical and physical properties that can provide both visual appeal and functional benefits in food products. The primary objective was to identify optimal production conditions to maximize pigment yield and to evaluate their potential as sustainable, functional food-grade colorants. Pigments extracted from R. mucilaginosa, using high-pressure homogenization (100 MPa), were characterized for their antimicrobial and antioxidant activities. These pigments were subsequently incorporated into a food formulation at concentrations ranging 20-40 mg per gram of product. A fermented chickpea-based matrix was selected as the food carrier to develop a functional, well-characterized ingredient suitable for hummus production. The final product was evaluated in terms of microbiological safety, quality parameters, and antioxidant capacity. The results demonstrated the promising potential of microbial-derived pigments as sustainable ingredients for food applications.

Keyword: *R. mucilaginosa,, pigments, high presure homogenization, fermented ingredient, functional features*

Encapsulation of water-soluble components by oil films

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In food systems, flavor components as salt and sugar tend to be perceived as more intense when heterogeneously distributed in layers or granules rather than uniformly dispersed. However, unevenly distributed water-soluble components diffuse during storage, changing to a uniform distribution. Therefore, even if encapsulated in polysaccharide gel or gelatin gel, unless the water-soluble components are completely sealed within the capsule, they will become uniformly distributed within a few days. However, rigid encapsulation is counterproductive, as it prevents the release of water-soluble components in the oral cavity, allowing them to be swallowed, digested, and absorbed in digestive organs. Therefore, it is necessary to achieve a balance between the seemingly contradictory properties of retaining water-soluble components within flavor granules during storage and releasing them sufficiently in the oral cavity.

Encapsulation by oil films is expected to prevent the diffusion of water-soluble components from inner layer to outer water layer. This study investigates an encapsulation method in which a capsule is coated with an oil film, sealing the enclosed water-soluble components during storage, while allowing them to be easily released by crushing under stress. Experimental results will be presented for the capsulations of sugar, salt and milk.

Keyword: *oil film, salt, sugar, Encapsulation, milk*

Variability in the Pun1 locus in Capsicum germplasm

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The Pun1 locus is primarily responsible for the pungency of species of the genus Capsicum, controlling the synthesis of capsaicinoids in hot and non-hot peppers, and stands out as one of the main loci to be analyzed when characterizing a germplasm bank. In this context, the present work aimed to evaluate the genetic variability in the Pun1 locus in pepper accessions belonging to the Pepper Germplasm Bank of the Genus Capsicum – EAH (Advanced Studies in Horticulture). To this end, the terminal end of exon 1 (approximately 175 bp) of the Pun1 gene was analyzed in 236 pepper accessions (208 pungent and 28 non-pungent) using PCR. Based on the results obtained, it was possible to verify that all accessions, regardless of whether they were pungent or not, presented the 300 bp band, which is associated with pungency, indicating, therefore, that the Pun1 gene was intact in this region. Therefore, it is possible to conclude that the analyzed region of exon 1 is conserved among the evaluated accessions and is not associated with the absence of pungency. Considering the importance of pungency for breeding programs, in-depth molecular analyses will be performed on the Pun1 locus, addressing both exon 1 and exon 2.

Keyword: *Pepper, pungency, mutation*

Advancing Sustainable Food Systems with Mobile Fruit Processing: A Feasibility Study on Upcycling Underutilized Produce in Georgia

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As the third-largest producer of fresh fruits and vegetables in the United States, Georgia experiences significant post-harvest losses due to strict market standards and limited regional processing infrastructure. This study designed and evaluated the feasibility of a mobile fruit processing unit to convert underutilized produce, including blueberries, peaches, watermelons, and citrus, into value-added products such as juice and purée. The mobile unit includes washing, pre-treatment, juice extraction, pasteurization, and packaging equipment within a truck-sized container. The study combines geographic information system analysis (GIS), techno-economic analysis (TEA), and life cycle assessment (LCA). TEA results show positive economic performance across all fruit types, with net present values (NPV) ranging from $1.4 to $11.9 million and annual revenues from $0.6 to $2.7 million per mobile unit. Watermelon shows the highest profitability, while citrus has the lowest, but remains economically viable. GIS analysis was used to classify regions by fruit density levels to estimate transportation distances and supply routes. LCA will be conducted in future work to quantify the environmental impacts associated with system deployment. Overall, the results suggest that a mobile fruit processing unit can be a practical, economically viable solution for reducing food loss across multiple fruit commodities.

Keyword: *Mobile Fruit Processing, Food Loss and Waste, Sustainable Food Systems, GIS Analysis, Techno-economic analysis*

Cold Plasma induced surface engineering for water resistance and barrier for next-generation biobased packaging

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The industrial adoption of biobased food packaging is constrained by poor barrier performance, hydrophilicity, and limited process scalability. This work presents an integrated process-engineering framework to overcome these limitations through coupling cold oxygen plasma (CP) surface activation with solvent-controlled self-assembly.

CP treatment of chitosan–nanocellulose systems reduced solution viscosity (~40%), enabling improved film processability, while simultaneously increasing surface roughness and introducing oxygen-functional groups that lowered water contact angle from ~78° to ~36°. Plasma-assisted layer-by-layer deposition of zein enhanced interfacial adhesion and significantly reduced oxygen and water vapor permeability; however, it also revealed a critical trade-off, where improved barrier properties coincided with increased surface hydrophilicity.

To address this, solvent-driven crystallization of suberin coatings was investigated as a parallel surface engineering strategy. Rapid evaporation (acetone) produced dense nanostructures with low droplet adhesion, whereas slower evaporation (ethanol) yielded microstructured surfaces with increased pinning behavior.

By integrating plasma-induced surface activation with evaporation-controlled morphology development, this study establishes process–structure–function relationships that enable deterministic control of wettability and barrier performance. The results provide scalable design pathways for next-generation biobased packaging systems aligned with industrial processing constraints.

Keyword: *cold plasma, biobased packaging, water resistance, oxygen barrier, Crystallization kinetics*

SOLID-STATE FERMENTATION OF PLANT-BASED INGREDIENTS AS SUBSTRATES USING LACTIPLANTIBACILLUS PLANTARUM: GROWTH KINETICS AND TECHNO-FUNCTIONAL PROPERTIES

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Solid-state fermentation (SSF) offers a promising approach to modify the functionality of plant-based ingredients for meat analogues (PBMA). This study investigated SSF with Lactiplantibacillus plantarum on chickpea flour (CF), oat flour (OF), and pea-protein isolate (PPI), and evaluated fermentation-induced changes in functional properties. L. plantarum showed substrate-dependent growth, approximately 1.3×10^{11}, 1.4×10^{10}, and 5.7×10^{9} CFU/g in CF, OF, and PPI at 48 h, respectively. Highest growth in CF was due to available carbon and nitrogen sources, whereas PPI followed amino acid catabolism. Growth data were fitted with Logistic, Modified Gompertz, and Baranyi–Roberts models, with Modified Gompertz providing best fit across all substrates (R^2=0.9898–0.9948, RMSE=0.102–0.107, and minimum AICc), enabling objective comparison of substrate suitability. CF and OF showed μ_{max} (0.31–0.36 h^{-1}), whereas PPI has 0.11 h^{-1}. Fermentation significantly acidified the chickpea and oat matrices (pH ~4.4) and reduced free sugars. Water absorption increased primarily due to hydration, with fermentation contributing through proteolysis-driven exposure of hydrophilic groups. Emulsifying activity and stability were higher for raw sample and were reduced or maintained during fermentation, depending on soluble protein content and degree of hydrolysis. Overall, substrate composition significantly influenced growth kinetics and functional properties during SSF, thereby providing valuable insights for developing fermented PBMAs.

Keyword: *Lactic acid fermentation, Microbial growth modelling, Chickpea, Oat flour, Pea protein*

INTEGRATION OF EMERGING TECHNOLOGIES FOR THE PRODUCTION OF DEHYDRATED EDIBLE JELLYFISH IN A ZERO-WASTE BIOREFINERY FRAMEWORK

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Jellyfish are an important food source in East Asia and an emerging novel food in Europe, with the species Cassiopeia andromeda valued for its nutritional profile. Conventional processing relies on prolonged brining with inorganic salts, which is inefficient and lacks standardized inactivation, leading to variability in quality and safety. An innovative processing pathway was developed using a mild pulsed electric field (PEF) pretreatment (1.079 kJ/kg) for inactivation, followed by osmotic dehydration. The PEF treatment effectively inactivated jellyfish without affecting phenolic content, antioxidant activity, physicochemical properties, or generating microbial hazards. Various dehydration solutions (saccharose, sorbitol, xylitol, honey, glycerol, agave syrup) reduced moisture at 40% solids within 1h at room temperature, with saccharose showing the highest efficiency. Optimization identified ideal conditions at 50% saccharose, 30°C, and 2.5 h, achieving moisture reduction from 95% to 65%. Additional pretreatments (liquid nitrogen freezing, higher PEF intensity at 10.79 kJ/kg, and thermal-treatment (boiling water /10 min) did not induce microbial contamination or quality loss, except for thermal degradation affecting protein solubility and phenolic content. Process-derived liquid streams were combined and valorized via hydrothermal humification (280–290 °C), producing humic and fulvic acids suitable for direct use. This approach enables a zero-waste biorefinery with improved resource efficiency.

Keyword: *alternative food materials, food quality, nonthermal processing, sidestream valorization, circular bioeconomy*

Influence of atmospheric pressure plasma jet processing parameters on total plasma-generated reactive oxygen species in aqueous phase and its quantification using iodine and starch

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The efficiency of atmospheric pressure non-thermal plasma is largely influenced by the multiple reactive oxygen species (ROS) generated and exposed to the target food material. This study investigated the influence of varying processing conditions - helium gas flow rate (1.5, 2, 2.5, 3, 3.5, 4 L/min), treatment time (0, 2, 4, 6, 8, 10 min) and distance between plasma jet outlet and liquid surface (2, 2.5, 3 cm) - on the total plasma-generated ROS in the aqueous phase by an atmospheric non-thermal plasma jet (APPJ) using iodine and starch reactions. The results showed that the plasma processing conditions for the maximum total ROS supplied are 3 L/min helium gas flow rate at 2.5 cm headspace distance for 10 min treatment time. Interactions between gas flow rate and headspace distance was also observed, indicating that the effect of gas flow rate is dependent on the headspace distance. A spectrophotometric method using iodide and starch solution serves as a simple, reliable and practical tool to indicate the total amount of ROS in the aqueous phase supplied to target food materials. This potentially facilitates comparison across studies using various APPJ technologies and experimental setups, as well as the translation to industrial scale in future.

Keyword: *Atmospheric pressure plasma jet, Reactive species, Plasma chemistry, Spectroscopy*

Enhancing lipid NPs prediction and design for food bioactive delivery using the AI language model and multi-task learning

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Lipid nanoparticles (LNPs) have broad potential as delivery systems for improving the protection, bioaccessibility, and utilization of food bioactive compounds. However, formulation screening remains time-consuming and data-limited. Here, we developed an artificial intelligence framework integrating a chemical language model with multi-task learning to predict key LNP formulation properties. We constructed a lipid candidate structure dataset containing approximately 16,000 LNP-related molecules and compiled experimental datasets for delivery efficiency and apparent pKa. A lipid-tailored language model was pre-trained using SMILES enumeration-based data augmentation to learn molecular representations, which were integrated with formulation information in a multi-task learning architecture. Across 10 repeated experiments with 5-fold data augmentation, our model achieved ROC-AUC values of 0.862 ± 0.037 for delivery efficiency and 0.867 ± 0.032 for apparent pKa. External validation demonstrated a prediction accuracy of 0.882 for in vivo delivery efficiency prediction. Ablation analysis indicated that pre-training was the major contributor to performance, while multi-task learning improved both tasks simultaneously. This framework may accelerate the prediction and screening of LNP formulations, providing methodological support for the rational design of lipid nanocarriers to improve the delivery and utilization of food bioactive compounds.

Keyword: *Food bioactive compounds, Lipid nanocarriers, Rational design, Language models, Multi-task learning*

Production and Nutritional Assessment of Cocoa (Theobroma cacao) Powder Beverage Using Date Palm Fruit (Phoenix dactylifera) as Sweetener

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Cocoa powder is among the most consumed beverages in the world and is conventionally sweetened with refined sugar. Despite its nutritional benefits such as antioxidants (flavonoids) and minerals content, heath- conscious-consumers avoid it due to its high sugar content, which has been linked to rapid sugar spikes, high caloric value and lack of micronutrients. Cocoa pod and date palm fruit processed into flour were formulated at ratios of 90g:10g, 70g:30g, 60g:40g, and 50g:50g for the cocoa powder and date palm fruit powder, respectively, while commercial beverage powder was used as the control. The samples were analyzed for functional properties, proximate composition, antioxidant activities, and sensory properties. The functional properties ranged from 0.63% to 0.71%, 1.30% to 1.85% and 1.22% to 4.47 min/sec for bulk density, water absorption capacity and wettability respectively. The proximate composition ranged from 1.85% to 3.89%, 5.80% to 9.28%, 1.52% to 4.07%, 1.94% to 10.67%, 8.58% to 12.87%, 61.27 to 80.35% and 373.02 to 398.72 kcal/j for moisture content, ash, crude fiber, fat, crude protein, carbohydrate and energy value, respectively. The antioxidant activities were 63.67 to 84.63% and 384.52 to 793.25 mg/GAE/100g for DPPH and total polyphenol, respectively. The cocoa/date beverages were liked moderately by the panelists,

Keyword: *Cocoa, date palm fruit, cocoa beverage, antioxidants properties, refined sugar*

Starch-EGCG complex alleviates glycogen fragility in db/db mice via gut microbiota–mediated bile acid metabolism and the FXR-GBE/GYS pathway

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Type 2 diabetes mellitus (T2D) remains a major global metabolic health challenge. Resistant starch type 5 (RS5), formed by complexing starch with guest components, represents a promising dietary approach for hyperglycemia control. This study used a novel RS5 complex of corn starch with EGCG (CSEG) and evaluate its beneficial effects and underlying mechanisms on T2D in db/db micemodel, with a specific focus on gut microbiota modulationand hepatic glycogen structure. db/db mice were fed a diet supplemented with CSEG for 6 weeks. Multidimensional assessments were performed, including insulin sensitivity tests, structural analysis of liver glycogen through size-exclusion chromatography, gut microbiota profiling, colonic metabolomics, and evaluation of hepatic signaling pathways. The results revealed that CSEG reshaped the gut microbiota composition in db/db mice by enriching beneficial genera such as Parabacteroides distasonis and elevating bile acids TCA and TDCA. These alterations collectively enhanced intestinal barrier function and stimulated the secretion of FXR. Furthermore, CSEG activated hepatic GYS/GBE signaling pathways, promoted glycogen synthesis, and improved glycogen structural stability via an increased proportion of α-particles, thereby ameliorating glucose homeostasis. This study provides novel insights into the prebiotic potential of CSEG as a functional food ingredient for T2D management.

Keyword: *type 2 diabetes, resistant starch, glycogen*

IMPROVING THE FUNCTIONALITY OF THE RICE BRAN PROTEIN BY COMBINING THE COLD PLASMA AND HIGH-PRESSURE -ASSISTED COVALENT CONJUGATION WITH CARRAGEENAN

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Rice bran protein (RBP) is often overlooked due to its poor solubility, which limits its application in aqueous food systems. This study aimed to improve the functionality of the RBP by cold plasma (CP) and high-pressure processing (HPP)-assisted glycation reaction with carrageenan (CAR) at ambient conditions. The CP treatment at 2 kV for 10 minutes and HPP at 300 MPa for 15 minutes increased the degree of grafting between RBP and CAR at dry heating at 40℃ for 72 hours. Notably, combined CP and HPP treatment resulted in enhanced grafting between RBP and CAR with fewer amine groups of 7.44 residues/mole. This enhancement is attributed to protein unfolding induced by CP and HPP treatments, which exposed hydrophobic amino acid residues and facilitated interactions with the carbonyl groups of CAR. The secondary structural analysis revealed a transition from ordered β-sheet structures to more flexible random coil conformations, contributing to improved solubility and thermal stability of RBP. Furthermore, the CP+ HPP modified RBP-CAR conjugate gels exhibited resilient and stable recovery with significantly enhanced rheological and textural properties, highlighting their potential application in texture-modified food systems such as meat analogues and beverages.

Keyword: *Rice bran protein, Carrageenan, Rheology, High-pressure processing, Cold plasma*

SYNERGISTIC GELATION BEHAVIOR OF XANTHAN GUM AND POLYSACCHARIDES ISOLATED FROM SEA COCONUT

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Natural polysaccharides are widely distributed in nature and possess diverse biological activities, attracting considerable research interest for their potential applications in the food, pharmaceutical, and cosmetic industries. However, little is known about polysaccharides in sea coconut (SCP), which has been used as a nutraceutical. SCP was extracted via water extraction followed by ethanol precipitation to give the final product with a yield of 9.92%. Structural elucidation revealed that SCP had a molecular weight of 18.174 kDa and was predominantly made of a linear polysaccharide with a mannose-to-galactose molar ratio of 5:1. The backbone comprised →4)-β-D-Manp-(1→, →4,6)-β-D-Manp-(1→, β-D-Manp-(1→, →4)-α-D-Manp-(1→, and →4)-β-D-Manp-(1→ residues, with terminal α-D-Galp residues attached as side chains. Despite the lack of intrinsic gelation capacity, SCP formed a firm and thixotropic hydrogel (SX) upon blending with xanthan gum (XG). The most pronounced synergistic interaction occurred at an SCP/XG ratio of 5:5, yielding a mixed hydrogel (SX) with higher storage modulus (G′) values at ambient temperature and during heating (25–80 °C) than comparable tara gum/XG (TX) and locust bean gum/XG (LX) systems. These findings provide insights into the fine structure of SCP and its synergistic gelation with XG.

Keyword: *Polysaccharide, Sea coconut, Synergistic interaction, Hydrogel, Structure*

ENCAPSULATION OF IRON WITH PECTIN FROM SUGAR BEET PULP: A SUSTAINABLE STRATEGY FOR FUNCTIONAL FOODS

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Iron deficiency anemia is one of the most prevalent nutritional disorders worldwide, particularly affecting children, women of reproductive age, and pregnant women. Conventional iron supplements often present low bioavailability, gastrointestinal discomfort, and poor stability in food matrices. Encapsulation has emerged as a promising strategy to overcome these limitations and enable iron incorporation into functional foods.

Pectin, a heteropolysaccharide recovered from fruit and vegetable by-products, represents a sustainable, food-grade carrier with relevant techno-functional and bioactive properties. In this work, pectin extracted from sugar beet pulp was evaluated as an encapsulating matrix for iron(II) sulfate. Extraction conditions were optimized using green alternatives, followed by structural and physicochemical characterization. Iron encapsulation was performed using spray-drying and ionic gelation. Preliminary results show successful particle formation, with encapsulation efficiency and particle size strongly influenced by pectin structure and treatment conditions. The systems were further characterized in terms of morphology, zeta-potential, and in vitro release behavior. Structural organization at different length scales is being investigated using SAXS/WAXS to better understand matrix–iron interactions and their impact on digestion.

This work contributes to the AVANZA_IRON project (PID2024-162710OB-I00), which aims to valorize agri-food residues within a circular economy framework while developing improved iron delivery systems.

Keyword: *pectin, iron encapsulation, agri-food by-products, spray-drying, ionic gelation*

Optimisation of Texture Profile Analysis Conditions for Early-Stage Cultivated and Alternative Meat Prototypes

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Texture is a key quality attribute for cultivated and alternative meat products, but texture profile analysis (TPA) results can be strongly affected by testing conditions, limiting comparison across studies. In this study, response surface methodology was used to optimise TPA parameters for early-stage cultivated and alternative meat prototypes.

Raw beef, mycoprotein-based meat analogue, extruded pea protein isolate, and cultivated meat samples were analysed under different hold times, compression levels, and test speeds. The measured texture attributes included hardness, springiness, cohesiveness, chewiness, and resilience. Across the tested samples, compression level was the dominant factor affecting texture responses, while cultivated meat showed stronger quadratic and interaction effects, suggesting higher sensitivity to parameter combinations and greater structural complexity.

A stable testing window was identified at 1.0–1.5 s hold time, 55–60% compression, and 2–3 mm/s test speed. Validation using raw beef and mycoprotein samples showed that this region reduced within-sample variation while maintaining significant differences between sample types. Additional probe-size comparisons further indicated that probe geometry influences measurement sensitivity and should be selected according to sample dimensions and structure.

These results provide a practical framework for improving the reproducibility and comparability of instrumental texture measurements in cultivated and alternative meat research.

Keyword: *cultivated meat; alternative meat; texture profile analysis; response surface methodology; compression level; testing conditions; probe geometry*

VALORIZATION OF IMMATURE CITRUS BYPRODUCTS: COMPARATIVE ANALYSIS OF PHYTOCHEMICAL PROFILES AND ANTIOXIDANT CAPACITIES OF TANKAN, MURCOTT, AND KOTOKAN DURING FRUIT MATURATION

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Citrus thinning practices generate substantial amounts of underutilized immature fruit waste, despite its bioactive potential. This study evaluated whole fruits of three varieties, Citrus tankan Hayata (Tankan), Citrus reticulata × C. sinensis (Murcott), and Citrus kotokan Hayata (Kotokan), across six maturity stages from June 2025 to February 2026. HPLC profiling quantified eleven major flavonoids and phenolics, including narirutin, naringin, hesperidin, neohesperidin, hesperetin, naringenin, nobiletin, tangeritin, rutin, quercetin, and kaempferol, with narirutin dominant in immature Murcott (11.8 mg/g). Total phenolic content (TPC) declined significantly during maturation, with Murcott TPC falling from 56.89 to 11.75 mg GAE/g. Antioxidant assays revealed contrasting trends: Murcott ABTS scavenging activity decreased sharply from 15.00 to 5.86 mg trolox equivalent/g, while DPPH scavenging gradually increased from 4130.48 to 4877.66 µg vitamin C equivalent/g. This divergence reflects the distinct reaction mechanisms of the two assays, with ABTS more responsive to declining hydrophilic phenolic content and DPPH influenced by shifts in lipophilic antioxidant compounds during ripening. Overall, immature fruits from thinning practices possessed superior phytochemical and antioxidant profiles compared to ripened fruits, supporting their potential as a sustainable phytochemical resource for food and nutraceutical applications.

Keyword: *Citrus thinning, Waste valorization, Phytochemicals, Antioxidant activity, Functional food*

ULTRASOUND-MODIFIED TARWI (LUPINUS MUTABILIS) PROTEIN AS A SUSTAINABLE WALL MATERIAL FOR IRON MICROENCAPSULATION

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Iron deficiency remains a major global public health concern, particularly in developing countries. Conventional iron fortification strategies are often limited by poor bioavailability and undesirable sensory changes in food products. Therefore, the development of alternative delivery systems using sustainable plant-based materials is of growing interest.

This study evaluates the potential of tarwi (Lupinus mutabilis Sweet, Andenes variety), an underutilized Andean legume with a high protein content (~38%), as a wall material for iron microencapsulation. Protein concentrates were obtained from debittered and defatted tarwi flour and modified using ultrasound treatment to enhance their functional properties. Microcapsules were produced using a freeze-drying (lyophilization) technique, incorporating ferrous sulfate as the core material.

The effects of protein concentration and formulation conditions on encapsulation performance and physicochemical properties were assessed. Results indicate that ultrasound treatment improves protein functionality, enabling the formation of stable microcapsules with potential for controlled iron delivery.

These findings highlight the potential of tarwi protein as a sustainable encapsulating agent, contributing to innovative strategies for improving iron fortification while promoting the use of native Peruvian biodiversity.

Keyword: *Lupinus mutabilis, microencapsulation, iron fortification, plant protein*

FUNCTIONAL CHARACTERISTICS OF UPCYCLED AVOCADO SEED STARCH AND ITS EFFECTS ON PHYSICOCHEMICAL AND STORAGE PROPERTIES OF SET-TYPE YOGHURT

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Avocado processing generates side-streams, mostly seed which end up in landfills, threatening environmental sustainability. Valorization of these side streams in food creates circular economy and provides nutritional, economic and environmental benefits. The objective of this study was to extract avocado seed starch, analyze, and test its performance in set yoghurt. Hass avocado seeds were sourced from an avocado oil processing company in Kenya. Starch extraction was done conventionally and through rotary rewatering equipment (Rodee). The starch was characterized by Fourier Transform Infrared (FTIR) Spectroscopy and Nuclear Magnetic Resonance (NMR) relaxation. Different concentrations of avocado seed starch (AS) and cornstarch (CS) were applied in set yoghurt and their effects on physicochemical and storage properties analyzed at 0, 14, and 28 days of storage. Results showed that AS had more compact and structurally ordered molecular organization than corn starch, with stronger water-starch interactions and reduced water mobility, thereby enhancing gel network formation and improving stability against syneresis in yoghurt. Rheological measurements of set yoghurts showed that higher CS increased viscosity, while AS lowered apparent viscosity. Addition of starch resulted in lowering T1 and T2 values. From these findings, avocado seed starch can be considered for use as stabilizers in set yoghurt production.

Keyword: *avocado starch, valorization, gel-network, stabilizer, spectroscopy*

Beyond Gelatin: Plant-Based Protein Gummies

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The increasing demand for plant-based functional confectionery has driven the exploration of alternative protein delivery systems. This study focuses on the development of vegan gummy candies enriched with protein matrix obtained through combined ultrasound and microwave assisted extraction. The dual-treatment approach significantly improved protein yield (up to 86%) while reducing particle size, leading to enhanced functional properties such as solubility, emulsifying activity, and foaming stability. High-methoxyl pectin (4-6%) was employed as a plant-based gelling agent under optimized acidic conditions (pH 3.0–3.5) and high solids content (78-80 °Brix) to replace conventional gelatin. The developed gummies exhibited a protein content of 15-18 g/100 g, with desirable textural properties indicated by storage modulus (G') values of 280-350 Pa and water-holding capacity of 72.4 ± 2.1%. Sensory evaluation demonstrated acceptable scores for texture, appearance, and overall acceptability. The product remained stable for up to 90 days at ambient temperature. This study highlights a sustainable and clean-label strategy for developing protein-enriched vegan confectionery using green processing technologies.

Keyword: *Plant-based confectionery, Vegan gummies, Protein fortification, High-methoxyl pectin, Clean-label*

Bioprocess Optimisation of Seeding Density and Media Exchange for Porcine Satellite Cell Expansion

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Porcine satellite cells (PSCs) are a key cell source for cultivated meat production, but the effects of seeding density and media exchange on cell expansion remain unclear. In this study, PSCs and C2C12 cells were cultured at different initial seeding densities without media exchange, and their growth, nutrient consumption, and differentiation were evaluated.

At low seeding-density, cell growth stopped after a certain stage, even though nutrients remained in the medium. In contrast, cells seeded at high density continued to proliferate until the culture surface was fully occupied, after which differentiation began. Spent media analysis using partial least squares-discriminant analysis showed clear differences in nutrient utilisation between the two groups. Low-density cultures showed significantly higher glucose consumption and lactate production rates than high-density cultures on a per-cell basis. However, transferring spent medium from high-density cultures to low-density cultures did not restore growth, suggesting the growth restriction of low-density could not be explained simply by the lack of accumulated soluble growth-promoting factors. Variable importance in projection analysis identified glucose depletion as the main factor associated with growth restriction in low-density cultures.

These results show that both seeding density and timely media exchange are important for efficient PSC expansion in cultivated meat production.

Keyword: *cultivated meat; porcine satellite cells; seeding density; media exchange; nutrient consumption; glucose depletion*

MICROBIAL SAFETY AND QUALITY OF SELECTED FOODS FROM PACKAGE-FREE STORES

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Package-free stores have reemerged as environmentally sustainable, zero-waste alternatives compared to conventional pre-packaged foods. However, there is paucity of research on the microbiology and the potential for added risk in foods sold through these systems. This study investigated the microbiology of selected foods from package-free stores in Metro Manila, Philippines based on indicators for bacteria (APC), fungi (YMC), coliforms (TCC), and S. aureus (SAC). Dried Cranberries (DC), Rolled Oats (RO), and Dried Herbs (DH) were selected as representatives for RTE foods, non-RTE foods, and Spices, respectively. From 27 samples tested, 92% complied with Philippine regulatory limits for APC, YMC, TCC, and SAC. However, DH exceeded SAC limits in 18% of all samples tested. Significant variability in overall microbial load between product categories and test stores was also observed. Given these, package-free stores may exhibit elevated microbial loads for indicators as well as potential pathogens like S. aureus, suggesting risks which have to be considered for package-free systems. This study serves as a baseline for further investigations on the microbial safety and quality of package-free stores in the Philippines to enable improvements in industry best-practices and the development of suitable regulations moving forward.

Keyword: *Package-free stores, Microbial quality and safety, Zero waste, Sustainable food systems*

Life Cycle Assessment of Plant Proteins Using Protein Quality-Related Functional Units

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Plant-based protein alternatives have gained prominence within sustainable food systems, with life cycle assessment (LCA) serving as a key tool for evaluating their environmental benefits. However, conventional LCAs rely on mass- or economic-based functional units, which may favor products with lower environmental impacts regardless of nutritional quality. While nutrition-related functional units are increasingly adopted, most studies consider only protein content, neglecting digestibility and Digestible Indispensable Amino Acid Score (DIAAS), metrics that more accurately reflect protein and amino acid bioavailability. To address this gap, our study applied protein digestibility and DIAAS as functional units to assess nine commercially available plant proteins, including concentrates and isolates from pea, soy, faba bean, wheat gluten, lupin, and canola. Compared to traditional mass-based assessments, where concentrates generally exhibit lower environmental impacts due to fewer processing steps, incorporating nutritional metrics substantially altered rankings. Notably, isolates of pea and faba bean outperformed their corresponding concentrates, while concentrates remained advantageous for other sources. Environmental hotspots were identified in both cultivation and processing stages, indicating key optimization opportunities. These findings demonstrate the necessity of integrating protein quality into LCA frameworks and provide a foundation for developing a plant protein nutritional LCA database to inform sustainable ingredient selection.

Keyword: *Plant-based protein, Life cycle assessment, Functional unit, Digestibility, DIAAS*

Himalayan Wild Blueberry (Vaccinium glaucoalbum): Chemical Composition and Functional Potential

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Himalayan wild Blueberry (Vaccinium glaucoalbum), locally known as Frepchang, has long been part of the traditional diet of the Monpa community in Arunachal Pradesh, India. Despite generations of traditional use, scientific information on its chemical composition and functional potential remains limited. This study comprehensively evaluated the fruit's physicochemical properties, proximate composition, mineral profile, antioxidant activity, and phytochemical composition to assess its potential for future food applications.

The fruit exhibited high total soluble solids (20.06 °Brix), appreciable vitamin C (17.85 mg/100g), total sugars (7.06 g/100g), low pH (2.57), and titratable acidity (1.04%, as citric acid). Proximate analysis (per 100g fresh weight) revealed moisture (80.65%), carbohydrates (15.77%), fiber (1.74%), protein (1.00%), fat (0.32%), ash (0.52%), and an energy value of 69.96 kcal/100 g. Potassium (1378 mg/kg), calcium (343.7 mg/kg), and magnesium (102.1 mg/kg) were the predominant minerals. The fruit also showed high total phenolic content (335.10 mg GAE/100g) and strong antioxidant activity (91.54% DPPH inhibition). HPLC analysis identified rutin, epigallocatechin, catechin, apigenin, and syringic acid as the major phenolic compounds.

These findings provide a comprehensive characterization of the Himalayan wild blueberry and highlight its potential for the development of functional foods, nutraceuticals, and other value-added food products.

Keyword: *Vaccinium glaucoalbum, Himalayan Wild Blueberry, Traditional foods, Chemical composition, Functional Foods*

Characterization of Sola l 7, a nonspecific lipid transfer protein in tomato seed

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Introduction: Tomato seeds are a protein-rich by-product with increasing potential for food applications. To support the safe utilization of this emerging ingredient, its allergenic proteins require detailed characterization. Among identified tomato allergens, Sola l 7, a seed-derived nonspecific lipid transfer protein (nsLTP), has attracted attention due to its structural stability and potential resistance to processing and digestion.

Objective: This study aimed to purify Sola l 7 and characterize its structural features, digestion stability, and physicochemical properties under varying pH and ionic strength conditions.

Results: Sola l 7 was purified using isoelectric precipitation followed by anion exchange chromatography. The purified protein and its simulated gastrointestinal digestion products were analyzed using Tris-Glycine and Tris-Tricine electrophoresis systems, respectively. Under reducing conditions (β-mercaptoethanol), Sola l 7 migrated as a monomer, whereas it appeared as a higher-molecular-weight oligomer under non-reducing conditions, indicating disulfide bond-mediated assembly. Simulated digestion showed that Sola l 7 remained largely intact during the gastric phase and underwent partial degradation during the intestinal phase. In addition, Sola l 7 maintained structural stability across a range of pH and ionic strength.

Significance: These results provide analytical insights for the identification and characterization of Sola l 7 in food systems.

Keyword: *Protein characterization, Novel food, Simulated gastrointestinal digestion, Tomato seed allergen, Structure stability*

PRODUCT DEVELOPMENT OF INSTANT ULTRA-LOW GLYCEMIC INDEX RICE PORRIDGE

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A common concern among diabetics in the Philippines is the limited availability of ultra-low glycemic index (GI) rice products. To address this, the study explored the development of a healthy and convenient alternative to traditional high-GI rice by using ultra-low GI rice from the International Rice Research Institute to produce instant rice porridge. Preliminary testing evaluated the texture profiles of various reconstituted rice samples for the development of instant rice through instrumental and sensory methods. Selected treatments were then formulated and subjected to consumer acceptability testing and proximate analysis. Results showed that ultra-low GI rice soaked for 2 hours most closely matched the control in terms of texture. The developed porridge had the following composition: moisture (10.66% ± 0.08), protein (24.78% ± 0.24), fat (1.56% ± 0.17), and ash (2.18% ± 0.10). Sensory evaluation indicated generally desirable attributes, though improvements in texture are still needed. The product received an overall rating of “Slightly Acceptable” based on a 9-point hedonic scale. Overall, the findings suggest that instant porridge made from ultra-low GI rice is a nutritionally viable and moderately acceptable option for diabetics, with potential for further enhancement.

Keyword: *Ultra-low glycemic index rice, instant rice porridge, functional food, sensory evaluation, proximate analysis*

HORDEIN MICROBEADS DERIVED FROM BREWER'S SPENT GRAIN FOR CULTIVATED MEAT CULTURING

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Suspension culture using microbeads (MBs) in spinner flasks provides a promising approach for cultivated meat (CM) production. However, the transition of CM from laboratory prototypes to industrial-scale production is currently hindered by relatively high cost and ethical concerns associated with animal-derived microcarriers, such as gelatin. To address these challenges, we report the development of utilizing hordein reclaimed from brewer's spent grain (BSG) to construct environmentally friendly MBs. We developed edible MBs with tunable sizes ranging from 50 to 300 μm via food-grade emulsion–evaporation method. These BSG-derived MBs offer a superior surface-to-volume ratio while providing an inherent, modification-free surface for the adhesion of adipose-derived stem cells (ADSCs). Furthermore, the immuno-fluorescence images and cell viability results demonstrated that these MBs support the robust expansion of ADSCs in bioreactors, maintaining high biocompatibility and good differentiation potential. This research established a novel, "waste-to-resource" strategy that replaces animal proteins with low-cost plant alternatives, providing commercially viable microcarriers for the sustainable and scalable manufacturing of CM products.

Keyword: *Brewer's spent grain, Hordein, Microbeads, Cultivated meat*

Revalorizing Cattle Industry By-products: Developing Hybrid Meat Analogues via Multi-screw Extrusion

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The cattle industry produces substantial amounts of side-streams, specifically offal, which remain underused in Western markets despite their high nutritional value. This research investigates the integration of meat organ paste derived from bovine heart (MOP-H) with pea protein isolate (PPI) to create hybrid meat analogues (HMAs). Using a multi-screw extruder (one central spindle; 35 auxiliary spindles; six compartment), the study examined the interplay between MOP-H, water content of the mass (WCM), and compartment temperature (TEMP) through a Box-Behnken experimental design.

Findings indicate that MOP-H inclusion and WCM were the primary drivers of colour (Lab*) and textural (e.g., hardness, chewiness) modification. Specifically, textural resilience diminished as MOP-H levels and WCM increased, whereas TEMP variations yielded no statistical impact on texture. Microstructural analysis revealed that higher WCM facilitated longitudinal protein fibre formation and uniform pore distribution. Furthermore, lower TEMP was linked to pore homogeneity at maximum MOP-H (15% dry matter). Ultimately, this study demonstrates that by calibrating multi-screw extrusion parameters, MOP-H can be successfully incorporated into PPI matrices to produce cohesive, fibrous structures. This approach offers a viable pathway for the revalorization of nutrient-rich animal side-streams through advanced food engineering.

Keyword: *multi-screw extrusion, bovine heart, meat analogues, side-streams, microtomography*

UNLOCKING COMMERCIALLY PRODUCED MARINE MICROALGAE FROM SOUTHERN BRAZIL FOR FUTURE FOODS: AN INTEGRATED CHARACTERIZATION

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Marine microalgae are emerging as sustainable sources of multifunctional food ingredients; however, integrated comparative data on commercially produced biomass remain limited. This study characterized four marine microalgae species produced in Santa Catarina, Southern Brazil: Isochrysis galbana, Nannochloropsis oculata, Phaeodactylum tricornutum, and Tetraselmis chuii. Dried biomass samples were evaluated for morphology, instrumental color, physical properties, proximate composition, fatty acids, carotenoids, phenolics, volatiles, and amino acids. This integrated characterization identified species-specific compositional and technological signatures for targeted food applications. Isochrysis galbana presented high protein content (37.30%) and oleic acid (18.89% of fatty acids), with hexanal and limonene as relevant volatiles. Nannochloropsis oculata was characterized by high polyunsaturated fatty acids (31.30% of fatty acids), leucine, iron, and vanillic acid content. Phaeodactylum tricornutum stood out for its lipid fraction and high eicosapentaenoic acid level (15.96% of fatty acids), reinforcing its nutritional relevance. Tetraselmis chuii showed the highest taurine content (1.12 g/100 g) and total carotenoid content (5.12 mg/g), mainly lutein and zeaxanthin, with 2,3-butanediol as a dominant volatile associated with crab-like aroma notes. These findings demonstrate that commercially produced marine microalgae offer species-specific nutritional, physical, color, and flavor functionalities for functional foods, seafood analogues, and clean-label formulations.

Keyword: *Bioactive compounds, Technological properties, Fatty acids, Volatile profile*

TOWARDS SUSTAINABLE DIETS ACROSS DIVERSE POPULATION GROUPS

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Reducing the environmental impacts of diets while maintaining nutritional adequacy is a key challenge for sustainable food systems. Mathematical optimization is widely used to model low-carbon diets; however, population-average approaches fail to capture dietary diversity across population groups. This study presents a framework that integrates dietary heterogeneity into the optimization of sustainable diets.

Country-specific life cycle assessment (LCA) data were compiled using the Sustainable Assessment of Foods and Diets (SAFAD) methodology and linked to individual dietary intake data from the Danish National Survey of Diet and Physical Activity (DANSDA). Foods were aggregated into relevant food groups and environmental impacts were estimated at the diet level.

Modelling was applied to optimize diets within each group by minimizing deviations from observed consumption while fulfilling nutrient requirements and progressively stricter GHGE constraints. A sharp increase in the required dietary change was observed below approximately 3 kg CO_2e per 10 MJ, corresponding to greenhouse gas emission reductions of about 25% across population groups.

Optimized diets consistently shifted towards higher intakes of cereals and starches, eggs, and fish, and lower intakes of beef and cheese. These findings highlight the importance of accounting for dietary diversity when designing effective sustainable dietary strategies.

Keyword: *sustainable diets, environmental impact, nutritional adequacy, dietary diversity*

AN IMAGE-BASED CHROMATIC MELANOSIS VALUE FOR OBJECTIVE QUANTIFICATION OF BLUING IN SNOW CRAB (CHIONOECETES OPILIO)

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Objective and reproducible quantification of melanosis is essential for evaluating quality changes in processed crustaceans, yet current assessments are often subjective and observer-dependent. This study highlights the development and application of an image-based chromatic melanosis value (CMV) method for snow crab (Chionoecetes opilio) clusters, enabling continuous, standardized and objective evaluation of discoloration. Calibrated digital images were captured under controlled conditions and analyzed to generate CMV, which were further transformed into a predicted visual quality score (PVQS) corresponding to perceived melanosis intensity.

The applicability of the method was demonstrated using snow crab clusters subjected to different high-pressure processing (HPP) treatments and stored at 4 °C. For these samples, the CMV/PVQS approach sensitively captured the progressive development of melanosis during storage and clearly distinguished pressure-dependent effects, including accelerated discoloration at intermediate pressures and reduced melanosis at higher pressures. The method provided sufficient resolution to detect statistically significant differences, supporting its suitability for factorial experimental designs.

In practice, the image-based CMV method offers an objective alternative to traditional sensory scoring for monitoring melanosis development in snow crab and similar products. This approach facilitates reliable comparisons of processing and storage conditions and supports quality control and process optimization in industrial and research settings.

Keyword: *Melanosis, Image analysis, Snow crab, Objective quality assessment*

Milling as a Pre-Treatment Strategy for Improving Protein Enrichment Efficiency during Dry Fractionation of Chickpea

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Background:

Efficient dry fractionation of chickpea flour requires effective separation of protein from starch granules. However, both overly coarse and overly fine milling can hinder dry separation, highlighting the need for process standardization. This study provides insights into dehulling and optimal milling to evaluate the extent of protein-starch disentanglement.

Methods:

The dehulling experiments followed a full-factorial design with chickpea moisture content (9%, 11%, and 13%) and dehulling duration (45, 60, and 75s) as independent variables. Dehulled chickpeas at 7%, 9%, and 11% moisture were milled using centrifugal-rotor and disc mills. The sieved fractions were analyzed for protein content, microstructure (microscopy), protein solubility index, and starch damage.

Results:

The optimized dehulling conditions were 9% moisture content and 60 s dehulling time, which resulted in high dehulling-efficiency and hull recovery with minimal powder formation. Dehulling slightly increased the protein content of chickpea from 19.03 to 19.54%. Flour milled at 9% moisture showed better fineness compared to higher moisture levels. Rotor milling at low moisture (7%) increased starch brittleness, resulting in higher starch damage. Microscopy revealed that fractions >125 µm retained intact chickpea cell structures with no separation of starch and protein, whereas fractions <125 µm showed ruptured cells with released protein bodies.

Keyword: *Dry fractionation, Protein extraction, Milling, protein-starch disentanglement*

FROM DRYING TO DEODORIZATION: MODULATING ODOR-ACTIVE VOLATILES IN TETRASELMIS CHUII FOR CLEAN-LABEL FOODS

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Marine microalgae are promising sustainable food ingredients; however, their intense marine aroma and processing-induced changes can limit consumer acceptance. This study evaluated how drying strategy and mild ethanol deodorization influence the volatile profile of commercially produced Tetraselmis chuii biomass. Fresh biomass was dried by convective drying, spray drying, and freeze-drying, and the resulting powders were subjected to green deodorization using concentrated ethanol under mild homogenization conditions (300 rpm, 60 min, 25 °C), followed by centrifugation, supernatant separation, and freeze-drying. Volatile organic compounds (VOCs) from untreated dried biomass (UTc) and deodorized biomass (DTc) were extracted by solid-phase microextraction and analyzed by gas chromatography–mass spectrometry. UTc presented a complex volatile profile containing alcohols, ketones, aldehydes, hydrocarbons, and pyrazines, commonly associated with marine, earthy, and roasted notes. Ethanol treatment removed approximately 70% of total volatile compounds, mainly aldehydes, alcohols, and pyrazines. The resulting DTc profile was dominated by hydrocarbons and ketones. By connecting drying effects on VOCs with deodorization, this study identified processing routes to modulate off-flavors while preserving the potential of T. chuii as a clean-label ingredient. The ethanolic extract also represents a promising co-product for further exploration as a natural dye and flavoring ingredient in food products.

Keyword: *Marine microalgae, Green deodorization, Volatile organic compounds modulation, Drying*

Sturgeon Collagen Peptides Protect Male Reproductive Function and Testicular Integrity in Obesity-Induced Rodent Models

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Obesity is a global health challenge that disrupts metabolic homeostasis and impairs male reproductive function. Marine-derived bioactive peptides represent a promising nutritional intervention. This study evaluated the effects of sturgeon collagen peptide (SCP) supplementation on systemic inflammation, metabolic indices, reproductive hormones, sperm quality, and testicular histology in a high-fat diet (HFD)-induced obese rodent model. Obese animals exhibited elevated TNF-α, TGF-β, CRP, and IL-10, alongside suppressed IL-6, confirming systemic inflammation. Gonadotropins (LH, FSH) were reduced, while estradiol was elevated, reflecting hypothalamic-pituitary-gonadal axis disruption. Metabolic profiling revealed hyperinsulinemia and hyperglycemia, consistent with insulin resistance. Sperm analysis demonstrated severe oligospermia and morphological defects, while histological examination showed vacuolated seminiferous epithelium and disrupted spermatogenesis. SCP supplementation reversed these abnormalities in a dose-dependent manner. SCP-H provided the strongest effects, restoring LH and FSH, reducing estradiol, lowering glucose, moderating insulin, and achieving >85% normal sperm morphology. Histology confirmed recovery of seminiferous tubule integrity and germ cell layering. These findings highlight SCP as a marine-derived nutraceutical that mitigates obesity-induced inflammation, metabolic dysregulation, and male reproductive impairment. SCP demonstrates translational potential for functional food applications targeting obesity-associated reproductive health.

Keyword: *Obesity, Sturgeon Collagen Peptide, Inflammation, Male Reproductive System, Sperm Quality*

DEVELOPMENT OF A NOVEL METHOD FOR CORTISOL QUANTIFICATION IN POSTMORTEM FISH MUSCLE

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Seafood quality is increasingly discussed not only in terms of freshness and safety but also in relation to its physiological status associated with pre-slaughter stress. Stress responses are associated with postmortem biochemical changes affecting fish quality, including ATP degradation and low pH. Cortisol is a biomarker of acute stress in fish. However, the cortisol content is usually measured from plasma derived from blood, using ELISA, which requires live fish and is impractical for quality assessment in postmortem fish. This study aimed to develop a novel HPLC-based method to quantify cortisol in postmortem fish muscle. Cortisol stability in fish muscle during storage was also evaluated. Japanese horse mackerel (Trachurus japonicus) were used as sample. After slaughtering, cortisol was extracted from the dorsal muscle and blood plasma for HPLC analysis. A positive correlation was observed between cortisol content in the dorsal muscle and blood plasma. Cortisol remained stable in fish muscle under refrigerated (4 °C) and frozen (−80 °C) conditions. Lower cortisol content in the sample was associated with higher pH and ATP contents. Therefore, this HPLC-based method enables the quantification of cortisol in postmortem fish muscle. Furthermore, it could be used to evaluate acute stress level in postmortem fish.

Keyword: *Cortisol, Postmortem quality, Quality assurance, High-performance liquid chromatography*

MOLECULAR MECHANISM OF TRANSMEMBRANE TRANSPORT AND HIGH-EFFICIENCY STABLE DELIVERY OF CAROTENOIDS INDUCED BY THE INTERFACE OF NATURAL FLAXSEED OIL BODIES AS A CARRIER

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Natural oil bodies (OBs) represent nature's own oil-in-water emulsion, offering a sustainable and "clean-label" platform for delivering lipophilic bioactives. However, the critical role of their native protein-phospholipid interface has remained underexplored. Here, we systematically unravel how the OB interfacial architecture governs stability, encapsulation, and gastrointestinal fate. Using flaxseed, rapeseed, and camellia OBs, we show that interfacial protein content dictates particle size, curcumin encapsulation efficiency (up to 91.9%), and bioaccessibility. Remarkably, a novel solvent-free tepidity-ultrasonic treatment enables high-efficiency loading of β-carotene (96.9%) and lutein (93.3%) by transiently remodelling the membrane. Furthermore, we reveal a structure-function paradigm: lutein resides at the hydrophilic membrane exterior, while β-carotene localises in the hydrophobic core, differentially modulating oxidative stability and rheology. Most strikingly, compared to artificial emulsions with identical compositions, the densely packed, ordered OB interface—where membrane proteins anchor within phospholipid alkyl chains—confers superior resistance to environmental stress and digestion. This topology enhances free fatty acid release by 1.37-fold and boosts carotenoid bioaccessibility by >10%, while better protecting α-linolenic acid. Our findings transform understanding of OB interfaces and provide a biomimetic blueprint for designing next-generation, nature-inspired delivery systems with tailored functionality.

Keyword: *Oil body interface, Transmembrane, Transport delivery*

Effects of sub-chilling on the biochemical stability and hydrolysis performance of salmon rest raw material

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The Norwegian salmon industry generates substantial volumes of rest-raw material (RRM), much of which is downgraded to low-value applications despite its high nutritional potential. Efficient preservation is essential, as the RRM are highly susceptible to enzymatic autolysis, lipid degradation, and microbial spoilage. The present project aimed to evaluate whether sub-chilling (-1.5°C) could improve the physicochemical stability of Atlantic salmon viscera and fillets compared to conventional chilling (4°C), and to assess how pre-treatment temperature influences subsequent enzymatic hydrolysis.

Two experimental phases were conducted. First, 40 salmon were stored under chilled or sub-chilled conditions, after which samples were analysed for pH, colour, texture, proximate composition, fatty acid profile, free fatty acids, total and free amino acids, and endogenous enzyme activities. In the second phase, viscera from both treatments were enzymatically hydrolysed with and without Alcalase to quantify effects on yield and biochemical composition.

Sub-chilling maintained a more stable pH, slowed shifts in total amino acid composition, and reduced variability in several spoilage-related parameters. Fatty acid profiles remained largely unchanged across treatments. During hydrolysis, pre-treatment temperature influenced fraction yields and amino acid release.

Overall, sub-chilling improved short-term biochemical stability of viscera and supports its use as a preservation strategy for higher-value RRM utilisation.

Keyword: *Atlantic salmon, Sub-chilling, Hydrolysis, Rest-raw material utilization, Stability*

Sustainable modification of high-fibre cassava starch: reaction optimisation, predictive modelling, and explainable artificial intelligence

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Native starches structurally limit dietary fibre, reducing its functional versatility and limiting its use in the food system. Developing sustainable and scalable routes to convert native starch into high-fibre functional ingredients remains a key technological challenge. In this study, cassava starch was modified using citric acid to improve its fibre content and functionality. The effects of temperature, acid concentration, and time were optimised using response surface methodology (RSM), while artificial neural network (ANN) modelling was used to assess predictive performance. SHapley Additive exPlanations (SHAP) were further applied to identify the key factors influencing each response. Citric acid modification markedly increased the fibre content, depending on the processing conditions. In the modification process, temperature and acid concentration showed the strongest effects, whereas time had a smaller influence. Results indicated that high-fibre starch can be produced under controlled conditions while still retaining acceptable physicochemical and functional properties. Combining RSM with ANN and SHAP analysis also improved the reliability and interpretability of the predictions, providing clearer insight into how processing variables affect starch modification and final product performance. Overall, this work presents a scalable, relatively sustainable route to clean-label modification technology to produce high-fibre starch ingredients with targeted functionality for future food applications.

Keyword: *Sustainability, High fibre, Citric acid modification, Esterification*

WEAK-BASE SYNCHRONOUS MEMBRANE SEPARATION: A GREEN STRATEGY FOR ENHANCING EMULSIFICATION STABILITY OF SOY PROTEIN ISOLATE BY REGULATING INTERFACIAL FLEXIBILITY

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Efficient preparation of soy protein isolate (SPI) with excellent functional properties is vital to broaden its application in food formulations. In this study, a green and mild weak base synchronous membrane separation (MS) method was employed to prepare SPI, with alkali extraction-acid precipitation (AE) and salt extraction (SE) as controls. Results showed that the protein yield of MS extraction reached 53.31%, which was 1.4-fold and 2-fold higher than those of AE and SE methods, respectively. Structural characterization indicated that MS treatment reduced disulfide bond content, induced partial protein depolymerization and hydrophobic group exposure, and decreased SPI particle size to 121.13 nm. These structural features endowed MS-SPI with faster interfacial adsorption, higher molecular flexibility and stronger interfacial interactions. It readily formed flexible and dense interfacial films with higher elastic modulus, effectively suppressing oil droplet coalescence. Notably, MS-SPI possessed an outstanding emulsifying stability of 252 min, 2.4 times that of AE-SPI and better than commercial SPI and sodium caseinate, enabling the preparation of nanoemulsions with outstanding long-term physicochemical stability. Overall, this green MS strategy efficiently modulates protein interfacial properties to fabricate high-emulsifying SPI, showing great potential for high-end food emulsion systems.

Keyword: *Soy protein isolate, Membrane separation, Interface flexibility, Emulsion stability, Nanoemulsions*

TEMPERATURE-DRIVEN MOLECULAR INTERACTIONS GOVERNING STABILITY OF FUNCTIONAL MILK BEVERAGES ENRICHED WITH AUSTRALIAN NATIVE FRUIT AND HERBAL PIGMENTS

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Functional milk beverages enriched with pigments from Australian native fruits (Queen Garnet plum, quandong) and herbal plants (raspberry, mountain pepper, pandan, aniseed, moringa) provide a promising approach to develop antioxidant-rich dairy systems; however, the molecular mechanisms governing their stability during processing remain insufficiently understood. This study elucidated protein–polyphenol–lipid interactions under thermal treatments (63 °C and 80 °C). At 63 °C, casein micelles (~0.68–0.79 µm) remained structurally intact, with κ-casein steric stabilisation and colloidal calcium phosphate crosslinks preserved, maintaining pH stability (6.6–6.8) and limiting interactions to weak surface adsorption. In contrast, 80 °C induced partial unfolding of β-lactoglobulin and α-lactalbumin, exposing hydrophobic residues and thiol groups, promoting thiol–disulfide interchange and β-Lg–κ-casein complex formation. These changes enhanced polyphenol binding via hydrogen bonding, hydrophobic interactions, and π–π stacking, resulting in increased viscosity and slight acidification. FTIR analysis showed minimal secondary structural disruption, indicating interfacial complexation rather than bulk denaturation, while reductions in lipid-associated bands suggested weak lipid–polyphenol interactions. Anthocyanin-rich fruits stabilised the flavylium cation at 63 °C, whereas higher temperatures promoted browning. Chlorophyll-rich herbs showed Mg^{2+} displacement and pheophytin formation. Overall, stability is governed by temperature-driven protein conformational changes and protein–polyphenol interactions, with mild heat preserving structure and enhancing colour and bioactive retention.

Keyword: *Australian native fruits, Protein–polyphenol interactions, Temperature-driven stability, Functional milk beverages, Interfacial interactions*

ANTIMICROBIAL PEPTIDE COCKTAIL FORMULATION AS NON-ANTIBIOTIC MITIGANTS TO CONTROL BACTERIA CONTAMINATION IN CULTURED MEAT PRODUCTION

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Cultured meat production presents unique food safety challenges owing to nutrient-rich culture media, prolonged culture periods, and the absence of terminal sterilization measures. Conventional antibiotics raise concerns regarding antimicrobial resistance, regulatory compliance, and consumer acceptance, necessitating alternative mitigation strategies. This study evaluates the potential of random antimicrobial peptides (RMPs) and naturally occurring Generally Recognised as Safe (GRAS) antibacterial agents cocktail formulations as non-antibiotic interventions to mitigate bacterial contamination in cultured meat systems. Our results showed that the RPMs exhibited stronger antibacterial activity against Escherichia coli O157:H7 (E. coli) and methicillin-resistant Staphylococcus aureus (MRSA), when compared with weak acids like lactic acid and acetic acid, and amino acids like glycine and lysine, without a significant impact on mouse myoblasts and mesenchymal stem cells. The synergistic multi-component formulation (LK20, glycine, and lactic acid) demonstrated broad-spectrum antimicrobial activity at low concentrations, inhibiting 6 log CFU/mL of E. coli and MRSA in cell culture medium without any cytotoxicity on cell viability or proliferation. These findings support the potential of AMP-based cocktails as practical, antibiotic-free mitigants to enhance biosafety in cultured meat production. The integration of such strategies may contribute to regulatory alignment and improved consumer confidence in next-generation protein systems.

Keyword: *Cellular agriculture, Food microbial safety, Antimicrobial peptides, Peptide synthesis, Amino acids*

BITTERNESS AND METALLIC AFTERTASTE REDUCTION IN LOW SODIUM POTASSIUM CHLORIDE SEASONING USING YEAST EXTRACT AND PEPTIDE RICH INGREDIENTS

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Reducing sodium with potassium chloride can preserve saltiness but often produces delayed bitterness, metallic aftertaste, and lingering off-notes. This study evaluated a yeast extract and peptide-based strategy to improve the taste quality of low sodium NaCl/KCl seasoning blends. Experimental blends were prepared using NaCl:KCl ratios of 70:30, 60:40, and 50:50, with the 60:40 blend further combined with monosodium glutamate, selected yeast extracts, and a food biopolymer benchmark. Candidate yeast extracts were profiled by LC-MS/MS with attention to low molecular weight peptides containing aspartic acid or glutamic acid, free glutamic acid, and umami-related nucleotides. Samples were applied to a clear soybean sprout broth model and evaluated for early saltiness, mid-phase bitterness and metallic notes, and lingering aftertaste. The yeast extract-containing blends showed a more balanced savory profile than KCl-only substitution, with reduced sharpness in the later tasting phase and improved similarity to the NaCl control. Peptide-rich candidates were also perceived as less artificial and more compatible with broth seasoning. These findings suggest that KCl bitterness reduction should be approached not only as taste masking, but as temporal modulation of potassium-driven off-notes in low sodium seasoning systems.

Keyword: *Low sodium seasoning, Potassium chloride, Bitterness reduction, Yeast extract, Peptide-rich ingredients*

DIFFERENCES IN PHYSICAL PROPERTY CHANGES BETWEEN FATTY AND LEAN MUSCLES OF ATLANTIC BLUEFIN TUNA DURING LONG-TERM COLD-AGING

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Long-term cold-aged fish, produced by refrigeration for a week or more, has received considerable attention owing to its improved taste and texture quality in Japan. It is mainly consumed raw, such as sashimi and sushi. Although it is generally believed that fish with high lipid content are more suitable for cold-aging than those with low lipid content, there is no scientific evidence. Thus, the fatty and lean muscles of Atlantic bluefin tuna (Thunnus thynnus) were aged for 14 days at 1 °C, and changes in their physical properties were investigated. The breaking force of the fatty muscle decreased during cold-aging, resulting in weakening of its muscle structure. In contrast, the lean muscle did not show tenderization. The lipid expressible drip of the fatty muscle increased during cold-aging, whereas that of the lean muscle decreased. Fat–water separation images of tuna muscle were obtained by magnetic resonance imaging. These images indicated that fat diffuses within the structure of the fatty muscle and water molecular mobility decreases in the lean muscle. Therefore, physical property changes during cold-aging differed between the fatty and lean muscles of Atlantic bluefin tuna. Furthermore, fat diffusion in the muscle contributes to quality improvement in long-term cold-aged fish.

Keyword: *Food processing, Fish aging, Sashimi, Texture, Magnetic resonance imaging*

A GENOMIC APPROACH TO THE BIOLOGICAL MINING OF THE INDIGENOUS NEW ZEALAND MUSHROOM HERICIUM NOVAE-ZEALANDIAE

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Novel edible fungi are promising sources of novel food proteins and bioactive compounds. However, limited genomic resources hinder their commercial and nutritional exploration. This study developed a genome-guided workflow to construct a species-specific protein database for the indigenous New Zealand mushroom Hericium novae-zealandiae, supporting biological functional mining and downstream precise proteomic identification of an H. novae-zealandiae protein concentrate. Long-read sequencing data were assembled de novo and conservatively screened to remove likely non-target sequences. The curated assembly was used for gene prediction and the construction of a species-specific protein library, yielding over 17,000 non-redundant predicted proteins. This custom-built database served as the foundation for comprehensive genomic bioprospecting. Targeted secondary-metabolite mining identified putative enzymes driving key bioactive pathways: eight HePT-like prenyltransferases, one eriF-like polyprenyltransferase, and three eriG-like diterpene cyclases, indicating Hericium-type meroterpenoid and diterpenoid biosynthetic potential. Furthermore, safety-focused bioprospecting prioritised 22 strong allergen-like candidates, four of which were flagged through cross-reference validation, alongside 17 proteinaceous anti-nutrient candidates. Finally, this database was successfully employed in a proteomic study of H. novae-zealandiae protein concentrate, identifying 339 protein groups at 95% confidence. Overall, this genomic bioprospecting framework facilitates the exploration of potential bioactivity and allergenicity assessment of New Zealand H. novae-zealandiae.

Keyword: *Hericium novae-zealandiae, Proteogenomic, Species-specific protein library, Secondary-metabolite mining, Allergen and anti-nutrient screening*

Plant-dairy hybrid cheddar type cheese gels: influence of protein source and heat-treatment and microbial transglutaminase crosslinking

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Plant proteins are emerging as novel substitutes for dairy proteins; however, their integration into hybrid systems remains challenging, potentially affecting gel formation and functionality. This study evaluated how plant protein type, heating and microbial transglutaminase (mTGase)-mediated interactions influence the structure and functionality of hybrid cheese gels with 40% replacement of bovine milk proteins by plant proteins (soy, pea or faba bean). Heating cheese milk preparations prolonged the coagulation stage of gelation, while the addition of mTGase slowed the acidification rate near the later stage of gelation. Compared with bovine milk gels, hybrid systems exhibited lower storage modulus and firmness, whereas soy-based gels showed better integration and strength than pea and faba-based gels. Heat treatment promoted protein unfolding and increased β-sheet content, contributing to improved structural organisation and protein retention. SDS-PAGE analysis of whey showed reduced protein loss following heating and mTGase treatment, indicating enhanced incorporation of proteins into the gel matrix. Confocal microstructure analysis revealed that soy-based gel formed dense protein networks, whereas faba systems showed heterogeneous; heating with mTGase promoted aggregation across all systems. Overall, these findings demonstrate that targeted processing strategies can modulate protein interactions, supporting the development of structurally stable and sustainable plant-dairy hybrid cheese products.

Keyword: *Cheese gel, heat-treatment, microbial transglutaminase, plant proteins, protein interactions*

Preparation and characterization of milk protein-derived peptides with anti-sarcopenic activity

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Sarcopenia poses health risks to the elderly. Milk peptides offer structural advantages over intact proteins, dually stimulating muscle protein synthesis and counteracting metabolic and oxidative stress. However, using peptides to combat sarcopenia by targeting these stresses remains limited. To identify anti-sarcopenic peptides, milk protein hydrolysates were prepared via sequential enzymatic hydrolysis and evaluated in C2C12 cells and Caenorhabditis elegans. The most bioactive hydrolysate was characterized via anion-exchange chromatography, and a new octapeptide, IRLSFNPT, was identified by LC-MS/MS. The synthesized peptide exhibited strong binding affinity for the stress and redox targets IKKβ and Keap1. IRLSFNPT reversed mobility deficits, increasing swimming speed and wave initiation rate by 7.4 and 3.4 times compared with the control in sarcopenic C elegans model. Furthermore, IRLSFNPT significantly alleviated oxidative and metabolic stress, reducing lipofuscin accumulation by 43.9% and lipid accumulation by 19.0%. Thus, milk protein-derived IRLSFNPT combats sarcopenia by alleviating metabolic and oxidative stress, advancing functional food development.

Keyword: *Milk-derived Peptide, Sequential Hydrolysis, Glucose Metabolism, Non-Human Primate Model, Multi-omics Analysis*

Revealing Starch Functionality through Pectin Deconstruction: Toward Rheophysical Control and Valorization of Green Mango Purées

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Green mangoes, largely discarded due to their rigid, starch and pectin-rich structure, represent a promising yet underexploited matrix for texture engineering. This study investigates how the rheophysical properties of green mango purées can be modulated by controlling the structural state of starch and pectins.

Purées were produced using thermomechanical treatments (70 and 95°C) combined or not with targeted enzymatic pretreatments, and characterized through particle size distribution, starch gelatinization, and rheological measurements.

All systems exhibited shear-thinning flow behaviour, typical of concentrated plant-based dispersions. Thermomechanical processing increased starch gelatinization, yet this was not directly reflected in flow and viscoelastic behaviour, highlighting that rheophysical properties cannot be controlled by starch state alone but also depend on pectin structuring. Consistently, pectinase-based enzymatic pretreatments reduced particle size and consistency, thereby enhancing starch accessibility to water and heat and, when coupled with thermal processing, leading to higher levels of gelatinized starch. This structural shift enabled a stronger expression of starch-driven structuring, resulting in marked changes in flow and viscoelastic behaviour.

Overall, this work demonstrates that the modulating starch–pectin structural states is a key lever to tailor rheophysical properties of plant-based matrices, opening new opportunities for the valorisation of green mango into structured food systems.

Keyword: *Rheological properties, Starch gelatinization, Pectin structuring, Thermomechanical and enzymatic processing, Green mango valorization*

PROTEIN DIGESTIBILITY, PEPTIDOMIC PROFILES, AND PUTATIVE ALLERGENICITY OF NEW ZEALAND-SOURCED LOCUSTA MIGRATORIA: FOLLOWING SIMULATED GASTROINTESTINAL DIGESTION

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The incorporation of edible insects into the global food supply requires systematic evaluation of their protein digestibility, digestion-derived peptide profiles, and putative allergenicity. This study compared the gastrointestinal digestion of proteins from New Zealand-sourced Locusta migratoria (LM) with three commercially available Orthoptera species using the INFOGEST in vitro digestion model, amino acid profiling, peptidomic analysis, and bioinformatic allergen screening. LM exhibited the highest degree of protein digestion, reflected by a free amino acid release rate of 30.1%, with essential amino acids comprising 56.39% of the released free amino acid pool. Bioinformatic screening further revealed a broad range of digestion-derived peptides with predicted antimicrobial, antihypertensive, and DPP-IV inhibitory activities, suggesting additional biofunctional potential after digestion. At the protein level, allergen family classification indicated that the prolamin superfamily represented the predominant putative cross-reactive allergen group across species. Following digestion, although several allergen-derived peptides retained sequence motifs corresponding to known IgE-binding epitopes, including motifs from arginine kinase, most resulting fragments were below 1000 Da in the final digests. Overall, New Zealand-sourced LM showed favourable protein digestibility, essential amino acid availability, and predicted biofunctional potential, while its residual allergenic potential warrants further immunological validation.

Keyword: *Edible insects, Simulated digestion, Peptidomics, Bioactive peptides, Allergenicity*

CHEMICAL AND TECHNO-FUNCTIONAL CHARACTERIZATION OF AVOCADO, MAIZE, AND AGAVE BY-PRODUCTS FOR CLEAN-LABEL APPLICATIONS

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The avocado, maize, and agave industries generate significant waste fractions that could be valorized as food industry by-products due to their bioactive compounds and techno-functional biomolecules. This research evaluated the chemical and techno-functional properties of maize cob, agave bagasse, and avocado seed to determine their potential as clean-label ingredients or additives for food industry applications. Chemical components (proteins, carbohydrates, fats, and ash) and techno-functional properties (water solubility, swelling capacity, water holding capacity, oil holding capacity, and emulsifying capacity) were determined.

The results showed that the agave bagasse presented a significantly higher content of ash (5.69%), water holding capacity (5.61 g/g), and swelling capacity (5.75 mL/g) compared to corn cob and avocado seed. The maize cob exhibited a higher carbohydrate (95.91%), oil holding capacity (4.24 g/g) and emulsifying capacity (97.78%). The avocado seed showed a higher content of proteins (4.03%), fat (3.75%), and water solubility (21.06%) compared to the other by-products.

Maize cob and agave bagasse stood out for their structuring and stabilizing properties, making them especially suitable for use as thickeners and emulsifiers in food systems. The integral use of these by-products can drive circular economy strategies and facilitate the formulation of products with clean labels and higher added value.

Keyword: *Valorization, plant-based ingredients, agro-industrial residues, thickening properties, emulsification properties*

UTILIZATION OF SPENT COFFEE (COFFEA ARABICA) GROUNDS IN THE DEVELOPMENT OF A HIGH-PROTEIN AND HIGH-FIBER SNACK BAR

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This study explored the utilization of spent coffee grounds (SCG) as a sustainable and functional ingredient in the development of snack bars. SCG is a common by-product in consuming coffee that is typically either used for compost or discarded despite its potential with regards to its application to food products. Four different formulations of a snack bar were developed, which contained 0%, 4%, 6%, and 8% SCG, respectively, as a partial substitute to all purpose flour. Results of physicochemical, proximate, nutritional, and antioxidant analysis showed that increasing concentrations of SCG significantly enhanced the protein, fat, crude fiber, dietary fiber, energy content, and antioxidant activity of the snack bars. Specifically, the 8% SCG formulation had the highest values for these parameters. Contrarily, higher concentration of SCG showed a decrease in moisture content, water activity, total carbohydrates, and hardness. Microbial analysis confirmed all snack bar formulations were safe for consumption. Sensory evaluation revealed that the 4% SCG formulation was most preferred by panelists. These findings exhibit the advantages of utilizing SCG in the development of snack bars with improved nutritional profile while aiming to reduce waste. Further research is recommended to refine processing techniques that enhance and mitigate undesirable sensory effects.

Keyword: *spent coffee grounds, snack bars, sensory evaluation, proximate analysis, functional*

OPTIMISING EMULSION STABILITY IN POTATO PROTEIN SYSTEMS: ROLES OF POLYSACCHARIDES IN INTERFACIAL AND RHEOLOGICAL BEHAVIOURS

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Interfacial properties play central role in determining emulsion stability by governing adsorption kinetics, interfacial thickness, and bulk viscosity. However, limited studies have systematically examined how different polysaccharides modulate potato protein's emulsifying performance and the relative contributions of interfacial properties. This study explored the relationship between polysaccharide type and emulsion stability in potato protein (PP) systems. Four polysaccharides, notably sodium alginate (SA), carboxymethyl cellulose (CMC), gellan gum (GG), and pectin (P), were incorporated with PP. The interfacial properties, rheological properties, and emulsion stability of these systems were evaluated to uncover the stabilization mechanisms. The results demonstrate that polysaccharide-induced viscosity is the primary factor governing stability. Notably, additions of all four polysaccharides increased the emulsion stability compared to system containing PP alone. Besides, increasing viscosity enhanced ζ-potential and storage stability; however, excessive viscosity, as observed in the PP-GG systems, resulted in significantly larger droplet sizes that shifted the stabilization mechanism from interfacial adsorption to objective thickening. In contrast, the PP-CMC system achieved the most balanced performance, exhibiting superior stability at both macroscopic and microscopic levels. These findings indicate that optimal emulsion stabilization requires a balance between viscosity enhancement and droplet size control, providing practical guidance for designing protein-polysaccharide emulsifiers for food applications.

Keyword: *Pickering emulsion, stability, potato protein, interfacial behaviour*

Quantitative Western blot assay for the detection of chicken serum albumin

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Introduction: Egg is one of the Big-Nine allergenic foods in the United States and one of the priority allergens recognized by FAO/WHO. Accurate detection of its allergenic proteins is critical for food safety and regulatory compliance. Chicken serum albumin (CSA, Gal d 5), an allergen present in egg yolk, chicken meat, and avian-derived materials, remains under-detected in food products due to limited analytical methods.

Objective: This study aimed to characterize CSA and develop a quantitative Western blot (qWB) assay for its detection.

Results: Biochemical characterization revealed that heat treatment above 69.61 °C significantly reduced CSA extractability, indicating the importance of thermal processing for allergen reduction. Despite this, CSA retained immunoreactivity, as confirmed by in vitro allergenicity tests using human plasma. Notably, CSA was also verified in egg white, suggesting possible cross-contamination or migration during processing. A monoclonal antibody (3H4E9) was developed and demonstrated high specificity toward poultry serum albumin. The optimized qWB assay exhibited good selectivity (specific to poultry species), working range (0.3-20 ppm), and sensitivity (ppm level).

Significance: This assay enables sensitive and reliable CSA detection on food contact surfaces, facilitating risk assessment of undeclared egg yolk residues and improving food safety management practices.

Keyword: *Food safety management, Risk assessment, Egg yolk allergen, α-Livetin, Swab*

PHYSICAL, RHEOLOGICAL AND MICROSTRUCTURAL PROPERTIES OF GRAPE POMACE-BASED EMULSION GELS FOR THE DEVELOPMENT OF REDUCED-FAT FOOD SYSTEMS

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Reducing saturated fat in processed foods is a key challenge for the food industry due to its link with cardiovascular diseases, obesity, or type 2 diabetes. Emulsion gels have attracted increasing interest as fat replacers because they can mimic the techno-functional and textural properties of conventional fats while improving nutritional quality.

This work evaluated freeze-dried grape pomace as a sustainable functional ingredient for the development of emulsion gels. Grape pomace is a winery by-product naturally rich in dietary fiber and phenolic compounds, which makes it attractive for food reformulation strategies focused on both health and circular economy principles. Eight formulations were produced using grape pomace (10 and 12.5%, w/w) and pea protein (0–3%, w/w) as structuring agents.

The emulgels were characterized by particle size, physical stability, rheological behavior, antioxidant properties, and microstructure. Results showed that the combination of grape pomace and protein resulted in emulsion gels exhibiting high viscosity and stable network structures, promoting the formation of semi-solid systems with properties similar to plastic fats.

These results support the use of grape pomace-based emulsion gels as sustainable ingredients for reduced-saturated-fat foods, contributing to clean-label formulations.

Keyword: *Oil structuring, physical stability, antioxidant properties, winery by-products, fat replacement*

DIGITAL AND CHAOTIC TRAJECTORY DESIGN FOR DELTA-ROBOT MIXING OF LIQUID FOOD SYSTEMS

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Robotic food mixing is emerging as a transformative approach enabling the transition from conventional rotation-based operations to digitally designed and engineered trajectories. This work uses a Delta Robot as an experimental and computational platform to investigate and program the mixing behaviour of liquid food systems. Oil-in-water model emulsions and virtual liquid food domains have been used to evaluate the effect of 2D, 3D and chaotic toolpaths on droplet disruption, spatial distribution and volumetric coverage. By tailoring trajectory topology, motor speed, robotic feed rate and mixing tool geometry, different mixing regimes have been targeted, ranging from gentle partial structuring to high-efficiency homogenisation. A kinematic digital twin based on voxel discretisation has been developed to quantify the Overall Distribution Ratio and identify the most effective space-filling trajectories. Chaotic attractors such as Aizawa, Rössler and Sprott A showed superior volumetric sweep compared with conventional 2-DOF planetary motion, while the dispersive disk enhanced the accessible mixed volume. The approach also enabled the identification of feed-rate saturation and scale-up effects, supporting the selection of operating windows compatible with shear-sensitive food matrices. These results position Delta-Robot-assisted mixing as a digital tool for programming liquid food structure, opening new opportunities for adaptive, product-driven and sustainable food processing.

Keyword: *robotic mixing, digitally designes trajectories, emulsions, chaotic attractors*

MACHINE LEARNING-BASED SENSORY QUALITY PREDICTION AND FLAVOR DRIVER IDENTIFICATION IN FERMENTED EDIBLE INSECT SEASONINGS

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The characteristic off-flavors and inherent bitterness of edible insects remain primary obstacles to consumer acceptance and commercialization, making sensory standardization challenging. Although conventional human sensory panels are the gold standard, they are limited by subjectivity and high costs. In this study, five machine learning models were evaluated to predict the sensory quality of fermented insect seasonings using physicochemical, electronic nose, and electronic tongue data. Gradient Boosting demonstrated the highest predictive performance ($R^2 = 0.98$, RMSE = 0.06). Furthermore, SHAP analysis clarified the contribution of specific compounds to consumer acceptance. High levels of isoleucine ($r = -0.59$) and valine ($r = -0.71$) strongly correlated with lower sensory acceptance, indicating the negative impact of bitterness-related amino acids. SHAP values revealed that these amino acids and specific volatile off-flavor compounds (EN_PC2) reduced acceptance scores by up to 0.20 points. Conversely, a higher umami-to-bitterness (U/B) ratio significantly mitigated these negative effects. A strong negative correlation with total nitrogen ($r = -0.78$) suggested that excessive protein hydrolysis during fermentation may compromise overall sensory quality. These findings indicate that producing palatable insect seasonings requires controlled flavor modulation through precise fermentation management rather than merely maximizing amino acid extraction.

Keyword: *Edible insects, Fermentation, Sensory prediction, Machine learning, Flavor optimization*

THREE-DIMENSIONAL PRINTED MODEL FOODS AS DIGITAL PLATFORMS FOR TAILORED RELEASE OF BIOACTIVES AND MICRONUTRIENTS

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Three-dimensional food printing is emerging as a transformative technology enabling the transition from conventional formulation-based approaches to digitally designed and functionally engineered foods. This work proposes the development of 3D-printed model food systems as experimental platforms to investigate and program the controlled release of micronutrients and bioactive compounds. Edible inks based on hydrocolloid and biopolymer matrices (e.g., alginate, starch and protein systems) have been designed as carriers for representative compounds such as iron and curcumin. By tailoring internal architecture, including infill density, spatial distribution and compartmentalisation, different release profiles have been targeted, such as sustained, delayed, increasing and pulsed release under simulated gastrointestinal conditions. Release kinetics have been described using established mathematical models (e.g., Higuchi, Korsmeyer–Peppas and Weibull), enabling the identification of dominant transport mechanisms. Proof-of-concept designs have aimed to modulate release over 30–180 min through combined control of material composition and geometrical parameters. Furthermore, multi-material structures have been fabricated using a dual-extrusion Felix Switch system to integrate two functional components with independently tunable release behaviours. This approach positions 3D food printing as a digital tool for programming nutrient delivery, opening new opportunities for personalised nutrition and function-driven food design aligned with future food system innovation.

Keyword: *3D food printing, controlled release profile, multi-material structure, personalised foods*

DECODING AND PROGRAMMING CRUNCHINESS THROUGH FORCE–SOUND ANALYSIS AND 3D PRINTED FOOD ARCHITECTURES

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Crunchiness is a key driver of food perception, arising from the multisensory integration of mechanical fracture, sound emission and oral processing. This work proposes a transition from the instrumental characterization of crunch to its digital design through food structure engineering. Five commercial potato chip brands were first analysed as reference crispy matrices using a TA.XT Plus Texture Analyzer equipped with an acoustic detector, enabling synchronized acquisition of force–time and sound–time signals. Mechanical descriptors (e.g., hardness, fracture peaks, area) were combined with acoustic parameters (e.g., sound peaks, acoustic energy and event density). A data-driven modelling approach identified the dominant role of high-frequency vibrations, fragmentation patterns and fracture dynamics in governing acoustic energy generation, supporting a multidimensional interpretation of crunch.

Building on these findings, 3D-printed potato-based structures were developed by modulating shell number (1-3), infill density (30-60%), nozzle diameter (0.84-1.37 mm) and air-frying conditions (140-180 °C). The resulting architectures exhibited distinct fracture behaviours, providing a controlled framework to manipulate the mechano-acoustic response of crispy products. This approach demonstrates how food structure can be used as a design variable to tune crunch-related properties, paving the way for digitally engineered, multisensory food textures and personalized snack design.

Keyword: *texture-sound relationship, mehcanical fractures, crispy products, digitalised structures*

COOKING-TRIGGERED MORPHING OF CEREAL-BASED FOODS AS A DIGITAL STRATEGY FOR FUTURE SUSTAINABLE FOOD DESIGN

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Morphing food is emerging as a transformative approach enabling the transition from conventional shape-defined foods to dynamically designed and process-responsive edible structures. This work proposes the development of cereal-based model food systems as experimental platforms to investigate and program controlled shape transformation during cooking. Flat cereal-based matrices have been designed with surface geometries, including grooves differing in depth, orientation and spatial distribution, as structural triggers for bending, curling and twisting. By tailoring product thickness, groove architecture and cooking conditions, different morphing behaviours have been targeted under air frying, steaming and deep-fat frying. Shape-changing kinetics have been described through image analysis, enabling the quantification of bending angle, curvature, dimensional shrinkage and transformation rate during processing. Moisture transfer, colour development, texture properties and microstructural changes have been analysed to identify the dominant mechanisms governing programmed deformation. Proof-of-concept designs have aimed to obtain predictable 2D-to-3D transformations through the combined control of material composition, geometrical parameters and heat–mass transfer conditions. The expected outcomes support the definition of process–structure relationships for cereal-based foods with programmable geometry, tailored texture and reduced storage volume. This approach positions morphing food as a digital and sustainable tool for function-driven product design, aligned with future food processing innovation.

Keyword: *Morphing food, Cereal-based foods, Cooking-triggered shape transformation*

INVESTIGATION OF PHYSICOCHEMICAL, STRUCTURAL, NUTRITIONAL, BIOACTIVE, AND DIGESTIVE PROPERTIES OF MALTED MILK POWDER ENRICHED WITH GERMINATED CEREALS AND PULSES

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Integration of germinated cereals and pulses into dairy-based functional foods is a promising strategy to enhance macronutrients and bioactive compounds through structural and interaction modifications within the food matrix. This study investigated a convenient instant malted milk powder formulated using germinated rice, maize, and green gram, focusing on its bioactive, nutritional, structural, and their digestive transformations. Malted milk powder was prepared by incorporating the germinated flour mix into milk at ratios of 40:60, 50:50, and 60:40. The formulations were evaluated for bioactive compounds, antioxidant activity, amino acid and mineral content along with protein secondary structural changes. Results showed that increasing the proportion of germinated malt mix significantly ($p < 0.05$) enhanced polyphenols, flavonoids, antioxidant activity, total amino acids, and minerals compared to ungerminated controls. Enzymatic hydrolysis during germination improved nutritional quality and bioactivity, while microstructural modifications contributed to changes in protein secondary structure.In vitro gastrointestinal digestion demonstrated significant ($p < 0.05$) increases in total polyphenols, flavonoids, antioxidant activity, amino acids, and mineral bioavailability across oral, gastric, and intestinal phases, particularly in malted milk powders formulated with germinated malt mix compared to controls. This study highlights the potential of germinated cereal–pulse–milk systems as functional dairy products with enhanced nutritional, bioactive, and digestive properties.

Keyword: *Germination, Bioavailability, Malted milk powder, In vitro digestion, Bio active compounds*

GRAS Biocontrol for Cultured Meat: Selective Activity of Antimicrobial Fatty Acids

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Due to environmental and medical concerns, widespread usage of antibiotics in cultured meat bioreactors is undesirable, requiring labs to fall back upon engineering controls. Over 10% of commercially-produced cultured meat batches succumb to contamination (Powell et al., 2025), constituting a significant drain on output and economic viability for this industry. We evaluated fifteen food-associated fatty acids and monoglycerides as bench-scale decontamination agents in mammalian culture systems contaminated with Listeria monocytogenes, a foodborne pathogen. TSB and DMEM + 10% FBS were inoculated with $5*10^5$ L. monocytogenes; antimicrobial activity was quantified by 20-hour OD600 growth curves and confirmed by drop-plate CFU enumeration. In TSB, the fatty acids C10MG, C11MG, C12MG, and C13MG achieved complete inhibition (no recoverable CFU) at concentrations below 1mM, selected as a cutoff due to cytotoxicity of the fatty acids towards C2C12 myoblasts as determined by resazurin assay. Antimicrobial activity of the fatty acids was marginally reduced in DMEM + serum, with the exception of C11, which fully inhibited Listeria growth in only DMEM + serum. These data support monoglycerides and the fatty acid C11 as preliminary, bench-scale biocontrol candidates for mammalian-cell manufacturing.

Keyword: *Cultured meat, Antimicrobial fatty acids, Food pathogens, Listeria monocytogenes, Monoglycerides*

INFLUENCE OF TEXTURE-MODIFIED CHICKEN ATTRIBUTES ON ELDERLY SENSORY PERCEPTION

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This study investigated how moisture content, particle size and textural properties of minced and moist curry chicken influence sensory perception by elderly, healthy individuals. Textural properties (hardness, adhesiveness and cohesiveness) were measured by back extrusion using P/20 probe while the fraction of coarse (> 4mm) and fine (< 1mm) particles were determined with sieving. Chicken samples with more fine particles were perceived as softer with a lower number of chews required before swallowing onset while leaving less throat residue post swallowing. An increase in coarse fraction significantly increased instrumental hardness but did not significantly affect sensory perception. A similar trend was observed for sample moisture content where it significantly affected textural properties but did not significantly affect sensory perception. There was a strong correlation between perceived hardness, number of chews before swallowing as well as oral and throat residue post swallowing. This study did not find a significant correlation between instrumental and sensory properties, possibly due to complex sample matrix of suspended chicken particles in a viscous liquid phase. Further work is necessary to understand factors contributing to perceived hardness in minced and moist chicken and identify an instrumental method to correlate with sensory perception.

Keyword: *ease of swallowing, elderly panel, sensory evaluation, texture-modified food*

Evaluation of Amino Acid Profile of Commercially Available “Plant-Based” or “Vegan” Collagen Peptides

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Global population growth and the impending protein crisis have intensified the demand for sustainable plant-based protein foods. This trend has extended to functional foods, leading to the market emergence of “plant-based” collagen peptides. However, this representation induces scientific paradox, since collagen is a protein uniquely inherent to animals. Collagen structure is characterized by a repetitive structure consisting of glycine (Gly)-X-Y tripeptide and the X and Y positions are frequently occupied by proline (Pro) and hydroxyproline (Hyp). To evaluate the authenticity in the composition of “plant-based” collagen peptides, five types of the commercial products labeled as “plant-based” or “vegan” were analyzed for their amino acid compositions by using HPLC. Results showed that three types of “plant-based” products contained approximately 33% Gly, 12% Pro, and 11% Hyp in peptide-form, which exhibit composition nearly identical to animal-derived collagen peptides. In contrast, the remaining two types of “plant-based” products mainly consist of free-form of Gly, Pro, and alanine (Ala), without any detectable peptide-form Hyp. This implies that these products are merely mixtures of free amino acids rather than peptides. The present results suggest that the composition of some "plant-based" collagen peptides products does not fully conform to the scientifically defined collagen peptides.

Keyword: *Collagen peptides, Plant-based, Hydroxyproline*

Design of an Ozone Treatment System for Fresh Produce Using Computational Fluid Dynamics

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The application of ozone for decontamination of fresh produce is significantly influenced by uniform gas distribution. Computational fluid dynamics (CFD) is a powerful tool that uses detailed geometry to understand the physical phenomena in fluid flow. In this study, CFD was used to design an ozone treatment chamber by simulating gas flow and distribution within it. Five different configurations were considered to evaluate the influence of inlet position on gas flow patterns and ozone distribution. The simulations were performed using COMSOL Multiphysics 6.0 by coupling the 'Laminar Flow and Transport of Diluted Species' modules. Two-dimensional models of the chamber were developed and analysed. Among the configurations, left-side middle inlet (configuration A) and top-middle inlet (configuration D) exhibited uniform ozone distributions. Configuration A reached a concentration of 0.65 mol/m^3 within 30 s, and configuration D achieved 0.75 mol/m^3 within the same period, both approaching the maximum inlet concentration (1 mol/m^3). Furthermore, ozone decay kinetics were analysed, revealing first-order behaviour with a shorter half-life than reported values due to confined geometry and transport effects. These findings provide valuable insights for optimising ozone treatment systems, which could improve food safety, extend product shelf-life, and enable efficient industrial-scale applications.

Keyword: *Ozone, Computational Fluid Dynamics, Decontamination, COMSOL Multiphysics, Shelf-Life*

SOLUBLE AMYLOSE CHAINS INHIBIT GELATINISATION AND RETROGRADATION IN WAXY CORN STARCH

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In this study, soluble amylose chains with degrees of polymerisation (DP 186–4020) were produced via isoamylase debranching of amylopectin from native and waxy corn starches. When introduced into aqueous suspensions of waxy corn starch, these chains spontaneously adsorb onto starch granule surfaces, forming a uniform coating. This amylose layer significantly suppresses gelatinisation, increasing the onset temperature by up to 10 °C. It also alters pasting and short-term retrogradation behaviour, evidenced by reduced trough viscosity, up to a 20 % decrease in breakdown viscosity, and an approximately 50 % increase in setback viscosity. These effects are strongly dependent on both amylose concentration and chain length. Chains within a critical DP range of 200–700 exhibit the most pronounced effects, suggesting a key role of entropic factors in starch–amylose interactions. Complementary analyses, including calorimetry, rheology, turbidity measurements, and small-angle X-ray scattering, confirm inhibited gelatinisation and modified retrogradation. X-ray diffraction further shows that the adsorbed amylose adopts a hydrated, V-type-like polymorphic structure. We propose that this coating restricts water penetration into granules, thereby limiting swelling and gelatinisation. Overall, this work reveals a previously unrecognised role of amylose chain length in governing starch transitions and offers a novel approach for designing functional starch-based systems.

Keyword: *Waxy corn starch, Soluble amylose chain, Isoamylase debranching, Gelatinisation, Retrogradation*

Beyond Protein Quantity: Comprehensive Characterisation of Fish Proteins Using Chemical and Spectroscopic Techniques

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In this study, the extraction yield and structural properties of proteins obtained from different fish species were comparatively investigated. Samples prepared from two white-fish and two oily-fish species were freeze-dried and ground into powder. Some of the samples were treated with alkaline extraction, followed by centrifugation to separate the supernatant, and then acidic precipitation was performed. The precipitate obtained after centrifugation was freeze-dried again to obtain protein powders. Crude and extracted fish protein powders were comprehensively characterized in terms of spectroscopic and analytical protein analyses.

Protein content and quantity were determined using the 3 chemical assays, Duma's and Kjeldahl method, along with FTIR, Raman, and UV-Vis spectroscopy.

The unique value of this study lies in the comprehensive comparative evaluation of proteins obtained after extraction in fish species with different lipid contents, using both quantitative, multiple spectroscopic techniques. Unlike studies in literature, generally focus on a single analytical method or limited number of species, this research directly compares the results of different protein determination methods, revealing the impact of methodological differences, offering a comprehensive approach to protein characterization.

All in all, the study contributes to a better understanding of the potential use of fish proteins in functional food and industrial applications.

Keyword: *Fish protein, freeze drying, spectroscopic-analytical analysis, protein characterization*

Influence of Physical Modification on the Functional Properties of Mango Kernel Starch

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Mango kernel starch represents a promising alternative starch source owing to its inherent water-binding, swelling, and solubility properties. This study aimed to evaluate how physical modifications of mango kernel starch influence its functional characteristics, with the goal of broadening its industrial applicability. Starch was extracted from mango kernels and subsequently modified using three methods: pregelatinization (PG), heat-moisture treatment (HMT), and ultrasonic treatment (UT). The extraction yield from mango kernels was 50.5 ± 5% (w/w). The extracted starch was relatively pure, consisting of 89% carbohydrates, 1.9% fat, 0.95% protein, and 0.13% ash. Swelling power increased significantly after HMT and UT ($p < 0.001$ for both). HMT also led to significant increases in solubility ($p = 0.025$) and WAC ($p < 0.001$). PG significantly enhanced both relative viscosity and WAC ($p < 0.001$). Syneresis was significantly reduced following HMT and UT ($p = 0.007$ and $p = 0.003$, respectively), indicating improved freeze–thaw stability. Fourier Transform Infrared Spectroscopy and Raman spectroscopy revealed treatment-dependent structural changes: UT promoted greater short-range molecular order, whereas HMT and PG caused partial disruption and reorganization of starch chains without fully destroying the crystalline structure. Despite these modifications, key fingerprint region peaks confirmed that the amylopectin structure remained intact across all treatments.

Keyword: *mango kernel starch, pre-gelatinization, Fourier Transform Infrared Spectroscopy, Raman spectroscopy, ultrasonic treatment*

BANANA LEAF AS A FOOD CONTACT MATERIAL: FROM TACIT KNOWLEDGE TO MEASURABLE CRITERIA

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Banana leaves are widely used as food-contact material in suman-sa-lihiya (Philippine lye-treated rice cake) processing, serving as wrapping, in-process containment, and post-process packaging. Knowledge holders assess leaf suitability through experience. However, leaf attributes relevant to selection, preparation and utilization have not been systematically characterized using measurable criteria, limiting reproducibility of material performance across production systems. This study documented traditional practices through key informant interviews and field observation; and characterized banana leaf properties from harvesting to storage. Mechanical, instrumental color, filth, and microbiological properties were analyzed. Saba (Musa x paradisiaca L.) was the most commonly used leaf, known for its perceived pliability and suitability for wrapping. Leaf performance varied across stages. At the raw material stage, leaf maturity influenced tensile strength, with position 0 having lower strength (4.52 N/mm²) than positions 1 to 3 (8.72-9.25 N/mm²), and instrumental color distinguished maturity levels. During pre-treatment, steaming reduced tensile strength (2.97 N/mm²), whereas hot-ironing increased toughness (89.72 N•mm), improving resistance to deformation during handling. Filth and microbiological load increased during storage due to handling. These findings define measureable criteria for banana leaf maturity, pre-treatment response, and storage related hygienic quality, providing baseline data for scale-up validation of traditional production.

Keyword: *Banana leaf, Food contact material, Traditional knowledge, Measureable criteria, Scale-up validation*

COMPUTATIONAL SCREENING OF LEVAN FRUCTOTRANSFERASE BASED ON ACTIVE SITE STRUCTURE SIMILARITY

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Difructose anhydride IV (DFA-IV) is a cyclic fructose dianhydride used as a functional sweetener and food ingredient. DFA-IV is produced from levan by levan fructotransferase (LFTase). In this study, we established an active site structure based screening strategy to discover LFTases from glycoside hydrolase family 32 (GH32) sequences in the CAZy database. Approximately 27,000 GH32 sequences were aligned using MAFFT, and a phylogenetic tree was constructed using FastTree for primary screening. Model structures of the primary candidates (30 sequences) were generated using AlphaFold 3 and aligned with AAF73829, a reported DFA-IV producing LFTase. Regions within 7 Å of the catalytic residues of AAF73829 were defined as active-site regions, and local structural similarity was evaluated by root-mean-square deviation (RMSD). Among the selected enzymes, ABM06991 from Paenarthrobacter aurescens TC1 showed high similarity to AAF73829, with an active-site RMSD below 0.1 Å and 86% sequence identity. To verify LFTase activity, the ABM06991 gene was cloned and expressed in E. coli BL21(DE3). Reaction analysis using levan as the substrate revealed that ABM06991 is a DFA-IV-producing LFTase. Furthermore, DFA-IV was produced via a coupled reaction with levan sucrase SacB using sucrose as the substrate. This active-site-based computational screening strategy can efficiently mine valuable biocatalysts from sequence databases.

Keyword: *Levan fructotransferase, DFA-IV, Computational screening, Glycoside hydrolase family 32*

Effects of Moisture and Salt Concentration on Amino Acid Levels during Miso-like Fermentation of Traditional Flint Corn

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Miso is a traditional Japanese fermented food associated with various health-promoting effects, many of which arise from bioactive compounds generated during fermentation. Flint corn contains phenolic compounds and carotenoids; however, their bioavailability is limited due to glycosidic binding to cell wall components. In this study, a traditional Hokkaido flint corn variety, Sapporo Hachigyo, was subjected to miso-like fermentation to investigate the effects of moisture and salt concentration on soluble polyphenol and amino acid levels. Corn substrates were fermented at 30 °C for 8 weeks using rice koji and yeast. Reductions in initial moisture and salt concentrations (25% each) led to a numerical tendency toward enhanced reddish-brown coloration, suggesting a possible promotion of Maillard reactions. Soluble total polyphenol content increased significantly following fermentation, with further enhancement observed under reduced moisture and salt conditions. Amino acid analysis by LC–MS/MS demonstrated that samples fermented with reduced salt concentration exhibited the greatest increase in total amino acids. These results indicate that controlling moisture and salt concentration during miso-like fermentation of flint corn effectively enhances the production and potential bioavailability of bioactive compounds, particularly amino acids, highlighting the potential of traditional crop-based fermentation as a sustainable food innovation strategy.

Keyword: *Traditional Flint Corn, Miso-like Fermentation, Polyphenols, Amino acids*

Isolation of potential probiotic lactic acid bacteria from virgin coconut oil processing waste

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Coconut skim milk (CSM) is an underutilized major processing waste from mechanically extracted virgin coconut oil (VCO) despite containing significant quantities of macronutrients and can promote beneficial bacterial growth. CSM shows potential to foster the growth of probiotic Lactobacilliaceae that confer health benefits when consumed as a plant-based probiotic drink. The study aimed to isolate endogenous lactic acid bacteria from CSM that may be used as a probiotic microorganism in plant-based drinks including CSM.

CSM samples were streak plated in de Mann, Rogosa, and Sharpe (MRS) agar at 35-37℃ anaerobically to select lactic acid bacteria. Eighteen (18) isolates with different colony morphologies were initially found. Four isolates were catalase-negative and reduced the pH of the media to pH<4. Gram staining confirmed rod shaped cell morphologies in singles, pairs, and clusters. All isolates produced gas in MRS broth tubes with Durham tubes. The 16S RNA sequences with 27f and 1492r primers cross referenced with NCBI BLAST confirmed isolation of one strain each of Lactiplantibacillus plantarum, Lactiplantibacillus pentosus, Lentilactobacillus curiae, and Limosilactobacillus fermentum. Further studies may utilize these strains to produce probiotic CSM beverages and other plant-based probiotic beverages. The safety risks and health benefits of these strains should also be characterized.

Keyword: *Probiotics, Lactobacillaceae, Virgin coconut oil, Processing Waste, Isolation*

Interplay of Human milk oligosaccharides with Immunosenescence

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Epidemiological studies have revealed that older face significantly increased risks of recurrent infections. The immune system undergoes characteristic functional declines during aging, termed "immunosenescence", which affects both innate and adaptive immune responses and plays a critical role in the development of most age-related chronic diseases. Against the backdrop of societal aging, elucidating strategies to regulate immunosenescence and identifying effective interventions-such as optimizing dietary regimens to enhance immune resilience in older are essential for improving quality of life. The human milk oligosaccharides (HMOs) like 2'-Fucosyllactose exerts its prebiotic effects primarily through interactions with gut microbial metabolism. Our studies focused on the regulatory effects of HMOs on central/peripheral immune organs, innate/adaptive immune cells, and immune effector molecules. The results identify the intervention on aging-related metabolic disorders and osteoporosis**.** The detailed mechanisms rely on the relieve of the aging-induced proportional changes in either the adaptive immunity of Th subtypes, or the changes in dendritic cell (DC) and macrophage subsets with age. The aging intestinal microecology was ameliorated. These findings highlight that HMOs play as ideal dietary prebiotics for improving aging-related chronic diseases by modulating both the inmmunity and the gut microbial profile, to support the development of targeted interventions to promote healthy aging.

Keyword: *Human milk oligosaccharides, Immunosenescence, prebiotics, aging*

ENZYMATIC SYNTHESIS OF O-METHYLATED EGCGS USING CAFFEOYL-COA O-METHYLTRANSFERASE TO ENHANCE OXIDATIVE STABILITY

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Epigallocatechin gallate (EGCG) is an abundant bioactive compound in green tea, Camellia sinensis and it is well known for its various functionalities. However, its hydroxyl groups make it highly susceptible to oxidation and subsequent browning. To improve its oxidative stability, we employed Caffeoyl-CoA O-methyltransferase (CCoAOMT), an enzyme that facilitates the O-methylation of catecholic structures. It catalyzes the transfer of a methyl group from S-adenosyl-L-methionine (SAM) to the hydroxyl groups of EGCG. The enzymatic reaction was performed at 37℃ for 3 h and methylated derivatives were identified using HPLC-UV and LC-MS. We confirmed the production of mono-, di-, tri- and tetra- methylated EGCGs, among which mono- and di- methylated forms were found to be the predominant products. By protecting the reactive hydroxyl groups, these methylated EGCGs are expected to have more stable oxidative property, suggesting the potential of these derivatives as high-value functional materials.

Keyword: *O-methyltransferase, Epigallocatechin gallate, oxidative stability*

EXPLORING UNDERUTILIZED LEGUMES AS SUSTAINABLE PROTEIN SOURCES FOR STRUCTURALLY AND NUTRITIONALLY OPTIMIZED PLANT-BASED MEAT ANALOGUES

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Growing demand for sustainable, nutritious meat alternatives necessitates diversifying plant proteins beyond soy. This study developed plant-based patties by combining textured soy protein isolate (T-SPI), soy protein isolate (SPI), and texturised mung bean (T-MBF), cowpea (T-CPF), and soy flours (T-SBF) at varying ratios to achieve protein levels comparable to commercial patties (16.7 g/100 g).

Texturised vegetable proteins enhanced β-sheet formation, strengthening protein networks and improving cooked firmness and texture. The developed patties exhibited improved hydration, stronger water binding, and lower cooking loss compared to beef. Mineral and amino acid analyses confirmed good nutritional quality, although sulphur-containing amino acids remained limited. Replacing SPI with MPI and CPI raised protein content, improved yield, and reduced shrinkage. Softer texture with lower hardness and chewiness, due to weaker protein interactions, made patties more beef-like, highlighting MPI and CPI as potential alternatives. INFOGEST in vitro digestion showed slower protein hydrolysis in plant patties compared to meat, due to β-sheet stabilization, fiber interactions, and anti-nutritional factors as supported by SDS-PAGE analysis. Overall, the study demonstrates that combining texturised legume flours with protein isolates provides a promising strategy to develop nutritionally balanced, structurally improved, and sustainable meat alternatives beyond soy.

Keyword: *Legume flour, Texturised vegetable protein, Plant protein, Plant-based meat analogues, Protein functionality*

BIOCHEMICAL PROPERTIES OF BETA-GLUCOSIDASE FROM COMMERCIAL ENZYME FOR THE PRODUCTION OF PHYLLODULCIN AND HYDRANGENOL

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Phyllodulcin and hydrangenol are bioactive compounds found in extracts of Hydrangea macrophylla leaves, exhibiting antioxidant, anti-inflammatory, and muscle function enhancing activities. In plants, phyllodulcin glucoside is the predominant compound, however it is converted into phyllodulcin and hydrangenol during metabolic processes. This study aimed to produce these compounds from phyllodulcin glucoside using commercial enzymes. The 25 commercial enzymes were screened for their ability to convert phyllodulcin glucoside, and Pentopan 500BG β-glucosidase (PBG) was purified. The PBG was approximately 43 kDa, with a recovery of 50.6% and a specific activity of 7.06 U/mg. Optimum pH was 5.5, and maintained more than 50% activity at 50–70°C for 18 h. PBG kinetics determined that the PBG exhibited a k_{cat}/K_m value of 216.68 $s^{-1} \cdot mM^{-1}$ for phyllodulcin glucoside, which is 10–40 times higher than those for other substrates. Furthermore, the highest phyllodulcin production reached at 6 h using the PBG, while hydrangenol was formed as the final product after 24 h. This study confirmed the sequential conversion of phyllodulcin glucoside into phyllodulcin and hydrangenol, demonstrating the potential of the PBG for producing bioactive compounds from Hydrangea macrophylla extracts.

Keyword: *phyllodulcin, hydrangenol, β-glucosidase, commercial enzyme*

SUSTAINABLE VALORISATION OF DAIRY PROCESSING SIDE-STREAMS: ENGINEERING YEAST CELL FACTORIES TO PRODUCE CAROTENOIDS FROM WHEY

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Dairy processing generates large volumes of whey-based side-streams that are underutilised due to their complex composition, disposal costs and associated environmental impact. Rich in lactose and other nutrients, these streams represent a promising substrate for microbial biotransformation. Precision fermentation offers a sustainable route to valorise these residues into high-value food ingredients.

We have constructed and validated a Saccharomyces cerevisiae cell factory that integrates lactose utilisation with β-carotene biosynthesis for whey-based fermentation. A heterologous carotenoid biosynthetic pathway was assembled using Golden Gate cloning and expressed in S. cerevisiae BY4741. Transformants exhibited visible carotenoid pigmentation, confirming pathway expression. Spectrophotometric analysis indicated a mixed carotenoid profile, including β-carotene and lycopene, with an estimated β-carotenoid yield of ~1 mg/L, consistent with early-stage production.

In parallel, efforts to enable lactose utilisation in S. cerevisiae involved expression of the LAC4 gene encoding β-galactosidase from Kluyveromyces marxianus, fused to a secretion signal. The recombinant strain was evaluated for its ability to utilise lactose.

Future work will focus on completing lactose utilisation pathway integration, optimising secretion and enzyme activity, and enhancing metabolic flux to increase carotenoid yields toward industrially relevant levels. Together, this work aims to advance the sustainable conversion of dairy side-streams into high-value pigments.

Keyword: *Precision fermentation, β-carotene, Waste valorisation, Biotransformation, Metabolic engineering*

EFFECT OF SWEETENER TYPE AND PROTEIN COMPOSITION ON THE QUALITY CHARACTERISTICS OF HIGH-PROTEIN BAR” EMPHASIS ON PROTEIN-SWEETENER INTERACTIONS

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High-protein bars are widely consumed as convenient nutritional supplements, but research on quality characteristics and interactions based on the combination of protein types and sweeteners is limited. Therefore, this study evaluated the effects of sweetener type, protein composition, and protein blending ratio on the quality characteristics of high-protein bars. In the first stage, the effect of sweetener types on protein bars with fixed protein content was evaluated, and in the second stage, the ratio of Whey Protein Isolate(WPI) to Isolated Soy Protein(ISP) was varied from 0:100 to 100:0 in 25% increments, and allulose was used to further investigate the interactions between protein ratios. Multivariate analysis of variance (MANOVA) revealed that sweetener type, protein type, and their interaction significantly affected the overall quality characteristics of protein bars (Wilks’ $\lambda = 0.002$, $p < 0.001$). Sweetener type significantly affected moisture content and color properties ($p < 0.001$), .while the effects of sweeteners on texture particularly hardness varied depending on protein type, showing different trends between ISP-based and WPI-based samples ($p < 0.001$).Texture properties were strongly influenced by protein composition, as hardness and cutting force significantly decreased with increasing WPI proportion ($p < 0.001$). These results demonstrate that protein–sweetener interactions play a critical role in determining product quality.

Keyword: *High-protein bar, Isolated soy protein (ISP), Whey protein isolate (WPI), Sweetener, Texture properties*

INNOVATING STUDENT ENGAGEMENT THROUGH AUTHENTIC ASSESSMENT IN FOOD SCIENCE EDUCATION

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FOOD2000 Food Science is a second-year introductory course at The University of Queensland, enrolling approximately 130 students across science, health, engineering and technology disciplines. The course previously struggled to sustain engagement across this diverse cohort. To address this challenge, the curriculum was redesigned to align learning objectives, activities and assessment while linking theory with real world application. Traditional quizzes and laboratory reports were replaced by a group-based Poster Symposium modelled on a professional conference. Student teams critically compared plant-based meat products with conventional meat equivalents and developed evidence-informed dietary recommendations. Groups collected retail data, analysed nutrition labels, assessed health impacts and applied the Health Star Rating system. Weekly tutorials scaffolded teamwork, analysis and poster development. The assessment culminated with a mini conference where students presented posters, answered questions and received peer evaluation contributing to final grades. Student Evaluation of Course and Teaching results and grade distributions from 2023 to 2025 showed improved understanding of course aims, increased satisfaction and clearer grade differentiation. The Poster Symposium enhanced critical thinking, communication and teamwork, with top posters showcased within the department. By simulating real-world professional experiences, this aligned with contemporary workforce transformation and experiential learning priorities within food science education and youth development.

Keyword: *Authentic assessment, Food science education, Student engagement*

Exploring consumer perception across Italy and Japan: a cross-cultural study on functional pasta

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Pasta, an icon of the Italian gastronomic culture whose use is spreading worldwide, has undergone extensive innovation following the agri-food market trends calling for peculiar, healthy, and sustainable products alternative to the traditional ones. Investigating how traditional and innovative pasta is perceived in different gastronomic cultural contexts offers valuable insights for both academia and the food industry. This study investigated consumer perception of traditional (semolina) and innovative (albumen-, matcha- and grape pomace-enriched) pastas in two different countries (Italy and Japan).
Optimization of the pasta formulations identified ideal enrichment levels of 16.5% albumen, 3% grape pomace, and 2% matcha. Sensory analysis revealed that cultural identity significantly shapes acceptance and sensory description of the different formulations. Italian consumers showed significant sensitivity to appearance, hardness, and wheat flavour intensity, whereas Japanese consumers were more responsive to visual, olfactory, and textural attributes. Japanese consumers demonstrated a pronounced preference toward traditional pasta, while Italians exhibited a relatively balanced preference distribution across products, with the semolina pasta receiving the highest preference, closely followed by the matcha-enriched counterpart.

These findings suggest that for functional pasta to succeed globally, enrichment must be localized to match the specific sensory-emotional expectations of each food culture.

Keyword: *cross-cultural sensory analysis, innovative pasta formulation, consumer preference, ingredient enrichment, sensory profiling*

PECTIN AND ALGINATE PHYSICAL FORMS MODULATE IN VITRO GUT FERMENTATION, METABOLITE PROFILES AND MICROBIOTA COMPOSITION

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Non-starch gelling polysaccharides are widely used in food formulation for texture modification, yet their interactions with the colonic microbiota remain poorly defined. This study examined how polysaccharide type, physical form and particle size influenced in vitro colonic fermentation, focusing on the production of gas and short chain fatty acids (SCFA), and microbiota dynamics. Sub-millimetre pectin and alginate gel particles (~140-300μm) were compared with their corresponding solutions during 48h fermentation using a pooled human faecal inoculum. Pectin showed faster gas production and greater substrate degradation than alginate, with gelation reducing fermentation rates by limiting microbial access. Reducing pectin gel particle size below 200μm partially overcame matrix effects, yielding gas and SCFA profiles similar to solutions. Conversely, all sizes of alginate gel particles fermented slowly and incompletely, producing sustained gas and SCFA throughout the 48h. This extended fermentation was associated with enhanced butyrate formation at later stages. Microbiota profiling revealed clear substrate dependent community shifts, with pectin supporting higher microbial richness and diversity, while alginate selected narrower consortia of specialised degraders. Physical form further influenced microbial composition, particularly in alginate systems, while particle size effects were modest. Collectively, results provide a mechanistic basis for designing food structures for desired gut health functionality.

Keyword: *Alginate, Gel particles, In vitro fermentation, Microbiota, Pectin*

Engineering porous starch from cassava and faba bean to enhance encapsulation capacity: Curcumin as a model bioactive compound

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This study focused on producing porous starch from cassava and faba bean sources with improved encapsulation ability by applying a combined modification approach. The method integrated ultrasound pretreatment, enzymatic hydrolysis, and an alcohol–alkaline granular cold-swelling process, with curcumin used as a model bioactive compound. Unlike traditional techniques that depend only on enzymatic hydrolysis, this approach introduced ultrasound as an initial step to enhance structural modification, followed by further treatment to increase porosity and functionality. The effects of these processes on starch characteristics including morphology, microstructure, thermal properties, particle size, and absorption capacities for water, oil, and curcumin were systematically analyzed. All modified starches showed rough surfaces and well-developed pores, with the most significant porosity observed in ultrasound-treated and triple-modified samples, particularly in cassava starch. Crystallinity decreased notably while the chemical structure remained intact, as confirmed by FTIR. Water absorption capacity increased substantially in triple-modified samples compared to unmodified starches. Additionally, all treated starches exhibited improved curcumin encapsulation, with the highest efficiency and thermal stability found in triple-modified variants. Overall, the combined modification strategy effectively enhanced starch porosity, absorption, and encapsulation performance, highlighting its potential for delivering heat-sensitive compounds in functional food systems.

Keyword: *modified porous starch, ultrasound, enzymatic modification, alcohol-alkaline treatment, bioactive carrier*

PHOTONIC CRYSTAL ASSISTED FLUORESCENCE ENERGY TRANSFER FOR ULTRASENSITIVE DETECTION OF EPIGALLOCATECHIN GALLATE

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(−)-Epigallocatechin gallate (EGCG) is a key functional tea polyphenol, and its rapid and accurate detection is essential for tea quality evaluation and functional food analysis. However, conventional methods remain labor-intensive, time-consuming, and heavily dependent on sophisticated instrumentation. Herein, we develop a rapid sensing method for EGCG detection based on fluorescence resonance energy transfer enhanced by hollow SiO_2 photonic crystals. We applied acridine orange and rhodamine 6G as the donor-acceptor pair. Matching the photonic bandgap with fluorescence emission enhances local electromagnetic fields and radiative processes, amplifying the sensing response. Our method exhibits linear relationship over a large concentration range of 1×10^{-18} to 1×10^{-3} mol·L^{-1} (R^2 = 0.994), achieving an extremely low detection limit of 9.66×10^{-20} mol·L^{-1}. Moreover, it has high selectivity, strong anti-interference capabilities, and good reusability. We applied it to determine EGCG in green, white, oolong, and black teas.

Keyword: *Tea, Photonic Crystals, Fluorescence Resonance Energy Transfer, EGCG Detection*

Effect of high-pressure homogenisation on the structure and functional properties of micro algae Golden Chlorella (Auxenochlorella protothecoides)

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Microalgae are widely recognised for their high protein content (30–70%), rich supply of essential amino acids, and beneficial fatty acids, making them valuable as food supplements and natural functional ingredients. Among them, Golden Chlorella (Auxenochlorella protothecoides) has recently attracted attention due to its strong nutritional profile, functional versatility, and sustainability. This study examined the impact of high-pressure homogenisation (HPH) on the microstructure and functional properties of Golden Chlorella (GC) suspensions. Samples were processed at pressures of 200, 500, and 1000 bar, using either one or two passes, and evaluated for structural and techno-functional changes. Microscopic analysis revealed that higher homogenisation pressures reduced large particle aggregates into smaller, more uniform fragments, improving their interaction within both water and oil systems. Water solubility increased significantly following single-pass treatments, rising by 22%, 35%, and 54% at 200, 500, and 1000 bar, respectively, compared to 12% in untreated samples. Oil adsorption capacity also improved by 46.4%, 61.0%, and 67.4%, while foaming capacity increased by 8.0%, 19.5%, and 28.0%. Additionally, viscosity at 200 bar rose up to 1.5 times compared to untreated suspensions. Overall, increasing HPH pressure enhanced solubility, adsorption, viscosity, and foaming properties, highlighting its effectiveness in improving microalgal functionality.

Keyword: *Auxenochlorella protothecoides, Golden Chlorella, Microalgae, High-pressure homogenisation, Functional properties*

EFFECT OF ANTICAKING AGENT ADDITION ON THE PHYSICOCHEMICAL AND FUNCTIONAL PROPERTIES OF PARTIALLY SUBSTITUTED SPRAY DRIED SALT

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Excessive dietary sodium intake remains a critical global public health challenge, driving demand for effective and stable salt reduction solutions. Current strategies, including size reduction and partial substitution, frequently produce agglomerated particles prone to caking and poor storage stability. This study investigated the effect of four anticaking agents: calcium carbonate ($CaCO_3$), fumed silica, magnesium oxide (MgO) and calcium silicate, at 0.5% and 1% w/w on the physicochemical properties of a partially substituted salt system consisting of KCl and $MgCl_2$ as replacers, produced via modified spray drying technique. Elemental mapping confirmed homogeneous surface distribution of all anticaking agents. FTIR analysis revealed chemical interactions specific to MgO containing samples, attributed to carbonate group formation. Flowability of the samples improved significantly at 1% w/w addition across all anticaking agents. Calcium silicate containing samples yielded the fastest dissolution profile, while MgO containing samples required approximately four times longer to dissolve than the control. Hygroscopicity was observed to be the highest for the control and was most effectively reduced by 1% MgO, followed by 1% $CaCO_3$. These findings demonstrate that anticaking agent type and concentration critically govern the functional performance of structurally modified partially substituted salt, offering practical pathways toward commercially viable, storage-stable low-sodium alternatives.

Keyword: *Partial substitution, sodium chloride, spray drying, anticaking agents, sodium reduction*

A NOVEL GREEN AND EFFICIENT METHOD FOR CHIA SEED MUCILAGE EXTRACTION: PHYSICOCHEMICAL PROPERTIES AND FUNCTIONAL CHARACTERISTICS

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Plant-derived seed mucilage from chia (Salvia hispanica L.) has attracted growing interest in the food industry due to its techno-functional properties, such as thickening and water-retention capabilities. However, conventional extraction methods are limited by the high viscosity of the hydrated mucilage layer, resulting in incomplete separation. This study proposes a novel steel ball milling extraction (SBME) method with higher yields and functional properties.

Dry chia seeds were soaked in ultrapure water for hydration. The hydrated seeds were freeze-dried, then vortexed with stainless steel balls for 30 s, followed by sieving to separate the mucilage. The yield was compared with traditional water extraction and heating & ultrasound-assisted extraction. Monosaccharide composition, molecular weight, particle size, functional properties and rheological properties were analyzed.

The extraction yield showed significant differences, with SBME achieving the highest yield (6.72%). The monosaccharide composition was similar, with differences in galacturonic acid and glucuronic acid. SBME-derived mucilage exhibited larger particle sizes and superior functional properties; for example, water swelling capacity reached 937 mL/g, approximately 40 times higher than that of traditional water extraction methods, along with higher water-holding capacity, thermal stability, and viscosity.

A novel method for chia seed mucilage separation was developed, showing potential for food industry applications.

Keyword: *Seed mucilage, Green extraction, Rheological properties, Functional properties, Hydrocolloid*

PHOTOPROTECTIVE EFFECTS OF FLAVONES ARE HIGHLY SENSITIVE TO THE NUMBER AND POSITION OF PHENOLIC GROUPS

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Excessive ultraviolet (UV) radiation exposure contributes to sunburn, photoaging, inflammation, and increased risk of skin cancer. Natural flavonoids have attracted attention as functional ingredients due to their UV absorption and antioxidant properties. Our preliminary screening of 77 flavonoids (46 monomers and 31 dimers) identified 5,3',4'-trihydroxyflavone (5,3',4'-THF) as a potent candidate. Therefore, this study evaluated photoprotective mechanism of 5,3',4'-THF through cell viability assay, ROS measurement, HPLC analysis, UV–Vis spectroscopy, transcriptome analysis and western blot assay. 5,3',4'-THF significantly maintained the cell survival after irradiation at the non-toxic concentrations and effectively reduced intracellular reactive oxygen species (ROS) levels. The compound remained stable under UV exposure without detectable degradation products, although slight reduction occurred after prolonged incubation in the cell culture condition. 5,3',4'-THF and its isomers all exhibited maximum absorption at the UVA range and similar extinction coefficients. In addition, 5,3',4'-THF can be metabolized into methylated derivatives by HaCaT cells after 24 h treatment, which retained comparable photoprotective activity. Meanwhile, 5,3',4'-THF treatment might alleviate irradiation-induced skin damage through the modulation of MAPK signaling pathway. In summary, 5,3',4'-THF can provide photoprotective effects through the regulation of oxidative stress and MAPK signaling pathway.

Keyword: *5,3',4'-trihydroxyflavone, Photoprotective effect, HaCaT cells*

Electron beam irradiation induces dose-dependent structural and biofunctional changes in adlay (Coix lachryma jobi L.) bran: Evidence for a 7.5 kGy threshold

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Adlay bran, a lignocellulosic byproduct rich in dietary fiber and phenolic compounds, was subjected to electron beam irradiation (0–10 kGy) to evaluate dose-dependent changes in microbial, structural, physicochemical, and bioactive properties. Irradiation significantly reduced microbial load, with aerobic plate counts decreasing by 2.7 log at 5.0 kGy and falling below detection (<10 CFU/g) at ≥7.5 kGy. Fourier transform infrared (FTIR) spectroscopy showed increased absorbance in carbohydrate, protein, and lipid regions up to 7.5 kGy, followed by attenuation at 10 kGy, indicating a transition from structural rearrangement to polymer degradation. Raman spectroscopy supported these findings through changes in glycosidic bond-associated bands. Moisture content decreased progressively from 12.09% (control) to 6.45% (10 kGy), while CIELAB color parameters remained unchanged, indicating minimal impact on visual quality. Total phenolic content increased from 2.35 ± 2.09 to 5.50 ± 2.42 mg GAE/g at 7.5 kGy ($p < 0.05$), whereas total flavonoid content decreased significantly. Multivariate analysis (PCA) revealed dose-dependent clustering, with 7.5 kGy representing a transition point between structural modification and degradation. These findings indicate that electron beam irradiation at 7.5 kGy effectively enhances microbial safety while maintaining structural integrity and selected bioactive properties, supporting its potential application in processing lignocellulosic cereal byproducts.

Keyword: *electron beam irradiation, adlay bran, FTIR spectroscopy, microbial inactivation, phenolic compounds*

TRANSFORMING FOOD CHOICES IN DIGITAL FOOD ENVIRONMENT: YOUTH EMPOWERMENT AND CO-CREATION AMONG NUTRITION STUDENTS IN MALAYSIA

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The rapid expansion of digital food environments (DFEs) is reshaping youth food choices through social media and food delivery platforms. However, a gap persists between nutrition knowledge and actual food choice behaviours among nutrition university students in DFEs. This study examined DFE experiences among Malaysian nutrition university students, a high-knowledge group operating within digitally driven choice architectures, and evaluated a youth empowerment programme. A sequential mixed-methods study, combining baseline surveys, photovoice, pre-post evaluation of a structured Train-the-Trainer (TTT) programme, was conducted among 30 nutrition students from nine universities under the United Kingdom–Southeast Asia Child and Adolescent Nutrition (UK-SEA ChAN) Network. Baseline findings showed high digital platform exposure (83.3%) and frequent out-of-home food consumption (70.0%) driven by convenience (86.7%) and promotional cues (50.0%). Photovoice-informed analysis suggested DFEs function as choice architecture systems, shaping decisions through sensory and social cues that favour impulsive choices. TTT evaluation showed improvements in digital literacy, empowerment, and health promotion competencies ($p<0.05$), enabling participants to co-create food choice interventions targeting peers and adolescents. These findings demonstrate that structured youth empowerment is a feasible and scalable approach to transform food choice behaviours within DFEs, positioning nutrition students as strategic changemakers.

Keyword: *Digital food environments, Food choice behaviour, Youth empowerment, Co-creation, Capacity building*

SURFACE-MODIFIED HALLOYSITE NANOTUBES: IMPACT ON THE PERFORMANCE OF CHITOSAN NANOCOMPOSITE FILMS FOR SUSTAINABLE FOOD PACKAGING

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The growing environmental impact of plastic waste has intensified the search for sustainable food-packaging materials. Chitosan is an appealing candidate biopolymer due to its natural abundance, biodegradability, and inherent antimicrobial activity, yet its poor mechanical properties and gas barrier performance restrict its practical use. Reinforcing chitosan with nanoclays provides a means to enhance these properties. However, meaningful improvements rely on achieving uniform filler dispersion and strong interfacial interactions (both of which constitute major bottlenecks in polymer–nanoclay systems). This work addresses these limitations by modifying the surface of halloysite nanotubes (HNT), a naturally occurring tubular clay mineral, to improve their compatibility with chitosan. Organosilane compounds with different functional groups were grafted onto HNT surfaces to reduce aggregation and promote interfacial bonding within the polymer matrix. Spectroscopic and microscopic analyses confirmed successful silylation of HNT surface and suggested increased steric hindrance, necessary for improved dispersion. Ongoing development of chitosan nanocomposite films aims to assess how these modified HNTs influence mechanical and barrier performance. We anticipate that enhanced dispersion combined with stronger interfacial interactions will lead to films with much improved functional properties. The overall aim of this work is to advance chitosan-based nanocomposites toward more practical sustainable food-packaging applications.

Keyword: *Chitosan, Halloysite nanotubes, Nanocomposites, Surface silylation, Biodegradable packaging*

COMPARATIVE EVALUATION OF MINERAL COMPOSITION, MICROBIOLOGICAL SAFETY, AND YOGURT APPLICATION OF COCONUT SAP SUGAR FROM DIFFERENT REGIONS OF THE PHILIPPINES

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Coconut sap sugar (CSS) is increasingly recognized as a healthier sweetener due to its lower glycemic index and mineral-rich profile. However, regional variability in composition may influence its nutritional value, functionality, and sensory performance in food systems. This study compared the mineral composition, physicochemical properties, microbiological safety, and preliminary consumer acceptability of CSS sourced from Davao, CALABARZON, and SOCCSKSARGEN regions in the Philippines. Results showed notable variation in sodium (81–166 mg/100 g), iron (53.42–56.05 mg/100 g), calcium (≤0.1–17 mg/100 g), magnesium (23–29 mg/100 g), and potassium (706–965 mg/100 g), with potassium as the predominant mineral across samples. Physicochemical properties, including moisture content, water activity, and protein levels, were within ranges for shelf-stable foods. Microbiological analyses confirmed compliance with food safety standards, with low counts of indicator organisms. Consumer evaluation of yogurt formulations indicated highest acceptability at 6% (w/w) CSS, associated with sweetness and caramel-like flavor. Ongoing work includes descriptive sensory profiling using Check-All-That-Apply (CATA) and evaluation of CSS effects on yogurt fermentation and quality. These findings highlight the potential of region-specific CSS as a functional sweetener with distinct compositional and sensory attributes, supporting its application in value-added food products.

Keyword: *Coconut sap sugar, Mineral composition, Regional variation, Yogurt sweetener*

PILOT-SCALE EXTRUSION AND SENSORY EVALUATION OF A MULTI-NUTRIENT RICE KERNELS FOR MATERNAL HEALTH

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Maternal undernutrition remains a public health concern in the Philippines. Feeding programs for pregnant and lactating women need safe, acceptable, and nutrient-dense food vehicles. The research team developed a multi-micronutrient extruded rice kernel fortified with iron, zinc, vitamin A, and folic acid. Fortification targets were based on recommended nutrient intakes for pregnant and lactating women. Processing conditions were standardized using a single-screw extruder with duplicate pilot-scale production runs. Product quality was evaluated using micronutrient analysis (atomic absorption spectroscopy for iron and zinc; high-performance liquid chromatography for vitamin A and folic acid), sensory evaluation (hedonic rating), and microbiological assessment during 6 months of storage.

The multi-micronutrient extruded rice kernels showed homogeneous micronutrient distribution, with retention values >50% post-processing and stability during storage. Sensory scores indicated acceptable cooked rice quality when blended with regular rice. Microbiological analyses confirmed product safety throughout storage period. These findings suggest that the multinutrient-fortified extruded rice kernels can function as a practical functional food ingredient with demonstrated safety and stability under typical storage conditions. When mixed with milled rice, the multi-micronutrient extruded rice kernels can be used for government feeding interventions.

Keyword: *multinutrient rice, extrusion, fortified rice*

Evaluation of S-adenosylmethionine (SAM) and Related Metabolites in Sake Kasu Produced by Different Yeast Strains

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Japanese rice wine (Sake) is made by fermentation of rice. After pressing the fermenting mixture to extract liquid sake, sake lees (sake kasu) remain as a byproduct. Previous studies have indicated that yeasts used in sake production yield higher levels of S-adenosylmethionine (SAM) than yeasts for beer and bread. SAM is a methionine-derived metabolite that has been reported to improve depression symptoms and alcoholic liver disease. This study aimed to compare the levels of SAM-related metabolites in sake kasu samples produced from different yeast strains.

Water extracts of sake kasu samples were deproteinized using 0.1% formic acid in methanol. Methionine, SAM and S-adenosylhomocysteine (SAH) were quantified by LC-MS/MS after 6-Aminoquinolyl-N-hydroxysuccinimidyl Carbamate (AQC) derivatization.

While SAH was not detected, methionine and SAM were detected in all sake kasu samples. SAM concentrations ranged from 17.3 to 57.4 mg/100 g in sake kasu samples. Significant differences in SAM content were observed among sake kasu prepared using different yeast strains. Interestingly, several samples showed high SAM/methionine ratios, suggesting that specific yeast strains may have enhanced capacity for SAM biosynthesis or suppressed the conversion of SAM into SAH. These findings provide insight into selecting yeast strains to produce SAM-enriched sake kasu for functional food applications.

Keyword: *Sake lees (Sake kasu), S-adenosylmethionine (SAM), LC-MS/MS*

EFFECT OF MALTODEXTRIN CONCENTRATION ON THE PHYSICOCHEMICAL AND FUNCTIONAL PROPERTIES OF FREEZE-DRIED EXTRACT FROM SALUYOT (Corchorus olitorius)

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Rising demand for health-oriented, clean-label, and plant-based functional ingredients highlights the need for stable, bioactive-rich powders. Corchorus olitorius (saluyot), a widely consumed leafy vegetable in the Philippines, remains underutilized despite its rich phenolic and antioxidant content due to the lack of standardized processing and formulation strategies. This study aimed to determine the maltodextrin concentration that balances physicochemical stability and bioactive retention in freeze-dried saluyot extract powder. A Completely Randomized Design with four maltodextrin treatments (10%, 15%, 20%, and 25%) was employed, and key physicochemical, functional, and bioactive properties were evaluated. Microscopic observation revealed irregular, amorphous particles with no observable structural differences among treatments. Increasing maltodextrin concentration significantly improved powder stability, as indicated by reduced hygroscopicity (21.12% to 16.61%) and viscosity (15.07cP to 12.17cP), along with increased lightness and reduced color intensity due to pigment dilution. However, total phenolic content (TPC) decreased from 4.25 to 1.84mg GAE/g, while DPPH antioxidant activity declined from 23.64 to 11.25mg AAE/g, with similar trends observed for CUPRAC, whereas ABTS showed no significant difference ($p>0.05$). Overall, 15% maltodextrin provided the most suitable balance between stability and bioactive retention, indicating a threshold concentration for optimal formulation. Findings support the development of standardized saluyot powder for functional applications.

Keyword: *Corchorus olitorius, freeze-dried powder, maltodextrin, powder stability, antioxidant activity*

Establishment of Optimal Extraction Conditions for Platycodon grandiflorus Root using BBD-RSM

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Platycodon grandiflorus belongs to the family Campanulaceae and is widely distributed across East Asia. In this study, the optimal extraction conditions for triterpenoid saponins, including platycodin D, from fresh P. grandiflorus root was investigated using response surface methodology (RSM). The effects of four independent variables—extraction time, solvent concentration, liquid-to-solid ratio, and extraction temperature—were evaluated using a Box–Behnken Design (BBD). Each factor was examined at three levels (−1, 0, +1), resulting in a total of 27 experimental runs.

Based on the experimental results, a second-order regression model was developed to describe the relationship between the variables and extraction efficiency. Analysis of variance (ANOVA) indicated that the model was statistically significant (R^2 = 0.844, p = 0.006), demonstrating good model fitness and reliability.

Response surface analysis demonstrated that solvent concentration was the predominant factor influencing extraction efficiency, with significant quadratic and interaction effects observed among the variables. These findings highlight the importance of optimizing solvent conditions. The optimal extraction conditions predicted by this model were an extraction time of 130 min, a solvent concentration of 0%, a liquid-to-solid ratio of 13.8 (v/w), and an extraction temperature of 60 °C. These results provide a scientific basis for efficient extraction and potential industrial applications.

Keyword: *Platycodon grandiflorus, Box-Behnken Design (BBD), Response Surface Methodology (RSM), Triterpenoid saponin, Optimization*

REAL-TIME REPLENISHING EMBEDDING SYSTEM FOR STRUCTURAL REPLICATION OF SEVEN-BAND GROUPER VIA 3D FOOD PRINTING

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The demand for high-value seafood analogs is increasing due to sustainability and supply limitations, particularly for premium species such as seven-band grouper. However, replicating the delicate muscle structure of fish using conventional 3D food printing remains challenging. A real-time replenishing embedding system (RRES) was developed to enable continuous support medium deposition synchronized with extrusion, improving structural stability during printing. Surimi-based tissue-derived ink was prepared with varying $CaCl_2$ concentrations and printed within sodium alginate support baths (0–8%). Printability, rheological behavior and cooking properties were evaluated. The RRES significantly improved filament deposition stability by compensating for buoyancy limitations observed in conventional embedding printing. Optimal conditions ($CaCl_2$ ~1% and alginate ~4%) enabled stable multilayer structures and complex geometries mimicking fish muscle orientation. Rheological analysis showed increased storage modulus (G′) with ion-induced gelation, indicating enhanced structural integrity during printing and curing. Texture analysis of cooked samples demonstrated tunable mechanical properties, with improved cohesiveness and cutting strength compared to non-embedded controls. The proposed RRES enables precise fabrication of fish-like muscle structures by overcoming limitations of conventional embedding-based 3D food printing. This approach provides a scalable platform for producing high-value seafood analogs with controlled texture and structural fidelity.

Keyword: *3D food printing, Real-Time Replenishing Embedding System, Seafood analog*

Chasing microbial footprints

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Microbial testing in foods relies heavily on conventional laboratory-based methods requiring off-site sample analysis and extended turnaround times. These delays increase costs and reduce the shelf-life of perishable foods. There is a need for rapid, complementary screening approaches that can be applied closer to production to enable early indication of microbial contamination.

This research explored volatile organic compounds (VOCs) as rapid, non-invasive indicators of microbial presence using gas chromatography–time-of-flight mass spectrometry (GC–TOF-MS). Headspace VOC profiling using solid-phase microextraction (SPME) was investigated across dairy and fresh produce systems.

Pathogenic and non-pathogenic Escherichia coli were spiked into UHT milk and fresh salads at different loads . Compounds including ethanol and acetic acid (milk), and indole (salads), showed significantly higher abundances in contaminated samples ($p < 0.05$) post incubation (24h). A novel study for Pseudomonas screening in milk was also conducted. UHT and raw milk were spiked (~4 CFU/mL) with raw milk isolates, and a metabolic booster was added to the spiked milk to enhance biomarker VOC production, enabling early (wtihin 48h) non-invasive screening of Pseudomonas in milk.

These findings highlight the potential of VOC profiling as a rapid screening tool to prioritise samples for confirmatory testing, reducing laboratory burden and improving decision-making.

Keyword: *Volatile organic compounds (VOCs), Rapid microbial screening, Gas chromatography–time-of-flight mass spectrometry (GC–TOF-MS), Food safety*

Nutrition-Oriented Life Cycle Assessment of Mung Bean and Lentil Proteins

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Mung bean and lentil proteins have emerged as promising plant-based alternatives due to their clean flavour, favourable functional properties and applicability in food systems. However, limited environmental data, together with uncertainties regarding their nutritional quality relative to animal proteins, making it difficult to determine whether they are truly greener alternatives. Life cycle assessment (LCA) is a powerful tool for quantifying environmental impacts across the full production chain, from crop cultivation to final protein ingredients. In this study, a comprehensive environmental assessment was conducted for mung bean, red lentil, and green lentil proteins, with employing protein digestibility as the functional unit and evaluating performance across 18 distinct environmental impact categories. The results revealed clear differences in environmental performance among these protein sources, with mung bean protein exhibiting a lower overall environmental impact score than lentil counterpart. Interestingly, the dominant impact categories were consistent across all samples, with the top five contributors identified as climate change, fine particulate matter formation, human carcinogenic toxicity, human non-carcinogenic toxicity, and land use. Furthermore, environmental hotspots during the production stages were identified, highlighting opportunities to optimise production systems and improve the overall sustainability of plant protein ingredients.

Keyword: *Life cycle assessment, Mung bean protein, Lentil protein, protein digestibility*

SUSTAINABLE EXTRACTION OF R-PHYCOERYTHRIN FROM DRY BIOMASS OF GRACILARIA CORTICATA EMPLOYING ULTRASOUND-ASSISTED EXTRACTION WITH NADES

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R-phycoerythrin (R-PE) is a valuable phycobiliprotein possess applications in functional foods, pharmaceuticals, and biotechnology due to its important biological properties. This highlights the need for efficient, environmentally sustainable extraction methods. In the present study, R-PE was extracted from dry biomass of Gracilaria corticata using four natural deep eutectic solvents (NaDES) in combination with ultrasound-assisted extraction. Among the tested systems, the glucose: glycerol (1:2) mixture resulted in the highest yield and was therefore selected for further investigation. Process parameters were subsequently optimized using a Box–Behnken design to examine interactions among variables and identify optimal conditions. In parallel, machine learning models were developed.

Field Emission Scanning Electron Microscopy (FESEM) analysis revealed a clear disruption of algal biomass after treatment, indicating enhanced mass transfer. Fourier Transform Infrared Spectroscopy (FTIR) spectra confirmed the presence of hydrogen-bonding interactions within the NaDES system, suggesting the successful formation of a stable eutectic structure. Thermogravimetric analysis further indicated that the extracted R-PE exhibited improved thermal stability, with minimal degradation observed under the optimized extraction conditions.

Keyword: *R-phycoerythrin; Gracilaria corticata; Natural deep eutectic solvents (NADES); Ultrasound-assisted extraction (UAE); ML; Characterization; Green extraction*

Photothermal and luminescent characteristic pigment in Wufan formed from reaction of rice and Vaccinium bracteatum Thunb. Leaves

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Wufan, prepared by cooking rice with aqueous extract of Vaccinium bracteatum thumb leaf (VBTL), is a popular traditional Chinese food possessing high nutritional value. We found that the black pigment in Wufan are NIR-luminescent. Therefore, this study aims to explore the photophysical properties and reaction mechanism of these substances. Wufan pigment (WFP) was extracted by enzymatic hydrolysis and alkaline extraction (yield: 7.305%, purity: 78.75%), and its structure was probed by LC-MS/MS. The results indicated that Wufan pigments, mainly iridoid glycosides crosslinked with rice proteins, contributing to the black colour of Wufan. The total amount of amino acids in WFP was higher than in rice protein, but the lysine level was lower, indicating it may be involved in the reaction with pigments. Uv-vis absorption spectrum exhibited broad absorption range spanning from the UV-vis region (300-650 nm) to the NIR window (650-1100 nm). Correspondingly, WFP demonstrated a good photothermal conversion and lowered the cell viability of 4T1 by 80% upon excitation at 808 nm. These findings uncovered the terpenoid-protein interactions in Wufan and open up a new use of old pigments present in traditional Chinese ethnic foods.

Keyword: *Vaccinium bracteatum thumb leaf, Wufan pigment, Photothermal, NIR luminescent, Terpenoid-protein interactions*

Composition and Thermal Properties of Philippine Cacao–Based Dark Chocolate Enriched with Lactiplantibacillus plantarum

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Chocolate is widely consumed and increasingly investigated as a vehicle for probiotic delivery; however, its physicochemical and thermal responses to probiotic incorporation remain underexplored. This study evaluated the composition and thermal behavior of UF18 Philippine cacao and 75% dark chocolate, comparing a control (DC) with a probiotic-enriched sample (PDC) containing Lactiplantibacillus plantarum. Probiotics were incorporated during tempering, yielding 9.8×10^6 CFU g^{-1}, within the recommended functional threshold. Proximate analysis showed no significant differences between DC and PDC in moisture, ash, and fat content, indicating compositional stability upon enrichment. GC–MS profiling confirmed the preservation of key lipid constituents and bioactive compounds, including fatty acids, phytosterols, and tocopherols. FTIR coupled with principal component analysis revealed only subtle spectral variations, suggesting minimal structural perturbation of the chocolate matrix. Differential scanning calorimetry showed comparable melting profiles for DC and PDC, with peak temperatures of ~30 °C and enthalpy values consistent with the stable Form V polymorphism. Thermogravimetric analysis further showed similar multi-stage degradation behavior, with minor shifts attributed to microbial biomass. Overall, probiotic incorporation did not significantly alter the compositional or thermal properties of dark chocolate, supporting its potential as a stable and effective carrier for functional food applications.

Keyword: *Probiotic chocolate, Lactiplantibacillus plantarum, Cacao, Physicochemical properties*

UNRAVELING IRON–STARCH COORDINATION IN FORTIFIED RICE FLOUR SYSTEMS VIA VIBRATIONAL SPECTROSCOPY

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Vibrational spectroscopic techniques, particularly FTIR and Raman spectroscopy, provide molecular-level insight into starch–fortificant interactions by resolving changes in bonding environments, coordination chemistry, and structural organization within complex carbohydrate matrices. This study investigates the interaction mechanism between sodium iron EDTA (NaFeEDTA) and rice starch systems with varying amylose content using complementary FTIR and Raman analyses. FTIR results revealed the emergence and progressive intensification of bands at ~1620 and ~1590 cm^{-1}, attributed to asymmetric stretching of coordinated carboxylate (COO^-) groups, indicating incorporation of the iron–EDTA complex into the gelatinized starch matrix. Peak shifts and deconvolution within the 1700–1560 cm^{-1} region further suggest localized coordination between the iron center and hydroxyl groups of starch chains. Despite these spectral changes, short-range molecular order indices (1047/1022 and 995/1022 cm^{-1}) exhibited minimal variation, confirming preservation of the semi-crystalline organization and double-helical structure of starch.

Raman spectroscopy corroborated these findings, as characteristic starch vibrational bands remained largely unchanged across all treatments, indicating retention of the polysaccharide backbone. The increasing I_{465}/I_{480} intensity ratio with higher fortification levels confirmed progressive incorporation of NaFeEDTA through enhanced Fe–ligand contributions. Collectively, the results establish a coordination-driven mechanism involving localized interaction domains within the starch matrix.

Keyword: *FTIR, Raman Spectroscopy, Vibration Spectroscopy, Rice Starch, Iron Fortification*

MAPPING VOLATILE CHANGES DURING FERMENTATION OF RICE BEAN AND PIGEON PEA USING CHEMOMETRIC AND MACHINE LEARNING APPROACHES

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Fermentation enhances flavor in legumes; however, the temporal evolution of volatile compounds in underutilized species remains poorly understood, with limited literature available. Legumes are an underexploited resource for developing plant-based foods, making it essential to better characterize their fermentation-driven flavor formation. This study explored changes in volatile profiles of rice bean (Vigna umbellata) and pigeon pea (Cajanus cajan) during submerged fermentation with lactic acid bacteria (Lactiplantibacillus plantarum). Volatile compounds were analyzed using headspace solid phase microextraction (HS-SPME) and gas chromatography mass spectrometry (GC–MS), combined with multivariate and machine learning approaches. Principal component analysis and partial least squares regression were used to identify time-dependent transformations, while random forest modelling provided additional insight into more complex, non-linear patterns across fermentation stages. The results show that fermentation leads to progressive changes in volatile composition, reflecting shifts in metabolic activity such as amino acid degradation and lipid oxidation, along with the formation of key aroma-active compounds. Differences between the two legumes suggest that their initial composition influences how these changes develop. Overall, this study highlights the value of combining analytical chemistry with data-driven approaches to better understand flavor development and supports the potential of underutilized legumes in the development of fermented, plant-based foods.

Keyword: *Fermentation, Lactiplanctibacillus plantarum, volatile compounds, rice bean, pigeon pea*

OVERPRODUCTION OF A TRUNCATED CYCLOISOMALTOOLIGOSACCHARIDE GLUCANOTRANSFERASE FROM THERMOANAEROBACTER THERMOCOPRIAE IN ESCHERICHIA COLI

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Cycloisomaltooligosaccharide glucanotransferase from Thermoanaerobacter thermocopriae (TtCITase) is a large modular enzyme composed of an N-terminal catalytic domain responsible for cycloisomaltooligosaccharide (CI) formation and a C-terminal domain involved in long-chain isomaltooligosaccharide (IMO) production. The excessive length of the full-length enzyme has been a drawback for its overproduction using a recombinant Escherichia coli system. In this study, an ideal gene construction for N-terminal catalytic domain of TtCITase (TtCIT-N) was attempted to improve the expression level in E. coli BL21 system. Based on protein modelling, tructation points were surveyed, and one of trucated genes for TtCIT-N showed high expression level in E. coli. The resulting gene product, TtCIT-N was fully soluble, yielding 36 mg of purified enzyme per 100 mL culture through Ni-NTA affinity chromatography. CI-producing activity for TtCIT-N using dextran as the substrate was compatible with the wild type TtCTIase. This work will facilitate the further study for such as process design of CI production and engineering of CITase.

Keyword: *Cycloisomaltooligosaccharide glucanotransferase, Thermoanaerobacter thermocopriae, Glycoside hydrolase family 66*

APPLICATION OF PLASMA CHILL SPRAY TECHNOLOGY FOR INACTIVATION OF ESCHERICHIA COLI BIOFILMS ON STAINLESS STEEL SURFACES

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Meat processing environments promote biofilm formation. Plasma-activated water (PAW) has gained attention as a non-thermal technology capable of disrupting microbial viability and biofilm integrity. It was hypothesized that employing high-pressure plasma chill spray produced from PAW would enhance biofilm inactivation through multiple stresses. This study evaluated the efficacy of plasma chill spray for inactivating Escherichia coli biofilms on stainless steel surfaces.

PAW was generated by exposing distilled water to a bubble-spark discharge plasma reactor integrated with a vortex-tube cooling system and a spray nozzle. The biofilms of E. coli on stainless-steel surfaces were subjected to sequential treatments comprising plasma chill spray and distilled water (DW) spray at different PAW temperatures.

PAW and plasma chill sprays exhibited low pH, high oxidation-reduction potential, and elevated electrical conductivity, characteristics commonly associated with strong antimicrobial activity. Plasma chill spray treatments achieved E. coli biofilm reductions to below the detection limit (>6.12 log CFU/cm²), likely due to the combined effects of oxidative stress from reactive oxygen and nitrogen species in PAW, cold stress induced by low-temperature treatment, and mechanical stress generated by high-pressure spraying. These findings demonstrate the potential of plasma chill spray as a sustainable method for decontaminating food-contact surfaces without chemical residues.

Keyword: *Plasma-activated water, Plasma chill spray, Escherichia coli, oxidative stress, antimicrobial*

From Theory to Practice: Embedding Industry Systems in Food Science Education

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Industry-integrated project-based learning (PjBL) supported by authentic assessments addresses the evolving demands of the food industry by linking disciplinary knowledge with real-world practice. The expected outcomes of these embedded industry systems are to prepare graduates to adapt quickly to the evolving food industry, allowing them to make immediate contributions to food safety cultures and quality management systems, thereby providing value to employers through enhanced productivity. This study examines how PjBL enhances student engagement, supports the application of theory to practice, and develops industry-relevant skills that strengthen graduate workplace readiness. The research draws on qualitative student reflections and institutional end-of-course evaluations from a 12-week industry-integrated food manufacturing project, the use of digital compliance tools, including HACCP plan development, and industry-co-designed assessments with iterative feedback. Student feedback indicates perceived development of employability-aligned capabilities such as communication, teamwork, problem-solving, critical thinking, enhanced digital literacy, and confidence in applying disciplinary knowledge, such as GMP monitoring tools, food safety program, and Australian food safety standards, while CES results demonstrate high levels of satisfaction with engagement, clarity, and confidence.

Keyword: *Industry-integrated project-based learning, authentic assessment, graduate capability, industry-co-designed assessments, HACCP Plan*

THE EFFECT OF IN VITRO DIGESTION AND FECAL FERMENTATION OF STARCH-POLYPHENOL COMPLEXES ON STARCH CHAIN LENGTH

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The composites were all prepared using corn starch (MS) and potato starch (PS) combined with various polyphenols （Resveratrol-RES, Curcumin-CUR, Quercetin-QUE, Icariin-ICA）, and the in vitro digestion and fermentation characteristics of the different composites were investigated. The results indicate that the introduction of polyphenols leads to the formation of starch-polyphenol complexes, primarily stabilized by non-covalent bonds. In vitro digestion experiments showed that the MS-QUE complex exhibited better resistance to digestion compared to other complexes. These interactions significantly alter the functional and structural properties of starch, enhancing its potential for application in dietary and functional foods. Following in vitro fermentation of the digested complex residues, changes were observed in the microbial community; the fermentation process was stable and produced higher levels of short-chain fatty acids (SCFAs), which was attributed to the increased growth of the SCFA-producing bacteria Blautia and Lactobacillus. Further studies using size-exclusion chromatography (SEC) revealed that starch-polyphenol complexes can selectively modulate the microbiota and short-chain fatty acids (SCFAs). This study clearly demonstrates that starch-polyphenol complexes with different structures not only effectively reduce starch digestion but also have the potential to act as prebiotics.

Keyword: *starch, polyphenol, digestion, in vitro fermentation, prebiotics*

Microbial Risk in Blenderized Tube Feeding: Implications for Decentralized Preparation

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Blenderized tube feeding (BTF) refers to the preparation of whole or minimally processed foods into a liquid consistency for enteral administration. Its use has increased in home and healthcare settings, and concerns about microbial quality and safety have been reported, particularly among the immunocompromised. From a risk-informed perspective, consideration is given to microbial hazards and factors that may influence contamination and exposure during handling, storage, and administration. This study examined reported microbial contamination in BTF and identified factors influencing microbial quality. A scoping review of peer-reviewed literature (2009-2025) was conducted, including studies reporting microbial indicators or preparation and storage practices, with findings synthesized narratively. Microbial contamination has been reported in home- and hospital-prepared enteral feeds, with coliforms used as indicators of hygiene-related contamination in some studies. Higher contamination was reported in blenderized than commercial formulas, with storage time and handling identified as influencing factors. Variation in outcomes has been linked to sanitation and preparation practices. Quantitative microbial levels and reported organisms varied across studies, limiting direct comparison. Appropriate food-handling procedures reduce contamination, and HACCP-based approaches have been applied in hospitals. These findings underscore the need for a risk-informed approach to food safety in BTF within decentralized settings.

Keyword: *Blenderized tube feeding, microbial safety, enteral nutrition, food safety management systems*

PPARγ/P21 Signaling Mediates Butyrate-Driven Protection Against Aging-Related Endothelial Dysfunction: A Novel Effect of Soybean Polysaccharide via the Gut-Vascular Axis

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Aging-induced endothelial dysfunction is the core pathological driver of age-related cardiovascular diseases (CVDs), the leading global cause of mortality. The gut-vascular axis is a key actionable target for anti-vascular aging interventions, while the protective effect of soybean polysaccharide (SP) on aging-related endothelial dysfunction and its underlying mechanism remains largely unelucidated. This study systematically investigated the vascular protective effect of SP and its regulatory cascade in 20-month-old naturally aged mice, with 8-week-old mice as the normal control. In aged models, SP supplementation significantly ameliorated aging-impaired endothelium-dependent relaxation, exerting a direct protective effect on vascular endothelial function. In terms of intestinal homeostasis, SP treatment markedly mitigated colon senescence and systemic inflammation, reshaped gut microbiota structure, and elevated gut and serum butyrate levels. Further validation confirmed that butyrate, the key functional metabolite of SP, alleviated aging-induced endothelial injury via activating the PPARγ signaling pathway, as verified by aortic transcriptome sequencing analysis. Mechanistically, SP modulated PPARγ to regulate its downstream target P21, and further reversed the abnormal upregulation of VCAM-1, ICAM-1 and P16. Meanwhile, butyrate administration also alleviated aging-induced intestinal inflammation. In conclusion, SP exerts vascular protection through the gut microbiota-butyrate-PPARγ/P21 regulatory cascade, providing a novel nutritional strategy for the prevention of age-related CVDs.

Keyword: *Aging, Endothelial dysfunction, Soybean polysaccharide, Butyrate, PPARγ signaling pathway*

ENGINEERING OF AMYLOSUCRASE TO IMPROVE TURANOSE PRODUCTION

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Amylosucrases catalyze the synthesis of turanose (glucopyranosyl-α-(1,3)-fructose) alongside amylose production, utilizing sucrose as a substrate. Despite the various health benefits of turanose, its large-scale production via amylosucrases remains challenging due to the enzymes' natural preference for amylose synthesis. In this study, directed evolution was employed to engineer an amylosucrase from Bifidobacterium thermophilum (BtAS), resulting in three distinct mutants with enhanced turanose yield and suppressed amylose formation. Mutant 58 demonstrated a slower substrate consumption rate but exhibited highly efficient turanose conversion relative to the amount of sucrose consumed. Mutant 66 achieved a significantly improved turanose conversion yield of 60%, representing a 1.7-fold increase over the wild type (35%). Furthermore, Mutant 331 displayed a 2.3-fold increase in the initial reaction rate (up to 3 h) compared to the wild type. The combination of these mutations exerted a synergistic effect on turanose production; the maximum conversion yield reached 71.4% at 24 h that is a twofold improvement over the wild-type yield of 35%. To our best knowledge, the turanose conversion yield of the triple mutant is the very highest value using sucrose as the single substrate.

Keyword: *Enzyme engineering, Amylosucrase, Directed evolution, Turanose*

Bicontinuous Bigels from Cellulose Derivatives for DIW 3D Printing and Bioactive Co-delivery

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Developing personalized nutraceuticals via additive manufacturing requires carriers with high structural integrity, good shear-thinning, and co-encapsulation capabilities. This study evaluates bioactive-loaded bicontinuous bigels composed of Carboxymethyl Cellulose (7 wt%) and Ethyl Cellulose (16 wt%) for Direct Ink Writing. Fluorescence microscopy revealed a broadened bicontinuous window (oleogel-to-hydrogel ratios 3:7 to 8:2), while XRD/Scherrer analysis indicated larger crystallite sizes in oleogel-rich formulations. FTIR confirmed extensive hydrogen bonding, ensuring phase stability. All formulations were stable for eight weeks at 4 °C. Rheological analysis revealed strong shear-thinning (n = 0.22-0.27) and high consistency indices (K = 399-596 $Pa{\cdot}s^n$), important for smooth extrusion. The 7:3L formulation exhibited superior thixotropic recovery (80% in 3.3 s). Consequently, 5:5L, 6:4L, and 7:3L formulations achieved high printing fidelity (Shape Inconsistency Factor<1.4; Deformation Factor≈1.0). The system successfully encapsulated Vitamin C (78% efficiency) and Vitamin E (61% efficiency). In vitro digestion showed biphasic release, with intestinal levels reaching ~60%. Kinetic modelling identified a transition from gastric Fickian diffusion to intestinal matrix erosion. These results provide a strong framework for producing stable, printable, and personalised 3D-printed nutraceutical carriers.

Keyword: *3D food printing, Bicontinuous bigel, Encapsulation efficiency, Co-delivery, Personalised delivery*

Computational fluid dynamics as a rational design tool for scaling up cultivated meat bioprocessing: a mechanistic review with systematic spinner flask simulations

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Cultivated meat (CM) bioprocess upscaling is hindered by the reliance on empirical correlations that fail to capture hydrodynamic heterogeneity in large-scale bioreactors. Computational fluid dynamics (CFD) offers a mechanistic alternative, spatiotemporally resolving shear stress, energy dissipation rate, and Kolmogorov length scale, and all these parameters can be directly relevant to the viability of shear-sensitive CM cell types. This work combines a comprehensive review of CFD applications in CM bioprocessing with original simulation data. The review establishes connections between cellular requirements and quantifiable flow parameters and identifies a progressive evolution from preliminary flow characterization to hybrid CFD-cell growth kinetics modeling, formalized into a staged roadmap culminating in digital twin-enabled process control. To address the scarcity of systematic CFD data in this field, spinner flask simulations were conducted across operating conditions representative of published CM bioprocesses. Volume-averaged shear stress and cell damage metrics were mapped across this parameter space, providing quantitative guidance for identifying favorable hydrodynamic operating windows. Together, the review and simulations demonstrate the value of CFD as a rational tool for CM upscaling.

Keyword: *Cultivated meat, Computational fluid dynamics, Bioreactor, Bioprocess, Scale-up*

FAGOPYRIN F CONTENT IN EXTRACTS FROM COMMON AND TARTARY BUCKWHEAT HULLS UNDER DIFFERENT EXTRACTION CONDITIONS

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Fagopyrin F is a photosensitizer found in buckwheat and its plants, including buckwheat hulls, an agricultural byproduct. The objective of this study was to evaluate the effect of extraction conditions (ethanol concentration, extraction temperature, extraction time, and extraction methods) on fagopyrin F content in extracts from common and Tartary buckwheat hulls (CBH and TBH). Fagopyrin F was analyzed using an HPLC-MS system. Fagopyrin F was the highest in CBH extracts obtained by reflux extraction with 75% ethanol at 90 °C. In TBH extracts, the highest content was obtained by maceration with 75% ethanol at 80 °C. No significant difference was observed between 1 h and 2 h of extraction, except for maceration with 75% ethanol at 50 °C, where a significant difference was observed in both CBH and TBH extracts. Fagopyrin F in both CBH and TBH extracts increased with increasing ethanol concentration and extraction temperature. These findings provide a basis for optimizing fagopyrin F extraction from buckwheat hulls and for further evaluating its potential use as a photodynamic antibacterial agent.

Keyword: *Fagopyrin F, Photosensitizer, Buckwheat Hulls, HPLC-MS*

DUAL MODELING FOR OPTIMIZATION OF COROSOLIC ACID EXTRACTION CONDITIONS FROM LAGERSTROEMIA SPECIOSA LEAVES USING RESPONSE SURFACE METHODOLORY AND AN ARTIFICIAL NEURAL NETWORK COUPLED WITH A GENETIC ALGORITHM

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Lagerstroemia speciosa leaf (banaba; LSL) extract has been used as a functional ingredient for blood glucose control, with corosolic acid (CA) being its major bioactive compound, known for its anti-diabetic effects. This study screened ethanol concentration (0–100%) and extraction time (1–2 h) at an 80 °C and optimized CA content using central composite design (CCD) based response surface methodology (RSM) and an artificial neural network coupled with a genetic algorithm (ANN–GA). CA was the highest at 75 and 100% ethanol, with no significant difference among them. In CCD modeling, ethanol concentration was significant, whereas extraction time was not significant within the experimental range. The RSM optimum (86.4% ethanol, 109.4 min) yielded 1.028 ± 0.09 μg/mg (3.9% relative error), while the ANN–GA optimum (98.3% ethanol, 106.5 min) yielded 0.974 ± 0.03 μg/mg (2.3% relative error). These results provide a methodological basis and supporting data for efficient standardization and systematic optimization of LSL extract production as a functional food ingredient.

Keyword: *Lagerstroemia speciosa, Banaba leaf, Corosolic acid, RSM, ANN–GA*

OPTIMIZATION OF MICROWAVE-ASSISTED PROCESSING CONDITIONS AFFECTING SULFORAPHANE CONTENT IN BROCCOLI SPROUTS USING RESPONSE SURFACE METHODOLOGY AND AN ARTIFICIAL NEURAL NETWORK COUPLED WITH A GENETIC ALGORITHM

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This study aimed to identify and optimize the processing parameters for sulforaphane content (SC) in broccoli sprouts using response surface methodology (RSM) and an artificial neural network (ANN) coupled with a genetic algorithm (GA). Broccoli sprouts were processed by grinding, freeze-drying, steaming, microwave treatment, juice preparation, sterilization, and fermentation. Sulforaphane, sulforaphane nitrile and glucoraphanin in broccoli sprouts were analyzed by UPLC-MS/MS. Microwave treatment was selected for further modeling due to its highest SC among processing methods. For RSM and ANN modeling, the input variables were treatment time and sprout weight, while the output variable was SC. The RSM model was adequate, with an R^2 of 0.9649 and an adjusted R^2 of 0.9399. The ANN model showed acceptable predictive performance, with an MSE of 0.0025 and an R of 0.9849. ANN-GA model showed higher SC and lower relative error than the RSM model. The predicted optimal processing parameters of the ANN-GA model for maximum SC were a treatment time of 120 sec and 76.9 g of sprouts. The corresponding SC was 5.39 mg/g on a dry basis, with a relative error of 2.34%. These findings provide a basis for development of processing methods for large-scale production of sulforaphane.

Keyword: *broccoli sprout, sulforaphane, response surface methodology, artificial neural network, genetic algorithm*

OPTIMIZATION OF HYDROTHERMAL SYNTHESIS CONDITIONS FOR MAXIMIZING THE QUANTUM YIELD OF CARBON QUANTUM DOTS DERIVED FROM COMMON BUCKWHEAT HULLS USING RESPONSE SURFACE METHODOLOGY

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This study aimed to optimize the quantum yield (QY) of carbon quantum dots (CQDs) derived from common buckwheat hulls (CBH) using response surface methodology (RSM) based on a face-centered central composite design (F-CCD) with 13 experimental runs. The CQDs were synthesized via a hydrothermal method at 220 °C. Reaction time (6–18 h) and solid to solvent ratio (w/v, 1:10–1:50) were selected as independent variables to evaluate their individual and interactive effects on QY. The ANOVA results showed that the model was statistically significant ($p < 0.05$) with a high coefficient of determination ($R^2 = 0.9220$; adjusted $R^2 = 0.8663$), indicating an adequate model fit. Reaction time and solvent ratio significantly affected QY. The solvent ratio was the most effective variable, and reaction time exhibited a significant quadratic effect, indicating an optimum point; no significant interaction was observed between the variables. The predicted QY under the optimal conditions obtained from the model was 5.14%, while the experimental value was 5.09 ± 0.05% (relative error: 0.97%). These results indicate that the RSM effectively optimized the QY of CBH-derived CQDs, supporting their potential use as agri-food byproduct-derived fluorescent nanomaterials.

Keyword: *Common buckwheat hulls, Carbon quantum dots, Response surface methodology, Optimization*

OPTICAL PROPERTIES OF CARBON QUANTUM DOTS SYNTHESIZED FROM COMMON BUCKWHEAT HULLS USING HYDROTHERMAL AND MICROWAVE-ASSISTED METHODS

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Common buckwheat hulls (CBH), an agri-food byproduct rich in carbon and oxygen-containing functional groups, are a promising biomass-derived carbon precursor for the synthesis of carbon quantum dots (CQDs). This study aimed to synthesize CQDs from CBH using hydrothermal and microwave-assisted methods and to compare their optical properties. In hydrothermal synthesis, reaction temperature (160–220 °C) and time (6–24 h) significantly affected fluorescence intensity ($p < 0.05$). Fluorescence intensity was the highest at 190 °C for 24 h. At lower temperatures, no significant change was observed with reaction time, whereas at higher temperatures, the fluorescence intensity decreased as reaction time increased. For the microwave-assisted method (700 W, 10–40 min), the highest fluorescence intensity was observed at 20 min, which was significantly higher than that at 10 min ($p < 0.05$), but not significantly different from that at 40 min. CQDs synthesized by the microwave-assisted method generally showed lower fluorescence intensity than those synthesized by the hydrothermal method. These results suggest that hydrothermal synthesis is more effective than microwave-assisted synthesis for enhancing the fluorescence intensity of CBH-derived CQDs. Overall, these findings indicate the potential of CBH-derived CQDs for various functional applications.

Keyword: *Carbon quantum dots, Common buckwheat hulls, Hydrothermal synthesis, Microwave-assisted synthesis, Optical properties*

Cold Plasma-Assisted Ultrasound Extraction of Bioactive Compounds from Black Pepper Husk Using Food-Grade Ethanol and Deep Eutectic Solvents: Sensory Characterization Using an Electronic Nose

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Black pepper (Piper nigrum L.) generates a substantial amount of by-products, particularly husk, which are rich in bioactive compounds such as piperine and caryophyllene. The valorization of these compounds can be achieved through efficient extraction techniques. In this study, both conventional and novel approaches were employed to enhance the recovery of bioactive compounds from black pepper husk using food grade ethanol and deep eutectic solvent (menthol: camphor, 1:1). Cold plasma treatment was carried out at different exposure times (1, 3, 5, 8, and 10 min) and voltages (1 and 2 kV). As a result, the extraction yield increased to 4.321% compared to 3.465% in the untreated sample. Ultrasonic treatment at 32 kHz for 30 min further improved the extraction yield up to 4.902%. The piperine content increased from 56,646.15 mg/kg in the untreated sample to 67,515.54 mg/kg in the treated sample. GC-MS analysis identified 20 distinct volatile compounds in plasma-treated samples. In addition, e-nose analysis identified 41 volatile compounds across major chemical classes, with sabinene and alpha-selinene dominating the profile imparting strong citrus, pepper and spicy flavor. The combined treatment enhanced extraction efficiency and volatile profile, indicating its potential application in the development of natural flavoring agents.

Keyword: *Cold Plasma, Ultrasound, Flavor Profile, Deep Eutectic Solvent, Electronic-nose*

LION'S MANE MUSHROOM AS A FUNCTIONAL INGREDIENT IN OAT-BASED DESSERTS FOR DYSPHAGIA AND HEALTHY AGEING

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Hericium erinaceus (Lion's Mane) is a medicinal mushroom known for its antioxidant and neuroprotective properties. This study explored its use as a functional ingredient in oat milk-based desserts designed for people with dysphagia. Freeze-dried Lion's Mane powder (LMP), rich in protein (~16%, amino acid score 88%), dietary fibre (~31%), and phenolic compounds (72.15 mg GAE/g), was added at different levels using gelatin or iota-carrageenan as gelling agents. Incorporating up to 5% LMP enhanced nutritional value while preserving desirable texture and sensory qualities, meeting International Dysphagia Diet Standardisation Initiative (IDDSI) Level 6 criteria. Both manual and instrumental fork pressure tests showed that all samples were soft, compressible, without stickiness or deformation recovery, supporting safe swallowing. Higher levels of LMP or hydrocolloids increased firmness and hardness, negatively affecting colour and mouthfeel. Carrageenan-based systems enabled stable, vegan-friendly formulations with suitable rheological properties. Overall, LMP-enriched soft desserts show promise as nutritious, texture-modified foods for dysphagia, offering a novel plant-fungal strategy to support healthy ageing and potential neuroprotective health benefits.

Keyword: *Lion's Mane; functional food; oat milk dessert; texture-modified foods; food fortification; dysphagia*

SHELF-LIFE DETERMINATION OF MULBERRY (Morus nigra L.), SOURSOP (Annona muricata), AND CRANBERRY (Vaccinium macrocarpon) JUICE BLEND USING ACCELERATED SHELF-LIFE TESTING

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Fruits are important sources of essential nutrients, including vitamins, minerals, and bioactive compounds, yet locally produced berries such as mulberry, soursop, and cranberry remain underutilized due to limited availability and low market familiarity. This study develops a mulberry-soursop-cranberry juice blend to enhance nutrient synergy and antioxidant activity, and determines its shelf life using accelerated testing through the Arrhenius model by evaluating microbial, physicochemical, sensory, and antioxidant changes under refrigerated storage temperature of 4°C, and elevated storage temperatures of 30°C, 40°C, and 50°C. The primary quality parameters determined were the sensory attributes. Kinetic modeling showed that color and aroma followed the zero-order reactions, while sweetness, sourness, smoothness, flavor, and overall acceptability generally followed the first-order reactions. The MSC juice blend demonstrated microbial safety and functional stability under refrigeration, but accelerated deterioration at elevated temperatures. Sensory attributes, particularly color and flavor, were identified as primary shelf-life indicators, corresponding to 215 days and 360 days, respectively, at 25°C. Overall, higher storage temperatures accelerated deterioration, emphasizing the need for refrigeration to preserve shelf life.

Keyword: *mulberry, soursop, cranberry, juice blend, accelerated shelf-life test*

ADVANCED ULTRASOUND PROCESSING FOR SUSTAINABLE INSECT PROTEIN ISOLATION: YIELD, FUNCTIONALITY, AND BIOACTIVITY

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The growing demand for high-quality, sustainable protein sources has increased interest in alternative ingredients such as edible insects. However, their development is limited by low extraction yields, insufficient purity, and suboptimal functional properties. Advanced processing technologies, such as ultrasound (US), offer rapid and environmentally friendly solutions to enhance protein extraction and functionality.

This study presents recent findings on US-assisted extraction of proteins from crickets and mealworms using a D-optimal experimental design combining acid treatment, with or without defatting and ultrasound pretreatment. Ultrasound positively affected protein recovery in both defatted crickets (+12.9%) and defatted mealworms (+22.1%). Defatting followed by US further increased extraction yields by 13–22%. Optimal conditions produced protein isolates with ~90% purity and >50% extraction efficiency in defatted samples, while US improved protein solubilization by more than 10%.

Techno-functional analyses revealed significant interactions between defatting and US, affecting protein profiles, solubility, and functional properties. US notably improved solubility and foaming capacity (in crickets), whereas defatting had a greater influence on digestibility. Following in vitro digestion, US altered peptide profiles, enhancing antihypertensive activity but reducing antioxidant capacity.

Overall, US-assisted extraction enables tailored functionality and supports the development of sustainable, high-value insect protein ingredients.

Keyword: *US-assisted extraction, protein functionality, digestibility, bioactivity, insect*

Comparing Structurally Different Dietary Fibers in Reversing Sucralose-Induced Microbiota Dysbiosis

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Although the non-nutritive sweetener sucralose is widely regarded as metabolically inert, it can adversely affect host metabolism by altering the gut microbiota. In contrast, dietary fiber fermentation generates beneficial metabolites that promote host health. To investigate whether these positive effects can counteract sucralose-induced disruptions in the gut microbiota, this study collected fecal samples from healthy individuals and established an in vitro fermentation model. Four dietary fibers, including FOS, inulin, β-glucan, and high-amylose starch, were fermented either alone or in combination with sucralose. Among them, only β-glucan effectively reversed the adverse microbial changes caused by sucralose. This protective effect was attributed to a selective increase in butyrate-producing bacteria and was closely associated with the unique chemical structure of β-glucan.

Keyword: *In vitro fermentation, Sucralose, Dietary fiber*

Comparative Evaluation of Antioxidant Activity and Anti-Muscle Atrophy Effects of Meju Supplemented with Mealworm and Okara

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Meju, a traditional Korean fermented soy block, is widely used as a base material for soy-based seasonings and is recognized as a rich source of fermentation-derived bioactive compounds. This study evaluated the effects of mealworm and okara supplementation on the antioxidant activity and anti-muscle atrophy potential of meju. Four meju formulations, SM (soy), SOM (soy+okara), STM (soy+mealworm), and SOTM (soy+mealworm+okara), were prepared. STM and SOTM showed significantly higher crude protein content, whereas SM exhibited the highest branched-chain amino acid (BCAA) and total essential amino acid contents. In contrast, STM and SOTM showed stronger antioxidant activity, with lower IC50 values in DPPH and ABTS assays and higher total phenolic content, particularly in SOTM. The samples were evaluated in C2C12 cells under dexamethasone (DEX)-induced muscle atrophy conditions. SM and SOM suppressed muscle atrophy-related gene expression. MuRF-1 expression was reduced by 2.32- and 2.10-fold in SM and SOM, respectively, compared with the DEX group, while STM and SOTM showed weaker effects. Atrogin-1 expression showed a similar trend. These results suggest that antioxidant activity alone does not determine muscle atrophy prevention, and that protein quality, BCAA availability, and fermentation-derived bioactive peptides may play a more important role in muscle atrophy prevention.

Keyword: *Meju, Mealworm, okara, Muscle atrophy, Antioxidant activity*

Beyond the Lab: Integrating Environmental and Community Data for Adaptive Management of Vibrio parahaemolyticus and Vibrio cholerae in Philippine Green Mussels

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Laboratory confirmation of Vibrio parahaemolyticus and Vibrio cholerae in green mussels from Cavite and Pangasinan confirms persistent contamination, but limited laboratory capacity in many Philippine coastal areas renders end-product testing insufficient. This study proposes an adaptive management framework grounded in One Health principles, integrating secondary environmental data (sea surface temperature, salinity, rainfall, fecal coliform levels) and community-generated data (harvesting schedules, perceived illness clusters, local ecological knowledge). Risk stratification revealed peak contamination during the warm, low-salinity wet season (June–October), especially in hyper-urbanized Cavite Bay. Stakeholder mapping showed that regulatory non-compliance often results from the absence of real-time risk communication, not negligence.

The framework deploys three non-laboratory interventions: geotagged mussel bed zoning using historical water quality proxies; community-based early warnings triggered by rainfall thresholds (≥50 mm over 72 hours); and seasonal harvesting advisories co-designed with local governments and fishers' associations. By harmonizing environmental monitoring, community surveillance, and adaptive governance, this approach reduces dependence on delayed laboratory confirmation, enabling proactive regulation. The model is replicable for resource-limited settings where Vibrio contamination threatens food security and public health.

Keyword: *Adaptive Management, One Health, Vibrio risk, Green mussel Safety, Community-based Surveillance*

BETALAIN EXTRACTION FROM RED BEET POMACE: ULTRASOUND VS PRESSURIZED FLUIDS

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Red beets, Beta vulgaris L., are a rich source of betalains which are thermolabile natural pigments. The aim of this study was to evaluate and compare two green technologies, Ultrasound (US) and Pressurized Fluid (PF) extraction, to optimize betalains yields. The US used a pulsed probe equipment (300-1200W, 1-10min), while the PF operated at 120°C, 50 bar, and 5mL/min up to 40 min. Solvents evaluated were water, aqueous citric acid (CA), and 20% ethanol. Total betalains were quantified with UV-Vis spectrophotometry. Results showed that US extraction achieved the highest yield of 4.74 ± 0.09 mg/g (300W, 1 min) compared to the PF extraction (4.03 ± 0.29 mg/g). At a 1:50 w/v ratio, the US extraction was the best using water compared to aqueous CA and 20% ethanol. In addition, the PF showed high rates of extraction within 10 min, where yields were ~2.9 mg/g, followed by a plateau with rates dropping by >85%. In conclusion, the US extraction resulted in higher yield, while the PF extraction (5 min) provided superior color. Both extraction methods resulted in high-value, plant-based alternative ingredients compared to synthetic (E129) or animal-derived (E120) pigments for applications as functional foods and cosmetics.

Keyword: *Ultrasound, Pressurized fluids, Extraction, Beets, Betalain*

Cereal Prolamin-Based Edible Biomaterials for Future Food Applications

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Amid global population growth, resource constraints, and climate change, future food systems—particularly cultivated meat and structured plant-based proteins—are advancing rapidly. However, progress is hindered by the lack of functional materials that combine edibility, biocompatibility, and scalability. This work explores cereal prolamins as a promising class of plant-derived biomaterials that are abundant, cost-effective, and highly processable.

We investigate their molecular structure and self-assembly behavior in aqueous ethanol systems, revealing mechanisms of conformational regulation and hierarchical structure formation. Leveraging these properties, a range of 3D edible scaffolding systems are developed via electrohydrodynamic printing (EHDP), emulsion templating, and solvent-induced self-assembly, including ultrafine fibrous scaffolds, tunable microspheres, and porous architectures. These materials exhibit controllable mechanical properties and micro/nanostructures that effectively support cell adhesion, proliferation, and differentiation, enabling applications in cultivated meat tissue engineering.

Additionally, protein microsphere-based cell expansion systems and plant protein bioinks are employed for textural design of cultivated meat. By extending to other cereal sources (e.g., secalin) and polysaccharide composites, fat-mimetic structures and delivery systems are further realized. Overall, this work provides a scalable and food-compatible material platform for next-generation structured and functional foods.

Keyword: *Cereal Prolamin, cultivated meat, 3D printing, edible biomaterials*

Identification And Detection Of Vibrio Cholerae In Green Mussels (Perna viridis) From Identified Growing Areas In Luzon (Pangasinan And Cavite) Using Polymerase Chain Reaction

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In many Asian coastal communities, shellfish bivalves like the green mussel (Perna viridis) are crucial for low-income populations, boosting socioeconomic conditions through the shellfish industry. However, as filter feeders, bivalves can accumulate hazards that affect food safety in the shellfish supply chain. Recent outbreaks of Vibrio cholerae linked to shellfish highlight the need for reliable detection methods in food sources. As it can enter a viable but not culturable state under stress, traditional culturing may fail. Polymerase Chain Reaction offers an effective alternative. Samples were collected from green mussels and seawater in Pangasinan (Anda and Bolinao) and Cavite (Bacoor, Kawit, and Cavite City). Genomic DNA was extracted from green mussels and seawater samples. V. cholerae were detected in green mussel and seawater samples using ctxA, tcpA, and ompW PCR primers. In green mussels and seawater, the presence of V. cholerae was detected in some replicates except for seawater in Anda, Pangasinan, where V. cholerae is absent.

Keyword: *Green mussels, Luzon, Perna viridis, Polymerase Chain Reaction, Vibrio cholerae*

DETERMINATION OF TOTAL PHENOLIC AND FLAVONOID CONTENT WITH ANTIOXIDANT ACTIVITY IN VACUUM FREEZE-DRIED BREWED LIBERICA COFFEE (Coffea liberica var liberica)

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Three species are known to the coffee industry – Arabica, Robusta, and Liberica. The former two are used tremendously in the production of shelf stable soluble coffee produced through drying techniques while only a few explored the potential of Liberica in this sector due to its limited resources. Freeze-drying together with carriers such as maltodextrin is known to be excellent in preserving the qualities of food products. The aim in this research is to identify the optimal maltodextrin concentration containing great physicochemical properties and high values of bioactive compounds. Three freeze-dried samples containing 15%, 20%, and 25% maltodextrin concentrations were prepared. Each treatment has undergone physicochemical, total phenolic content (FC), total flavonoid content ($AlCl_3$), and antioxidant activity (DPPH) analyses. The moisture, ash, and protein contents of the samples were also investigated. The freeze-dried brewed Liberica coffee containing 15% maltodextrin concentration appeared to have the highest bioactivity among the treatments with phenolic (1311.31 ± 3.63 mg GAE/100g FW), flavonoid (8.49 ± 0.12 mg QE/100g FW) and antioxidants (1320.60 ±158.70 umol TE/100g FW) as well as good physicochemical properties ensuring microbiological stability and prevention of immediate deterioration.

Keyword: *Liberica, coffee, maltodextrin, freeze-drying, bioactivity*

Developing a Training Course on Food Safety Risk Profiling for Chemical and Microbiological Hazards in the Philippines: Teaching and Communicating Risk to Regulatory Agencies

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Background: Philippine food safety regulatory agencies require risk-based evidence to prioritize interventions, yet technical capacity for risk profiling remains limited. A training course on Food Safety Risk Profiling for Chemical and Microbiological Hazards was developed to address this gap, utilizing results from the Philippine Food Safety Risk Profiling project.

Objective: To describe the development, content, and delivery of a risk profiling training course tailored for Philippine regulatory agencies, and to demonstrate how research outputs are translated into teachable risk communication tools.

Methods: Training needs assessment was conducted with agencies including BFAR, FDA, and NMIS. Course modules were developed using results from the Philippine Food Safety Risk Profiling project, covering hazard identification, exposure assessment, risk characterization, and risk ranking. Case studies featured chemical hazards (e.g., heavy metals, histamine) and microbiological hazards (e.g., Hepatitis A virus, Vibrio spp.) relevant to Philippine commodities.

Results: The training course has been delivered upon request to multiple regulatory agencies. Participants demonstrated improved competency in constructing risk profiles and interpreting risk ranking outputs. Course materials included hazard-specific risk matrices, data templates, and communication guides.

Conclusion: Research-generated risk profiles are effectively translated into training curricula that build regulatory capacity for evidence-based food safety decision-making in the Philippines.

Keyword: *Risk Profiling, Training Course, Risk Communication, Philippine Food Safety, Regulatory Capacity Building*

EFFECT OF ELICITORS ON LIGNAN ACCUMULATION DURING SAFFLOWER SEED GERMINATION

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Lignans are diphenolic compounds derived from the combination of two phenylpropanoid units and are classified as phytoestrogens. This study investigated the effects of different elicitors on lignan accumulation during safflower (Carthamus tinctorius L.) seed germination. Five elicitors, including sucrose, calcium chloride, salicylic acid, chitosan, and hydrogen peroxide, were applied during germination. The total lignan content in ungerminated seeds was 8.434 mg/100 g and increased during germination, reaching a maximum at day 6–7, followed by a decreasing trend thereafter. Among the treatments, salicylic acid (1 mM) resulted in the highest lignan content, reaching 178.364 mg/100 g on day 6, which was approximately 15% higher than that of the control. In contrast, sucrose treatment showed the lowest lignan content (13.160 mg/100 g on day 7). In addition, phenylalanine ammonia-lyase (PAL) activity was elevated in the salicylic acid-treated group, particularly at day 6, compared with the control. These results suggest that elicitor treatment, especially salicylic acid, enhances lignan accumulation during safflower germination, potentially through the activation of PAL-related phenylpropanoid metabolism.

Keyword: *Safflower germination, Lignans, Elicitors, Salicylic acid, Phenylalanine ammonia-lyase*

Supply Chain Vulnerability Assessment for Hepatitis A Virus in Philippine Oysters and Mussels: Informing Resilience-Building Through Multi-Criteria Decision Analysis

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Hepatitis A virus (HAV) poses persistent food safety risks in Philippine oyster (Crassostrea iredalei) and mussel (Perna viridis) supply chains. Building supply chain resilience requires identifying where vulnerabilities concentrate, even without implementing specific technological solutions. To identify, weight, and rank vulnerability factors across the Philippine bivalve supply chain using multi-criteria decision analysis (MCDA), and to generate evidence that guides resilience-building priorities without new laboratory data. Systematic literature review and expert elicitation (n=15) identified candidate vulnerability factors. Analytic Hierarchy Process (AHP) calculated factor weights. Five supply chain archetypes were scored against weighted factors using existing data from the parent dissertation and published literature. Raw consumption practice (weight 0.22), proximity to sewage outfall (0.18), absence of depuration (0.15), and boiling duration under three minutes (0.12) were highest-weighted. Traditional wet market supply chains scored highest vulnerability (87/100), followed by raw oyster bars (79/100). Depurated supermarket chains scored lowest (31/100). A 10-item Vulnerability Scoring Card enables rapid risk classification. Resilience-building for HAV in Philippine bivalves should prioritize traditional wet markets and raw oyster bars, targeting raw consumption behavior and sewage proximity before depuration infrastructure. The scoring card guides decentralized risk management.

Keyword: *Hepatitis A Virus, Supply Chain Resilience, Vulnerability Assessment, Multi-criteria Decision Analysis, Philippines*

CHANGES IN LIGNAN CONTENT DURING THE PROCESSING OF SESAME PRODUCTS

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【Background】

Lignans are functional components of sesame seeds. Sesamolin, a type of lignan, has been reported to decompose under acidic conditions to produce sesamol, which exhibits strong antioxidant activity. Sesame seeds are often used in acidic foods such as dressings; however, the extent of sesamolin decomposition during processing and storage has not been fully clarified. Therefore, this study aimed to investigate the processing conditions affecting sesamol formation in order to enhance the functional value of sesame products.

【Methods】

Commercial sesame dressings were analyzed for lignan composition using high-performance liquid chromatography (HPLC), and acidity was determined by neutralization titration. A model system was constructed by dissolving a sesamolin standard in ethanol, followed by the addition of acetic acid. Compositional changes were evaluated by HPLC under varying acidity (0.5–1.5 %) and temperature (30–60 ℃) conditions.

【Results】

Analysis of commercially available dressings revealed a negative correlation (r= -0.94) between the sesamol formation ratio and acidity. In the model system using a sesamolin standard, sesamol formation was enhanced at higher acidity and temperature. These results suggest that controlling acidity and temperature may be important for promoting sesamol formation during the processing of sesame products and enhancing their functional value.

Keyword: *Sesame seed, Sesamolin, Sesamol, Acid hydrolysis*

EFFECT OF 4-α-GLUCANOTRANSFERASE ADDITION ON THE STORAGE STABILITY OF RICE FLOUR BREAD

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【Background】

4-α-Glucanotransferase (4αGT) is an enzyme that acts on the non-reducing ends of α-1,4-linked glucan chains with a degree of polymerization of four or more and catalyzes an α-1,3-glycosidic transfer reaction in trisaccharide units. 4αGT has been reported to suppress starch staling. In this study, we investigated the effects of 4αGT addition on the physical properties and storage stability of rice flour bread.

【Methods】

Rice flour breads were prepared with or without 4αGT using a home bread maker. After storage at room temperature for 0.5–3 days, crumb properties were evaluated using a texture analyzer. Rice flour gels were prepared from rice flour and water at a 1:1 ratio, with or without 4αGT, and stored at 15 °C for 0–3 days. Recrystallization behavior and nanoscale starch structure were analyzed by X-ray diffraction (XRD) and small-angle X-ray scattering (SAXS), respectively.

【Results】

Rice flour bread with 4αGT showed physical properties comparable to those of the control during the early stage of storage. In contrast, crumb firming was suppressed after 2 days of storage. In the rice flour gel system, the increase in the degree of staling was suppressed in the 4αGT-treated samples from day 2 onward.

Keyword: *Rice flour bread, Retrogradation, Starch-modifying enzyme*

DEVELOPMENT OF FUNCTIONAL READY-TO-DRINK BEVERAGE FROM CALABASH (CRESCENTIA CUJETE) FRUIT

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Diabetes mellitus remains a major public health concern in the Philippines, necessitating the development of functional foods that support glycemic management. Calabash fruit, traditionally utilized by indigenous communities, represents a promising yet underutilized source of bioactive compounds. This study developed a calabash-based ready-to-drink (RTD) beverage using a systematic research and development framework, with formulation optimized through response surface methodology. The raw fruit and optimized RTD were evaluated for physicochemical properties, nutritional composition, bioactivity, and microbiological safety. Both samples exhibited strong antioxidant activity and contained key phytochemicals, including phenolics, flavonoids, tannins, and saponins. Additional constituents such as alkaloids, gums, and mucilages were also detected. Thermal processing enhanced bioactive content and was associated with improved glucose-lowering potential. Microbiological analyses confirmed compliance with food safety standards, with indicator organisms below detectable limits. These findings highlight the potential of calabash-based RTD beverages as safe, functional food products with applications in glycemic control, supporting the valorization of indigenous food resources and the development of health-oriented food innovations.

Keyword: *functional food, calabash fruit, diabetes mellitus, glycemic regulation*

NEW INSIGHTS INTO VOLATILE PHENOL–DRIVEN OFF-FLAVOR IN SOY (2) REGULATION OF OFF-FLAVOR CONTRIBUTING VOLATILE PHENOLS IN SOYMILK USING LACCASE

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In our recent studies, we have demonstrated that structurally related phenolic components contribute significantly to the beany off-flavor of soymilk. To elucidate the impact of individual phenols on flavor perception, feeding experiments were conducted in which eleven structurally related phenolic components were added to soymilk. The results demonstrated that, among these components, guaiacol and 4-vinyl guaiacol play an important role in the generation of beany off-flavor.

Based on these findings, we hypothesized that controlling phenolic components could lead to an effective improvement of beany off-flavor in soy products. We therefore focused on laccases, an oxidative enzyme known to accept a broad range of phenolic components as substrates, as a potential control strategy. Laccase treatment of soymilk resulted in a reduction of phenolic components concentrations.Furthermore, sensory evaluation revealed that laccase-treated soymilk exhibited a significant decrease in undesirable sensory attributes such as astringency, which are characteristic of beany off-flavor, leading to an overall improvement in flavor quality. These results suggest that laccase treatment represents an effective approach for improving the sensory properties of soy products through the control of phenolic off-flavor components.

Keyword: *volatile analysis*, *flavor attribute*, *enzyme*, *soy note*

NEW INSIGHTS INTO VOLATILE PHENOL–DRIVEN OFF-FLAVOR IN SOY (1) CONTRIBUTION OF STRUCTURALLY RELATED VOLATILE PHENOLS TO THE BEANY OFF-FLAVOR IN SOYMILK

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Hexanal has long been recognized as a major contributor to off-flavors in soybeans and soy-based products. However, reducing hexanal alone is often insufficient to achieve a substantial improvement in the overall flavor quality of soy products, suggesting the involvement of additional, yet unidentified components. In this study, we aimed to identify previously unreported volatile components that play a significant role in soybean off-flavor.

Volatile components in soymilk were analyzed by solvent-assisted stir bar sorptive extraction (SA-SBSE) combined with GC–MS, enabling the detection of polar volatile components. Furthermore, GC–MS/O coupled with aroma extract dilution analysis (AEDA) was employed to evaluate the sensory relevance of individual components. Consequently, volatile phenolic components were identified as potential key contributors to undesirable soybean flavors. Notably, these volatile phenols exhibited clear structural correlations. This observation implies that their origin is not endogenous biosynthesis in soybeans, but rather non-enzymatic cleavage from common precursor components.

Keyword: *volatile analysis, flavor attribute, GC-O, soy note*

Microbial Profiling of Seafood Spoilage Bacteria and Phage Cocktail Development Against Predominant Pseudomonas bubulae

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Aquatic foods are a key global protein source but highly prone to microbial spoilage. Psychrotolerant Pseudomonas spp. thrives under refrigeration, challenging seafood preservation. Although bacteriophages offer promising biocontrol, phages targeting Pseudomonas bubulae remain poorly characterised, with limited genomic and functional data. This study evaluated a bacteriophage-based approach for controlling P. bubulae in seafood systems. Whole-genome sequencing (WGS) of 52 seafood isolates identified Pseudomonas as the dominant genus (37/52), with P. bubulae as the most prevalent species. Three strictly lytic phages (S4, S9, TF) were isolated and characterised for stability, host range, and lytic efficacy in TSB and on salmon fillets. All phages were stable across pH 6–8 and −20 °C to 6 °C, consistent with seafood storage conditions, with cross-infectivity demonstrated among multiple P. bubulae strains and related Pseudomonas species. The phage cocktail outperformed individual treatments, extending the bacterial lag phase by up to 2.98-fold. It achieved a 6.5-log CFU/mL reduction within 24 h at 25 °C and a 6.3-log reduction after 7 days at 6 °C in TSB, with a sustained ~2-log reduction after 6 days of refrigerated storage on salmon fillets. These findings highlight phage cocktails as a effective strategy for controlling seafood spoilage.

Keyword: *Seafood spoilage microbiota, Pseudomonas bubulae, Bacteriophage cocktail, Biopreservation*

Geometry-engineered microgels for intestinal region-specific probiotics delivery in future food systems

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China Agricultural University

The physiological efficacy of functional food ingredients, particularly probiotics is highly dependent on their spatial localization within the intestine. The non-specific delivery of probiotics severely restricts their therapeutic efficacy. Herein, we first developed a sustainable, food-grade geometry-engineered corncob nanocellulose-based hierarchical microgel delivery platform for programmable intestinal probiotic release. Spherical nanocellulose-based microgels (CNSM) were found to disintegrate in the ileum, while rod-like nanocellulose-based microgels (CNRM) remained intact until reaching the colon, where they subsequently ruptured. Molecular dynamics simulations confirmed the superior structural stability of CNRM against osmotic pressure, indicating a structural control over release pattern. Both microgels significantly enhanced probiotic survival, as well as nanocoating-mediated mucoadhesion and colonization. To maximize functionality, bile salt hydrolase-producing L. plantarum WCFS1 and immunomodulatory L. rhamnosus GG were embedded into CNSM and CNRM, respectively. Consequently, ileum-targeted WCFS1@CNSM significantly ameliorated hypercholesterolemia via gut-liver axis regulation whereas colon-targeted LGG@CNRM profoundly alleviated symptoms of ulcerative colitis via epithelial barrier restoration and inflammation suppression. This work provides a region-specific delivery strategy for next-generation functional foods and probiotic therapeutics.

Keyword: *Probiotics, Nanocellulose, Region-specific targeting, Oral delivery, Microgels*

DEVELOPMENT OF COMPOSITE COLORIMETRIC INDICATORS BY PIEZOELECTRIC INKJET PRINTING FOR MONITORING PRODUCT FRESHNESS DURING PROLONGED STORAGE

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Colorimetric indicators are promising intelligent packaging materials capable of revealing product's real-time quality information through detectable color responses in the visible spectrum. Preparation and optimization of colorimetric indicators requires laborious work on the manipulation of dye solution composition, hence inkjet printing is an alternative technique, which deposits indicators via computer control. Using piezoelectric inkjet printing, the color-responsive inks can be readily printed onto designated substrates, with precise print quality and pre-designed complex indicator pattern. The indicator's color response can be captured and analyzed by software, hence largely reducing human errors to differentiate color changes subjectively. This talk will discuss a few of our relevant research findings on developing inkjet-printed colorimetric indicators for intelligent packaging systems. In particular, the efficacy and sensing mechanisms of these printed indicators have been elucidated, with the specific focus on quality monitoring of seafood products during chilled storage. One of our recent studies reported the integration of machine learning models based on composite indicator's color response for the prediction of shrimp quality parameters, such as pH, total volatile basic nitrogen, lipid oxidation products, and bacterial growth. These results demonstrated the feasibility of incorporating artificial intelligence for future intelligent packaging innovations.

Keyword: *Colorimetric indicator, Piezoelectric inkjet printing, Seafood quality, Machine learning*

Repositioning Indigenous Foods and Traditional Knowledge for Future Food Systems in Sub-Saharan Africa: A Scoping Review

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For generations, indigenous foods and associated indigenous knowledge systems have nourished communities and supported resilient diets in Sub-Saharan Africa. Today, however, rapid urbanization, globalization, and shifting dietary patterns have led to their declining utilization worsening the region's double burden of malnutrition.

This scoping review investigated current evidence on indigenous foods, including African Indigenous Vegetables, traditional cereals, legumes, wild edibles and forest resources and their sustaining indigenous knowledge systems. We explored how these foods and knowledge contribute to nutrition, health, and more sustainable food systems. Guided by the PRISMA-ScR framework, 1,287 records were screened, and 72 studies were included in the final synthesis.

The findings demonstrate that many indigenous foods are packed with essential micronutrients and bioactive compounds. Traditional processing methods like fermentation, sun-drying, and smoking not only preserve these foods but also improve their nutritional value and safety. Indigenous knowledge plays a vital role in food preparation, preservation, therapeutic use, and helping communities adapt to climate challenges. However, these foods and the knowledge that sustains them are at risk of being lost. Repositioning indigenous foods through value addition, creative innovation, and supportive policies could help create more nutritious, culturally meaningful, and sustainable food systems for the future of Sub-Saharan Africa.

Keyword: *Indigenous foods, traditional processing, Indigenous knowledge systems, Sustainable food systems, Sub-Saharan Africa*

Liquid-liquid phase separation for food system

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Liquid-liquid phase separation (LLPS) has emerged as a crucial strategy for designing novel food structures and delivery systems. While the coacervation behaviors of soy and pea proteins have been extensively studied for encapsulation and textural improvement, the LLPS mechanisms of chickpea protein remain largely underexplored, despite its potential as a highly nutritious and sustainable plant alternative. Therefore, this study systematically investigated the phase separation behavior of chickpea protein and its application potential within food systems. The research primarily focused on the critical conditions driving the simple coacervation of the protein itself. Furthermore, it delved into the interaction mechanisms underlying its complex coacervation with oppositely charged macromolecules, specifically lysozyme (protein-protein interactions) and gum arabic (protein-polysaccharide interactions). By elucidating these mechanisms and comparing them with established plant proteins, this study fills a theoretical gap in multi-component chickpea protein systems. Ultimately, it provides a robust scientific basis for developing novel plant-based texture modifiers and bioactive encapsulation technologies in the food industry.

Keyword: *Liquid-liquid phase separation, Chickpea protein, Complex coacervation, Simple coacervation, Plant-based food*

Ultrasound Attenuation Spectroscopy for smart industrial in-line monitoring and control of food structure formation dynamics

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Background – Many food systems experience phase changes and related dynamic structure transformation in production. The resulting structure determines product properties like texture, rheology, appearance, stability and shelf life. Ultrasound propagation in specific frequency domains depends on the rheology of fluid systems as well as on the morphology of semi-solids/solids. Ultrasound Attenuation Spectroscopy (UAS) thus mirrors rheological and underlying structural states of materials.

Objective – Primary goal was to develop a methodology for detection of dynamic phase-change induced rheology and structure development in food production processes. Many industrial processes are hardly accessible for representative sampling and fast material transfer to off-line measurements. Accordingly, an in-line UAS technique was developed.

Methods – To the exemplary process chain of pre-crystallized chocolate melt deposition into molds, subsequent cooling, crystallization solidification and de-molding of the products, the UAS technique was adapted applying two US-transmitter/receiver pairs fixed to the bottom surface of the molds and coupled with IMU and temperature sensors.

R**esults -** Characteristic time-dependent UAS patterns were measured which enable quantification of (i) viscous damping by the deposited viscous chocolate melt, (ii) crystallisation-onset and (iii) -intensity (kinetics), (iv) solidification and related volume contraction as well as (v) detachment of the solidified chocolate product from the mold walls.

Keyword: *In-line Ultrasound Attenuation Spectroscopy, Phase change kinetics monitoring, rheology and texture quality*

THERMAL PROCESSING OF READY-TO-EAT CHOCOLATE RICE PORRIDGE: ADVANCING SHELF STABILITY, SAFETY, AND SENSORY EVALUATION

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Ready-to-eat (RTE) Chocolate Rice Porridge (Champorado), a widely consumed traditional Filipino chocolate rice-based dish, is highly perishable, limiting its commercial scalability. This study evaluates the application of retort-based thermal processing to develop a shelf-stable RTE product that ensures microbiological safety while maintaining consumer acceptability. Product performance was assessed in terms of commercial sterility, sensory acceptability, and nutritional composition. Results confirmed that the optimized thermal process achieved commercial sterility and extended shelf stability under ambient conditions without chemical preservatives. Sensory evaluation indicated that flavor is the primary determinant of overall acceptability ($p < 0.05$), exhibiting a moderate positive correlation with consumer preference ($r = 0.597$), while appearance and color showed limited influence. Nutritional analysis indicates that the product is energy-dense, supporting its suitability as a convenient food option. The findings highlight the potential of retort-based processing technologies to transform traditional foods into safe, convenient, and market-ready products. The study supports the integration of food processing innovations with sensory-driven product development to enhance consumer acceptance and scalability of culturally relevant foods.

Keyword: *thermal processing, food preservation, champorado, commercial sterility*

TRANSFORMING DIGITAL FOOD ENVIRONMENTS IN MALAYSIA: SYSTEMS INSIGHTS AND CO-CREATED PATHWAYS FOR HEALTHIER AND MORE SUSTAINABLE FUTURES

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Digital food environments (DFEs), encompassing online food delivery, e-grocery platforms, and social media, are reshaping food access and purchasing behaviours. However, governance often lags behind digital innovation, creating public health and nutrition risks. This study examined governance gaps, identified system drivers, and co-created pathways to healthier, more sustainable DFEs in Malaysia. Document review and consultations with 40 multi-sector stakeholders were undertaken. Data were analysed thematically and synthesised into system maps and causal loop models. Stakeholders noted that existing policies and regulations were largely developed for physical food environments and remain insufficiently adapted to digital settings, relying heavily on voluntary or self-regulatory approaches. DFEs operate as dynamic, complex systems in which unhealthy food behaviours are reinforced and sustained through interconnected behavioural, commercial, platform, and governance factors. Key drivers included affordability and convenience pressures, low nutrition literacy, greater visibility of unhealthy options, limited healthier choice availability, profit-driven promotions, and algorithm-driven personalisation and marketing. These dynamics were compounded by fragmented DFE governance, weak implementation and enforcement, limited platform transparency, and capacity constraints. Stakeholders identified co-created pathways, including stronger regulation (e.g., digital food marketing, nutrition labelling), healthier platform design, transparent data systems, market incentives, and consumer empowerment, highlighting the need for coordinated systems-based action.

Keyword: *Digital food environment, governance gaps, system drivers, stakeholder co-creation pathways, public health nutrition*

PRODUCTION OF BIOPOLYMERS FROM FOOD WASTE: THE CASE OF ECUADOR

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Packaging materials made from petroleum-derived plastics represent an environmental challenge due to their persistence and accumulation in ecosystems. This study evaluates the development of biodegradable materials from agro-industrial residues, using starch obtained from cassava peels as a sustainable alternative to conventional plastic polymers.

Cassava peels, which represent approximately 10–15% of the fresh root weight, were used as a raw material for starch extraction. The extraction process included washing, impurity removal, drying, grinding, sieving, aqueous dispersion, filtration, sedimentation, and drying of the recovered starch. Subsequently, biopolymer films were produced using the casting method, incorporating water, pH adjustments, thermal treatments, and glycerol as a plasticizer to improve flexibility and film-forming capacity.

The extracted starch was characterized through physicochemical analyses, including moisture, ash, protein, lipid, carbohydrate, and starch content. The resulting biopolymers were evaluated based on functional and mechanical properties, including thickness, density, moisture content, solubility, color parameters, biodegradability, tensile strength, elongation at break, and Young's modulus. This research promotes agro-industrial waste valorization and contributes to the development of sustainable materials for food packaging applications within a circular bioeconomy approach.

Keyword: *Biopolymers, Food waste, Biodegradable packaging*

TRANSLATING BULK PROTEIN INTO BIOACTIVE POTENTIAL: A MULTI-SCALE EXPLORATION BASED ON HEMPSEED

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A novel, predictive understanding of the composition to bioactivity relationships within hempseed protein isolate has been established, revealing its potent capacity to yield targeted bioactive peptides. To achieve this, a systemic, multi-scale investigation was conducted to map the transition of HPI from a bulk ingredient to a source of highly specific bioactives. First, the influence of different processing techniques on the complex protein matrix was characterised physicochemically and functionally and then decoded using label-free quantitative proteomics. To translate this micro-level proteomic profile into physiological outcomes, a custom in silico bioinformatic pipeline was developed for prediction. This automated computational framework simulated multiple enzymatic hydrolysis simultaneously, enabling the high-throughput prediction of targeted bioactive peptide release. These computational findings were subsequently rigorously validated via in vitro bioassays, which quantified significant anti-hypertensive and anti-diabetic activities. This research showcases a novel integrative approach, demonstrating how computational tools can be effectively paired with experimental methodologies to advance the discovery of bioactive peptides in food proteins. Ultimately, this establishes a new scientific understanding of hempseed bioactivity while providing a scalable, precision-driven model to accelerate the global development of health-promoting, plant-based functional ingredients.

Keyword: *Hempseed protein isolate, Label-free proteomics, In silico digestion, Bioactive peptides, Bioinformatics pipeline*

Multiscale probing of cholesterol-lowering effect from dietary bioactives

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Micellization is a crucial step in the intestinal absorption of cholesterol. In the small intestine, bile salts, phospholipids, and cholesterol spontaneously self-assemble into mixed micelles (typically 3–20 nm in diameter), which solubilize hydrophobic cholesterol and facilitate its uptake by enterocytes (1). One of the pharmacological strategies to lower blood cholesterol levels is to inhibit the formation of these bile acid–cholesterol micelles, thereby reducing cholesterol absorption. Certain dietary components with known bioactivity in lowering cholesterol, such as soluble dietary fibers, bioactive peptides, and plant-derived phytochemicals also exert similar functions.

This research applies soft matter characterization techniques to understand how plant-derived bioactives influence micelle stability and disassembly (“demicellization”). Collectively using asymmetric flow field-flow fractionation (AF4) coupled with multi-angle light scattering (MALS), X-ray scattering techniques and advanced microscopic imaging, we will investigate structural changes in model bile-cholesterol micelles upon interaction with selected plant extracts of known composition. The results contributes to a deeper understanding of the intervention from food constituents in hypercholesterolemia at a nanoscale level.

(1). Chem. Phys. Lipids. 2016, 200, 62–73.

Keyword: *Micellization, self-assembly, cholesterol-lowering, plant extract, dietary bioactives*

ANTI-INFLAMMATORY EFFECTS OF PECAN-DERIVED PHENOLICS AND THEIR POTENTIAL AS FUNCTIONAL FOOD INGREDIENTS

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Chronic inflammation contributes to the progression of chronic diseases, including cardiovascular disease, diabetes, and inflammatory bowel disease. This has motivated the development of dietary strategies that modulate inflammatory response and promote health. Plant-derived phenolics are widely recognized for their anti-inflammatory properties and are incorporated into functional foods or supplements as bioactive components. Pecans (Carya illinoinensis (Wagenh.) K. Koch) are a rich source of phenolic compounds, though their anti-inflammatory activities remain largely unexplored. In this study, we aimed to investigate the anti-inflammatory potential of pecan-derived phenolics and to compare the effects of distinct phenolic fractions on inflammatory mediator production. The crude extract and its low- and high-molecular weight fractions were assessed in mammalian macrophage models following lipopolysaccharide (LPS)-induced inflammation. Compared with LPS-treated controls, pecan phenolics reduced nitric oxide production and differentially modulated inflammatory cytokines, including IL-1b, IL-6, TNF-a, and IL-10, at both the transcriptional and protein levels, in a fraction- and dose-dependent manner. Our findings demonstrate that pecan-derived phenolics exert anti-inflammatory effects at the mammalian cell level and support their use as functional food ingredients. Pecan-derived phenolics represent promising bioactive components in dietary strategies to modulate chronic inflammation.

Keyword: *Anti-inflammatory activity, Functional foods, Macrophages, Pecans, Phenolics*

OSMOTIC STRESS ENHANCES ANTIBIOTIC RESISTANCE AND BIOFILM FORMATION OF LISTERIA MONOCYTOGENES IN DAIRY PROCESSING ENVIRONMENTS

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Listeria monocytogenes is a persistent foodborne pathogen capable of surviving diverse stress conditions encountered in dairy processing environments. This study investigated the effect of osmotic stress (4% and 6% NaCl) on antibiotic resistance, survival, and biofilm formation of 10 isolates obtained from a dairy facility.

Exposure to osmotic stress resulted in significant, strain-dependent changes in survival ($P < 0.001$), with $\log_{10}$ reductions of up to −1.03 at 4% NaCl, while some isolates showed increased survival at 6% NaCl ($\log_{10}$ FC up to +0.24), indicating adaptive responses. Osmotic stress markedly affected antibiotic susceptibility, with minimum inhibitory concentrations increasing for multiple antibiotics. Notably, tetracycline increased from ≤0.5 to 16 µg/mL, vancomycin from ≤1 to >64 µg/mL, and lincomycin from ≤4 to >256 µg/mL in several isolates.

Biofilm formation remained robust under stress and increased at higher NaCl concentrations. Biofilm counts reached up to 7.85 log cfu/cm², with higher biomass observed on polyurethane surfaces.

These findings demonstrate that osmotic stress enhances antibiotic resistance and persistence of L. monocytogenes, highlighting the need to include environmental stress factors in risk assessment and sanitation strategies.

This study was funded by the Minister of Science under “the Regional Initiative of Excellence Program” (Warsaw, Poland).

Keyword: *Listeria monocytogenes, osmotic stress, antibiotic resistance, biofilm, dairy environment*

Ultrasound-assisted extraction of lipids from oat flakes using green solvents: a sustainable approach for replacing n-hexane

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Traditional oil extraction methods rely heavily on the use of solvents, predominantly hexane due to its chemical stability and high oil selectivity. However, its industrial use has raised concerns owing to high volatility and toxicity, posing detrimental impacts on health and environment. The objectives of the current research study were to investigate green solvents including 2,2,5,5-Tetramethyloxolane (TMO) and 2-Methyltetrahydrofuran (2-MeTHF) as sustainable alternatives and integrating ultrasonication (20 kHz) as an advanced extraction technology for extracting lipids from oat flakes in shorter duration. 2-MeTHF-based ultrasonic-assisted extraction at 100% amplitude for 10 min achieved comparable oat oil yield (4.41 ± 0.11%) to mechanical stirring for 3 h (4.54 ± 0.16%) and significantly higher than when using hexane (3.77 ± 0.19%) during ultrasonication. Interestingly, 2-MeTHF (100%, 10 min) extracted oils displayed substantially higher content of total phenolics (556.77 ± 43.95 mg-GAE/100g) followed by TMO (101.91 ± 13.65%) and n-hexane (50.29 ± 2.26%), demonstrating a positive relationship with antioxidant activity (974.03 ± 79.27 mg-Trolox/100g). All the extracted oils demonstrated minimal cytotoxicity in human colorectal adenocarcinoma and embryonic kidney cells. The findings concluded that 2-MeTHF can be further explored as a sustainable alternative for extracting lipophilic substances from different foods with improved quality and stability.

Keyword: *oat lipids, ultrasonic extraction, green solvents, phenolics, antioxidants*

3D-PRINTED CHOCOLATE FOR DYSPHAGIA: HYDROCOLLOID-ENHANCED RHEOLOGY, TEXTURE AND PRINTABILITY

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This study investigates how hydrocolloid addition and storage influence the rheology, texture, and printability of a chocolate-based dysphagia food ink. Dark chocolate formulations were supplemented with 0.4% xanthan gum or carrageenan to improve performance during extrusion-based 3D printing, and samples were printed at 0, 7, and 14 days to assess storage effects. Rheological data showed that viscosity at rest and during extrusion was not significantly affected ($p > 0.05$) by hydrocolloid incorporation or storage time, although at shear rates >50 s^{-1}, viscosity increased with carrageenan and decreased with xanthan gum. Temperature sweeps indicated maximum flowability at 24–27°C for all samples, with xanthan-containing inks exhibiting significantly lower tan(δ), consistent with a weaker structural network. Importantly, significant differences in firmness during storage were observed between the control and hydrocolloid-added samples, with the latter showing more stable textural properties over time, indicating that hydrocolloids contribute to storage stability. Texture Profile Analysis and the International Dysphagia Diet Standardisation Initiative (IDDSI) testing classified the 3D-printed chocolates as soft and cohesive, meeting IDDSI Level 7 (Easy-to-chew), with the potential to reach IDDSI Level 6 (Soft and bite-sized) through size modification.

Keyword: *3D printing, Dysphagia, Storage stability, Hydrocolloids, Printability*

A food-energy-water nexus solution towards a sustainable and resilient Europe

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This study applied a three-step approach, data collection and sorting, GIS-based analysis, and technical analysis to evaluate the food, water, and energy systems in Europe. It explores a FEW nexus solution based on maize, wheat, and rice production, utilizing crop residues for bioelectricity and treated wastewater for irrigation and energy generation. The study considers four sub-regions of Eastern Europe, Northern Europe, Southern Europe, and Western Europe to assess the impacts of the FEW nexus solution across the continent. Results indicate that under sub-regional maximum values of crop production, bioelectricity generation, and treated wastewater reuse, Europe could increase crop production by 62 % without expanding arable land. Bioelectricity could replace 10 % of Europe's current fossil-based electricity generation. The reuse of treated wastewater would reduce freshwater demand for irrigation in Europe by 86 %. The results highlight the potential of the FEW nexus approach to enhance sustainability and resilience in Europe's resource management.

Keyword: *Bioelectricity, Treated wastewater, Crop residue, GIS, Spatial analysis*

CONSUMER BEHAVIOUR TOWARDS FUNCTIONAL FOODS, DIETARY SUPPLEMENTS AND NUTRIENT AWARENESS: A COMPARATIVE STUDY ACROSS FIVE EUROPEAN COUNTRIES

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The growing market for functional foods reflects increasing consumer interest in health-oriented nutrition, while consumer knowledge about nutrient functions and sources remains diverse across Europe. This study examines consumer behaviour towards dietary supplements, fortified food products, and nutrient awareness in five European countries: Ireland, France, Norway, Poland, and Romania, based on a cross-national quantitative survey (CAWI) conducted on a representative adult sample of 5,077 respondents. The study explores three interrelated dimensions: patterns of dietary supplement use, willingness to purchase fortified food products, and familiarity with selected nutrients, including omega-3 fatty acids, collagen, other proteins, vitamins, and antioxidants. Additionally, it investigates consumer expectations regarding fortified foods, focusing on product quality, health benefits, and ingredient transparency. The results reveal substantial cross-country differences in supplementation habits, acceptance of fortified food categories, and self-declared knowledge of nutrients and their dietary sources. The findings also suggest that nutritional awareness play an important role in shaping consumer openness to health-oriented food innovations.

This research was funded in whole within the Up4Food project (Upcycling side-streams for sustainable and healthy ingredients and new food concepts) by National Science Centre, Poland, project registration no. 2023/05/Y/HS4/00121, through the JPI HDHL Joint Programming Initiative „A Healthy Diet for a Healthy Life”.

Keyword: *functional foods, dietary supplements, consumer behaviour, nutrient awareness, food fortification*

ENHANCING DIFFUSION-ASSISTED FORTIFICATION IN RICE THROUGH MICRO-PERFORATION: A KINETIC AND MASS TRANSFER STUDY

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Fortification of staples is an effective strategy to address micronutrient deficiencies. Rice, a primary staple, is a valuable vehicle to deliver micronutrients to the masses. Conventional techniques, including dusting, coating, and extrusion are commercially adopted, but involve challenges related to nutrient retention, shelf-life, infrastructure and consumer acceptance. Diffusion-based fortification is a simpler alternative; however, its efficiency is limited by structural barriers within grains restricting mass transfer and slowing uptake.

This study proposes micro-perforation as a process innovation to enhance diffusion-assisted fortification in rice. Controlled micro-perforation on the grain surface reduces mass transfer resistance during soaking at temperatures 40, 50 and 60℃, reflected by the time taken (T_{sat}) to reach equilibrium moisture content. The diffusion behaviour was analysed using kinetic models (Peleg, Weibull, Modified Azuara) along with effective diffusivity (D_{eff}).

Results indicated a decrease in T_{sat} and increase in D_{eff} in micro-perforated grains compared to untreated samples. High coefficients of determination (R^2>0.95) indicated strong correspondence between experimental data and empirical predictions through kinetic models. The impact on quality attributes, including morphological, chemical, and thermal changes were evaluated to ensure feasibility.

The micro-perforation-assisted diffusion-based fortification offers a promising alternative delivery system for micronutrients in staple foods.

Keyword: *Surface engineering, transport phenomena, micronutrient delivery, diffusion mechanism, Fickian diffusion*

Development and Characterisation of Radiofrequency-Treated Foxtail Millet and Brown Seaweed Protein Composites and its application in a Ready-to-Serve Beverage

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The present study investigates the development of a composite protein complex from foxtail millet (Setaria italica) and brown seaweed (Sargassum wightii) using radiofrequency (RF) treatment and evaluates its suitability as a sustainable functional ingredient in ready-to-serve beverages. Protein isolates were extracted and blended at an optimised 80:20 ratio, followed by RF treatment at 40 Hz and 440 W for 5 to 15 min to induce protein-polysaccharide interactions, with a probe height of 320 mm and a conveyor speed of 5 m/hr. RF-treated composites showed improved functionality, with water solubility increasing from 62.4 ± 1.80% to 78.6 ± 2.10% and emulsifying activity index from 28.50 ± 1.20 to 41.70 ± 1.50 m^2/g. Structural analysis indicated protein unfolding and stronger interactions, improving dispersion stability. RTS beverages containing 2-4% (w/v) composite protein were evaluated. The optimised 3% formulation had protein 3.84 ± 0.12%, viscosity 18.60 ± 0.90 mPa·s, and pH 6.52 ± 0.04. Antioxidant activity reached 46.32 ± 2.35%, while digestibility improved from 71.25 ± 1.68% to 82.50 ± 1.90%. Sensory evaluation showed flavour 7.22 ± 0.56 and overall acceptability 7.50 ± 0.43. Overall, RF-assisted modification enhanced techno-functional and nutritional quality, supporting its application as a sustainable RTS ingredient for improved stability and consumer acceptance outcomes.

Keyword: *Brown seaweed, Composite protein, Foxtail millet, Radiofrequency processing, Ready-to-serve beverage*

HIGH YIELD BACTERIAL CELLULOSE FROM WASTE DERIVED CULTURE MEDIA FOR SUSTAINABLE FOOD PACKAGING

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About one-third of global food production is lost or wasted annually, while petroleum-derived plastic packaging, although effective in protecting perishables, imposes severe and persistent environmental burdens. This highlights the need for renewable, low-carbon packaging materials. Bacterial cellulose (BC), produced by Komagataeibacter xylinus, offers exceptional purity, mechanical strength, biodegradability, and structural tunability, but its wider adoption is constrained by the high cost and substrate demand of conventional Hestrin–Schramm (HS) media. This study valorised industrial fruit processing waste to develop waste-derived culture media that enhance glucose-to-BC conversion efficiency. BC yield coefficients ($Y_{p/s}$) differed significantly between the HS control and the waste-derived formulations, and a single optimised medium achieved approximately double the $Y_{p/s}$ of the control, indicating markedly superior conversion of glucose into bacterial cellulose. Microbial growth in each medium was described using the modified Gompertz model, and bioprocess kinetics of BC formation were evaluated to support process design and scale-up. The resulting BC was structurally and chemically characterised by scanning electron microscopy, micro-computed tomography, Fourier-transform infrared spectroscopy, and atomic force microscopy, indicating its suitability for development as a sustainable food packaging material and showing that waste-derived media can enhance yield efficiency while valorising fruit processing side streams as alternative substrates.

Keyword: *Bacterial cellulose, Komagataeibacter xylinus, Agro-industrial waste valorisation, Sustainable food packaging, Circular bioeconomy*

COMPARISON OF ISO AND AOCS OFFICIAL METHODS FOR MEASURING TRYPSIN INHIBITOR ACTIVITY IN OILSEEDS, PULSES AND CEREALS AND JUSTIFICATIONS FOR ALIGNING ISO 14902 WITH AOCS BA 12A-2020

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Trypsin inhibitors of proteinaceous nature are ubiquitous, and richly present in oilseeds, pulses and cereals. They are considered antinutritional and need to be heat denatured. For determining trypsin inhibitor activity (TIA), there are two major official methods: International Organization of Standardization (ISO) 14902:2001 and American Oil Chemists' Society (AOCS) Ba 12a-2020. Although sharing the same principle, the two differ in 12 out of 19 elements identified for assays. Upon systematically comparing the two methods, several scientific flaws were found with the ISO method. These include: (1) The ISO method has a higher substrate-to-enzyme ratio, leading to significantly higher substrate inhibition; (2) The ISO method wrongly assumes a fixed 56% purity for all trypsin reagents; and (3) The ISO results are sensitive to the specific activity of trypsin used. The AOCS method avoids these issues by using a lower substrate-to-enzyme ratio and standardized conversion factor based on enzyme specific activity. Furthermore, the AOCS method uses half less assay volume and 10-time cheaper synthetic substrate than the ISO method, leading to higher analytical sensitivity and lower operational cost. With above scientific and economic justifications, for promoting global trade, we propose harmonization of TIA method by aligning ISO with the AOCS method.

Keyword: *Trypsin inhibitor activity, Official Method, ISO, AOCS, Oilseeds, legumes and cereals*

PRODUCTION AND QUALITY EVALUATION OF AN OAT WHEAT COMPOSITE BREAD ENRICHED WITH RICE BRAN AND BANANA EXTRACTS

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This study assessed the nutritional, functional, physical, sensory, and storage properties of oat-wheat composite bread that was enhanced with rice bran and banana extract. Measured amounts of rice bran and banana extract were added, and oat flour was mixed with wheat flour at different substitution levels. The straight dough method was used to create bread samples, which were then examined for proximate composition, functional qualities, physical features, micronutrient content, shelf life, and sensory qualities. In comparison to 100% wheat bread, the results demonstrated that enrichment greatly enhanced nutritional quality, with higher levels of protein, crude fiber, ash, and minerals. Higher fiber and bioactive components also increased functional qualities.

Structural integrity and baking performance were acceptable despite a modest drop in loaf volume and specific volume with increasing substitution. Moderately enriched samples were the most preferred, according to sensory evaluation, which revealed broad acceptability. Studies on shelf life showed increased microbiological stability, which was linked to antioxidant chemicals found in banana extract and rice bran. All things considered, the composite bread showed improved nutritional value without sacrificing customer acceptance. Utilizing locally accessible raw materials encourages the creation of useful bread goods, lessens dependency on imported wheat, and supports sustainable production.

Keyword: *Oat–wheat bread, rice bran, banana extract, proximate composition, functional properties*

Efficacy of Food-Grade Silica Nanoparticles for Controlling Stored-Product Insects in Grains and Tree Nuts

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Stored-product insects such as Tribolium castaneum (red flour beetle, RFB) cause significant postharvest losses in grains and high-value food commodities, including tree nuts. Conventional chemical insecticides raise concerns regarding resistance, residues, and food safety, highlighting the need for alternative control strategies. In this study, the efficacy of food-grade silica nanoparticles (SNPs), including fumed silica nanoparticles (FSNPs) and precipitated silica nanoparticles (PSNPs), was evaluated against RFB in stored rice grains and tree nuts (walnut, almond, and pistachio kernels) by using smart probes.

Under simulated storage conditions (30 °C and 75% relative humidity), both FSNPs and PSNPs exhibited clear dose- and time-dependent insecticidal activity. FSNPs showed superior efficacy in tree nuts, achieving rapid and high mortality at dosages ≥0.5 g/kg, whereas PSNPs performed better in rice grains. In comparison, diatomaceous earth (DE) showed relatively lower efficacy across all tested systems. Notably, SNPs remained effective even under high-humidity conditions, where conventional inert dusts typically show reduced performance.

These findings demonstrate that food-grade silica nanoparticles are promising alternatives for controlling stored-product insects, with efficacy strongly influenced by the food matrix. Optimizing nanoparticle type and dosage according to commodity characteristics will be critical for practical application in food storage systems.

Keyword: *Nano particles, insect control, grain, tree nuts*

PRODUCTION AND CHARACTERIZATION OF LIQUID SMOKE FROM LIGNOCELLULOSIC BIOMASS USING A COMPACT FOOD-GRADE PYROLYSIS REACTOR

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Lignocellulosic biomass waste poses environmental risks if not properly managed, while traditional smoking introduces toxic polycyclic aromatic hydrocarbons (PAHs) into food. This study presents a sustainable alternative by producing liquid smoke through the development of a compact food-grade pyrolysis reactor. Pyrolysis was conducted at 380 °C for 30 minutes using low-quality cinnamon bark, cinnamon wood, cinnamon leaves, coconut leaves, and peanut shells. Purified samples were evaluated for physicochemical and functional properties and compared with commercial liquid smoke. Yields ranged from 21.91 ± 0.79% to 40.69 ± 1.0%, with cinnamon wood yielding the highest. Distillation significantly improved quality, with pH (2.38–3.31), titratable acidity (5.18–7.99%), and total phenolic content (88.43–143.82 mg GAE/g), exceeding the commercial sample (23.60 mg GAE/g). Antioxidant activity measured by DPPH assay ranged from 92.31–94.99%. Antimicrobial activity against Staphylococcus aureus showed inhibition zones of 2.00–3.20 cm, absent in the commercial sample. GC-MS analysis confirmed phenolic and carbonyl compounds as major constituents, with no detectable PAHs, ensuring safety. Sensory evaluation indicated highest acceptability for cinnamon bark-derived liquid smoke (6.49 ± 1.29), followed by peanut shells (6.00 ± 1.41). The study demonstrates effective biomass valorization, reactor design, and potential application of liquid smoke as a safe food flavoring agent.

Keyword: *Lignocellulosic biomass*, *Liquid smoke*, *Polycyclic aromatic hydrocarbons*, *Pyrolysis*

Evaluation of the Bactericidal Effects of Ozone Ultrafine Bubble Water in Model Systems and Fresh Vegetables for Application in Japanese Pickles Production

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Japanese pickles are typically produced without heating. It is therefore necessary to establish effective non-thermal treatment methods to inhibit microbial growth. Although ozone water is known to have a bactericidal effect against various bacteria, the bactericidal effects of ozone ultrafine bubble water (OUFBW) and its impact on the quality of fresh vegetables have not been studied in detail. This study aimed to examine the effectiveness of OUFBW for washing raw vegetables used in Japanese pickles.

First, the fundamental bactericidal efficacy of OUFBW was evaluated using a model system with Escherichia coli and Staphylococcus aureus. As the ozone concentration increased, both bacteria were effectively inactivated. When OUFBW at an ozone concentration of approximately 4.5 ppm was added to these bacterial pellets, the bacterial count decreased by more than 7 log CFU/mL.

Next, practical washing tests were conducted with fresh vegetables, focusing on natural microorganisms. Various combinations of treatments, including heat, ultrasound, and detergents, as well as different washing times and cycles, were examined. The most effective method for reducing microbial contamination was found to be increasing the number of washes. In comparison with water washing, OUFBW treatment reduced bacterial counts on fresh vegetables, and repeated washing further enhanced the reduction.

Keyword: *ozone ultrafine bubble water (OUFBW), bactericidal effects, Japanese pickles*

DEVELOPMENT OF GLUTEN-FREE DRIED RICE NOODLES INCORPORATED WITH RED SEAWEED, KAPPAPHYCUS ALVAREZII

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Commercially available rice noodles are often low in essential nutrients and offer limited functional benefits. This study aimed to enhance the nutritional value and functional properties of gluten-free dried rice noodles by incorporating red seaweed powder, Kappaphycus alvarezii. Noodles were formulated with varying concentrations (3%, 6%, 9%, and 12%) and evaluated for physical properties and sensory acceptability to determine the best formulation. Proximate composition and dietary fibre analyses were conducted for the noodles, while storage stability was assessed through water activity, colour, and texture over eight weeks. Increasing seaweed concentration resulted in higher cooking yield and cooking loss but reduced optimum cooking time. Colour analysis showed decreased lightness (L*) and yellowness (b*), and increased redness (a*). The 9% formulation was identified as the best formulation, balancing sensory acceptance and textural properties, with significantly ($p<0.05$) higher hardness and gumminess. It also demonstrated improved nutritional quality, with higher ($p<0.05$) ash (5.42%), crude fibre (0.55%), and dietary fibre (3.57%) compared to the control. Moisture content (9.83–11.67%) and water activity (0.44–0.47) remained within safe limits throughout storage. In conclusion, incorporation of 9% K. alvarezii powder enhances the nutritional, functional and storage properties of gluten-free dried rice noodles, indicating strong commercial potential.

Keyword: *Rice, Noodles, Gluten-free, Seaweed, Kappaphycus alvarezii*

Machine-learning-guided extraction optimization and physicochemical characteristic of GRAS microalgae proteins for sustainable food applications

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GRAS microalgae are promising sustainable protein sources, but their diverse cell-wall architectures limit efficient recovery and predictable ingredient functionality. This study developed an integrated processing and modelling workflow to optimize ultrasound-assisted alkaline extraction of proteins from Chlorella pyrenoidosa, Chlorella sorokiniana, and Arthrospira platensis for food applications. Probe sonication outperformed bath sonication and alkaline-only extraction, with A. platensis reaching 96.40% protein recovery and 365.30 mg/g biomass yield, reflecting near-saturated release from its readily disrupted sheath. Response surface methodology identified species-specific optima, achieving validated recoveries of 26.91% for C. pyrenoidosa and 31.81% for C. sorokiniana despite their more recalcitrant walls. To move beyond point optimization, Gaussian process regression was applied to generate prediction and uncertainty surfaces, improving cross-validated prediction for C. pyrenoidosa and confirming robust behaviour for C. sorokiniana, while diagnosing saturation in A. platensis. Recovered concentrates contained 63–79% protein, with SDS–PAGE and FTIR indicating preserved structural profiles. Functionality was strongly pH- and medium-dependent: solubility remained low in water but reached ~90% in neutral–alkaline buffers. Species-specific hydration and oil-binding properties further supported targeted use in beverages, emulsions, and lipid-rich formulations. This workflow links extraction engineering, predictive reliability, techno-functional performance, and process-aware ingredient selection decisions for scalable microalgal protein ingredients.

Keyword: *Microalgae proteins, ultrasound-assisted alkaline extraction, response surface methodology, gaussian process regression, sustainable protein sources*

Bacteria-Matrix Interactions Influence the Viability and Intestinal Survival of Lacticaseibacillus Rhamnosus GG Encapsulated in Whey Protein and Starch Hydrogels

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This work investigated how interactions between Lacticaseibacillus rhamnosus GG (LGG) and a whey protein isolate/modified starch hydrogel influence probiotic encapsulation, survival, and gastrointestinal persistence. Gels assembled via in situ bacterial fermentation formed within 30 minutes at room temperature. In a murine model, encapsulation increased viable cell counts in the intestine, cecum, and colon by 0.6–2.1 log CFU/g compared to unencapsulated cells, with sex-dependent differences observed. Hydrated gels maintained viable counts of 6.5–7.8 log CFU/g after 60 days without refrigeration. Using a pilus-depleted (ΔspaCBA) and exopolysaccharide-deficient (ΔwelE) mutants, we demonstrated that both surface structures contribute to protection: ΔspaCBA cells showed reduced in vivo survival and higher release from gels, while ΔwelE cells exhibited the fastest viability loss during room temperature storage. These findings demonstrate that bacterial surface molecules mediate retention within the matrix and contribute to both physical protection during digestion and storage stability, with implications for the development of food-grade encapsulation systems for probiotics.

Keyword: *probiotics, encapsulation, pili, exopolysaccharides, hydrogel, gastrointestinal delivery*

Impact of thermal processing and simulated gastrointestinal digestion on the nutritional, structural and metabolomic fate of microalgae protein concentrates

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Microalgal protein concentrates are promising functional-food ingredients, but how cooking redirects their digestive fate remains unclear. This study compared Arthrospira platensis (APPC), Chlorella pyrenoidosa (CPPC) and Chlorella sorokiniana (CSPC) protein concentrates under fresh-undigested, boiled-undigested, fresh-digested and boiled-digested states using an INFOGEST-aligned model. CPPC showed the greatest TCA-based hydrolysis after digestion (71.84% fresh; 65.30% boiled), exceeding APPC (6.52%; 4.36%) and CSPC (1.03%; 1.57%). Conversely, CSPC showed the highest OPA-reactive amino groups after boiling and digestion (832.67 mg serine equivalents/g), indicating that peptide fragmentation and amino-group liberation were uncoupled. Digestion strongly enhanced antioxidant capacity, with ABTS reaching 96.57 mg TEAC/g in APPC and 93.96 mg/g in CSPC, while tannins, saponins, phytate and phenolics were redistributed rather than uniformly reduced. Interaction-ranked metabolomics revealed species-specific remodeling of peptide-like, nucleotide-derived, lipid-associated and redox-related features, including His-Gly-Val/His-Met, cyclic nucleotides, glycerides, docosahexaenoyl ethanolamide and cysteine-glutathione disulfide, supporting the biochemical basis of hydrolysis, antioxidant and antinutrient shifts. PCA separated digested from undigested matrices, confirming digestion as the dominant driver and cooking as a matrix-dependent modulator. These findings demonstrate that microalgal protein concentrates are not nutritionally interchangeable, and that cooking modulates protein bioaccessibility for targeted functional-food formulation and evidence-based alternative-protein selection across evaluated species and future applications.

Keyword: *Microalgae protein concentrates, thermal processing, in vitro gastrointestinal digestion, protein digestibility, untargeted metabolomics*

Interfacial Engineering of Aspergillus Oryzae Biofilm–Oleogel Hybrid Composites via Plant Protein–Based Adhesion for Structured Food Systems

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Replicating the complex lipid-protein architecture of animal tissues remains a primary challenge in developing next-generation plant-based meats. This study introduces a novel strategy to create hierarchical food structures by integrating Aspergillus oryzae biofilms with ethyl cellulose-stearic acid oleogels. We engineered a multilayer hybrid composite using plant protein adhesives (zein and wheat gluten) to bridge the hydrophilic fungal surface and the hydrophobic lipid phase. The interfacial adhesion was characterized via wettability analysis, surface morphology, and SDS-PAGE to determine the mechanisms of mechanical interlocking and non-covalent bonding. Zein demonstrated superior adhesive performance over gluten, attributed to its unique amphiphilic nature and ability to form a stable interface with the fungal mycelia. The resulting hybrid composites effectively "locked" the liquid oil within the fungal matrix, significantly reducing oil leakage and weight loss during cooking. The mechanical profile of the cooked composites (hardness ~3–13 N) successfully mimicked the texture of some traditional processed meat products. These findings demonstrate that fungal-oleogel hybrids can serve as a scalable, clean-label platform for structured fat mimetics. By leveraging fungal biofilms as a structural scaffold, this research provides a sustainable pathway to improve the sensory and nutritional profiles of alternative protein products.

Keyword: *Aspergillus oryzae, oleogel, bio-composites, interfacial engineering, fat mimetics*

FOOD-GRADE SYNTHESIZED BIFLAVONOIDS AS PROMISING ANTIMICROBIALS AGAINST METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS

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Methicillin-resistant Staphylococcus aureus (MRSA) is a major antimicrobial-resistant pathogen of public health concern and has been detected in food products and food-producing environments. Flavonoids are widely studied natural compounds, while their dimeric forms (biflavonoids) remain less accessible despite growing evidence of enhanced bioactivity. In this study, a library of approximately 70 biflavonoids synthesized via a food-grade approach was evaluated for anti-MRSA activity. More than 10 compounds exhibited minimum inhibitory concentrations (MICs) ≤ 32 μg/mL. A representative biflavonoid (Luteolin-Apigenin, MIC = 32 μg/mL) was selected for mechanistic investigation.

Time-kill assays demonstrated that Luteolin-Apigenin (Lu-Ap) exhibits bacteriostatic activity. Binding assays suggested an interaction between Lu-Ap and peptidoglycan. LC–MS analysis further revealed decreased peptidoglycan crosslinking. Electron microscopy showed pronounced morphological abnormalities, including pseudo-multicellular clustering indicative of impaired cell division. Transcriptomic analysis revealed modulation of genes associated with cell wall processes and cell division. Notably, serial passaging under increasing drug pressure resulted in minimal MIC changes, suggesting a low propensity for resistance development.

These findings suggest that Lu-Ap disrupts peptidoglycan remodeling and cell division in MRSA, thereby contributing to its bacteriostatic activity. This work provides a potential strategy for controlling MRSA.

Keyword: *Biflavonoids, MRSA, Antimicrobial activity, Cell wall remodeling*

INTERFACIAL REGULATION AND MULTISCALE KINETICS OF OLEOSOME DIGESTION: INSIGHTS FROM PULSED ELECTRIC FIELD-INDUCED RECONSTRUCTION AND SINGLE-DROPLET MICROFLUIDIC ANALYSIS

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Functional lipids often face challenges such as poor stability, susceptibility to oxidation, and limited control over their lipid release during food processing and gastrointestinal digestion. Oleosomes, natural lipid storage organelles in plant cells, are promising delivery systems due to their natural emulsified structure for functional lipids. However, their interfacial membrane can hinder hydrolysis and subsequent absorption of the inside functional lipids, making precise interfacial regulation essential for controlled digestion. In this study, oleosomes are used to investigate the relationship between interfacial structure regulation and lipid digestion behavior. Pulsed electric field treatment is applied to induce controlled interfacial reconstruction, enabling modulation of protein conformation and phospholipid rearrangement at the interface. These structural changes are correlated with lipid digestion behavior to elucidate structure–function relationships. Furthermore, a microfluidic platform is employed to characterize digestion kinetics at the single-droplet level, enabling time-resolved analysis of interfacial dynamics. A cross-scale predictive model is developed to link microscale structural evolution with overall digestion performance. This work reveals the digestion mechanism of oleosomes from the perspective of interfacial structure regulation and multiscale kinetics. The findings offer new strategies for the structural design of oleosome-based delivery systems for functional lipids and promote the efficient application of functional lipids.

Keyword: *Oleosomes, Pulsed electric field, Interfacial regulation, Single-droplet microfluidic platform, Lipid digestion kinetics*

Cold Plasma Activated Water as a Green Alternative for Pesticide Degradation and Food Safety

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Plasma Activated Water (PAW) was generated using dielectric barrier discharge with oxygen, nitrogen, and mixed gas systems, and its physicochemical properties and efficacy in degrading organophosphate pesticides were evaluated. Increasing plasma treatment time (0–30 min) resulted in significant decreases in pH and increases in oxidation–reduction potential, electrical conductivity, and reactive nitrogen species (nitrite and nitrate), confirming the formation of reactive oxygen and nitrogen species. PAW treatment of malathion (145 mg/L solubility) and phosmet (25 mg/L solubility) resulted in progressive degradation, with LC–MS analysis identifying transformation products including malaoxon intermediates, dimethyl phosphate, and phosphoric acid, indicating cleavage of ester bonds and oxidative pathways. Application on pesticide-spiked blueberries (25 mg/L) using repeated dipping cycles demonstrated effective residue reduction. Quality analysis over 8 weeks showed no significant deterioration in texture, color, or key bioactives, including ascorbic acid and anthocyanins. Cytotoxicity assessment using SH-SY5Y and dendritic cell models indicated reduced toxicity of degradation products compared to parent compounds. The results demonstrate that PAW is a scalable, residue-free, and environmentally sustainable approach for pesticide degradation and fresh produce safety, with strong potential to replace conventional chemical washing systems

Keyword: *plasma activated water, pesticide degradation, malathion, phosmet, non-thermal processing*

TAILORING THE STRUCTURE AND FOOD FUNCTIONALITY OF MICROALGAE AUXENOCHLORELLA PROTOTHECOIDES PROTEIN BY SUPERCRITICAL CARBON DIOXIDE AND SUBCRITICAL WATER TREATMENT

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Heterotrophic Auxenochlorella protothecoides is a promising sustainable protein source, but its naturally compact and highly ordered protein architecture limits molecular flexibility and functionality. The comparative functional windows of subcritical water treatment (SWT) and supercritical CO_2 ($SCCO_2$) processing for this protein extract remain insufficiently defined. This study aimed to tailor the structural and functional properties of A. protothecoides protein extract using these two green processing strategies. Protein extracts were subjected to ten SWT conditions and ten $SCCO_2$ conditions, followed by analyses of solubility, water holding, oil absorption, emulsifying and foaming properties, and structural attributes. SWT was particularly effective in enhancing oil absorption and foaming capacity, increasing OAC by 83.60% at 150 °C for 10 min and foaming capacity by 97.14% at 150 °C for 40 min. Moderate SWT promoted partial unfolding and functional group exposure, whereas excessive treatment caused hydrolysis, aggregation, color deterioration, and reduced functionality. $SCCO_2$ treatment for 90 min showed property-specific improvements, with WHC increased by 55.76% under certain conditions, while ethanol-assisted $SCCO_2$ increased OAC by 22.39%. These findings demonstrate that SWT and $SCCO_2$ provide complementary intensity-dependent modification windows for improving microalgal protein functionality.

Keyword: *Auxenochlorella protothecoides, Subcritical water treatment, Supercritical CO2, Protein functionality, Microalgal protein*

Host-phage co-evolution and resistance trade-offs: insights for sustainable food biocontrol applications

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Bacteriophages have emerged as promising biocontrol agents in medicine, agriculture, and food safety; however, the evolutionary factors determining their persistence or failure remain poorly understood. In this study, Salmonella strains were co-evolved with lytic phage SF1 over 30 days, resulting in either phage extinction or stable co-existence. We systematically analyzed phenotypic and genetic changes in both host and phage populations to elucidate the underlying mechanisms. Bacterial populations developed diverse resistance phenotypes, including sensitivity, partial resistance, and complete resistance. Resistance strength correlated strongly with phage adsorption, indicating that receptor modification is the dominant mechanism. Genomic analysis revealed two categories of resistance mutations: key mutations, such as nonsense or frameshift mutations in rfaH-regulated rfb genes that remove the O-antigen receptor, and secondary mutations affecting functions such as fimbrial synthesis. Key mutations conferred strong, irreversible resistance and led to phage extinction, whereas secondary mutations resulted in partial resistance that could be overcome by evolved phages, enabling co-existence. Importantly, bacterial populations leading to phage extinction exhibited higher mutation rates and lower fitness costs. These findings demonstrate that fitness trade-offs and mutation dynamics govern host–phage co-evolutionary outcomes, providing insights for optimizing phage stability and application in food systems.

Keyword: *Co-evolution, Co-existence, Phage extinction, Fitness, Phage resistance*

ASSOCIATION OF EXPOSURE TO SELECTED CHEMICAL CONTAMINANTS WITH DIABETES MELLITUS IN CHINESE ADULTS: MIXTURE ASSOCIATIONS AND METABOLIC MEDIATION IN THE PRECISION NUTRITION AND FOOD SAFETY STUDY

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Background: Foodborne and environmental chemical contaminants—including acrylamide, 3-monochloropropane-1,2-diol (3-MCPD), glycidol, and thiocyanate—are widely present in heat-processed and daily-consumed foods. However, the joint health effects of co-exposure and underlying metabolic mechanisms remain unclear.

Objective: To evaluate associations between mixture exposure to these contaminants and diabetes mellitus (DM), and to identify mediating plasma metabolites.

Methods: A cross-sectional analysis was conducted within the Precision Nutrition and Food Safety study, including 1,744 Chinese adults aged 40–75 years. Urinary biomarkers were quantified for the four contaminants. Logistic regression, Bayesian kernel machine regression, and quantile g-computation modeled mixture effects. Untargeted metabolomics on 342 plasma samples and causal mediation analysis identified metabolic intermediates.

Results: The contaminant mixture was positively associated with DM prevalence. Thiocyanate emerged as the dominant contributor (groupPIP = 0.948), exhibiting a nonlinear dose–response relationship, while iso-GAMA also showed independent associations (OR = 1.49). Six plasma metabolites mediated the thiocyanate–DM association, with acrylic acid (36.19%) and glucose (35.22%) being principal mediators.

Conclusions: Co-exposure to common food-related contaminants increases DM risk through identifiable metabolic pathways. Findings underscore the need for cumulative risk assessment frameworks and revised food safety standards beyond single-chemical paradigms.

Keyword: *Food chemical contaminants, Mixture exposure assessment, Diabetes mellitus, Metabolomics mediation, Cumulative risk assessment*

IMPACT OF DIFFERENT ROASTING TECHNIQUES ON NUTRIENT RETENTION AND METABOLOMIC PROFILING OF INDIAN PIGMENTED AND NON-PIGMENTED RICE LANDRACES

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This study evaluated the impact of different roasting techniques (sand, pan and microwave roasting) on the structural integrity, poly-phenolic composition, amino acid profiling and metabolite distribution in Indian pigmented and non-pigmented rice landraces. FTIR analysis confirmed that among all roasting methods, microwave roasting better maintained molecular integrity, with characteristic functional groups remaining intact, whereas pan roasting induced greater oxidative changes. Pigmented rice exhibited higher spectral variation, indicating increased thermal sensitivity. UHPLC poly-phenolic and amino acid profiling demonstrated that microwave roasting retained the highest levels of poly-phenols followed by pan and sand roasting, likely due to shorter heating time and reduced thermal degradation. Pigmented rice was particularly rich in p-coumaric acid, kaempferol, cinnamic acid, trans-ferulic acid and chlorogenic acid, while non-pigmented rice showed relatively higher retention of gallic acid and essential amino acids. Pan and sand roasting promoted Maillard reaction hence, reducing lysine availability. GC-MS analysis revealed superior metabolite retention in microwave-roasted pigmented rice, with pyrazines, phenolics and furans as dominant compounds. Multivariate analyses supported by VIP scores and KEGG pathway mapping, highlighted distinct metabolic alterations. These findings provide critical insights into how roasting modulates nutritional and biochemical attributes, enabling selection of processing conditions to balance flavor development with nutrient retention.

Keyword: *Roasting techniques, Metabolites, Multivariate analysis, Thermal sensitivity, Maillard reaction*

FROM BULK AVERAGING TO SINGLE-DROPLET PRECISION: AN AI-DRIVEN MICROFLUIDIC PLATFORM FOR DECODING DIGESTION DYNAMIC KINETICS

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Understanding carrier digestion at the microscale is essential for advancing functional food design, yet conventional approaches largely rely on macroscopic, averaged analysis. In this study, we develop an integrated microfluidic platform coupled with AI-driven image analysis and data-driven modeling to monitor and predict digestion behavior at the single-droplet level directly. A microfluidic digestion chip enables real-time capture and tracking of individual carriers, allowing time-resolved observation of morphological evolution and release behavior, and shifting analysis from bulk description to intrinsic microscale characterization. By combining high-resolution imaging with automated analysis and digital conversion, dynamic visual data is converted into quantitative descriptors. This approach integrates food colloid science, microfluidics, and computational methods, enabling direct observation of interfacial changes and revealing key mechanisms governing digestion. The interface transitions from a stable barrier to a critical breakdown state, triggering rapid digestion, while a measurable temporal mismatch highlights a phase-lag effect that governs the balance between interfacial and diffusion-controlled processes. Overall, this microfluidic platform provides a new route to convert dynamic structural changes into quantifiable variables and offers a scientific basis for the rational design of functional delivery systems, supporting the future of precision nutrition by enabling the predictable and programmable release of bioactive compounds.

Keyword: *Microfluidic platform, AI-driven analysis, Delivery system, Interfacial dynamics, Digestion kinetics*

Understanding Gelation Behaviour of different Soy Protein Model Systems as a Structurization Tool for 3D printing

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Soy protein isolates (SPIs) are widely used in food processing applications. Commercial SPIs vary in protein properties like solubility, leading to differences in gelation properties; however, underlying mechanisms for these differences remain unclear. In 3D printing, gel properties define print quality, instead of protein properties. Therefore, understanding gelation mechanisms in different SPIs is essential. Hence, this study investigates the factors governing gelation behaviour in SPI model systems and evaluates gelation as a structurization tool for 3D printing.

Laboratory-scale gels were prepared using a water bath and characterised for water-holding capacity (WHC) and water mobility using low-field NMR, followed by 3D printing under constant parameters. Gelation properties were determined via rheological temperature sweeps simulating heat-induced gelation, while secondary structure evolution during hydration and gelation was assessed using Fourier Transform Infrared Spectroscopy (FTIR).

Variations in gelation temperature and gel strength were observed across SPIs and were reflected in WHC and water mobility, influencing shape fidelity. FTIR revealed that, at 15% concentration, structural differences were driven by SPI type rather than gelation, with minimal changes in β-sheet and random coil, indicating limited structural rearrangement at high concentration.

Overall, understanding SPI gelation is key to modulating it for accurate 3D printing of plant-based foods.

Keyword: *SPI gelation behaviour, Protein secondary structure, 3D print quality, Water Holding Capacity, Water Mobility*

ENHANCING PROBIOTIC FUNCTIONALITY USING A PEACH KERNEL OIL-BASED DOUBLE EMULSION SYSTEM

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The application of probiotics in food systems is often limited by poor survival and reduced functionality during processing, storage and gastrointestinal transit. This study proposes a strategy using a water–in–oil–in–water ($W_1/O/W_2$) double emulsion system incorporating peach kernel oil (PKO), a value-added by-product, as a functional lipid phase to enhance probiotic performance. Lactobacillus rhamnosus LGG was used as a model probiotic and evaluated for growth and viability in MRS broth under varying PKO concentrations (0–6%). Growth analysis showed that 6% PKO significantly improved probiotic viability after 48 h incubation in MRS broth ($p < 0.05$). Surface hydrophobicity increased with PKO concentration, reaching 13% at 6%, indicating enhanced cell surface properties associated with improved adhesion potential. Confocal laser scanning microscopy suggested enhanced mucoadhesion in PKO-treated samples. Based on preliminary screening, the 6% PKO formulation was incorporated into a $W_1/O/W_2$ system. The emulsions exhibited stable particle size, moderately negative zeta potential (approximately –25 mV), and acceptable polydispersity index. Rheological analysis confirmed shear-thinning behaviour, and minimal creaming over seven days of storage indicated good physical stability. These findings demonstrate that PKO-based double emulsions provide a promising approach to enhance probiotic functionality and delivery in functional food systems.

Keyword: *Probiotics, Double emulsion, Peach kernel oil, Mucoadhesion, Functional foods*

Enhancing the Sensory Acceptability of Plant-Based Foods: Microbial Modulation of a Fermented Soy-Based Cheese

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Transitioning toward plant-based diets is vital for establishing a sustainable food system. While soybeans offer a nutritious and economical protein base, their consumer acceptance is limited by inherent beany flavor. Fermentation offers an effective and eco-friendly solution for flavor modulation. This study evaluated the efficacy of various starter cultures in the biotransformation of soybean protein matrix (tofu), mapping how synergistic metabolic interactions drive sensory evolution.

Solid-state fermentation was performed using monocultures of spore-forming bacterial species and yeasts, alongside a selected co-culture of Bacillus subtilis and Pichia kluyveri. Chemical and flavor characteristics were assessed using chromatographic techniques (HPLC, GC-MS, GC-IMS), electronic sensors (e-nose, e-tongue), and human sensory evaluation.

Monoculture fermentations revealed distinct strain functionalities. B. subtilis enhanced proteolysis and umami taste but increased bitterness and fatty notes, while yeasts promoted aroma formation through alcohols and ester synthesis. The co-culture system established a coordinated metabolic interaction where yeast utilized amino acid-derived intermediates produced by B. subtilis to reduce bitterness, increase fruity and floral volatiles, achieving a more balanced sensory profile with reduced beany notes.

These findings highlight the significant role of microbial fermentation and its synergistic effects on flavor modulation, providing new strategies for developing highly acceptable, probiotic-enriched plant-based foods.

Keyword: *Plant-based protein, Solid-state fermentation, Flavor modulation, Sensory evaluation*

Isorhamnetin as a dietary flavonoid: Exploring its multitarget activity across diverse biological systems

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Isorhamnetin (Iso), 3'-O-methylated metabolite of quercetin, is a dietary flavonoid found in various fruits and vegetables, though in limited quantities. We synthesized the Iso and explored its bioactivities in different biological models. Iso showed anti-steatosis and anti-fibrotic effects in liver of nonalcoholic steatohepatitis mice model by inhibiting lipogenic and fibrogenic gene expression. Iso prevented the activation of hepatic stellate cells in vitro, effectively inhibiting αSMA expression, thus the initiation of fibrosis. Next, we investigated the direct effect of Iso on cancer-associated fibroblasts (CAFs) derived from human pancreatic ductal adenocarcinoma (PDAC). CAFs, a key component of the tumor microenvironment of PDAC, actively contribute to fibrotic extracellular matrix and the development of chemoresistance. Iso treatment of CAFs showed a downregulation of pathways in cell cycle and DNA replication, G2/M checkpoint, and inflammatory gene expressions, and the upregulation of p53 pathway genes. To further evaluate these effects in a more physiologically relevant context, we intend to investigate the Iso activity within a 3D bioprinted cancer model. Taken together, our study highlights that the Iso possesses multiple potential bioactivities in disease prevention and alleviation, particularly through its ability to modulate cell growth, and activation, warranting further investigation as a multi-target therapeutic candidate.

Keyword: *Isorhamnetin, Flavonoid, NASH, CAFs, 3D bioprinting*

ENVIRONMENTAL INFLUENCE ON THE NUTRITIONAL COMPOSITION, ANTIOXIDANT ACTIVITY, AND CONSUMER ACCEPTABILITY OF HYDROPONIC SWEET BASIL (OCIMUM BASILICUM L.): A HIGHLAND-LOWLAND COMPARISON

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Hydroponic farming is a soilless cultivation method using nutrient-rich solutions and is increasingly important in modern agriculture. Environmental factors such as temperature, relative humidity, and light intensity can influence plant growth, metabolism, and phytochemical production. This study evaluated the effects of highland and lowland hydroponic cultivation on the nutritional composition, phytochemical content, antioxidant activity, and consumer acceptability of sweet basil (Ocimum basilicum L.). Significant differences ($p < 0.05$) were observed in proximate composition, micronutrients, and phytochemical content between samples. Highland hydroponic sweet basil (HHSB) exhibited higher protein, ash, vitamin C, total phenolic content, and carotenoids, along with stronger antioxidant activity (lower half-maximal inhibitory concentration, IC_{50}). In contrast, lowland hydroponic sweet basil (LHSB) contained higher carbohydrate, total dietary fiber, fat, and chlorophyll b levels. Despite these differences, no significant differences ($p > 0.05$) were observed in sensory attributes or overall acceptability. The enhanced antioxidant capacity of HHSB may be associated with increased phytochemical accumulation under cooler environmental conditions. These findings highlight the influence of cultivation environment on sweet basil quality and suggest that highland hydroponic systems may be advantageous for producing nutritionally superior sweet basil without compromising consumer acceptance.

Keyword: *Sweet basil, Hydroponic, Highland and lowland, Nutritional composition, Phytochemicals*

DEVELOPMENT AND CHARACTERIZATION OF CINNAMON-INFUSED INSTANT BLACK TEA FOR INSTANT FUNCTIONAL BEVERAGE APPLICATION

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Instant black tea is widely consumed due to its convenience; however, high spray-drying temperatures reduce bioactive compounds, volatile aroma compounds and antioxidant activity. This study aimed to enhance the antioxidant potential of instant black tea by infusing cinnamon bark (Cinnamomum zeylanicum) as a natural antioxidant source while addressing the growing demand for flavoured teas. Unlike previous studies that added cinnamon after drying, this research introduced a novel method by infusing cinnamon before spray drying. Concentrated black tea extract (TSS =15 g/ 100 g) was infused with 3%, 5%, and 7% (w/v) cinnamon and mixed with maltodextrin (12% w/v) before spray drying. Physicochemical properties including water activity and solubility were not significantly ($p < 0.05$) affected, while moisture content, colour, pH, and titratable acidity were significantly affected by cinnamon infusion level. The total phenolic content increased significantly (14.01-16.21 g GAE/ 100 g DM) with cinnamon infusion level. Antioxidant activity, determined by DPPH scavenging activity (60.06-66.39%), FRAP assay (23.42-26.88 mmol$L^{-1}Fe^{2+}$), and total antioxidant assays (12.74-15.20 g AAE/100 g DM) was significantly increased with cinnamon infusion level. 5% cinnamon-infused sample received the highest overall acceptability score. Results showed that infusing cinnamon into instant black tea enhances antioxidant activity while maintaining desirable physicochemical properties.

Keyword: *antioxidant, cinnamon, functional beverage, instant tea, spray drying*

Engineering oleic acid-loaded spray-dried powders: Effects of protein source, denaturation, and surfactant type on microstructure and rehydration stability

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This study aimed to engineer oleic acid-based lipid powders with improved rehydration and dispersion stability by controlling interfacial composition during high-pressure homogenization and spray drying. Four formulation strategies were designed based on surfactant type and protein structural state: lecithin or Tween 80 combined with native or denatured proteins. Whey, soy, pea, and mung bean protein isolates were used as wall materials, and protein denaturation was induced via pH-shifting and heat treatment. The resulting powders were characterized for particle morphology, moisture sorption behavior, and rehydration performance. Electron microscopy revealed predominantly spherical particles with porous surfaces and segmented internal structures, indicating effective encapsulation of lipid phases within heterogeneous matrices. Particle structure was strongly influenced by protein type and interfacial composition. Upon rehydration, dispersion stability varied significantly among formulations. Zeta potential and Turbiscan analyses showed that whey protein-based systems exhibited superior stability, whereas plant protein-based systems, particularly mung bean protein, were more prone to flocculation and phase separation. Protein denaturation further altered dispersion behavior depending on surfactant type. These findings demonstrate that protein source, structural state, and surfactant selection collectively govern the microstructure and rehydration stability of oleic acid-loaded powders.

Keyword: *spray-drying, oleic acid, protein, denaturated, rehydration*

Structure–Function Relationships in Lactose–Protein Powders: Effects of Protein Source and Moisture-Induced Physical State on Interfacial Functionality

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Protein–carbohydrate powders are widely used as delivery matrices in food systems; however, their functional performance after rehydration is strongly influenced by processing conditions and composition. Drying pathways and moisture-induced plasticization can induce transitions between glassy and crystalline states, altering molecular mobility and protein–lactose interactions, which in turn affect interfacial behavior and emulsion stability. This study investigates how different protein sources—whey protein isolate (WPI), soy protein isolate (SPI), and pea protein isolate (PPI)—interact with lactose to form powders with distinct structural and functional properties. Protein–lactose mixtures were subjected to controlled drying and storage conditions to systematically modulate moisture content and physical state. Thermal and structural properties were characterized using DSC, TGA, FT-IR, SEM, and particle size analysis, along with moisture sorption behavior analysis using dynamic vapor sorption (DVS). Functional performance was evaluated in terms of rehydration behavior, interfacial adsorption, and emulsion stability in oil-in-water systems (MCT and palm oil), supported by CLSM, droplet size distribution, and Turbiscan analysis. Results demonstrate that both protein source and physical state govern powder functionality, influencing interfacial adsorption kinetics and film formation, ultimately determining emulsion stability.

Keyword: *Protein-Lactose, Drying, Structure, Interfacial, Emulsions*

EFFECT OF COCONUT FLOUR AND WHEAT FLOUR FORMULATIONS ON THE PHYSICO-CHEMICAL AND CONSUMER ACCEPTABILITY OF KABABAYAN BREAD (FILIPINO MUFFINS)

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The accumulation of coconut residue waste from virgin coconut oil (VCO) production, along with the rising demand for functional food alternatives, has driven the use of coconut residue flour (CF) as a sustainable substitute in composite bread products. One possible example is kababayan bread, a Filipino muffin known for its distinct domed top. This study analyzed the effects of varying CF and wheat flour (WF) ratios on the specific volume (SV), moisture content (MC), hardness (H), and overall consumer acceptability (i.e., 9-pt Hedonic scale) of kababayan bread using mixture design response surface methodology. Kababayan bread samples had a hardness of 20.63-31.70 mm, SV of 1.353-2.732 ml/g, MC (% dry basis) of 24.71-31.80%, and overall consumer acceptability score of 7.00 - 7.91 (like moderately). Only H was observed to have been significantly affected ($p < 0.05$) by the varying CF and WF ratio, with higher levels of CF incorporation leading to a corresponding increase in the H of the samples. The findings of this study serve as baseline data for the food industry developing viable bread alternatives, as well as valorization studies utilizing coconut residue waste from VCO production.

Keyword: *coconut residue flour, wheat flour, kababayan bread, virgin coconut oil, valorization*

SUBSTRATE-DRIVEN BIOCONVERSION OF PALM KERNEL CAKE AND COCONUT DREGS BY BLACK SOLDIER FLY (HERMETIA ILLUCENS) LARVAE FOR NUTRIENT-RICH BIOMASS AND FUNCTIONAL OIL PRODUCTION

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Black soldier fly (Hermetia illucens) larvae (BSFL) bioconversion offers a sustainable strategy for valorising agro-industrial residues into nutrient-rich biomass and functional oil. This study investigated the effects of palm kernel cake (PKC) and coconut dregs (CD) as rearing substrates on BSFL growth performance, proximate composition, and oil bioactive properties. BSFL were reared on PKC or CD for 7 days and analysed for growth performance, bioconversion rate, proximate composition, phytochemical content, antioxidant capacity, phytosterol profile, and antimicrobial activity of BSFL oil. PKC-fed BSFL showed better early growth performance, with larval weight and length reaching 4.68 mg and 11.77 mm, respectively, while CD-fed BSFL demonstrated more gradual and steady growth. Both substrates showed comparable bioconversion rates of 7.74% and 8.07% for PKC and CD, respectively, indicating their suitability for BSFL rearing. PKC-fed BSFL contained higher protein (39.47%), ash (10.25%), and carbohydrate (29.89%) contents, whereas CD-fed BSFL had a higher fat (58.43%). In contrast, CD-derived BSFL oil showed higher total phenolics and antioxidant capacity, while PKC-derived BSFL oil reported higher total phytosterols and stronger antimicrobial activity against Escherichia coli. These findings demonstrate that substrate selection significantly influences BSFL biomass quality and oil functionality, supporting sustainable agro-industrial waste valorisation and alternative animal feed development.

Keyword: *Black soldier fly larvae, Palm kernel cake, Coconut dregs, Bioconversion, Antioxidant*

CHARACTERIZATIONS OF β-GLUCAN FROM BLACK GLUTINOUS HIGHLAND BARLEY AND ITS USE IN HIGH INTERNAL PHASE EMULSION SYSTEMS

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Although plant-based meat analogues have received considerable attention, the development of fat tissue mimics with both desirable structural properties and health benefits remains underexplored. Black glutinous highland barley (BHB), a novel cultivar rich in β-glucan (8.39%), has shown good glucose and bile salt acids adsorption capacities in our previous work. In this study, β-glucan extracted from BHB was combined with whey protein and MCT oil to fabricate a series of high internal phase emulsions (BW-HIPEs) with different β-glucan to whey protein ratios. All BW-HIPEs exhibited solid-like behavior, high centrifugal stability (> 92%), thermal stability, and strong thixotropic recovery. The BW-HIPE with a 1:1 ratio showed the highest hardness (137.34 g), widest linear viscoelastic region, and highest gel strength, indicating good performance in mimicking pork fat tissue. Microscopic images revealed densely packed oil droplets stabilized by a protein interfacial-bridging network, while β-glucan distributed in the continuous phase contributed to viscosity and structural reinforcement. Hydrogen bonding was identified as the dominant force driving network formation. Moreover, incorporation of BW-HIPEs into burger patties significantly reduced chewiness, suggesting potential for developing meat analogues suitable for people with dysphagia. Overall, our findings offered a potential candidate for fabricating functional meat analogues and texture-modified food applications.

Keyword: *β-glucan, High internal phase emulsion, Fat tissue mimic, Rheology*

CHARACTERIZATION OF THERMAL, STRUCTURAL AND FUNCTIONAL PROPERTIES OF CORN OIL WAX AND ITS COMPARISON WITH OTHER WAXES

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Corn oil wax (CoW), a byproduct of corn oil refining, is a promising bio-based material with a wide range of potential applications in food sector. Even though it has various advantages, including availability and sustainability, its thorough characterization has not been extensively studied. This limits its industrial applications compared to other commercially available waxes like carnauba wax (CW), beeswax (BW) and paraffin wax (PW). Therefore, a multivariate statistical approach was employed to compare thermal and structural characteristics, chemical composition and functional properties of CoW with these waxes. It was observed that CoW melting point (80.17 ^{o}C) was lower than CW but higher than BW and PW, with negligible mass loss upto 359.60 ^{o}C. Their structural analysis revealed diffraction peaks at 21.54^{o} and 23.96^{o} indicating orthorhombically packed long chain wax molecules. The long chain fatty acids (C22, C26) and fatty alcohols (C24, C27 and C28) were predominantly present in CoW. Its ability to form a stable gel network at lower concentrations, along with higher oil binding capacity. These findings highlight CoW as an alternative to commercial wax (paraffin). Further studies on scale up and performance in diverse food matrices are recommended to facilitate its commercialization.

Keyword: *corn oil wax, sustainable, functional groups, gelation, thermal stability*

FACTORS AFFECTING WILLINGNESS OF FILIPINOS TO CONSUME CELL-BASED FISH MEAT (PRELIMINARY ANALYSIS)

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With fish consumption expected to rise alongside population growth, ensuring sustainable supply is a pressing concern globally and in the Philippines. Cell-based meat and seafood technologies offer a promising alternative, yet commercialization remains constrained by production efficiencies, consumer acceptance, and regulatory challenges. This study addresses a critical gap by examining public readiness for cell-based fish in the Philippine context.

An online survey measured food choice motives, fish attachment, food and food technology neophobia, food disgust sensitivity, and constructs from the Theory of Planned Behavior (TPB). Data were analyzed using correlation techniques to identify determinants of willingness to consume (WTC) cell-based fish.

Preliminary findings (n=365) indicate that most Filipino respondents express willingness to consume cell-based fish. Gender (ρ=-0.1175, p-value=0.025) and technology familiarity (ρ=0.186, p-value=<0.001) emerged as weak but significant predictors, while TPB constructs positively influenced WTC. Among the different constructs, food and food technology neophobia were negatively associated with WTC. Natural content, prior familiarity, fish attachment and food disgust showed no significant effects. SEM will further contextualize these relationships, offering insights into consumer acceptance dynamics. These findings contribute to understanding how cultural and psychological factors shape attitudes toward cell-based seafood, informing strategies for sustainable innovation and policy development in the Philippines.

Keyword: *Structural Equations Modelling, Cell-based fish meat, Factors affecting willingness, Theory of Planned Behavior, Consumer acceptance*

CHANGES IN LIGNAN AND FLAVONOID METABOLISM AND ANTIOXIDANT ACTIVITY DURING SESAME GERMINATION AND ASSOCIATED METABOLIC PATHWAYS

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This study investigated changes in lignan content and antioxidant activity during sesame (Sesamum indicum L.) germination (0–8 days). Sesame seeds of the Korean cultivar ‘Ansan’ were germinated for 8 days using distilled water under controlled conditions. The contents of sesamin and sesamolin gradually decreased during germination. Meanwhile, total polyphenol and total flavonoid contents increased progressively during germination, reaching up to 7-fold higher levels on day 8 compared with ungerminated seeds (day 0). On day 8, ABTS and DPPH radical scavenging activities were considerably higher than those at day 0. KEGG pathway mapping, together with targeted metabolite analysis, suggest a reduction in lignan-associated phenylpropanoid metabolism and a concomitant increase in flavonoid biosynthesis during germination. These findings suggest that the improvement in antioxidant capacity is associated with changes in lignan and flavonoid metabolism during sesame germination.

Keyword: *Sesame germination, Lignans, Flavonoids, Antioxidant activity, KEGG pathway analysis*

Lignan Composition and Antioxidant Activity of Safflower Seeds from Different Regions of Korea

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This study investigated the lignan content and antioxidant properties of safflower (Carthamus tinctorius L.) seeds collected from 10 different regions in Korea. The lignan content showed a wide variation, ranging from 4.645 to 132.767 mg/100 g, indicating significant regional differences. Total polyphenol and total flavonoid contents ranged from 3.151 to 3.702 mg GAE/ g and 0.823 to 1.169 mg CE/ g, respectively. DPPH radical scavenging activity ranged from 73.5% to 86.8%. The antioxidant capacity and relative antioxidant capacity index were highest in SS-10, with a value of 1.236. Principal component analysis suggested partial separation among samples. Lignan content showed a negative correlation with antioxidant activities, whereas total polyphenol content exhibited a positive association with antioxidant capacity. These results indicate that lignan content and antioxidant properties vary among safflower seeds from different regions, although no distinct regional pattern was observed.

Keyword: *Lignans, Antioxidant activity, relative antioxidant capacity index, Principal component analysis, Safflower seeds*

EFFECT OF ROASTING TEMPERATURE AND TIME ON THE PHYSICOCHEMICAL PROPERTIES AND CONSUMER ACCEPTABILITY OF CAFFEINE-FREE COFFEE SUBSTITUTE FROM COCONUT RESIDUE

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The adverse effects of caffeine from excessive coffee consumption have led to the growing interest in caffeine-free coffee substitutes. Coconut residue (CR), a by-product of coconut milk and virgin coconut oil (VCO) production, is a potential raw material for a caffeine-free coffee substitute. This study explored the effects of roasting temperature and time on instrumental color, total soluble solids (TSS), pH, and consumer acceptability of coconut residue coffee (CRC). Results showed that roasting temperature and time had a significant effect ($p < 0.05$) on the lightness (L*), chroma (C*), and pH (brewed) of CRC. L* (12.09-22.84) and C* (5.63-17.42) values of ground CRC decreased with increasing roasting parameters. Moreover, the pH (5.83-6.14) of brewed CRC also decreased, indicating increased acidity, with higher roasting parameters. These findings demonstrate the potential of coconut residue to be valorized as a caffeine-free coffee substitute.

Keyword: *coffee, coconut residue, virgin coconut oil, valorization*

A SCAFFOLD BASED ON UNCOATED RICE GRAINS INTEGRATED WITH PISCINE CELLS SUPPORTING THE PRODUCTION OF A SUSTAINABLE FOOD

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Searching for natural scaffolds with structural and nutritional properties favorable for cell adhesion and growth is a challenge for piscine cell culture. In this study, myoblasts and preadipocytes from Larimichthys crocea were cultured on uncoated rice grains, and the cell confluence reached over 80% after two days of cultivation. The physical and chemical properties of different rice grains showed that the hardness had a relatively significant regulatory effect on the growth of cells, and 6.45 to 7.28 N was beneficial for the growth of cells. Finally, the nutritional composition and flavor of rice grains were evaluated, revealing that myotubes-organized rice grains were rich in protein, adipocytes-organized rice grains were high in fat. All rice grain samples displayed enhanced flavor profiles. These findings suggest that specific rice varieties can serve as effective scaffolds for the in vitro proliferation and differentiation of piscine stem cells. The resulting rice-meat composite food emerges as a promising innovative food product.

Keyword: *Natural scaffold, Uncoated rice grains, Piscine stem cells, Cell culture, Sustainable food*

Tailored microbial consortia for the valorisation of legume-based ingredients: from strain selection to functional food applications

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The growing demand for sustainable protein sources has intensified interest in legumes as key ingredients for future food systems. However, technological limitations, antinutritional factors, and suboptimal sensory properties still hinder their wider application. This study aimed to develop tailored biotechnological strategies based on microbial fermentation to improve the nutritional, functional, and technological properties of legume-based matrices. A selection of lactic acid bacteria and yeast strains was performed to identify the most suitable candidates for fermenting chickpea flour. Selected strains were further combined into microbial consortia to exploit synergistic metabolic interactions. Fermentation processes were optimised and evaluated in terms of biochemical transformation, including protein hydrolysis, peptide release, reduction of antinutritional compounds, and modulation of volatile profiles. The resulting fermented ingredients were characterised for their nutritional and functional properties, including antioxidant activity and prebiotic potential. Both the fermented ingredient and the derived food formulation (pasta enriched with fermented chickpea flour) were further evaluated through in vitro colonic fermentation models, demonstrating a positive modulation of gut microbiota composition, along with enhanced short-chain fatty acid production. Overall, the integration of strain selection, consortium design, and functional characterisation highlights the potential of fermentation to valorise legumes into innovative, sustainable, and health-promoting food ingredients.

Keyword: *fermented chickpea, Microbial consortia, Functional foods, gut microbiota, food formulation*

TEA POLYPHENOLS PRETREATMENT BALANCES SAFETY, NUTRITIONAL VALUE, AND FLAVOR OF POTATO CHIPS BY REGULATING MAILLARD REACTION: A FOODOMICS STUDY

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Traditional strategies for reducing hazardous Maillard reaction products in heat-processed foods typically focus on a narrow range of specific contaminants. This targeted approach often overlooks the broader chemical transformations that influence both nutritional quality and flavor profiles. To overcome this limitation, the present work deployed an untargeted foodomics strategy combining high-resolution mass spectrometry with multivariate statistics to evaluate the global chemical profiles of air-fried potato chips treated with epicatechin (EC), epigallocatechin gallate (EGCG), or tea polyphenols (TP). Compared to the individual catechins, TP pretreatment reshaped the chemical landscape most profoundly. This intervention significantly lowered the concentrations of hazardous products including acrylamide and furfural while simultaneously improving the retention of amino acids such as lysine and asparagine. Furthermore, TP boosted the abundance of bioactive phenolics and desirable pyrazine flavor compounds while suppressing potentially mutagenic furaneol. Collectively, the results demonstrate that the multi-component synergy of TP is uniquely capable of concurrently harmonizing food safety, nutrient retention, and flavor optimization, thereby offering a robust scientific basis for improving the overall quality of heat-processed foods.

Keyword: *Potato chips, Polyphenolic antioxidants, Chemical profiling, Foodomics*

FOOD ORIGINATED POLYAMINES AS METHYLGLYOXAL-TRAPPING AGENTS: ANTI GLYCATION ACTIVITY AND STRUCTURAL CHARACTERIZATION OF REACTION ADDUCTS

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Methylglyoxal (MGO) is a highly reactive dicarbonyl compound produced endogenously during glucose and lipid metabolism. Its accumulation leads to the formation of advanced glycation end-products (AGEs), which are strongly associated with diabetes-related complications, neurodegeneration, and cardiovascular disease. This study investigated the capacity of four naturally occurring polyamines — spermidine, spermine, putrescine, and cadaverine — to trap MGO and inhibit AGE formation in vitro. MGO-trapping efficiency was quantified by HPLC-PDA after derivatization with o-phenylenediamine (OPD). Additional carbonyl-scavenging activity was evaluated using a Girard reagent assay, and non-enzymatic browning was monitored spectrophotometrically. The chemical identity of the polyamine–MGO adducts was characterized by ESI-MS/MS and NMR spectroscopy. All four polyamines significantly inhibited fluorescent AGE formation in the amino acid model (arginine-MGO model), but only spermine showed effective inhibition in the protein model (BSA-MGO model). Spermine demonstrated a high MGO-trapping efficiency, forming mono-adducts (m/z 275) and di-adducts (m/z 347) with MGO. These findings suggest that the number of amines is an important factor for naturally occurring polyamines to be effective MGO-scavenging agents. The high MGO scavenging activity of spermine may suggest its role in protecting proteins from damaging by reactive carbonyl species in human.

Keyword: *methylglyoxal, polyamines, advanced glycation end-products, MGO-scavenging, Maillard reaction*

SPORE-EMBEDDED SCAFFOLDS FOR ENHANCED MASS TRANSPORT AND PROGRAMMABLE BIOMANUFACTURING

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This study proposes a biomanufacturing strategy that integrates traditional fermentation principles with three-dimensional (3D) printing to achieve high-value utilization of agricultural waste. 3D-printed fungal scaffolds enable precise spore distribution and optimized microenvironments, significantly enhancing resource transport and activating fungal growth, reproduction, and biosynthetic capacity, with fungal biomass and carotenoid yields increased by 3.42- and 3.27-fold. Notably, the developed food-grade bio-ink based on soybean residue played a pivotal role in scaffold construction, whose polysaccharides and fibers confer a hierarchical porous architecture, improving oxygen transport, water retention, and sustained nutrient release, thus supporting fungal compatibility and growth. Leveraging the structural programmability of 3D printing, the platform enables modular inoculation, structure-environment coupling regulation, and continuous cultivation, etc. It also exhibits strong stability under extreme conditions (freeze–thaw, LN_2, UV). Such customizable and robust system shows broad application potential in biomanufacturing, future food and environmental remediation.

Keyword: *3D printing, Solid-state fermentation, Neurospora crassa*

A Novel Setup Mimicking Oral Processing and the Human Tongue for the Objective Assessment of Food Texture and Mouthfeel: A Pathway Towards Sustainable Food Development

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The human tongue and oral processing are highly sophisticated. The tongue has a unique surface texture and properties, and oral processing conditions, including mastication force and speed as well as saliva secretion, all contribute to the overall taste and textural perception of food. To date, food design and testing have mainly relied on human sensory trials, which are subjective, labour-intensive, and expensive. Limited success in the quantification and mechanistic understanding of food texture imposes a major challenge for the food industry in meeting sustainability targets and achieving consumer acceptance.

Objective, laboratory instrument-mediated methods that can mechanistically determine what drives textural perception, and accurately quantify oral sensory attributes in an objective manner, can accelerate the development cycle of healthy, sustainable, and nutritious foods, benefiting both industry and end consumers.

We recently developed the first oral simulator integrated with a biomimetic tongue, emulating the tribological conditions occurring during oral processing and replicating the topography of tongue papillae, wettability, and mechanical properties of a real human tongue.

I will present multiple case studies of food systems ranging from fat-replacer protein microgels and emulsions to chocolates and gas-filled beverages, where this setup unveiled mouthfeel mechanisms and aided the formulation of foods containing sustainable proteins.

Keyword: *Oral processing simulator, Biomimetic tongue, Oral tribology, Texture and mouthfeel, Sustainable food development*

IDENTIFICATION OF ACRYLOYL-HISTIDINE AS A HEAT-INDUCED DERIVATIVE OF AN IMIDAZOLE PEPTIDE IN FOODS

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Imidazole dipeptides (IDPs), such as carnosine, are abundantly distributed in skeletal muscles of various animals. Clinical studies have demonstrated their health-promoting effects, including improvement of cognitive function and suppression of physical fatigue. Recent studies have revealed structural modifications of dipeptides in foods, such as 2-oxo-IDP formation and dipeptide cyclization; however, a comprehensive understanding of heat-induced denaturation of IDPs remains limited.

This study aimed to identify novel structural derivatives of IDPs formed during thermal treatment. Autoclaved Car was analyzed by High-Performance Liquid Chromatography (HPLC), revealing a novel peak absent in unheated controls. Liquid Chromatography-Electrospray Ionization-Mass Spectrometry (LC/ESI-MS) and Nuclear Magnetic Resonance (NMR) analyses identified this compound as acryloyl-histidine component, a deamidated derivative of Car.

This finding was validated in a food matrix. Acryloyl-histidine was absent in 5 unheated meat samples but increased after heat treatment. Furthermore, its concentration in chicken breast increased in a temperature- and time-dependent manner, ranging from 4.07 nmol/g (110°C, 1 h) to 21.16 nmol/g (120°C, 4 h). These results indicate that thermal processing induces a previously uncharacterized structural modification of IDPs, providing new insights into the chemistry of heat-treated meat products.

Keyword: *imidazole dipeptides, acryloyl-histidine, thermal processing, carnosine*

REIMAGINING FOOD SCIENCE EDUCATION THROUGH THE IMPLEMENTATION OF HYFLEX (HYBRID-FLEXIBLE) MODALITIES

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Modern food science education requires balancing rigorous practical training with flexible, student-centred learning. At Taylor's University, HyFlex model was implemented across two core modules, Sensory Evaluation and Food Microbiology, combining laboratory sessions with digital learning tools. The model incorporated pre-class digital delivery through AI-avatar videos and an AI-powered adaptive tutoring platform to support foundational concepts. In-person sessions were reserved for application, including laboratory work and digitally enhanced activities such as role plays, gamified quizzes, and reflection. Survey responses show that 79.5% of students reported improved conceptual understanding from AI-avatar videos, while 86.4% reported increased confidence through AI-supported feedback. Engagement reached 73% in sessions integrating laboratory work with structured digital activities. Student feedback indicated that flexibility supported preparation and access, although reduced interaction was observed during discussion tasks. Overall, the sequencing of digital preparation and in-class application is critical for student engagement during HyFlex learning. HyFlex delivery can support both conceptual understanding and practical skill development when laboratory activities are intentionally structured. This approach also supports the development of data interpretation, digital literacy, and adaptive learning skills relevant to current food industry practices, preparing Food Science graduates who are both technically competent and ready for an increasingly digitalised food sector.

Keyword: *HyFlex Learning, Food Science, AI Pedagogy, Learning Design, Adaptive Tutor*

EFFECT OF PROCESSING ON ENDOCANNABINOIDS IN COCOA

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Endocannabinoids (ECs) and endocannabinoid-like compounds (ECL) are lipid-based signalling molecules, including N-acylethanolamines, N-acylamino acids, N-acylneurotransmitters, and monoacylglycerols. They play crucial roles in humans, particularly in glucose and lipid metabolism, inflammation, and mood regulation. In addition to human metabolic pathways, ECs and ECL have been observed to be synthesized by microorganisms and, accordingly, to be formed via fermentation in fermented foods. Although cocoa, as a fermented food, exhibits a rich profile of these molecules, there remains a significant gap in understanding how cocoa processing affects its ECs and ECL profile. Therefore, this study aims to investigate the effects of processing, including alkalization and roasting, and of geographic origin on ECs/ECL in cocoa. Compared to Ghana cocoa liquor, Ivory Coast cocoa liquor contained higher concentrations of 20 ECL compounds, especially N-oleoylethanolamine, N-oleoylleucine, and N-oleoylserotonin. Moreover, alkalized Ivory Coast cocoa liquor samples had significantly lower levels of N-acylneurotransmitters (N-acyldopamine and N-acylserotonin) than the non-alkalized sample. The results also demonstrated that alkaline treatment and varying roasting parameters applied to fermented cocoa beans affected the content of ECs/ECL. In conclusion, the findings of this study can be used to optimize cocoa processing to produce functional cocoa products enriched in ECs and ECL.

Keyword: *endocannabinoids, functional cocoa products, alkalization, roasting*

EFFECT OF ADVANCED THERMAL STERILISATION AND STORAGE TEMPERATURE ON SENSORY AND AROMA QUALITY OF SHELF-STABLE RED LENTIL DHAL.

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Shelf-stable ready-to-eat meals are increasingly popular because they suit busy lifestyles. Conventional thermal sterilisation is widely used to develop such foods, but it can strongly degrade sensory quality. This study investigated whether an advanced thermal sterilisation process could better preserve the quality of ready-to-eat dhal during storage while maintaining microbial safety.

Sterilised Dhal was stored for 6.5 months at 1°C as a control, 20°C as room-temperature storage, and 40°C as accelerated storage. Sensory evaluation and chemical analysis were conducted at weeks 2, 6, 8, 14, 20, and 26 to link aroma changes with sensory changes over time. Aroma compounds were extracted using solvent-assisted flavour evaporation and analysed by gas chromatography–olfactometry/mass spectrometry. Chemical analysis showed that linalool and eugenol decreased with storage, whereas copaene and geranyl acetate remained relatively stable. Difference-from-control testing revealed that sterilisation significantly reduced aroma, flavour and texture quality. During storage, the 40°C stored samples showed the greatest quality loss, with colour darkening and reduced tomato aroma, while sour and spice-related attributes increased. In contrast, 20°C stored samples remained largely similar to 1°C stored samples. Overall, advanced thermal sterilisation produced shelf-stable dhal with good quality retention at room temperature, but higher storage temperatures accelerated sensory deterioration.

Keyword: *Sterilisation, sensory quality, chemical analysis, storage*

PREPARATION OF NANO-CHITOSAN LOADED WITH ELDERBERRY ANTHOCYANINS: CHARACTERIZATION OF ADSORPTION KINETICS AND PHYSICOCHEMICAL PROPERTIES FOR SUSTAINABLE PACKAGING

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As natural antioxidants susceptible to the ambient environment conditions, anthocyanins are often encapsulated in protective carriers. Chitosan is a widely studied biopolymer due to its antimicrobial activity and film-forming property. Nano-chitosan could be derived from chitosan with enlarged surface area and possibly enhanced functional properties. In this study, nano-chitosan was prepared by the ionic gelation method, with laden elderberry anthocyanins. The adsorption kinetics between anthocyanin and nano-chitosan matrix was studied at various temperature conditions (4 ºC, 22 ºC and 35 ºC) for up to 240 s. The prepared composite was characterized by Fourier transform infrared spectroscopy, differential scanning calorimetry, and scanning electron microscopy, followed by the evaluation of antioxidant and antimicrobial activities. Results indicated that the anthocyanin adsorption mechanism was multilayer stacking, conformed to the Freundlich model (R^2 = 0.9865) and followed the pseudo-second-order kinetic characteristics with equilibrium time within 40 s. The antioxidant activity was confirmed by DPPH and ABTS radical scavenging assays, and the antimicrobial effects against Staphylococcus aureus, Escherichia coli and Monilinia fructicola were compared with different anthocyanin contents. In a preliminary study, the edible coating made from nano-chitosan loaded with elderberry anthocyanins showed detectable preservative effects for stored fruits at room temperature.

Keyword: *Nano-chitosan, Elderberry anthocyanins, Adsorption kinetics, Edible coating*

Decoding Chocolate Texture Across Scales via In Situ Tribology-microscopic Techniques Using a Biomimetic Tongue

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Chocolate is a classic example of a complex multicomponent food with phase-changing characteristics, transitioning from a solid state to an oil-in-saliva emulsion during oral processing. This makes it challenging to decode the dominant mechanisms underlying gritty, silky, sticky, and creamy sensory attributes of chocolate during oral processing, from licking to swallowing.

For the first time, we developed an in-situ tribo-microscopy setup to unveil the mouthfeel mechanisms of chocolate via rheological, tribological, and confocal microscopy techniques across the three main eating stages—solid, molten, and saliva-mixed—under realistic orally-relevant conditions. We used a sophisticated biomimetic tongue replicating the surface texture, wettability, and mechanical properties of a real human tongue.

Results from the initial stage of oral processing showed a shift from solid fat-dominated lubrication to a saliva-dominant regime, the latter disrupting lubrication and the mouthfeel of chocolate. We visualised the confinement of cocoa particles at the interface of fungiform papillae, bringing about grittiness. In the molten state, bridging of cocoa fat between confined cocoa particles provides silky attributes; hence, higher-fat-content chocolates showed better lubrication. In the saliva-mixed stage, lubrication of chocolate was independent of fat content, and coalescence of emulsion droplets provided the desired oiliness, with saliva influencing the confinement of solid particles.

Keyword: *Mouthfeel, Oral tribology, Biomimetic tongue, in situ tribo-microscopy, Chocolate*

Production-side vulnerability and constrained resilience under drought stress in China’s grain system

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Climate change poses escalating risks to grain production systems, yet the extent to which adaptation capacity translates into the resilience of grain system remains insufficiently understood. This study examines the effect of drought stress on production-side vulnerability and constrained resilience in China’s grain system using county-level panel data from major grain-producing regions. We conceptualise resilience not as an automatic outcome of adaptation but as a conditional process shaped by access to resources, effectiveness of adaptation measures, and resource trade-off constraints. The study first assesses how growing-season drought stress affects grain production vulnerability, measured through yield anomalies and production instability. It then evaluates whether resilience capacities, particularly irrigation, mechanisation, and economic support, buffer drought-induced losses. Finally, it tests whether these buffering effects are weakened by water scarcity, infrastructure limitations, and environmental pressure.By integrating climate exposure, production outcomes, and resilience constraints within a unified empirical framework, this research moves beyond conventional climate–yield analysis and identifies how adaptation capacity impacts food production. The findings are expected to provide policy-relevant evidence for designing climate-resilient grain systems that are not only productive but also resource-sensitive and sustainable.This study contributes to the broader agenda of sustainable food systems and global food security under intensifying climate uncertainty.

Keyword: *climate change, grain production systems, food-system vulnerability, constrained resilience, sustainable food systems*

FUNCTIONAL ENHANCEMENT OF ABALONE THROUGH MUSHROOM FERMENTATION

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Fermentation is an effective strategy to enhance the nutritional and functional properties of food materials through microbial transformation. Cordyceps militaris, an edible and medicinal mushroom , has strong potential as a fermentation strain for functional food development. In this study, abalone, a high-value marine food resource rich in proteins and amino acids, was utilized as a substrate for mushroom fermentation. The fungus was successfully cultivated on abalone, demonstrating its suitability as a fermentation platform and enabling in situ production of bioactive compounds. Notably, cordycepin production was markedly enhanced compared to conventional substrates such as brown rice and insect-based media. Fermentation also significantly improved amino acid composition, including a substantial increase in taurine content. The antidiabetic potential was evaluated based on inhibitory activities against advanced glycation end-products (AGEs) formation and α-glucosidase. The water extract of C. militaris fruiting bodies cultivated on abalone exhibited stronger inhibitory activity against AGEs formation compared to abalone alone and C. militaris grown on other substrates. In contrast, no inhibitory activity against α-glucosidase was observed. These results suggest that mushroom fermentation using C. militaris is an effective approach to enhance the functional value of abalone and highlights its potential for developing functional foods targeting glycation-related health benefits.

Keyword: *Mushroom fermentation, Abalone, Cordyceps militaris, Cordycepin, Advanced glycation end-products (AGEs)*

TECHNO-ECONOMIC ANALYSIS AND LIFE-CYCLE ASSESSMENT OF DAIRY, NON-DAIRY, AND VEGAN WHIPPING CREAMS

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Background. Whipping creams span dairy, non-dairy, vegan classes widely assumed to embody a cost–environment trade-off, with animal formulations cheaper but dirtier, plant-based cleaner but costlier – This **Assumption** has not been quantitatively tested.

Methods. 89 public resources yielded 52 mass-balanced optimal recipes (23 dairy, 19 non-dairy, 10 vegan); each ingredient priced and tagged with cradle-to-gate Global Warming Potential (GWP) using ≥3 references. Functional unit: 1 kg pre-whip emulsion.

Results. Class medians rise monotonically vegan -> non-dairy -> dairy: cost 0.81 -> 0.96 -> 3.62 SGD/kg; GWP 0.81 -> 1.32 -> 4.10 kg CO_2-equivalent/kg (5.1× dairy/vegan ratio). Animal-share correlates positively with cost (r [Pearson correlation coefficient]= +0.678) and emissions (r = +0.676); cost and emissions co-rise (recipe r = +0.833; ingredient-level r = +0.943). The Pareto frontier collapses to a single lentil-our vegan recipe (0.26 SGD/kg; 0.15 kg CO_2-eq/kg; 14× lower in cost, 27× lower in emissions than dairy median), dominating all others. Three ingredients — anhydrous milk fat, dairy cream, hydrogenated palm kernel oil — account for 53% of cost and 63% of emissions; anhydrous milk fat alone delivers 36% of total emissions.

Conclusions. This dataset falsifies the cost-environment trade-off hypothesis: cost and emissions co-rise with animal-origin share, leaving no interior sweet-spot. The optimum lies at the plant-only end.

Keyword: *Techno-Economic Analysis (TEA), Life-Cycle Assessment (LCA), Whipping Cream, Plant-based Dairy Alternatives, Ingredient Hotspots*

Microfluidization and TEMPO-Oxidation Modified Chickpea Husk Fiber: Structure, Function and Prospect for Elderly Food Development

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Chickpea husk is rich in dietary fiber and represents a sustainable alternative to wood-based sources. However, its structural and functional properties remain underexplored in food systems, especially in developing elderly-friendly easy-to-swallow foods. In this study, dietary fibers were extracted from agricultural waste chickpea husk using an acidic deep eutectic solvent (DDF) and subsequently modified by microfluidization (MDF) or TEMPO-oxidation (TDF). The results showed that DDF was primarily composed of glucose (65.94%), xylose (14.03%), and mannose (7.65%), consistent with the monosaccharide composition of cellulose and hemicellulose. Both microfluidization and TEMPO-oxidation preserved the core glycosidic bonds but altered the structure differently: microfluidization caused depolymerization of the main chain, while TEMPO-oxidation removed the chains of xylose and mannose, improving dispersibility and lubrication behavior in both cases. In addition, the evaluation of their potential applications showed that MDF had a higher ability to improve the gel strength and structural integrity of gummy candies, owing to its non-dispersible fraction and higher zeta potential. In contrast, TDF was more effective in improving the stability, viscosity and anti-freezing properties of model emulsions due to its higher dispersibility. Such structural modifications broaden its potential as gelling agents, emulsifiers and thickeners, promising great value for formulated elderly soft foods.

Keyword: *Chickpea husk, dietary fiber, gummy candy, emulsion, cellulose*

A UNIFIED ANALYTICAL PLATFORM FOR FOOD SAFETY, QUALITY, AND AUTHENTICITY: CASE STUDIES USING COMPREHENSIVE TWO-DIMENSIONAL GAS CHROMATOGRAPHY

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Food safety, quality, and authenticity are interconnected pillars of consumer protection, yet each is typically addressed through independent analytical strategies. Comprehensive two-dimensional gas chromatography–time-of-flight mass spectrometry (GC×GC–TOFMS) offers a unified platform capable of resolving complex volatile chemical fingerprints that underpin all three. Compared with conventional one-dimensional GC–MS, GC×GC–TOFMS delivers higher peak capacity, resolves coelutions, and yields cleaner spectra for confident identification in complex matrices. We illustrate this through three case studies. For safety, headspace solid-phase microextraction (HS-SPME)–GC×GC–TOFMS profiled microbial volatile organic compounds (mVOCs) in UHT milk spiked with Escherichia coli; ethanol and acetic acid emerged as biomarkers ($p < 0.05$), supporting rapid non-targeted pathogen screening. For quality, the same platform tracked volatile changes in full-cream and chocolate-flavoured UHT milk stored at 20 °C and 40 °C; the effect of storage time dominated unflavoured milk, whereas both time and temperature drove flavour loss in chocolate milk. For authenticity, GC×GC–TOFMS with statistical modelling resolved provenance-relevant volatiles in extra virgin olive oil, differentiating cultivars. Collectively, GC×GC–TOFMS provides a single platform spanning pathogen screening, shelf-life monitoring, and authenticity verification, supporting integrated approaches to food safety and quality assurance.

Keyword: *Comprehensive two-dimensional gas chromatography, Food authenticity, Foodborne pathogens, Quality monitoring, Shelf-life monitoring*

SCALING TRADITIONAL TOHU AND PE POKE: APPROPRIATE-TECHNOLOGY UPGRADING OF WET AND DRIED MYANMAR LEGUME FOODS FOR FUTURE PROTEIN APPLICATIONS

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Myanmar is among the world's largest bean and pulse exporters, yet protein deficiency persists across low-income populations. This paradox points to Knowledge, R&D and Capacity (KRC) limitations in traditional processing rather than raw-material scarcity. Field observations across two climatic zones, cool-humid Shan State (Nyaung Shwe, Heho, Aung Ban; ambient 9–18 °C) and hot-dry Mandalay Region (Yamethin; 17–28 °C), were conducted in February 2026, covering traditional chickpea curd (tohu) and fermented soybean (pè poke). Structured producer and consumer interviews with 52 informants, supplemented by process observation, found consumption averaging twice weekly at prices at or below egg-protein per portion. Ambient fermentation across both zones operates below the Bacillus subtilis optimum (30–40 °C). Endpoints are determined empirically without temperature, time, or pH control, resulting in inconsistent quality and short shelf-life in wet forms (~3 days), while dried forms achieve multi-month stability. A two-track scaling pathway emerges. Improving wet-form safety and consistency to expand daily local consumption, and promoting already shelf-stable dried forms for wider distribution. Both depend on the KRC interventions: fermentation control, hygiene, and sun-drying. A Process and Hygiene Improvement Guideline for tohu and pe poke MSMEs has been developed and is awaiting dissemination.

Keyword: *Tohu, coagulated chickpeas, pè poke, fermented soybean, traditional food scaling*

TUNABLE RHEOLOGICAL PROPERTIES AND STABILITY OF PLANT PROTEIN–PERILLA OIL BIGELS AS BUTTER SUBSTITUTES FOR BREAD BAKING

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Plant-based fat mimics with tailored mechanical and functional properties are increasingly demanded as sustainable alternatives to butter in bakery applications. We conceptualized and developed a bigel system by combining a transglutaminase-crosslinked mung bean protein (MBP) hydrogel with a zein–xanthan gum oleogel structured using perilla oil, rich in α-linolenic acid. By varying the oleogel-to-hydrogel volume ratio (φ) from O3H7 to O7H3, systematic modulation over microstructure, rheological behavior, freeze-thaw stability, and oxidative protection was achieved. All bigels adopted an oil-in-water morphology with the hydrogel serving as the continuous phase throughout the φ range examined. As φ increased, viscosity and network compactness progressively rose, while structural self-recovery declined from 90.4% to 34.8%, reflecting a shift in network dominance from the hydrogel to the oleogel phase. The O4H6 formulation emerged as optimal, exhibiting the highest thermodynamic stability (ΔH = 587.75 J/g), a wide linear viscoelastic region (γc = 1.42%), and superior freeze-thaw oil retention of 93.8% after two cycles. The dual-phase protein network — comprising the MBP hydrogel matrix and the zein–xanthan gum interfacial film — conferred remarkable oxidative protection to the perilla oil. When applied as a butter substitute in bread, O4H6 bigel delivered comparable specific volume, crumb texture, and air cell distribution to butter-based controls.

Keyword: *Bigel, Mung bean protein, Zein, Fat mimic, Rheology*

SOLVENT-ASSISTED FLAVOUR EVAPORATION (SAFE) OPTIMISATION FOR EXTRA VIRGIN OLIVE OIL: A DESIGN OF EXPERIMENT APPROACH ENHANCED BY MULTIDIMENSIONAL GAS CHROMATOGRAPHY

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While solvent-assisted flavour evaporation (SAFE) is a well-established technique for isolating volatile compounds under gentle, high-vacuum conditions, its extraction parameters for extra virgin olive oil (EVOO) are typically adopted without systematic evaluation, despite solvent choice and volume potentially affecting which volatile classes are extracted. This study employed a face-centred central composite design (13 runs, 5 centre replicates) with response surface methodology (RSM) to investigate the effects of solvent composition (0-100% diethyl ether, DE, in dichloromethane, DCM) and solvent volume (50-150 mL) on volatile compound extraction from Coratina EVOO. Extracts were chemically profiled in parallel by one-dimensional GC (1DGC) and comprehensive two-dimensional GC (GC×GC)–TOFMS, with volatile compounds identified using the NIST17 library and linear retention index cross-validation. Quadratic RSM models for GC×GC responses (normalised peak area, total peak count, and identified peak count) were statistically significant ($p < 0.05$). Derringer-Suich desirability optimisation identified an optimum region of low solvent volume (50-60 mL) with moderate DE content (25-45%), providing a practical and robust operating window. Compared to 1DGC, GC×GC resolved coeluting peaks, delivered higher mass spectral purity, and revealed compound class selectivity: DCM preferentially extracted hydrocarbons and terpenes, whereas DE favoured aldehydes and acids; the mixed solvent provided the most balanced compound coverage.

Keyword: *Comprehensive two-dimensional gas chromatography, Coratina, Response surface methodology, Solvent-assisted flavour evaporation*

ANTI-INFLAMMATORY AND ANTIOXIDANT EFFECTS OF KAKADU PLUM (TERMINALIA FERDINANDIANA) EXTRACT ON CANINE INTESTINAL EPITHELIAL CELLS

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Inflammatory bowel disease (IBD) affects both human and canine species, characterised by gastrointestinal inflammation and epithelial injury. Conventional long-term antibiotic treatments carry risks of bacterial resistance and microbiota disruption, necessitating alternative approaches. Kakadu plum (Terminalia ferdinandiana Exell), an Australian native plant, exhibits potent antioxidant and anti-inflammatory properties in human in vitro models, yet its efficacy in canine systems remains unexplored. To this aim, a novel in vitro canine intestinal cell model was developed, using H_2O_2 (oxidative stress), LPS or TNF-α+IFN-γ (inflammatory stimuli). Kakadu plum extracts were assessed via cell proliferation assays, ELISA, immunofluorescence, and reactive oxygen species (ROS) quantification. ELISA analysis revealed that pro-inflammatory cytokines (IL-6, IL-8, MCP-1) were more responsive to the LPS than the TNF-α+IFN-γ. However, neither ethanol nor aqueous extracts of Kakadu plum inhibited the pro-inflammatory cytokine production. Kakadu plum aqueous extract treatment reduced H_2O_2-induced ROS 4.0-fold at 2 hr, with dose-dependent effects observed at concentrations of 5 to 25 µg/mL from 0 to 8 hrs; the ethanol extract significantly reduced ROS production 4.2-fold at 50 µg/mL. These findings demonstrate the protective potential of Kakadu plum extract against oxidative stress in canine intestinal epithelium, supporting its application in functional pet foods and nutraceuticals for gut health.

Keyword: *Terminalia ferdinandiana Exell, canine IBD, functional pet food, antioxidant, intestinal epithelial cells*

EFFECT OF DRYING TIME AND TEMPERATURE ON THE PHYSICO-CHEMICAL AND CONSUMER ACCEPTABILITY OF CARROT-BASED JERKY STRIPS

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The shift in consumer preferences toward healthier food alternatives has led to increased demand for plant-based food products. In this study, the effects of drying time and temperature on the water activity, color, and consumer acceptability (Hedonic rating) of carrot-based jerky (CBJ) strips were explored using central composite response surface methodology. CBJ strips were produced through cabinet drying using different time (DTM) and temperature (DTP) combinations (65-70 ℃, 210-225 min). DTM and DTP generally had a significant ($p<0.05$) effect on the hue (H°) and water activity (aw) of PB jerky. The H° values (28.07°-38.44°) decreased with increasing DTM and DTP, resulting in a color shift from orange to red. The aw values decreased as the DTM and DTP increased, with aw values ranging from 0.48- 0.62. DTM and DTP had no significant effect on pH (4.30-4.59) and consumer acceptability (6.13-7.17, equivalent to “like slightly” to “like moderately.”). Validation studies also showed that significant ($p<0.05$) statistical models may be used to predict responses. The study highlighted the potential use of carrots as a raw material for producing a plant-based alternative to meat-based snacks and extends opportunities in the snack market in terms of health and innovation.

Keyword: *plant-based snack, plant-based jerky, carrot snack, cabinet drying, response surface methodology*

A Bistable Phase-Change Actuated Cushioning Packaging System Enabling Self-Adaptive Wrapping of Fresh Produce

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Nearly one-third of fruits and vegetables lost or wasted across supply chains, imposing substantial burdens on economic efficiency. Physical damage incurred during logistics and handling represents a predominant driver of such losses. The existing cushioning packaging solutions remain inadequate, which is unable to conformally accommodate the geometric diversity of fresh produce and thus leaving fruits vulnerable to mechanical injury throughout the supply chain. Here, we present an intelligent cushioning packaging system that integrates a gas-liquid phase-change actuator with a bistable flexible structural mechanism to achieve self-adaptive, self-locking and temperature-triggered wrapping of fresh fruits. The system autonomously engages a conformal wrapping state in response to ambient temperatures encountered during cold-chain logistics, and reversibly releases upon removal from the cold environment for convenient access. The bistable structure inherently provides self-locking stability and the Fin Ray finger provides geometric versatility across a wide range of fruit morphologies. Coupled mechanical and thermal characterization establishes that the system delivers reliable impact mitigation, precise thermally triggered actuation, and robust cycling durability, collectively validating its suitability for practical cold-chain deployment. This morphology-adaptive, thermally responsive packaging strategy offers a scalable and intelligent solution to mitigate post-harvest physical damage, with broad implications for optimizing fresh produce supply chains.

Keyword: *Bistable, Soft robotics, Smart packaging*

ENHANCEMENT OF BIOACTIVE COMPOUNDS AND BIOLOGICAL ACTIVITIES IN CENTELLA ASIATICA LEAVES BY COMBINED TREATMENT OF MELATONIN AND ULTRASOUND

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Centella asiatica leaves contain bioactive compounds, including triterpenoids, flavonoids, and vitamins, that contribute to their health-promoting properties. This study examined the effects of combined melatonin and ultrasound treatment on bioactive compound accumulation and related biological activities in C. asiatica leaves. Leaves were treated with various concentrations of melatonin at 50–200 μM combined with ultrasound for 5–20 min and the optimal treatment was determined based on triterpenoid contents and antioxidant-related parameters. The combination of 100 μM melatonin and 10 min ultrasound was then compared with the control (no treatment) and single-treatment groups (100 μM melatonin or 10 min ultrasound alone). The combined treatment increased total triterpenoid content from 192.28 to 229.19 mg/g dry weight, compared with the control. Furthermore, this treatment resulted in the highest levels of polyphenols, flavonoids, vitamins C and E, radical scavenging activities, and antioxidant or biosynthetic enzyme activities among all experimental groups. Moreover, the combined treatment group exerted the strongest protective effects against hydrogen peroxide-induced oxidative stress in C2C12 myoblasts by reducing intracellular reactive oxygen species and lipid peroxidation while restoring glutathione levels. These findings indicate that combined melatonin and ultrasound treatment is an effective strategy for enhancing the functional value of C. asiatica leaves.

Keyword: *Centella asiatica, Melatonin, Ultrasound, Bioactive compounds, Biological activities*

PROTECTIVE EFFECTS OF GARLIC SPROUT AND DIALLYL TRISULFIDE AGAINST PALMITATE-INDUCED ATROPHY IN C2C12 MYOTUBES

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Sarcopenic obesity, characterized by reduced muscle mass and increased adiposity, is driven by lipid accumulation, mitochondrial dysfunction, and oxidative stress. Garlic sprouts (GS) exhibit more potent biological activities than mature garlic, likely due to higher volatile sulfur compounds, including diallyl trisulfide (DATS). This study investigated the protective effects of GS extract (GSE) and DATS against palmitic acid (PA)-induced C2C12 myotube atrophy. To ensure comparability, DATS (3.38 μM) was treated at a concentration equivalent to that found in 100 μg/mL of GSE, based on the DATS content in freeze-dried GS and a 45% extraction yield. As evidenced by Oil Red O staining, GSE and DATS reduced lipid accumulation by 39% and 32%, respectively, alongside significant decreases in intracellular triglycerides. Furthermore, both treatments restored mitochondrial membrane potential, increased ATP production (36% and 31%), and suppressed oxidative stress by reducing ROS levels. This metabolic recovery was associated with the downregulation of muscle atrophy-related markers. These findings suggest that GSE and DATS are promising functional ingredients for the prevention and management of sarcopenic obesity.

Keyword: *Sarcopenic obesity, C2C12 myotubes, Garlic sprout, Diallyl trisulfide, Lipid accumulation*

NANOPORE-BASED MYCOTOXIN DETECTION TECHNOLOGY AND INSTRUMENT

Guoliang Li *

Shaanxi university of sciense and technology

Mycotoxins, toxic fungal metabolites contaminating agricultural products, pose serious risks to human and animal health. Conventional detection methods such as high-performance liquid chromatography (HPLC), mass spectrometry (MS), and enzyme-linked immunosorbent assays (ELISA), offer high sensitivity but require complex sample preparation, expensive instrumentation, and trained personnel, limiting on-site application. Herein, we developed a nanopore-based sensing platform integrating hybridization chain reaction, CRISPR-Cas, and Argonaute systems for signal amplification. A library of nucleic acid probes enables simultaneous multi-channel signal output for multiplexed detection [1–2]. During nanopore translocation, characteristic ionic current signatures from reporter probes are captured and analyzed via digital signal processing algorithms, allowing accurate differentiation of multiple mycotoxins in complex food matrices. A compact, lightweight portable instrument facilitates field testing [3]. This platform provides a rapid, multiplex solution for on-site mycotoxin monitoring in food safety, environmental, and agricultural applications.

Keyword: *Food safety, Mycotoxins, nanopore technology, biosensor*

Non-invasive measurement of isothermal water activity based on Raman spectroscopy: A case study of egg powders

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Isothermal water activity is of great significance in assessing the resistance to thermal death of foodborne pathogens through pasteurization. Nevertheless, industrial water activity sensors cannot function above 50°C, while conventional headspace relative humidity techniques are invasive and limited. Such limitations result in the lack of appropriate technology to design a proper pasteurization process. To overcome these limitations, a non-invasive method was designed based on Raman spectroscopy to measure isothermal water activity at high temperatures. Egg powder samples containing fat (0.66 to 56.71%) and protein (31.84 to 83.47%) were employed as model foods. Although they possessed the same physicochemical properties, the sample demonstrated various behaviors in terms of moisture level when subjected to the same water activity levels due to different compositions. Higher fat content resulted in higher temperature sensitivity and reduced affinity towards water binding, based on the findings of adsorption thermodynamics obtained from the Clausius–Clapeyron equation. The invention of a novel and reusable test cell composed of polymethyl methacrylate, organic silica, and optical quartz helped obtain accurate Raman spectra. Using first derivative preprocessing and support vector machine regression achieved strong predictive performance for isothermal water activity across 25 to 55°C (R^2_p = 0.9304, RPD = 3.20).

Keyword: *Water activity, Low-moisture foods, Raman spectroscopy, Chemometrics, Predictive modeling*

SYNERGISTIC PROTECTIVE EFFECTS OF BLACK SOYBEAN AND BLACKBERRY EXTRACTS AGAINST DIHYDROTESTOSTERONE-INDUCED OXIDATIVE STRESS IN HUMAN DERMAL PAPILLA CELLS

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Androgenetic alopecia (AGA) is characterized by hair follicle miniaturization, primarily driven by dihydrotestosterone (DHT)-induced oxidative stress in human dermal papilla cells (hDPCs). Although medications such as finasteride are effective, potential side effects have increased interest in safer and natural alternatives. Black soybean and blackberry are rich in bioactive isoflavones and anthocyanins, which possess potent antioxidant and hair-growth-promoting properties. This study evaluated the synergistic cytoprotective effects of the combined treatment of black soybean extract (BSE) and blackberry extract (BBE) against DHT-induced damage in hDPCs. The most potent synergistic effect was observed at a combination of 15 μg/mL BSE and 2.5 μg/mL BBE, which provided the highest level of cytoprotection against DHT-induced stress. Quantitative analysis via CompuSyn yielded a combination index of 0.2–0.4, indicating strong synergism between BSE and BBE. The optimal synergistic combination effectively suppressed the generation of DHT-induced reactive oxygen species. Furthermore, the treatment mitigated oxidative stress by elevating glutathione levels and enhancing the activities of antioxidant enzymes, such as superoxide dismutase and catalase, while significantly reducing malondialdehyde production. These findings demonstrate that the synergistic interaction between BSE and BBE reinforces the endogenous antioxidant defense system, highlighting their potential as potent natural ingredient for the management of AGA.

Keyword: *Androgenetic alopecia, Human dermal papilla cells, Black soybean, Blackberry, Synergistic effect*

PHYSICOCHEMICAL PROPERTIES AND IN VITRO DIGESTIBILITY OF SORGHUM POLYPHENOL-POTATO STARCH COMPLEXES FOR GLYCEMIC MANAGEMENT

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Postprandial hyperglycemia is a major concern in managing diabetes and obesity. Accordingly, developing functional starches via polyphenol complexation has emerged as a promising strategy to modulate starch digestibility. This study investigated the physicochemical properties and digestibility of sorghum polyphenol (SP)-potato starch (PS) complexes. The complexing index increased dose-dependently to approximately 40% at the 5% SP, reflecting enhanced molecular interactions. SP incorporation significantly increased solubility while markedly decreasing swelling power suggesting that SP interacted with the starch matrix to restrict granule expansion. Scanning electron microscopy revealed that SP-PS complexes exhibited a more compact and continuous surface characterized by the presence of surface-associated SP deposits. In vitro digestion analysis demonstrated a significant reduction in the content of rapidly digestible starch following complex formation. Notably, resistant starch content increased from 20.1% in native starch to 30.5% in the 5% SP-PS complex, thereby delaying glucose release. These physicochemical and microstructural modifications enhanced the digestion resistance of PS. Consequently, SP-PS complexes represent promising functional food ingredients for developing low-glycemic products with potential benefits for long-term glycemic management.

Keyword: *Sorghum polyphenols, Potato starch, Resistant starch, Starch digestibility*

IDENTIFICATION OF NOVEL DPP-IV INHIBITORY PEPTIDES FROM PERILLA SEED MEAL BASED ON MACHINE LEARNING AND EXPERIMENTAL VALIDATION

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Dipeptidyl peptidase-IV (DPP-IV) inhibition is a crucial therapeutic target for type 2 diabetes mellitus (T2DM). Perilla seed meal, rich in hydrophobic amino acids, offers strong potential to interact with the DPP-IV active site. In this study, proteins recovered from defatted perilla seed meal via alkaline extraction and isoelectric precipitation were enzymatically hydrolyzed, reaching a 24% degree of hydrolysis. The hydrolysate (11.96 mg/mL) was separated via ultrafiltration, yielding three fractions with protein concentrations of 5.21, 5.67, and 21.03 mg/mL for the < 3, 3–5, and > 5 kDa ranges, respectively. The < 3 kDa fraction exhibited the highest DPP-IV inhibitory activity, reaching approximately 62% at a protein concentration of 2 mg/mL. Following LC-MS profiling, four candidate peptides (QPAGQYL, SPDWAMQ, IPGLPLR, IPQPMPI) were selected through a combined approach of LightGBM machine learning and in silico screening (PeptideRanker, ToxinPred, AllerCatPro, X-Pro motifs). Furthermore, network pharmacology revealed these peptides target T2DM-related genes involved in hydrolase activity, signal transduction, and neuroactive ligand-receptor interactions. These findings highlight perilla seed peptides as promising functional ingredients for T2DM improvement. These results provide a foundation for further validation of peptide efficacy through chemical synthesis and gastrointestinal stability tests.

Keyword: *Perilla seed meal, Type 2 diabetes mellitus, DPP-IV, Machine learning, Network pharmacology*

ENZYMATIC HYDROLYSATES OF BEER BREWING BY-PRODUCTS AS POTENT AGENTS AGAINST ULTRAVIOLET B-INDUCED PHOTOAGING IN HUMAN DERMAL FIBROBLASTS

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Ultraviolet B (UVB)-induced photoaging triggers cellular damage and extracellular matrix degradation via excessive reactive oxygen species (ROS) generation. Beer brewing by-products, including brewer's spent grain (BSG) and malt rootlet (BMR), are protein-rich but largely undervalued. This study investigated the potential of enzymatic hydrolysates derived from BSG and BMR as functional skin-protective ingredients. Extracted proteins were hydrolyzed using Alcalase alone or sequentially with Flavourzyme, then fractionated into ≥3 kDa and <3 kDa fractions Sequential hydrolysis significantly enhanced the degree of hydrolysis compared to Alcalase treatment alone, with BMR increasing from 33% to 41% and BSG from 11% to 27%. All hydrolysates were non-cytotoxic and effectively rescued UVB-irradiated Hs68 human dermal fibroblasts at 10 ug protein/mL. While UVB-exposed controls retained only 70% viability relative to the untreated control, BSG and BMR hydrolysates restored viability to 107% and 92%, respectively, whereas non-hydrolyzed samples showed no significant effect. Furthermore, the hydrolysates reduced intracellular ROS accumulation, downregulated matrix metalloproteinases MMP-1 and MMP-3, and consequently preserved collagen levels relative to UVB-exposed controls. Overall, enzymatic hydrolysates of beer by-products show great potential as functional ingredients for mitigating UVB-induced skin photoaging.

Keyword: *Photoaging, Beer brewing by-products, Enzymatic hydrolysis, Hs68 cells, UVB irradiation*

Circular Bioprocessing: A Case Study of Spent Media and Spent Microbial Biomass Recycling in a Zero-Waste Fermentation Processes with Umbelopsis isabellina

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Precision fermentation is a promising platform for sustainable production of food ingredients and biomolecules, yet generates large amounts of by-products including spent media and spent microbial biomass. These by-products retain nutrients and metabolites with potential for reuse or recovery but are typically disposed. A circular bioprocess integrating spent media recycling and spent microbial biomass valorisation was developed in Umbelopsis isabellina fermentations for microbial lipids such as γ-linolenic acid. Spent media and spent microbial biomass before and after supercritical CO_2 extraction were characterised using Liquid Chromatography Quadrupole Time-of-flight Mass Spectrometry (LC-QTOF-MS). Fermentation performance was evaluated across multiple cycles with varying proportions of recycled spent media (0%, 25%, 50%, 75%, 100%) with and without additional nutrient supplementation. Metabolomic profiling revealed dynamic shifts in organic acids, amino acids, and lipids in spent media, indicating residual nutrient availability. Supercritical CO_2-processed biomass contained diverse metabolite classes, with amino acids identified as the primary valorisable fraction, alongside identified compounds such as flavonoids and lipids with potential applications as food ingredients. Functionally, recycled spent media supported robust fermentation at up to 50% reuse across multiple cycles, while targeted nutrient supplementation restored performance relative to fresh media, demonstrating a strategy to reduce freshwater consumption and improve process sustainability.

Keyword: *Precision fermentation, Spent media recycling, Microbial biomass valorisation, Umbelopsis isabellina, LC-QTOF-MS metabolomics*

Biodegradable starch films with finger lime peel antioxidant extracts

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The finger lime (Citrus australasica), an Australian native citrus, is rich in phenolic compounds with strong antioxidant properties. Although often treated as an agro-industrial byproduct, its peel contains higher phenolic content and antioxidant capacity than the pulp. In this study, peels from three finger lime varieties (pink, red, and green) and pulp from the red Champagne variety were freeze-dried and subjected to ultrasound-assisted extraction (UAE) using 50% ethanol. Total phenolic content (TPC) was quantified, and optimal extraction conditions were identified as 30% amplitude, a 1:40 solid-to-liquid ratio, and 5 minutes of treatment. The optimized extract was incorporated into starch-based biopolymer films to develop biodegradable active packaging. The films were evaluated for physicochemical, mechanical, and optical properties, as well as biodegradability, antioxidant activity, and TPC. The most promising formulation was further tested for its ability to delay lipid oxidation in avocado. Results demonstrate that incorporating finger lime peel extracts into starch-based films enhances antioxidant functionality and supports the development of biodegradable, sustainable packaging materials, offering a natural strategy to improve food preservation and reduce environmental impact.

Keyword: *phenolic compounds, antioxidant activity, biodegradable packaging, active packaging, sustainable materials*

Barley and oat β-glucans: structure, digestibility and fermentability for health

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β-Glucans are soluble dietary fibers predominantly found in cereals, characterized by β-(1→3)/(1→4) glycosidic linkages that determine their unique structural and functional properties. Barley and oat β-glucans have approved health claims due to their roles in preventing metabolic disorders. This study investigated the rheological, structural, and functional properties of powdered, concentrated β-glucans from barley and oat. Rheological behaviour was evaluated through dynamic viscoelastic measurements and steady shear viscosity at 10% concentration using an AR-G2 rheometer. Particle size distribution was determined by Mastersizer analysis, molecular weight by size-exclusion chromatography, and β-glucan content, starch fractions, and total dietary fibre using Megazyme assay kits. Digestibility was assessed following the INFOGEST (2019) protocol. Both samples exhibited similar rheological profiles, indicating predominantly elastic behaviour. Oat β-glucan showed larger particle size, while barley β-glucan had higher molecular weight and β-glucan content. Barley also contained more total and resistant starch, whereas oat had higher total dietary fibre. Both demonstrated high digestibility and fermentability. Overall, despite similar structural features, differences in molecular weight, particle size, and composition may influence their functionality in food and nutraceutical applications, as well as their physiological effects, including digestibility, fermentability, and associated health outcomes.

Keyword: *β-glucans, cereals, fermentability, functional properties*

Research on Highly Sensitive Aptasensors for Rapid Detection of Foodborne Pathogens

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Foodborne pathogens pose serious threats to food safety, driving the need for rapid and sensitive detection. Aptamer-functionalized DNA hydrogels enable detection without enrichment or DNA extraction. The widely used “target-triggered hydrogel collapse” strategy is relatively fast but requires high target levels, limiting sensitivity. Here, a “target-induced hydrogel formation” strategy is proposed, allowing low target concentrations to trigger gelation and improve sensitivity. However, the relationship between gelation time and template sequence composition in rolling circle amplification (RCA) products hydrogels remains unclear, often leading to gelation times exceeding 7 h. In this study, the rapid gelation mechanism of RCA products DNA hydrogels was systematically investigated. The effects of AC content, polyA/T/G/C segments, and template length on RCA efficiency were optimized. Meanwhile, the influence of complementary regions on gelation behavior was analyzed, revealing the key roles of physical entanglement and metal ion-mediated electrostatic interactions in accelerating gelation. Based on these findings, gelation time was reduced to 10 min, and a series of aptasensors were developed by integrating chemiluminescent and AIE techniques. These strategies enabled sensitive detection of Salmonella typhimurium and Listeria monocytogenes, with detection limits of 4–8 CFU/mL within 80–120 min, providing a basis for on-site rapid detection of foodborne pathogens.

Keyword: *Foodborne pathogens, Aptamer, DNA hydrogel*

ENVIRONMENTAL STRESS ADAPTATION AND PHENOTYPIC HETEROGENEITY IN SHRIMP-BORNE VIBRIO PARAHAEMOLYTICUS

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Vibrio parahaemolyticus is a major seafood-borne pathogen, yet how retail environments shape its adaptive and risk-associated traits remains unclear. Here, we characterized phenotypic and genomic features of 13 isolates from shrimp sold via traditional markets and online platforms in China. Phenotypic assays showed substantial heterogeneity in auto-aggregation, motility, NaCl tolerance and biofilm formation. Notably, biofilm-forming capacity was strongly correlated with both NaCl tolerance ($r = 0.98$) and auto-aggregation ($r = 0.91$), suggesting a close link between surface-associated persistence and environmental stress adaptation. Whole-genome sequencing confirmed species assignment for all isolates, with average nucleotide identity values exceeding 95% relative to reference strains. Pangenome analysis further revealed distinct gene repertoires associated with retail source. Isolates from online retail platforms encoded a broader set of biofilm-associated genes, together with stress response determinants, including adiAC, cadC and mazEF, and uniquely carried the virulence gene tdh. By contrast, isolates from traditional retail markets were enriched in antimicrobial resistance genes, including bla_{CARB} and aphA, as well as efflux pump-associated genes. These findings indicate that the retail environment may shape divergent adaptive strategies and risk profiles in V. parahaemolyticus, with implications for source-specific surveillance and risk assessment in aquatic food supply chains.

Keyword: *Vibrio parahaemolyticus, phenotypic heterogeneity, biofilm formation, stress adaptation, comparative genomics*

RAPID DETECTION AND QUANTIFICATION OF MULTI-SOURCE STARCH ADULTERATION IN TAPIOCA STARCH AND TAPIOCA SAGO USING FOURIER TRANSFORM MID-INFRARED AND FOURIER TRANSFORM NEAR-INFRARED SPECTROSCOPY USING CHEMOMETRICS AND AI INTEGRATION

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Tapioca starch and tapioca sago are globally traded commodities susceptible to economically motivated adulteration with low-cost starches. Conventional detection methods are time-consuming, destructive, and unsuitable for high-throughput screening. This study independently evaluated Fourier Transform Infrared (4000–400 cm^{-1}) and Fourier Transform Near-Infrared (12000–4000 cm^{-1}) spectroscopy for rapid detection and quantification of corn, rice, potato, and wheat starch in tapioca starch and sago across a 0–100% (w/w) adulteration range. Samples were prepared at 5% concentration intervals, yielding more than 400 spectra with more than five replicates per sample. Optimal spectral preprocessing was identified among multiple evaluated methods. Each spectroscopic dataset was independently evaluated using PCA, SIMCA, PLS-DA, PLS-R, ANN, and additional ML models. PCA and PLS-DA revealed significant spectral discrimination across all adulterant-matrix combinations. Regression models obtained R^2 values over 0.80 across all combinations, indicating robust prediction capabilities. Higher accuracy models (R^2>0.90) are further assessed for cross and external validation for model robustness. Integration of AI achieved the significant improvement in model accuracy and predictability in sago samples. Results indicate that FTIR and FTNIR datasets are comparable and effective as independent screening tools for tapioca starch authentication, providing a reagent-free approach for food quality control and regulatory enforcement.

Keyword: *Tapioca starch/sago, Food adulteration, Chemometrics, Machine learning, Starch authentication, FTIR/FTNIR*

COMPARATIVE GENOMIC ANALYSIS REVEALING DISTINCT ACID TOLERANCE MECHANISMS IN LACTIPLANTIBACILLUS PLANTARUM TMA126 AND KCCP 11859

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Lactiplantibacillus plantarum is a commercially important lactic acid bacterium whose acid stress tolerance is a key determinant of probiotic efficacy and industrial applicability. To elucidate the genomic basis underlying strain-level differences in acid tolerance, we performed comparative genomic analysis between an acid-tolerant strain, L. plantarum TMA126, and an acid-sensitive strain, L. plantarum KCCP11859. Comparative analysis revealed that TMA126 harbors a distinct set of defense-oriented genomic features, including teichoic acid biosynthesis gene clusters, a Na^+/H^+ antiporter, a mismatch repair system, and associated regulatory elements. These components collectively support intracellular pH homeostasis and structural integrity of the cell envelope under acid stress conditions. In contrast, KCCP11859 encodes multiple proton symporters and an expanded repertoire of phosphotransferase system-dependent sugar transporters, which likely facilitate excessive proton influx coupled with accelerated carbohydrate catabolism, thereby promoting intracellular acidification and compromising acid stress adaptation. These findings demonstrate that L. plantarum TMA126 employs a multi-layered, defense-oriented strategy to maintain physiological homeostasis under acid stress, whereas KCCP11859 exhibits a metabolism-driven susceptibility characterized by intracellular acidification. This study provides an integrated genomic framework for understanding strain-specific acid tolerance mechanisms in L. plantarum and offers a basis for rational selection of robust probiotic strains with enhanced acid stress resilience.

Keyword: *Lactiplantibacillus plantarum, COMPARATIVE GENOMIC ANALYSIS, ACID TOLERANCE MECHANISMS*

EFFECT OF GELLING AGENT COMPOSITION ON RHEOLOGICAL PROPERTIES AND EXTRUDABILITY OF JELLY INKS FOR THREE-DIMENSIONAL FOOD PRINTING

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This study analyzed the rheological properties of jelly-based food inks formulated with varying compositions of gelatin, pectin, agar, and carrageenan, and evaluated their correlation with extrudability. Rheological analyses including amplitude sweep, frequency sweep, and three-interval thixotropy tests (3ITT) were conducted. Across all samples, G′ exceeded G″ throughout the entire frequency range, confirming gel-like behavior. At 1 rad/s, G′ ranged from 359.84 to 42,286 Pa and tan δ from 0.046 to 0.184, indicating distinct differences in network strength among formulations. Higher pectin and agar content corresponded to elevated G′, whereas gelatin-dominant formulations exhibited lower tan δ, reflecting stronger elastic network characteristics. 3ITT revealed irreversible structural breakdown in all samples with significant inter-sample differences ($p < 0.001$). Initial viscosity (η_1) varied by formulation and closely correlated with extrusion behavior. All samples demonstrated shear-thinning behavior. Syringe-based extrusion tests showed smooth, continuous flow in gelatin- and carrageenan-rich samples, whereas discontinuous extrusion was observed in high-agar and high-pectin formulations. These findings suggest that gelatin–carrageenan combinations offer a favorable balance between extrudability and shape retention, providing a material basis for extrusion-based 3D food printing. Printability, shape fidelity, and dimensional accuracy will be further evaluated to establish design criteria for personalized and functional food production.

Keyword: *3D food printing, Rheology, Hydrocolloid, Extrudability, Food ink*

From Waste to Print: Unlocking the Multi-Scale Structural Secrets of Non-Conventional Starches for High-Precision, Health-Focused 3D Food Printing

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Conventional 3D food printing often relies on high starch concentrations or chemical modifications to achieve rapid gelation and shape fidelity, compromising sustainability. Meanwhile, starch-rich agricultural byproducts—ginger rhizomes, rambutan seeds, and Millettia speciosa residues—are discarded annually. Our research demonstrates that starches isolated from these waste streams possess unique multi-scale architectures that naturally deliver exceptional 3D printability at low concentrations without additives. Integrated structural analyses (SEC, FACE, SAXS, XRD, Raman/FTIR) and rheological characterization revealed that high amylose content (25.70–33.47%) coupled with abundant short amylopectin chains (DP 6–12) promotes rapid molecular entanglement and double-helix formation. This enables ultra-fast gelation within 1–2 min (up to 21× faster than potato starch) and outstanding printing precision: Curcuma starches achieved 95.40–96.08% accuracy at only 6% concentration, while rambutan BR-7 starch reached 99.14% with a dense, closed-pore network. Rheological tests confirmed solid-like elastic behavior (G′>G″) and high thixotropic recovery (>99%), ensuring structural stability after extrusion. Beyond printability, these starches offer targeted health benefits, including up to 44.55% resistant starch (CLS), up to 73.45% slowly digestible starch, and IDDSI Level 5 textures suitable for dysphagia diets. This “waste-to-ink” paradigm establishes a sustainable strategy for high-value agricultural residue utilization, advancing precision health food manufacturing.

Keyword: *Non-conventional starch, Food 3D printing, Agricultural waste valorization, Rheological properties, Rapid gelation*

Metagenomics and volatile metabolomics reveal microbial succession and its correlations with fruity flavor volatile compounds during Mianhua industrial processing

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Mianhua, a traditional fermentation-type staple food popular in northern China, undergoes dynamic microbial and volatile compound changes during industrial processing. 848 volatile compounds were identified using volatile metabolomics dominated by esters (18.51%), notably hexanoic acid ethyl ester and octanoic acid ethyl ester, which confer fruity flavors. Metagenomics analysis revealed Proteus (25.93%), Fructilactobacillus (16.63%), Lactobacillus (10.16%) and Companilactobacillus (7.14%) as dominant genera. Mixing with traditional starters was critical for flavor development, driven by microbial succession and synergistic interactions between Lactobacillaceae (e.g., Fructilactobacillus sanfranciscensis and Lactobacillus helveticus) and Kazachstania during fermentation. Notably, F. sanfranciscensis and L. helveticus were significantly correlated with the formation of key esters with fruity characteristics, elucidating their roles in substrate conversion via carbohydrate metabolism and the esterification pathways. This study clarifies the microbial contributions to fruity flavor and provides insights into volatile-microbiota correlations, laying a foundation for future flavor-oriented research and industrial applications of microbiota regulation in Mianhua production.

Keyword: *Mianhua, Core microbes, Volatile compounds, Metabolome-microbiome correlation, Characteristic flavor, Fruity ester*

COMPARATIVE EVALUATION OF PHAGE COCKTAILS AGAINST A BROAD RANGE OF FOODBORNE PATHOGENS

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Salmonella remains a widespread foodborne pathogen, requiring the development of precise, phage-based biocontrol strategies. Although bacteriophages represent a specific alternative to traditional antimicrobials, their industrial application remains limited by narrow host ranges and the accelerated emergence of phage-resistant subpopulations. In this study, we isolated and characterized six Salmonella-specific phages (GAO1, AGO7, NB1, NB2, NB3, and FPU) exhibiting high-titer infectivity profiles and broad acid and thermal stability across diverse environmental conditions (pH 3-11; 25-60°C). By combining these phages into optimized cocktails, we developed three formulations designed to broaden host range and increase selection pressure. These cocktails achieved pan-serotype lysis of all tested Salmonella isolates and exhibited expanded interspecies activity against Escherichia coli, Pseudomonas aeruginosa, Listeria monocytogenes, and Serratia marcescens. Particularly, while bacterial resistance was observed within 8 h of monophage treatment, the strategic cocktails successfully suppressed the emergence of resistant phenotypes for at least 24 h. Our findings demonstrate that the synergistic integration of diverse phage isolates effectively overcomes the limitations of individual phages, providing a reliable platform for the development of high-efficacy, broad-spectrum phage-based interventions in food safety and public health.

Keyword: *Salmonella, Bacteriophages, Phage cocktail, Biocontrol, Food safety*

SYNERGISTIC ENCAPSULATED GREEN TEA-TURMERIC POLYPHENOLS: A TRANSLATIONAL FUNCTIONAL BEVERAGE STRATEGY FOR COLORECTAL CANCER PREVENTION

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Polyphenol-rich green tea catechins and turmeric curcuminoids possess significant anti-cancer potential. However, poor physicochemical stability, limited gastrointestinal bioaccessibility and undesirable sensory attributes restrict their application in functional foods. This research investigated the synergistic anti-cancer efficacy of green tea-turmeric combination extracts (COE), their application in an instant functional peach beverage prototype and the effect of freeze-dried encapsulation on digestive stability and colorectal cancer prevention. In vitro evaluation using RKO human colon carcinoma cells showed that crude extracts exerted stronger anti-proliferative effects than pure standards. The optimal 2:1 ratio (12.5 and 6.25 μg/mL) significantly reduced RKO cell viability and exhibited strong synergistic anti-proliferative effects, confirming synergy between the two extracts. Encapsulation using pectin, maltodextrin, and inulin achieved high efficiencies for catechins (79.52%) and curcuminoids (82.14%). During intestinal digestion, EGCG retention increased from 23.86% to 81.02%, while curcumin retention increased from 69.85% to 79.56%, indicating improved bioaccessibility. The optimized encapsulated COE was incorporated into an instant functional peach beverage, reducing bitterness and astringency while improving overall liking, with 95% consumer acceptance. In vivo, high-dose COE (2500 mg/kg bw) reduced aberrant crypt foci by 63.49% and lowered crypt multiplicity in DMH-induced rats, supporting its potential as a functional beverage for colorectal cancer prevention.

Keyword: *Synergistic, Green tea-turmeric extracts, Encapsulation, Functional beverage, Colorectal cancer prevention*

Preserving fresh eggs via a recyclable and impact-resistant gelatin hydrogel

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Egg waste constitutes an important component of global food waste, and egg spoilage is mainly driven by moisture loss and bacterial contamination. In this study, an efficient, recyclable, and glycerol-soaked gelatin hydrogel was developed for egg preservation, enabling shelf-life extension without additional refrigeration. Glycerol soaking for 6 h reduced the moisture content of the hydrogel while increasing the proportion of triple-helix structures, thereby improving its toughness (4.59 MJ/m^3), fracture energy (17.28 kJ/m^2), and mechanical stability, with resistance to 10,000 cyclic stretching tests. These enhanced properties allowed the hydrogel to form an effective coating on the eggshell and to provide a certain degree of impact resistance. Eggs treated with the hydrogel-maintained Grade A quality for up to four weeks at room temperature. Compared with uncoated eggs, coated eggs showed improved Haugh unit, yolk index, albumen index, and pH stability. In addition, the hydrogel was degradable under natural conditions or at 45°C, highlighting its environmental friendliness. Overall, this gelatin hydrogel demonstrates strong potential as a sustainable egg-preservation material and offers a promising strategy for extending egg shelf life and reducing egg waste.

Keyword: *Gelatin hydrogel, Egg preservation, Impact resistance, Biodegradable*

VALORIZATION OF BREAD WASTE INTO BIODEGRADABLE, GREEN, AND SUSTAINABLE PACKAGING MATERIALS

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Bread waste represents one of the most abundant and environmentally impactful food waste streams. Bread is a multi-component material comprising biopolymers, including starch, proteins and cell wall polysaccharides, whose high molar mass opens the potential of fabricating biomaterials.

This work explores the valorization of stale bread into biodegradable packaging materials, including flexible films and porous gels, in comparison with wheat flour and commercial starch. We performed a comprehensive investigation of molecular changes and interactions of wheat flour biopolymers during breadmaking. Baking induced significant macromolecular transformations, including starch molecular weight reduction (from 42.5×10^7 to 6.4×10^7 g/mol), gluten network formation (evidenced by CLSM), and increased bound polyphenols (from 61.5% to 83.5%). These changes notably affected material properties. Bread films exhibited lower tensile strength, elastic modulus, and degradation temperature than wheat flour counterparts, but presented significantly higher elongation at break. For porous materials, bread-based aerogels showed better porosity, but inferior mechanical strength compared to those from commercial wheat starch. The gluten network constrained porous properties, as its removal substantially increased specific surface area (up to 79 m^2/g) and other porosity parameters. Results of this work will be cornerstone to upcycle the stale bread matrix and its constituting biopolymers into biodegradable packaging materials.

Keyword: *stale bread, biopolymers, flexible films, porous gels*

GREEN EXTRACTION OF BIOACTIVE COMPOUNDS FROM COFFEA ARABICA SIDESTREAMS WITH AQUEOUS DEEP EUTECTIC SOLVENT AND THEIR APPLICATION IN MAYONNAISE AS ANTIOXIDANT AGENTS

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Coffee processing generates large quantities of sidestreams that remain underutilized despite their rich bioactive content. This study investigated the application of antioxidant compounds from four Coffea arabica sidestreams—skin and pulp, husk, silverskin, and parchment—in mayonnaise, using microwave-assisted extraction with a glycerol–water aqueous deep eutectic solvent. Among the tested solvent systems, 61.3% (v/v) glycerol–water yielded the highest total phenolic content, particularly in skin and pulp (16.5 mg GAE/g) and husk (15.2 mg GAE/g). Chlorogenic acids, especially 5-caffeoylquinic acid, were the dominant phenolics (0.07–2.3 mg/g), while caffeine ranged from 5.3 to 13.6 mg/g. Antioxidant activity followed the order: skin and pulp > husk > silverskin > parchment, correlating strongly with phenolic content. Incorporation of these extracts into mayonnaise significantly improved oxidative stability, with peroxide and p-anisidine values markedly reduced ($p < 0.001$). Extracts from 1.5% skin and pulp exhibited the lowest oxidation levels, outperforming butylated hydroxytoluene. Although color parameters were affected by extract pigmentation, pH remained within safe limits (4.27–4.37), and textural properties remained largely unchanged. Overall, coffee sidestream extracts show strong potential as natural antioxidants in emulsion-based food systems.

Keyword: *Coffee sidestreams, Aqueous deep eutectic solvent, Microwave-assisted extraction, Natural antioxidants, Phenolic compounds*

NEUROPROTECTIVE EFFECTS OF PEDIOCOCCUS PENTOSACEUS TAP041 AGAINST METHYLGLYOXAL-INDUCED COGNITIVE IMPAIRMENT IN AN ALZHEIMER'S DISEASE MOUSE MODEL

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Advanced glycation end-products (AGEs) and methylglyoxal (MGO) drive neurodegeneration through oxidative stress, neuroinflammation, and amyloid pathology in Alzheimer's disease. This study evaluated probiotic candidates for mitigating MGO-induced cognitive decline. Six-month-old male 5xFAD mice received MGO (50 mg/kg/day) via drinking water and were administered Pediococcus pentosaceus TAP041, Levilactobacillus brevis KGK002, or P. pentosaceus KCA007 (1×10^9 CFU/day) for one month; donepezil (3 mg/kg) served as a positive control. Cognitive performance was assessed by Morris water maze, Y-maze, and open-field tests, complemented by brain immunohistochemistry, HMC3 microglial mechanistic assays, and 16S rRNA gut microbiome profiling. Strain TAP041 reduced Morris water maze escape latency comparably to donepezil and restored Y-maze spontaneous alternation. It decreased GFAP and Iba1 expression in the hippocampus and cortex, and lowered Thioflavin-S–positive amyloid-β plaques. In MGO-stressed HMC3 cells, Strain TAP041 suppressed IL-1β, TNF-α, and IL-6 while elevating TGF-β and IL-4, consistent with M1-to-M2 polarization, upregulated Nrf2/HO-1/catalase/SOD, and inhibited the Bax/Bcl-2–caspase apoptotic cascade. Microbiome analysis revealed restored α-diversity and recovery of Akkermansia muciniphila. P. pentosaceus TAP041 exerts neuroprotection through the gut–immune–glia–behavior axis, supporting its psychobiotic potential.

Keyword: *Probiotics, Methylglyoxal, Alzheimer's disease, Neuroinflammation, Gut-brain axis*

Effects of Static Retort Processing on Colour, Viscosity, and Texture of Ready-to-Eat Beef Stew

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Shelf-stable, ready-to-eat meals are increasingly popular beyond emergency and military use for their convenience. This study examined the effects of two retort processing profiles, 115 °C, 60 min and 121 °C, 30 min, both achieving an equivalent lethality ($F_0 = 11$ min), on the colour, viscosity, and texture of pouch-packed beef stew. The stew, containing beef, carrots, potatoes, and a flour-thickened tomato sauce, represented a multi-component RTE system. No significant differences in overall colour, viscosity or texture were observed between processing treatments. All components darkened, reflected by reduced L* values. Beef and carrots showed decreased b* values and increased a* values due to absorption of tomato sauce. Potatoes with a* (redder) and b* (darker) values increased. Retorting at 121 °C resulted in softer, less tender, and more adhesive beef, along with softened carrots and gluey potatoes. This higher-temperature treatment also increased sauce flow resistance and velocity due to starch gelatinisation. In contrast, extended processing time at 115 °C promoted greater molecular breakdown, producing lower viscosity and easier flow. No growth of Geobacillus stearothermophilus indicator strips was observed for either process, confirming product safety. These findings guide the selection of thermal processing profiles to balance safety with textural and flow properties.

Keyword: *Retort processing, Ready-to-eat beef stew, Colour, Texture, Viscosity*

SYNERGISTIC ENZYMATIC HYDROLYSIS AND LACTIC ACID BACTERIA–YEAST CO-FERMENTATION ENHANCE NUTRITIONAL QUALITY, PROBIOTIC VIABILITY, AND FLAVOR ATTRIBUTES OF KOMBU (SACCHARINA JAPONICA)

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Kombu (Saccharina japonica) is a nutrient-dense brown seaweed, but its utilization is limited by low nutrient bioaccessibility and undesirable lipid-derived off-flavors. This study evaluated the effects of enzymatic hydrolysis followed by lactic acid bacteria (LAB) fermentation and LAB–yeast co-fermentation on the nutritional, metabolic, and sensory properties of kombu slurry. Enzymatic treatment disrupted the protein–polysaccharide matrix, releasing fermentable sugars, peptides, and amino acids that supported microbial growth. LAB fermentation, particularly with Lactiplantibacillus plantarum, achieved high cell viability (up to 8.33 log CFU/mL), produced lactic acid and γ-aminobutyric acid (GABA), and reduced off-flavor volatiles such as hexanal and 1-octen-3-one. Metabolomic analysis revealed the formation of bioactive compounds, including D-3-phenyllactic acid. To further enhance probiotic viability and aroma, LAB–yeast co-fermentation using Lacticaseibacillus paracasei or L. plantarum with Pichia kluyveri was conducted for the first time in kombu. Co-cultures significantly improved probiotic survival (7.36–7.48 log CFU/mL), suppressed key off-flavor aldehydes and ketones, and enhanced fruity esters with odor activity values ≥2.1. Overall, enzymatic treatment combined with synergistic LAB–yeast fermentation effectively improves the nutritional quality, probiotic viability, and flavor profile of kombu, supporting its application in fermented functional foods and beverages.

Keyword: *Seaweed, Enzymatic hydrolysis, Fermentation, Lactic acid bacteria, Yeast*

Rapid Production of Australian-Grown Chickpea Tempeh: Influence of Acidification on Key Physicochemical Properties

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Traditional tempeh fermentation relies on natural acidification during soaking to suppress spoilage and microorganisms and promote Rhizopus oligosporus growth. However, this process is time-consuming and often inconsistent. This study aims to evaluate the effects of a rapid tempeh making method, where the soaking step was replaced with a pre-acidification step using glucono-δ-lactone (GDL), as well as to assess the impact of the modified process on key physicochemical parameters of tempeh made from Australian-grown chickpeas. No significant differences were observed in the pH of tempeh made with different methods. Similarly, the moisture contents of GDL-treated tempeh ($57.50 \pm 2.00\%$ were comparable with conventionally made tempeh ($60.70 \pm 1.50\%$). GDL treatment did not affect the colour of the tempeh, as indicated by their L*, a* and b* values, which were not significantly different between different method. Similar pattern could be observed from the texture profile of the GDL-treated samples, with their hardness, gumminess and chewiness were not significantly different with the control. Overall, the rapid methods could effectively reduce the soaking time, from 36 h to 8 h, while at the same time maintaining the quality parameters of chickpea tempeh.

Keyword: *tempeh, rapid method, glucono-δ-lactone, chickpea, acid soaking*

Dietary Methionine Restriction Alleviates Diabetic Metabolic-Associated Steatotic Liver Disease by Activating Hepatic Autophagy and Remodeling Metabolic Pathways

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Metabolic-associated steatotic liver disease (MASLD) is highly prevalent in type 2 diabetes and lacks effective therapies. Methionine restriction (MR) has shown metabolic benefits, but its role in diabetic MASLD remains unclear. This study aimed to investigate whether dietary MR alleviates MASLD in diabetic mice and to explore the underlying metabolic mechanisms. m/m and db/db mice were fed a normal (0.86% methionine, w/w) or methionine-restricted diet (0.17% methionine, w/w) for 13 weeks. Hepatic steatosis, fibrosis, inflammation, and oxidative stress were assessed using histology, biochemical assays, and gene expression analyses. Metabolic cage analysis and untargeted serum metabolomics were conducted to evaluate systemic metabolic alterations. MR markedly reduced liver weight, hepatic lipid accumulation, and circulating lipids in db/db mice. These improvements were accompanied by suppressed lipogenic gene expression, alleviated fibrosis and inflammation, and reduced oxidative stress. MR also enhanced lipid utilization and substantially remodeled the pathways related to sulfur amino acid metabolism and the TCA cycle. Notably, MR activated hepatic autophagy signaling, suggesting enhanced cellular metabolic adaptation. Dietary MR alleviates MASLD in diabetic mice partly through the activation of hepatic autophagy, improved redox homeostasis, and systemic metabolic remodeling, highlighting the translational potential of dietary amino acid modulation in the management of metabolic diseases.

Keyword: *dietary restriction, TCA cycle, Metabolic-associated steatotic liver disease, autophagy, sulfur amino acid metabolism*

Characterization of Kombu Dashi Extracted under Different Temperature Profiles using Multiband Spectroscopy

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Dashi (soup stock) is a fundamental element of Japanese cuisine, and understanding its characteristics is essential for culinary optimization. For kombu (kelp) dashi, the extraction temperature profile is a critical factor influencing quality. This study aimed to clarify the effects of water temperature on extraction behavior by analyzing glutamic acid concentrations and multiband (X-ray fluorescence, UV, and IR) spectral data.

In the experiment, 0.03 kg of cut kombu was added to dm^3 of mineral water preheated to specific temperatures ranging from 298 to 363 K. Samples were collected over a 60-min period to measure glutamic acid levels and multiband spectra. The results indicated that the influence of temperature varied across different analytical parameters, with varying temperature profiles leading to distinct component balances. Notably, the extraction results did not always follow a linear temperature gradient. These findings suggest that dashi components are complexly influenced by temperature profiles, which can be effectively captured via multiband spectroscopy. This demonstrates the potential for evaluating dashi quality under diverse extraction conditions using multiband spectroscopic information.

Keyword: *Optical Sensing, Quality, Low-Temperature Cooking*

Valorization of Food Side Streams as Sustainable Serum Replacements for Cultivated Meat Culture Media

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The high cost and dependence on fetal bovine serum remain major barriers to the large-scale production of cultivated meat. This study investigated the valorization of food industry side streams as low-cost and sustainable alternatives for serum replacement in cell culture media. Hydrolysates derived from soy whey (SW), soybean meal (SBM), and brewer's spent grain (BSG) were evaluated using immobilized porcine skeletal muscle satellite cells as a validation model. All hydrolysates supported cell growth and enabled 50% FBS replacement, while certain combinations exhibited enhanced performance, suggesting synergistic effects. Compositional analysis revealed distinct nutritional profiles among the side streams, with SBM showing high protein content (~45.9% dry basis), whereas SW and BSG were comparatively rich in carbohydrates. Enzymatic hydrolysis using different proteases, including Flavourzyme, Neutrase, and Alcalase, produced hydrolysates with degrees of hydrolysis ranging from 10% to 40%. Peptide fractions were predominantly distributed within the 1–5 kDa range, followed by fractions below 1 kDa, indicating the presence of both potentially bioactive peptides and readily utilizable nutrients that may contribute to cell growth. Further investigation into the underlying mechanisms is ongoing. Overall, this work demonstrates a promising strategy for the development of cost-effective and sustainable culture media for cultivated meat production.

Keyword: *Food side streams, Cultivated meat, Serum replacement, Protein hydrolysates*

COLD PLASMA-INDUCED OXIDATIVE MODIFICATION REDUCES EGG WHITE PROTEIN ALLERGENICITY AND PROMOTES ORAL TOLERANCE

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The rising prevalence of egg allergy in children has created an urgent need for safer egg white protein (EWP) utilization. Current food treatments are costly or polluting. This study evaluated cold plasma (CP), a green non-thermal technology to reduce the allergenicity of EWP. EWP were treated with CP for 0–60 min and assessed for structural changes, IgE/IgG binding, cell degranulation, mouse allergic responses (intraperitoneal and oral gavage), and safety in C. elegans. Results showed that CP treatment for 30 min significantly reduced IgG/IgE binding capacity of EWP with a slight benefit at 60 min. The mechanisms involved disruption of allergen hydrophilicity and oxidative destruction of linear epitopes. CP-treated EWP inhibited RBL-2H3 cell degranulation in vitro. Paradoxically, intraperitoneal administration exacerbated allergic reactions in mice, elevating serum sIgE, sIgG and Th2-type cytokine responses, and downregulating intestinal tight junction proteins. Conversely, oral administration restored the Th1/Th2 balance by increasing IFN-γ and decreasing IL-4/IL-13 levels, accompanied by increased IL-10 production, indicating oral tolerance induction. Safety evaluation in C. elegans showed that CP-treated proteins (0-2 mg/mL) did not affect survival, body size, movement, or reproduction. Thus, CP treatment effectively reduced EWP allergenicity through oxidative modification with good biocompatibility, supporting its promise for hypoallergenic egg products.

Keyword: *Cold plasma, Egg white protein, Oxidative modification, Allergenicity, Immune modulation*

Impact of spray and freeze drying on physicochemical and functional characteristics of encapsulated custard apple peel extract: A waste valorization study

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Growing emphasis on sustainable food processing and circular bioeconomy has increased interest in valorization of food processing waste streams. Custard apple peel a rich source of bioactive compounds, largely remain underutilized. In this work, the ethanolic extracts of custard peel were encapsulated in a polysaccharide-based (maltodextrin+gum acacia) and protein-polysaccharide-based (Whey protein+pectin) matrix through spray and freeze drying. The prepared encapsulates were characterized for physicochemical and functional properties, microstructure and core-wall interactions. Spray dried encapsulates showed higher moisture content, while freeze dried samples demonstrated lower water activity and higher yield. All encapsulated samples reported higher encapsulation efficiency in the range of (~96-99%) with freeze dried maltodextrin+gum acacia sample reporting highest encapsulation efficiency (99.02 ± 0.38%) owing to minimal thermal degradation. Consequently, total phenolic (10.78 ± 0.34 mg GAE/g) and flavonoid content (7.63 ± 0.27 mg QE/g) and antioxidant activity (61.44 ± 1.35%) was observed higher in freeze dried encapsulates. Microstructure analysis revealed smooth spherical particles in spray dried encapsulates as opposed to flake-like particles in freeze dried ones. FTIR analysis shows successful encapsulation of phenolic compounds. Overall, this work demonstrates successful encapsulation of custard apple peel extracts with a strong potential for development of a nutraceutical product from fruit processing waste.

Keyword: *Encapsulation, Spray drying, Freeze drying, Polyphenols, Waste valorization*

DEVELOPMENT OF LOW-COST PROCESSING TECHNOLOGIES FOR THE PRODUCTION OF NUTRIENT-DENSE PUPURU WITH IMPROVED SAFETY AND QUALITY

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Pupuru is a fermented staple food widely consumed in Nigeria, and some parts of Ghana, Benin Republic and Togo. The traditional processing methods for pupuru are constrained by poor hygiene, nutrient losses, inconsistent quality, and health risks from microbial contamination and residual cyanogenic compounds. This proposal seeks to reform pupuru production by developing low-cost, scalable, and adaptable processing technologies that can significantly enhance its safety, nutritional value, and market quality. Processing technologies such as energy-efficient gritting and milling technology, flash drying equipment, and safety-proven packaging machines were reviewed. The study will fortify pupuru with nutrient-dense ingredient, optimize fermentation processes using controlled and hygienic techniques, develop efficient drying systems for shelf stability, and conduct evaluations on nutritional composition, functional properties, microbial safety, and sensory acceptability. The methodology will include a pilot-scale innovations, employing accessible technologies for cyanide reduction, microbial load, and nutrient retention. The expected outcomes will include establishment of a low-cost processing model, production of safer and more nutrient-rich pupuru, improved shelf life, and enhanced economic opportunities for smallholder processors. This project will reposition pupuru from a being traditional staple to a safe, nutritious, and commercially viable product, for advancing the MDG goals on zero hunger and food security.

Keyword: *Energy-Efficient, Equipment, Food Safety, Machines, Processing Technologies, Pupuru,*

FERMENTATION-BASED BIOTRANSFORMATION OF NATIVE PLANT MATRICES INTO FUNCTIONAL FOOD BASES: A SCALABLE MODEL FOR SUSTAINABLE FOOD SYSTEMS

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The growing demand for sustainable, nutrient-dense, and minimally processed foods has intensified interest in underutilized plant biodiversity as a source of functional ingredients. Controlled fermentation, particularly lactic acid fermentation using lactic acid bacteria (LAB), is recognized as an effective biotransformation strategy capable of improving protein digestibility, reducing antinutritional factors such as phytates, enhancing mineral bioavailability, and promoting the formation of bioactive compounds in plant-based matrices.

This study proposes a process-oriented model to investigate lactic acid fermentation in a matrix composed of native Brazilian species, namely Araucaria angustifolia seeds and Pereskia aculeata leaves. These species present complementary nutritional characteristics, combining resistant starch associated with glycemic modulation and short-chain fatty acid production by the gut microbiota with proteins, dietary fiber, minerals, and mucilage, contributing to improved metabolic responses and functional food potential.

The model integrates preprocessing (cooking, dehydration, and milling), followed by rehydration using potable water to achieve adequate water activity and form a semi-solid substrate suitable for microbial metabolism, controlled LAB fermentation, and subsequent drying to increase product stability.

The final product is a stable, dehydrated powder with long shelf life, industrial scalability, and adaptability to region-specific biodiversity, contributing to resilient, scalable, and resource-efficient food systems.

Keyword: *Fermentation, Biotransformation, Functional foods, Scalable food systems, Lactic acid bacteria (LAB)*

Enhancing the Physicochemical and Sensory Properties of Meretrix lusoria Clam Essence Using Microbubble-Assisted Extraction: A Novel Approach Toward Sustainable Nutraceutical Development

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Meretrix lusoria, a nutritionally rich bivalve, is a promising source of marine-derived nutraceuticals; however, conventional thermal extraction often degrades thermolabile bioactives and impairs sensory quality. This study evaluates microbubble-assisted extraction (MB-AE) as a non-thermal alternative to enhance the physicochemical, nutritional, and sensory properties of clam essence. Treatments included control, standard cleaning process (SCP), and MB exposure (10-60 min). MB60 achieved the highest extraction yield (41.47%), exceeding control (35.65%) and SCP (36.00%). MB20 improved color (ΔE = 36.9), maintained pH (8.29), and increased soluble solids (6.9 °Brix). HPLC analysis showed enhanced levels of proline, tyrosine, and glutamic acid, contributing to umami and bioactivity. Sensory evaluation indicated superior aroma and flavor in MB30-MB60 samples. MB-AE enhances mass transfer via cavitation-induced shear, enabling efficient extraction under mild conditions. These findings support MB-AE as a scalable, energy-efficient strategy for sustainable marine nutraceutical production. Control integration and future bioavailability studies of MB-extracted marine bioactives.

Keyword: *Microbubble-assisted extraction, Non-thermal processing, Amino acid profiling*

GREEN WHEAT FREEKEH: FROM TRADITIONAL CEREAL TO SUSTAINABLE FUTURE FOOD - A COMPARATIVE EVALUATION OF NUTRITIONAL, FUNCTIONAL, AND PHYSICAL PROPERTIES ACROSS MULTIPLE CULTIVARS

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Freekeh, a traditional cereal produced from immature wheat grains, is gaining global attention as a nutrient-dense and climate-resilient alternative to refined cereal staple. This study investigated nutritional, functional, and physical properties of immature green wheat, Freekeh, and mature wheat across four cultivars (Scepter, Calibre, Organic Scepter, Durum) to evaluate effects of grain maturity and processing. Green wheat and Freekeh showed higher dietary fibre (13.07-15.05%) than mature wheat (10.4-11.9%). Protein content ranged 8.30-14.99%, with the highest values observed in Durum, while starch varied 37.52-61.13%. Freekeh showed higher ash content (2.19-2.44%) than green (1.73-2.05%) and mature wheat (1.43-1.81%). Bioactive compounds decreased with maturity, with highest total phenolic (7.08-10.40 mg GAE/g) and flavonoid contents (3.50-7.44 mg QE/g) in green wheat, followed by Freekeh and mature wheat. Antioxidant activity showed similar trends. Microstructural analysis revealed a transition from porous green wheat endosperm to dense mature structure, with Freekeh showing intermediate characteristics. Mature wheat exhibited higher peak and final viscosities compared to green wheat and Freekeh, indicating greater starch functionality. The optimum processing conditions for ready-to-eat Freekeh grain were also evaluated using a retorting technique in this study. Overall, early-harvest wheat and Freekeh retained higher fibre and bioactives, supporting their potential as functional food ingredients.

Keyword: *Green wheat, Freekeh, Wheat maturity, Physicochemical properties, Antioxidant properties, Morphology, Pasting properties, Processing techniques.*

Print Parameters Shape Texture and Quality in 3D Printed Chickpea Protein Dysphagia Foods

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Three-dimensional food printing (3DFP) offers a novel approach to improving the visual appeal of texture-modified foods for individuals with dysphagia. This study evaluated printing parameters to balance printing time, texture, and visual fidelity while examining consumer perceptions relevant to technology adoption. Printing evaluation showed that a 1.5 mm nozzle diameter at 900 mm/min offered a desirable balance between resolution and printing time. Rheological analysis confirmed shear-thinning behaviour and elastic dominance ,supporting extrusion and shape retention, with larger nozzle diameters reducing apparent
viscosity. Texture profile analysis indicated that prints produced with a 1.5 mm nozzle maintained cohesion within reported IDDSI Level 4 ranges, whereas larger nozzles exceeded these limits. These findings are important because individuals with dysphagia require foods with different textures depending on their swallowing capabilities, highlighting the potential of 3DFP to tailor foods to individual needs. An online consumer survey (n = 230) validated print-resolution classifications; participants preferred high-fidelity, moderately complex, food-like shapes over non-food-related shapes. Free word association revealed mixed perceptions of 3DFP products, frequently referencing artificiality and innovation. Greater familiarity with 3DFP was associated with more food-related interpretations.

Keyword: *3D food printing, Dysphagia, Rheology, Texture, Consumer Assessment*

DISCOVERY OF FOOD-RELEVANT MICROORGANISMS CAPABLE OF ACTIVE VITAMIN B12 BIOSYNTHESIS

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Vitamin B_{12} is a key micronutrient for humans, and its deficiency could be exacerbated as food systems transition toward plant-based and future foods that inherently lack B_{12}. Biofortification of B_{12} into foods via microbial fermentation with bacteria (lactic acid bacteria (LAB), bifidobacteria, propionibacteria) offers a promising solution. LAB isolates from the Singapore STCC library for their B_{12} biosynthetic potential. Pathway analysis revealed that the isolates lacked most of the B_{12} biosynthesis pathway. Sequence similarity network (SSN) analysis was therefore applied to identify strains containing BluB/CobT homologues, associated with active B_{12} synthesis, shortlisting 6 microorganisms based on risk group. Media composition analysis further revealed that half of the cultivation media lacked cobalt, an essential component in cobalamin biosynthesis. Only strains grown in cobalt-containing media were experimentally evaluated, leading to the identification of Kitasatospora setae as a novel vitamin B_{12} producer, albeit at low titers. To identify more robust producers, isolation efforts shifted towards food, targeting propionibacteria colonies from cheese, a renowned B_{12} producer. Isolates were screened for vitamin B_{12} production and biomass accumulation. Promising strains are currently undergoing physiological characterization and whole-genome sequencing, with downstream food applications to follow.

Keyword: *Vitamin B12, Isolation, Biomass*

ADVANCES IN VITAMIN B12 ANALYSIS AND B12 BIOFORTICATION OF PLANT-BASED FOODS

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Vitamin B_{12} deficiency is a key concern for populations adopting primarily plant-based diets. Fermentation using B_{12}-producing microorganisms has emerged as a promising strategy to biofortify plant-based foods and their by-products. A major limitation in current literature is the variability of analytical approaches for B_{12} quantification. Common microbiological and spectrophotometric assays, while cost-effective, may overestimate B_{12} content due to the presence of pseudo-B_{12}. In contrast, advanced instrumental methods enable more accurate quantification but require specialized expertise and instrumentation. Furthermore, differences in extraction and cyanidation efficiencies, matrix effect, and sample clean-up contribute to inconsistencies across studies. These methodological constraints complicate direct comparison of reported B_{12} levels and limit the confidence in the nutritional relevance of B_{12} biofortified products. Microorganisms such as propionibacteria, lactic acid bacteria and bifidobacteria have been shown to biofortify plant-based substrates with B_{12}. However, B_{12} production remains highly dependent on substrate composition, precursor availability and potential microbial interactions within fermentation systems. Additionally, B_{12} bioaccessibility, sensorial properties and process scalability are not well established. Overall, while fermentation-based B_{12} biofortification shows potential, improved application of standardized vitamer-specific analytical methods and critical interpretation of reported data are needed to support the development of nutritionally meaningful and scalable B_{12} biofortified plant-based food.

Keyword: *Vitamin, Fermentation, Plant-based food*

ENHANCING POLYPHENOL RECOVERY AND ANTIOXIDANT ACTIVITY FROM PILI (CANARIUM OVATUM, ENGL.) FRUIT POMACE THROUGH OPTIMIZED MICROWAVE – ASSISTED EXTRACTION

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Pili (Canarium ovatum, Engl.) fruit pomace is a polyphenol-rich waste residue from pulp oil pressing. This work utilized microwave-assisted extraction (MAE) instead of conventional extraction procedures which are generally more labor-intensive, costly and time-consuming. A response surface methodology (RSM) using a central composite design was employed and the optimal parameters were determined as follows: particle size of 0.149 mm, microwave power of 750 W, liquid to solid ratio of 76:1 (mL:g), ethanol concentration of 48 % (v/v), and extraction time of 15 minutes. Under these simultaneous conditions, the extraction yield was 63.63 ± 1.52 %, with total phenolic content of 431.39 ± 7.68 mg GAE/g, total flavonoid content of 212.82 ± 3.11 mg CE/g, total monomeric anthocyanin content of 15.42 ± 0.76 mg Cy3GE/g demonstrating strongest antioxidant activities of 375.89 ± 2.81 mg TE/g , 456.37 ± 19.20 mg TE/g, and 57.01 ± 9.20 mg TE/g, as measured by DPPH, ABTS and FRAP assays, respectively. All predictive models were highly significant ($p < 0.0001$) thereby accurately representing the relationship between independent variables and responses. These findings present an eco-friendly and sustainable approach for the recovery of bioactive compounds from pili pomace that have potential for nutraceuticals and functional food applications.

Keyword: *Canarium ovatum, response surface methodology, phenolics, antioxidant, microwave-assisted extraction*

Sustainable Upcycling of Cheese Whey via Symbiotic Fermentation for Functional Metabolite Generation

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Cheese whey is a major byproduct of the dairy industry and represents a significant environmental burden when improperly managed. Within a circular economy and waste valorization framework, this study investigated the use of a biotechnological approach to upcycle sweet whey using symbiotic cultures of bacteria and yeasts (SCOBYs) from different origins (S1 and S2). A consistent acidification was observed across all treatments (ΔpH −0.59 to −1.24), reflecting progressive metabolic activity throughout the process. Acetic acid, the main end-product, reached similar final concentrations (~10 g L^{-1}), with no significant differences among treatments. Glucuronic acid was initially detected at low levels and slightly decreased over time. In contrast, lactic acid increased significantly, particularly in S2, indicating enhanced activity of lactic acid bacteria. Ethanol production increased, reaching approximately 5–10 g L^{-1} by day 21, reflecting active yeast metabolism. Importantly, these metabolites, especially organic acids and ethanol are highly relevant for the food industry, as they can function as natural preservatives, acidulants, and flavoring agents, supporting the development of novel functional foods and value-added ingredients. Overall, fermentation with cheese whey demonstrated strong potential for circular economy-based valorization, transforming a low-value dairy byproduct into a bioactive, acidified matrix enriched with functional metabolites.

Keyword: *Mixed culture*

Upcycling of Shiitake (Lentinula edodes) Residues via Kombucha-Type Mixed Fermentation: A Sustainable Strategy to Enhance Bioactive Compounds and Antioxidant Potential

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The rapid growth in edible mushroom consumption has intensified the generation of agro-industrial residues, creating an urgent need for sustainable and value-added utilization strategies. This study proposes an innovative upcycling approach based on kombucha-type mixed fermentation to enhance the functional properties of shiitake (Lentinula edodes) mushroom residues (volva). A comparative evaluation between non-fermented (NF) and fermented (F) samples revealed a marked enhancement in bioactive compounds after fermentation. Total polyphenols (mg GAE/100 g) increased approximately twofold, while total flavonoids (mg QE/100 g) showed a fivefold increase in F samples. Moreover, antioxidant activity, assessed by ABTS and DPPH assays, exceeded 90% inhibition in F, significantly outperforming NF (<76%). These results demonstrate that mixed fermentation is a powerful and low-cost biotechnological strategy to valorize mushroom by-products, substantially improving their functional and antioxidant properties. This approach aligns with circular economy principles and offers a scalable solution for converting low-value residues into high-value functional ingredients, with strong potential for applications in food and animal nutrition systems.

Keyword: *Mixed Fermentation*

Co-Fermentation of Olive Leaves for High-Value Bioactive Production: A Sustainable Approach for Meat Analogues

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Agro-industrial by-products, such as olive leaves, pose environmental challenges but also represent valuable sources of bioactive compounds. Rich in phenolics with strong antioxidant activity, they have gained attention for their potential in producing high-value bioactive molecules through biotechnological processes. In this context, fermentation using symbiotic cultures of yeast and bacteria emerges as an efficient and sustainable strategy to improve the release, transformation, and bioavailability of these compounds, enhancing their functional properties and expanding their industrial applications. This study aimed to evaluate the fermentation of olive leaves using symbiotic cultures as an innovative strategy to enhance metabolite production and functional properties, as well as to explore its potential application in cultivated meat production. The resulting extract showed total polyphenols of approximately 4 mg GAE g^{-1} and antioxidant activity near 20% (DPPH and ABTS). Thirty bioactive compounds were identified (DI-ESI-MS), including phenolic acids and flavonoids such as p-hydroxybenzoic acid, ferulic acid, kaempferol, catechin, and myricetin. Preliminary assays indicated stimulation of cell growth. Additionally, pilot-scale tests demonstrated the successful replacement of fetal bovine serum with agro-industrial residues in cultivated meat production, improving cell proliferation and viability. These findings highlight the potential of olive residues as sustainable inputs for alternative protein systems.

Keyword: *Mixed fermentation, Sustainability, Production of metabolites*

Regulatory Effects of Ultrasonicated Polysaccharides on Fish Protein Conformation and Functional Properties

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Fish protein is an important food ingredient due to its high nutritional value and desirable functional potential; however, its application can be limited by structural instability and insufficient performance in complex food systems. This study aims to investigate how ultrasonicated polysaccharides regulate fish protein conformation, intermolecular interactions, and functional properties. β-glucan, pectin, and laminarin will be individually subjected to ultrasound treatment and then mixed with fish protein to form protein–polysaccharide systems. Changes in protein conformation, molecular interactions, and physicochemical characteristics will be evaluated using particle size, fluorescence spectroscopy, FTIR, solubility, and rheological properties. It is hypothesized that ultrasound treatment may alter the molecular structure, chain flexibility, and dispersion behavior of polysaccharides, thereby enhancing their interactions with fish protein through hydrogen bonding, electrostatic interactions, and hydrophobic interactions. These interactions may induce conformational rearrangement and modify the functional behavior of fish protein. This study will provide insights into polysaccharide-mediated regulation of protein systems and support the development of functional protein-based food ingredients.

Keyword: *Advanced food preservation and processing technologies, Texture, rheology and material properties of foods*

EFFECT OF SOLID-STATE FERMENTATION OF YELLOW PEAS ON FORMATION OF MAILLARD REACTION PRODUCTS

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Solid-state fermentation is a promising strategy to improve the nutritional quality and palatability of plant-based substrates. During this process, microbial proteases and carbohydrases hydrolyze proteins and starches, leading to elevated levels of free amino acids and mono- and disaccharides. Because the Maillard reaction is initiated by the interaction between amino and carbonyl groups, these increases in free amino acids and reducing sugars might promote Maillard reactions during fermentation. In this study, the impact of solid-state fermentation on Maillard reaction products were evaluated using three separate fermentations of yellow pea with Bacillus subtilis, Aspergillus oryzae, and Rhizopus oryzae.

After 48 hours of B. subtilis fermentation, a 3-fold increase in total free amino acids and a 26-fold increase in free essential amino acids were observed. Fungal fermentations also increased free essential amino acids, showing 6-fold and 5-fold increases after 72 hours of A. oryzae and R. oryzae fermentation, respectively. All measured free advanced glycation end-products (AGEs) (Nε-(carboxymethyl)lysine (CML), Nε-(carboxyethyl)lysine (CEL) and methylglyoxal-mediated hydroimidazolones (MG-Hs)) increased significantly during fermentation.

Overall, these findings indicate that solid-state fermentation substantially elevates free essential amino acids and free AGEs.

Keyword: *Advanced glycation end-products, Solid-state fermentation, Fermentation of peas, Fungal fermentation, Amino acids*

FROM CONSUMER IDEAL TO SWEET POTENCY DETERMINATION: SWEETNESS OPTIMIZATION OF NATURAL SWEETENERS IN A CHOCOLATE-FLAVORED TARWI (LUPINUS MUTABILIS) BEVERAGE

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The growing plant-based market has positioned Tarwi (Lupinus mutabilis) as a strategic protein source. However, its success in cocoa beverages is limited by a complex sensory profile: "beany" off-flavors and bitterness. While sucrose is the traditional masker, current global health guidelines demand sugar reduction. To achieve successful sucrose replacement, this study aimed to identify the consumer's ideal sweetness in a Tarwi-based cocoa beverage and determine the relative sweetening potency of Rebaudioside D, monk fruit, and allulose as total substitutes. First, a consumer test (n = 120) using a Just About Right (JAR) scale identified the ideal sucrose concentration. Then, sweetness perception was modeled using the Magnitude Estimation (ME) method with a selected panel (n = 12), applying Stevens' Power Law. Results indicated that 9.68% (w/w) sucrose achieved the highest consumer preference. Under these specific matrix conditions, the sweetening potency was quantified as follows: 81.2x for Rebaudioside D, 77.7x for monk fruit, and 0.67x for allulose, with R^2>0.87 for all models. To match the target sweetness, concentrations of 0.1192%, 0.1245%, and 14.44% were required, respectively. These findings demonstrate that the Tarwi-cocoa matrix modulates sweetness perception, highlighting the importance of matrix-specific sensory optimization for sugar reduction without compromising sensory acceptance.

Keyword: *Tarwi (Lupinus mutabilis), plant-based beverages, sweetness perception, sensory optimization, natural sweeteners*

Decoding the Umami Profile of Traditional Fermented Sufu: A High-Throughput Prediction Strategy Integrating Peptidomics, Machine Learning, and Virtual Screening

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Sufu, a traditional fermented soybean curd, is well known for its rich and complex flavor, particularly its intense umami taste. However, the molecular basis underlying the dynamic evolution of umami during fermentation and its relationship with sensory perception remains insufficiently understood. This study presents a high-throughput strategy to characterize umami development in sufu during ripening.

A total of 9,081 differential peptides were mapped by LC–MS/MS across the fermentation timeline, among which 637 were predicted as umami peptides using AI-based models. Their abundance and proportion increased significantly, particularly within the first 60 days, indicating a critical stage for umami formation. These peptides were mainly derived from the hydrolysis of 11 key soybean precursor proteins, reflecting dynamic proteolytic activity during fermentation. Molecular docking further characterized five novel umami peptides (DFEGDV, GRGPTVTDP, NDDRDSYNL, RVPAGTTY, and SDNFEY) in ripened sufu, which exhibited strong interactions with key receptor residues, suggesting their contribution to umami perception. Sensory validation confirmed their pronounced umami characteristics and low taste thresholds (0.22–0.38 mmol/L), which is consistent with computational predictions.

Overall, this study reveals the dynamic evolution of umami peptides in sufu, and demonstrates the effectiveness of AI-driven high-throughput screening strategies for umami peptides identification.

Keyword: *Traditional Fermentation, Umami peptides, Machine learning, Virtual screening, Molecular docking*

EVALUATION OF THE FUNCTIONAL AND PASTING PROPERTIES OF AERIAL YAM (Dioscorea bulbifera), GERMINATED BLACK TURTLE BEAN (Phaseolus vulgaris) AND TIGERNUT (Cyperus esculentus) COMPOSITE FLOURS.

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This study evaluated the functional and pasting properties of composite flour blends from aerial yam, germinated black turtle bean (GBTB), and tigernut flour (TF) blends at varying ratios 100:0:0, 90:10:0, 80:15:5, 70:20:10, 60:25:15, 50:30:20 for producing extruded snacks. Standard analytical procedures were employed to determine water absorption capacity(WAC), wettability, bulk density, swelling index, gelatinization temperature, and pasting properties. Results revealed that there was a decrease in WAC (2.66 - 2.05 g/g) and swelling index (6.27 - 3.06) with increasing substitution with GBTB and TF indicating reduced starch hydration. Bulk density ranged from 0.90 - 0 0.72g/ml, indicating an improved expansion potential at a higher substitution level. The wettability varied between 33.33 and 41.67s reflecting differences in reconstitution behaivour. The gelatinization temperature increased variedly from 80.33 - 86.33°C which suggests an enhanced thermal stability. The peak viscosity of the flour blends also declined from 136.50 - 7.00 RVU, attenuation value varied slightly across the samples. Regeneration value reduced which shows lower retrogradation. These effects were attributed to starch – protein – lipid interactions and compositional changes resulting from germination. The study demonstrates that incorporation of GBTB and TF enhances functional and pasting properties of the flours for the production of extruded snacks.

Keyword: *Aerial yam, Germinated Black Turtle Bean, Tiger nut, Functional properties, Pasting properties*

COMPARATIVE CHARACTERISATION OF ULTRASOUND-EXTRACTED PROTEINS FROM RED SEAWEED AND SUNFLOWER MEAL

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Background: Sustainable proteins from marine and terrestrial biomass are increasingly explored. However, their extraction and functionality are constrained by intrinsic matrix characteristics. Chondrus crispus (red seaweed) contains relatively low protein embedded within a polysaccharide-rich matrix, whereas sunflower oilseed meal is protein-dense but associated with fiber and phenolic compounds.

Scope and approach: This study investigates ultrasound probe-assisted extraction as a unified strategy to recover protein from Chondrus crispus and sunflower meal. In addition to extraction performance, the study is designed to compare chemical composition, protein structural characteristics, and functional properties of the extracted protein.

Key findings and conclusions: Ultrasound treatment increased protein content in both materials. For Chondrus crispus, protein content rose from 16.63% in the raw material to 53.49% after extraction, while protein recovery remained limited at 18.60%, indicating incomplete protein release and significant co-extraction of polysaccharides and minerals. In contrast, sunflower meal yielded a highly concentrated protein fraction (95.39%) with higher recovery (50.08%), approaching isolate-level purity. These results demonstrate that, although ultrasound probe is effective in enhancing protein extraction across diverse biomasses, its efficiency is strongly matrix dependent. Ongoing analyses will further elucidate how these differences influence protein structure and functionality, providing insights for tailoring biomass-specific protein ingredients.

Keyword: *Ultrasound probe extraction, Red seaweed, Oilseed meal, Protein recovery, Protein structure, Functional properties, Matrix effects*

EFFECTS OF CELL DISRUPTION ON THE BIOACCESSIBILITY OF FRACTIONATED AUXENOCHLORELLA PROTOTHECOIDES DURING IN VITRO DIGESTION

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Metabolic diseases are increasingly linked to gut microbiota imbalances, driving interest in dietary strategies that modulate microbial metabolism. Among emerging functional ingredients, microalgae are promoted as a sustainable functional food with potential gut benefits. While whole microalgal biomass has been shown to enhance short-chain fatty acid (SCFA) production, the specific contribution of distinct nutrient fractions remains unclear. This study focuses on Auxenochlorella protothecoides, a microalga approved for human consumption. We examined how cell disruption by bead milling and ultrasonication followed by fractionation, alters the bioaccessibility and potential fermentability of this microalga. Following disruption, biomass was separated into supernatant and pellet fractions, which were subjected to the INFOGEST 2.0 static in vitro digestion model.

This study quantifies the release of soluble fraction enriched in carbohydrates and proteinaceous materials relative to the insoluble pellet to determine their relevance for future colonic fermentation. By identifying how these components are released during digestion, this research provides mechanistic foundation for understanding its potential as a prebiotic substrate. These findings offer a workflow for optimizing microalgae-based functional foods and provide the necessary basis for future colonic fermentation studies.

Keyword: *Microalgae, Cell disruption, Bioaccessibility, In vitro digestion, Gut microbiota*

DEVELOPMENT AND PROXIMATE CHARACTERIZATION OF GLUTEN-FREE PASTA FORMULATED WITH ARROWROOT FLOUR AND TAIOBA RHIZOME

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The development of non-conventional pasta leverages technologies that exploit the techno-functional properties of plant matrices. In this context, Underutilized Edible Plants (UEP/PANC) emerge as a strategic alternative for the gluten-free food sector. This study aimed to formulate a tagliatelle-style pasta composed of arrowroot flour (Maranta arundinacea L.) and taioba rhizome (Xanthosoma sagittifolium), determining its proximate composition. The starch base consisted of arrowroot and taioba flours. Physicochemical analyses, performed in triplicate, evaluated moisture, ether extract, crude protein, ash, and total carbohydrates. The final product exhibited a characteristic yellow color and rheological properties analogous to conventional commercial pasta. Results revealed that the PANC-based formulation offers nutritional superiority compared to commercial gluten-free pasta, showing significantly higher levels of proteins (3.07 g/100g vs. 1.19 g/100g), lipids (4.15 g/100g vs. 0.01 g/100g), and ash (0.73 g/100g vs. 0.03 g/100g). In conclusion, the application of PANC in pasta production is a viable, low-cost alternative that promotes food biodiversity. It provides a nutritionally enhanced option for the functional and specialty food markets, particularly for individuals with celiac disease, demonstrating strong potential for sustainable food innovation.

Keyword: *Gluten, Gluten-free, Edible plants, Pastas*

EVALUATION OF THE SENSORY DIFFERENCE BETWEEN FRESH, FROZEN AND ULTRA-FROZEN JAPANESE RICE BALLS (ONIGIRI)

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In recent decades, accelerated lifestyle and the demand for convenience have driven increased consumption of ready-to-eat foods. The global market for these products is projected to increase substantially, creating opportunities for culturally differentiated items such as onigiri, a traditional Japanese rice ball valued for its convenience and perceived healthfulness. In Brazil, onigiri consumption is influenced by both Japanese immigration and the global dissemination of Asian culture, positioning the product as a competitive niche within the food sector.

Despite its popularity, cooked rice exhibits technological limitations due to starch retrogradation, which leads to rapid textural deterioration and reduced shelf life. Freezing represents a potential preservation strategy, although it may adversely affect sensory attributes. This study aims to compare the sensory acceptance of fresh and frozen onigiri, identifying the most suitable processing method to extend shelf life while maintaining sensory quality.

Keyword: *Onigiri, Sensory evaluation, Freezing methods, Rice-based foods, Quality attribute*

DEVELOPMENT AND NUTRITIONAL EVALUATION OF GLUTEN-FREE PASTA ENRICHED WITH MUSHROOM FLOUR FOR INDIVIDUALS WITH CELIAC DISEASE

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Gluten is a protein composed of the gliadin and glutenin fractions, which are responsible for the viscoelastic and structural properties of a wide range of foods, such as bread and other processed products. This protein is found in widely consumed cereals, including wheat, barley, and rye. In recent decades, there has been a substantial increase in the demand for gluten-free foods, mainly driven by the growing prevalence of celiac disease and gluten sensitivity, as well as increased consumer awareness regarding diet and nutritional quality. Despite the expansion of this market, several studies have demonstrated that gluten-free diets may present nutritional limitations, including low levels of dietary fiber, protein, vitamins, and minerals, along with high contents of refined simple carbohydrates, particularly sugars. In this context, mushrooms have emerged as promising functional foods due to their nutritional composition and potential health-promoting properties. The incorporation of mushroom flours represents a viable strategy for improving the nutritional profile of gluten-free products. Therefore, a thorough understanding of the physicochemical composition of these flours is essential to support their industrial application in the development of safe, nutritionally balanced, and technologically appropriate food products.

Keyword: *Gluten-free pasta, Mushroom flour, Celiac disease, Nutritional enrichment*

NUTRITIONAL ASPECTS AND NATURAL RADIOACTIVITY IN BRAZILIAN NUTS

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Brazilian oilseeds are widely recognized for their remarkable biodiversity and high nutritional value, positioning Brazil as one of the leading global producers of nuts and oilseeds. This study aimed to evaluate the proximate composition and the levels of natural radioactivity in these seeds. The methodology followed standardized and validated protocols established by AOAC (2010) and the Instituto Adolfo Lutz (2008) for the determination of moisture, ash, lipids, proteins, and carbohydrates, in addition to the use of gamma spectrometry for the detection of soil-derived radionuclides. The results indicate that the evaluated samples are high energy-density matrices with elevated lipid content, highlighting their importance as sources of essential fatty acids. Significant protein levels further demonstrate their value as high-quality plant-based protein sources. Regarding radioactivity, although its presence is associated with natural uptake from the soil, the nutritional benefits of these oilseeds prevail, provided that consumption is moderate, equivalent to one serving per day. The observed variability in nutritional composition reflects the influence of environmental factors and agricultural practices, reinforcing the role of these seeds as functional foods of relevance in contemporary diets.

Keyword: *Brazilian oilseeds, proximate composition, natural radioactivity, gamma spectrometry, functional foods*

EXTRACTION, NUTRITIONAL, TECHNO-FUNCTIONAL AND SAFETY ASSESSMENT OF ALTERNATIVE PROTEINS FROM WATERWEED, ELODEA NUTTALLII.

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Background and Objective

The growing demand for sustainable protein sources has stimulated interest in underutilized aquatic biomass. This study evaluates the potential of underutilized Elodea nuttallii within an integrated biorefinery process, focusing on protein extraction, functional characterization, and quality screening for potential food and feed applications.

Methods

Protein was extracted using a pH-shift method, alongside amino acid profiling to evaluate nutritional quality against FAO/WHO recommendations. For quality and contaminant screening, potentially toxic elements and iodine were quantified using ICP-MS, while antinutritional factors, specifically tannins and polyphenols, were determined by spectrophotometric methods. Additionally, techno-functional properties, including solubility and particle size, were evaluated to assess application suitability, alongside bioavailability testing to determine practical viability.

Results

Preliminary findings indicate that the protein extraction process effectively yields functional proteins with balanced amino acid profiles, while simultaneously providing critical baseline data on bioavailability, antinutritional factors, and trace minerals to objectively assess the ultimate suitability of Elodea nuttallii for food and feed applications. Ultimately, this research highlights the potential of Elodea nuttallii as a novel aquatic biomass resource within a sustainable biorefinery framework, supporting circular bioeconomy strategies.

Keyword: *Aquatic biomass, Antinutritional factors, Bioavailability*

COMPARATIVE EFFECTS OF DAIRY AND PLANT PROTEINS IN PROTEIN–ALGINATE MATRICES FOR SPRAY DRYING ENCAPSULATION

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The development of sustainable protein ingredients requires a deeper understanding of how protein source influence structure formation in food delivery systems. In protein–polysaccharide encapsulation matrices, interfacial interactions are key determinants of particle architecture and functional performance during spray drying.

This study evaluates the comparative effects of dairy and plant proteins in protein–alginate matrices for spray drying encapsulation of polyphenols. Formulations containing 2 % alginate combined with 2 % whey, soy, or lupin protein were designed to investigate how protein identity directs matrix assembly and powder functionality.

All systems exhibited high encapsulation efficiencies exceeding 97 %, demonstrating robust polyphenol retention across protein sources. However, marked differences in structural and physicochemical properties were observed. Whey protein matrices showed pronounced particle shrinkage and the highest solubility (70 %). Soy protein generated smaller particles with elevated residual moisture (approximately 8 %) and reduced solubility (47 %), while lupin protein formed larger, more spherical particles with intermediate solubility (59 %) and low moisture (approximately 2 %).

In vitro release behaviour is currently being evaluated and will be presented at the conference. These results highlight protein identity as a critical design parameter for engineering alginate-based encapsulation systems with tunable structure and functionality.

Keyword: *Spray drying, encapsulation, plant protein*

Sustainable Leaf Protein Concentrate from Cauliflower Leaves via Ultrasonication-Assisted Extraction and Sieve Filtration

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RMIT University

Plant-based protein extraction is gaining importance due to the rising demand for sustainable protein sources. Cauliflower leaves, often discarded as waste, offer a valuable nutrient-rich resource. This study investigated the combined effect of ultrasound time (0 [NS], 5 [5S] and 10 [10S] min) and sieve size (non-filtered [NF], 124 µm [F124] and 48 µm [F48]) on the recovery and structure-functional properties of cauliflower leaf protein concentrates (LPC). The combination of ultrasonication and finer sieve filtration (F48) significantly reduced the particle size of cauliflower leaf juice. LPC colour measurements showed that 10S-F48 produced a darker colour than the other LPCs. Increasing the sonication time from 0 to 10 min significantly increased yield (12.24% to 18.32%) and protein recovery (36.32% to 47.32%), but reduced protein content (59.06% to 46.95%). Finer filtration reduced protein extraction yield and recovery but increased protein content. The highest protein solubility, 32%, was observed at pH 9 for 10S-NF LPC. Thermal analysis shows denaturation peaks at 61.50-63°C. FTIR and SEM revealed sonication-induced structural changes, resulting in uniform, well-dispersed particles in the filtered samples. This research highlights how pre-treatment parameters impact the LPC properties, offering a potential avenue for scalable industrial protein production from agricultural by-products.

Keyword: *Ultrasonication, Sieve Filtration, Agricultural by-product, Cauliflower leaf, Protein extraction*

From Off-Flavour to Function: NADES-Based Engineering of Protein-Polyphenol Interactions in Pea Protein Isolates

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Plant-based protein-rich foods made from yellow peas are often unpopular due to their strong off-flavours. Natural deep eutectic solvents (NADES) mitigate these issues by extracting astringent polyphenols from ground pea particles, offering an innovative and sustainable route to cleaner taste profiles. Percolation-based extraction used ground peas (1-2 mm) and betaine-1,2-propanediol (1:4) NADES with 20% water at 55°C (flow rate 1 L h^{-1}, 5 hours). Subsequently, proteins were recovered by alkaline extraction-isoelectric precipitation and membrane filtration (5 kDa), yielding globulin-enriched (42% yield, 68% purity) and albumin-enriched (41% yield, 76% purity) isolates (N x 5.4). Compared to controls, NADES-refined proteins contained over 95% fewer polyphenols, resulting in white, neutral-tasting materials that nevertheless showed modest functional shifts, such as reduced foamability (i.e., 19% lower foam overrun, 25 °C) or surface tension stabilization (i.e., 64 versus 67 mN m^{-1}, 5000 ms, bubble pressure tensiometry) for globulins. However, functionality was tunable through selective polyphenol conjugation. For example, conjugation with 5% (w/w) gallic acid improved albumin solubility by 226%, alongside decreased particle size. This work highlights polyphenols as critical modulators of plant protein functionality and demonstrates NADES-refining as a viable strategy for next-generation plant proteins aligned with consumer preferences.

Keyword: *Natural deep eutectic solvents, Peas, Protein, Polyphenols*

Structural determination and physicochemical characterization of ultrasound-induced complexes between high-amylose corn starch and protocatechuic acid

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Starch complexation with phenolic compounds has attracted increasing attention due to the improved physicochemical and functional properties of the resulting systems. The incorporation of phenolics can modify starch digestibility and enhance its nutritional value, owing to their antioxidant, anti-inflammatory, and hypoglycemic effects. However, the mechanisms governing starch–phenolic interactions remain unclear, although gelatinization is considered a key factor facilitating complex formation. In this study, ultrasonication was evaluated as a strategy to enhance complexation compared to annealing under similar conditions. High-amylose corn starch (5% w/w) and protocatechuic acid (PCA, 5% w/w based on starch content) were dispersed in distilled water and subjected to ultrasound treatment (15 min, 3 s on/2 s off) at 70 °C, using a probe Hielscher UP400St ultrasonicator (Hielscher Ultrasonics GmbH, Teltow, Germany) coupled with a 22 mm probe. Ultrasound induced fragmentation of starch granules, followed by their agglomeration with PCA during subsequent processing steps. The presence of PCA in the complexes was confirmed by DSC, FTIR, and XRD analyses. Additionally, the treatment temperature promoted partial gelatinization, which contributed to changes in pasting and rheological properties. Overall, ultrasonication proved more effective than annealing in promoting starch–PCA complexation.

Keyword: *Starch-polyphenol complex, Ultrasound treatment, Physicochemical properties*

NADES-Based Refining of Rapeseed Proteins: Controlling Polyphenol–Protein Interactions for Improved Flavour and Functionality

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Rapeseed is a neglected protein source in human nutrition due to antinutritional factors and pungent, astringent tastes. Natural deep eutectic solvents (NADES) mitigate these issues by selectively extracting undesirable polyphenols and glucosinolates from whole, dehulled rapeseed. This study used a percolation-based extraction approach, where choline chloride-1,2-propanediol (1:3) NADES with 20% water at 55°C (flow rate 1 L h^{-1}, 7 hours) selectively removes over 80% of these phytochemicals from dehulled rapeseed with minimal protein loss (< 15%). Subsequent protein extraction via wet grinding and sequential filtration (0.45 µm, 5 kDa) yielded either a napin-rich isolate (20% yield, 95% purity) or a protein-oleosome co-extract (aqueous “milk” phase or dried concentrate; 55% yield, 46% purity) (N x 5.7). These protein-rich fractions exhibit white colour profiles and desirable neutral tastes. Yet, phytochemical removal altered functionality: rapeseed “milk” formed stable emulsions but showed 14% reduced foam overrun at 25°C compared to controls; isolates exhibited ~50% solubility loss across pH and salinity. Recombining isolates with specific polyphenols revealed conjugation-driven effects on structure and performance, revealing novel pathways to recover protein functionality. These findings highlight NADES-refining as a viable strategy towards mitigating off-flavours in plant proteins, and protein-polyphenol conjugation as a novel approach to modulate protein functionality.

Keyword: *Natural deep eutectic solvents, Rapeseed, Protein, Polyphenols, Glucosinolates*

LLM-assisted formulation design of instant rice: a knowledge-grounded approach for high-rehydration product development

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Instant rice development must balance rapid rehydration, texture, feasibility and storage stability, yet the literature lacks a structured design evidence base. Herein a six-table database of 55 sources (1996-2025) was constructed to test whether domain context alters large language model (LLM) generated formulations. Three models (GPT-5, Gemini-2.5 Pro, DeepSeek Chat) were queried with and without additional context, generating twelve formulations evaluated blindly by a 14-member expert panel. The database shows a strong focus on rapid rehydration products, with drying strategy as the primary process lever, while porosity related parameters remain under reported (8/30 records). Overall scores did not differ between conditions, but dimension level profiles diverged: unconstrained formulations favored rehydration and innovation, whereas knowledge grounded formulations improved risk control ($P<0.05$). Top ranked formulations were not directly manufacturable, highlighting a gap between theoretical evaluation and industrial feasibility. This study provides a structured design framework for LLM assisted food formulation.

Keyword: *Instant rice, formulation design, Retrieval-augmented generation, Rehydration, Large language models*

Subcritical extraction optimizes the milk thistle value chain: Balancing disproportionate economic-health gains with marginal environmental trade-offs

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The industrial development of Silybum marianum has accelerated in recent years, yet its processing chain, characterized by the long-standing sequence of mechanical oil removal followed by solvent-based silymarin extraction, has remained unchanged for years and lacks a structurally integrated sustainability evaluation framework. In this study, three common oil extraction pathways-solvent extraction (SE), mechanical pressing (PE), and subcritical butane extraction (SBE)-were treated as a system-level decision variable. A unified multi-endpoint life-cycle framework integrating carbon footprint (CF), economic value (EV), and a benefit-risk-based health performance index (HPI) was established based on experimentally derived inventories. PE achieved the lowest carbon emission, whereas SBE delivered the highest economic value and superior health performance. Under an environmentally-priority structure, PE represents the preferred pathway. In contrast, when economic return is prioritized, SBE becomes optimal. Transitioning from PE to SBE led to a moderate increase in carbon emissions (2%), accompanied by a substantial rise in economic value (151%) and a slight improvement in health performance (4%). Under expanded oil commercialization scenarios, economic gains were further amplified (176%). These findings not only provide a new perspective on enhancing profitability within the milk thistle industry, but also provide decision support for balanced technology selection in multifunctional agro-food systems.

Keyword: *Life cycle assessment, Economic-health integration, Sensitivity analysis, Sustainability assessment, Silybum marianum*

FROM BEAN TO BIOACTIVE PEPTIDES: OPTIMIZATION OF MUNG BEAN (VIGNA RADIATA L.) PROTEIN HYDROLYSATE AND EVALUATION OF SIZE-FRACTIONATED ANTIOXIDANT AND ANTI-INFLAMMATORY POTENTIAL

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Mung bean is a rich protein source with limited solubility and functionality in its native form. This study optimized mung bean protein hydrolysate (MBPH) production using response surface methodology (RSM), investigating alcalase concentration (2-7%) and hydrolysis time (2-7 h). Optimal conditions of 5.88% alcalase and 3.56 h hydrolysis time yielded a degree of hydrolysis of 33.09%, producing MBPH with 79.33 ± 0.62% protein content and molecular weight distributions of 45.57% (1.1-10 kDa) and 47.29% (<1 kDa). MBPH exhibited strong radical scavenging capacity, improved foam capacity, and enhanced solubility. Subsequently, MBPH was fractionated by ultrafiltration into <1, 1-3, 3-5, and >5 kDa fractions to evaluate antioxidant and anti-inflammatory potential. All fractions exhibited higher antioxidant activity than crude MBPH, with a size-dependent pattern observed whereby bioactivity increased with decreasing molecular weight. The <1 kDa fraction demonstrated the greatest radical scavenging capacity, recording DPPH and FRAP values of 26.12 ± 0.31 and 5.43 ± 0.24 µmol TE/g, respectively. Furthermore, this fraction exhibited the highest anti-inflammatory activity, demonstrating inhibitory effects against COX-2, LOX-2 enzymatic pathways, and protein denaturation under thermal stress. These findings highlight the potential of low-molecular-weight MBPH peptides as multifunctional bioactive constituents for incorporation into health-promoting food systems.

Keyword: *Bioactive peptides, Functional properties, Antioxidant activity, Anti-inflammatory activity, Ultrafiltration fractionation*

ENZYMATIC STABILISATION OF FIBER-ENRICHED WHEAT BREAD SYSTEMS USING CARBOHYDRATE DEGRADING ENZYMES ON STRUCTURAL INTEGRITY

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Consumer demand for high-fibre bakery products has challenged the food industry to maintain textural quality while increasing nutritional density. The objective of this research was to quantify the physico-chemical trade-offs of fibre enrichment and evaluate the efficacy of targeted enzymatic hydrolysis in mitigating gluten-matrix disruption. It was found that fibre enrichment up to 12.5% (w/w) induced a 48.7% reduction in volume and a 6.65-fold increase in crumb hardness. Experimental analysis further identified 10% (w/w) fibre enrichment level as the critical threshold for structural stability, despite an observed 53% decrease in volume compared to a control wheat bread. To restore the quality of fiber-rich bread, targeted enzymatic interventions were evaluated for their ability to re-engineer the dough microstructure. Amyloglucosidase application clearly optimised yeast kinetics and gas retention, which significantly improved crumb softness through increased fermentable sugar availability. Simultaneously, cellulase application enhanced loaf volume and reduced crumb density by the fifth day post-baking. Both enzymatic interventions successfully delayed staling over a five-day storage period, preserving springiness, resilience, and cohesiveness compared to those fiber-rich wheat breads without any enzymatic treatments. These findings establish that precise enzymatic intervention is critical to balance fibre fortification with the physical and storage quality of wheat-based systems.

Keyword: *Bread, Fiber-enriched bread, Staling, Texture, Cellulase*

DEVELOPMENT OF NOVEL GREEN ANTIFUNGAL FORMULATION AGAINST AFLATOXIN B1 PRODUCING ASPERGILLUS FLAVUS AND DECIPHERING MECHANISM OF ACTION USING MATHEMATICAL MODELING AND TRANSCRIPTOMIC APPROACHES

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Aflatoxin B_1 (AFB_1) is one of the most common and resilient mycotoxins in food commodities produced by Aspergillus flavus and A. parasiticus. AFB_1 (a Class 1 human carcinogen) contamination is often considered a global threat to food safety due to its thermal stability, and toxic effects on livestock and consumer health. The present study aims to develop a novel green antifungal formulation based on synergistic combination of trans- cinnamaldehyde (C), methyl eugenol (M), and estragole (E) through mathematical modeling. Further to boost the stability and sustained release the formulation was encapsulated inside the chitosan-based nanomaterials (Ne-CME) and characterized by Dynamic Light Scattering (DLS), Fourier Transform Infrared Spectroscopy (FTIR) and X-ray Diffraction (XRD) analysis. The nanoencapsulation significantly improved the antifungal (0.04µl/ml) and AFB_1 inhibitory (0.03µl/ml) activity of Ne-CME. The integrated biochemical and transcriptomic approaches revealed coordinated mechanism targeting ergosterol biosynthesis, antioxidant enzymes, mitochondrial membrane potential, glycolysis, TCA cycle, and gene expression involved in AFB_1 biosynthesis. The in-situ result revealed that Ne-CME protects fungal growth (85%) and AFB_1 (100%) without any significant changes in sensory and nutritional characteristic of model food system, demonstrating its potential as a promising novel green antifungal agent for food safety against A. flavus and AFB_1 mediated toxicity.

Keyword: *Aflatoxin B1, Chitosan nanoparticles, Plant-based antifungal formulation, Mathematical modeling, Transcriptomic approaches*

From Plain to Palatable: Innovation in Texture-Modified Foods for Singapore's Seniors

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Singapore's rapidly ageing population faces a growing risk of malnutrition, often due to age-related oral health decline and swallowing difficulties. Texture-modified foods (TMF) play a crucial role in supporting elderly nutrition. However, current products are often visually unappealing, bland, nutritionally inadequate, limited in variety, and lacking shelf stability, reducing both acceptance and enjoyment.

To support this effort, a trained sensory panel of elderly participants was established through a two-stage screening process, where candidates completed various tests to be screened for their sensory acuity. Finally, the panellists were selected based on a combination of their online pre-screening scores and in-person performance, with priority given to those demonstrating strong descriptive ability and minimal errors in colour vision, taste identification, and texture evaluation.

The selected panellists were trained using the International Dysphagia Diet Standardisation Initiative (IDDSI) framework. Through group discussions, participants collaboratively developed sensory lexicons for texture, appearance, flavour and other key sensory attributes. Results showed that carefully screened and trained elderly panelists can reliably contribute to descriptive sensory evaluation. Their input is instrumental in developing appealing and dignified TMF, providing a novel pathway to enhance elderly nutrition and quality of life in Singapore and beyond.

Keyword: *Elderly trained panel, Texture-modified foods, Sensory evaluation, Descriptive analysis, Dysphagia*

DEVELOPMENT OF A SCREENING FRAMEWORK FOR FUNCTIONAL EVALUATION OF CRUCIFEROUS VEGETABLE GERMPLASM

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Cruciferous vegetables are widely recognised for health-promoting properties, primarily attributed to glucosinolate-derived compounds such as isothiocyanates. However, their direct effects on metabolic endpoints, including glucose uptake, remain underexplored, particularly when assessed across diverse germplasm generated through breeding programs. Furthermore, the suitability of in vitro assay conditions for high-throughput screening of vegetable extracts has not been fully established.

This study forms part of a broader innovation-driven research framework aimed at developing a robust screening pipeline for an extensive database of cruciferous varieties. Commercial vegetables were first evaluated as baseline references to establish assay feasibility prior to expansion into a wider germplasm collection. Methanolic extracts from various commercial vegetables were assessed for their effects on glucose uptake using a C2C12 skeletal muscle cell model, while monitoring cell viability. Glucose uptake was employed as a proof-of-concept functional endpoint to validate assay applicability for large-scale screening.

While no statistically significant enhancement of glucose uptake was observed under the conditions tested, cell viability varied across different extracts and concentrations. These findings highlight critical methodological considerations, including extraction and assay optimization, necessary to define standardized, non-cytotoxic extract concentrations. Such optimization supports the development of a scalable screening pipeline for prioritizing cruciferous germplasm with potential metabolic functionality.

Keyword: *glucose uptake, cruciferous vegetables, germplasm, screening, functional food*

THREE-DIMENSIONAL PRINTED SWEET POTATO TEETHING SNACKS: TUNING TEXTURE WITH HYDROXYPROPYL METHYLCELLULOSE

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Infants transitioning to complementary feeding require safe, dissolvable, self-feeding snacks that are rarely commercially available, particularly in resource-limited settings. Three-dimensional food printing (3DFP) offers a promising route to engineer appropriate snack geometry and texture, yet formulation guidance remains constrained by limited access to advanced rheological instrumentation. This study presents a practical, post-print workflow for designing infant teething snacks using accessible bench-level tests. A sweet potato-based ink with food-grade hydroxypropyl methylcellulose (HPMC; 0.0–2.0% w/w) and chamomile extract was extruded into soft ring-shaped structures. Printability was assessed through layer definition, microstructure via scanning electron and optical microscopy, and water management through syneresis monitoring. Oral performance was evaluated by dissolution profiling and softening behavior in artificial saliva. Increasing HPMC improved print stability and reduced syneresis; however, 2.0% formulations resisted adequate softening within acceptable timeframes. Formulations at 1.5–2.0% HPMC achieved the most favorable balance, maintaining geometric integrity during handling while reaching a finger-pressure-collapsible texture within 8–10 minutes of saliva exposure, consistent with safe oral processing for pre-dentition infants. This work demonstrates that targeted post-print characterization can effectively guide 3DFP ink formulation for developmentally appropriate infant snacks without specialized rheometry.

Keyword: *Three-dimensional food printing, Hydroxypropyl methylcellulose, Texture modification, Printability*

AGRO-INDUSTRIAL VALORISATION OF PEANUT SKIN AND MOROMI ON PLEUROTUS OSTERATUS MYCELIAL COLONISATION

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Peanuts and soybeans are among the most widely consumed legumes globally, with annual production exceeding 46 and 353 million tonnes, respectively. They are processed into diverse food products and generate substantial agro-industrial by-products, which are discarded or used as animal feed. Two such underutilised by-products, peanut skin (PS) and moromi (MM; soy sauce press cake) are nutritious resources, with MM receiving limited research due to its high residual salt content. Valorising these by-products through solid-state fermentation using Pleurotus ostreatus offers a promising and sustainable strategy towards sustainable food production. This study evaluated four PS:MM substrate ratios (100% PS, 70:30, 60:40, 50:50) supplemented with gypsum (0%, 1%, 2%, 3%) to optimise P. ostreatus colonisation. Mycelial colonisation kinetics, Bradford protein, and phenolic content were significantly influenced by substrate ratio, gypsum concentration and their interaction ($p < 0.001$), with substrate ratio identified as the primary driver of colonisation performance. A higher MM ratio (50:50) yielded significantly greater Bradford protein and phenolic content, highlighting its potential as a value-added ingredient. These findings demonstrate an effective valorisation of low-value by-products into nutrient-rich substrate through P. ostreatus fermentation, laying a promising groundwork for mushroom production, contributing to zero-waste and circular economy principles in sustainable food systems.

Keyword: *Solid-state fermentation, Pleurotus ostreatus, Peanut skin, Moromi, Waste valorisation*

EVALUATING SPENT TEA AND PEANUT SKIN BLENDS AS SUSTAINABLE SUBSTRATES FOR PEARL OYSTER MUSHROOM PRODUCTION

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Rising cost and constrained availability of sawdust-based substrates have increased interest in alternative materials for mushroom cultivation. In Singapore, limited agricultural residues and land constraints motivate valorisation of post-processing by-products. Spent tea (ST) and peanut skins (PS) are lignocellulosic by-products with potential as alternative substrate. This study evaluated the feasibility of using ST with PS as an alternative substrate for Pleurotus ostreatus. Substrate comprising 50–100% ST with 10–50% PS were investigated, alongside 100% ST and 100% PS treatments. Performance was evaluated by harvest period, fresh yield, biological efficiency (BE), and morphology. Mushrooms cultivated on 100% ST achieved highest fresh weight, driven by thicker stems, while cap size did not differ significantly across treatments. PS inclusion ≥50% significantly reduced fresh yield without extending harvest period. This decline in yield was reflected in BE where 100% PS recorded to be the lowest. Overall, ST with low-to-moderate PS is a feasible substrate for P. ostreatus, with best performance at low PS inclusion and clear yield penalties at ≥50% PS. Although these substrates outperformed the non-supplemented sawdust substrate, they did not match the productivity of the supplemented substrate. This indicates that further optimisation is needed to achieve commercial equivalence.

Keyword: *Mushroom, Spent Tea, Peanut Skin, Waste Valorisation*

DECODING INTERFACIAL DYNAMICS IN PROTEIN-PHOSPHOLIPID SYSTEMS ACROSS TIME AND TEMPERATURE

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Phospholipids (PLs) and proteins such as β-lactoglobulin (β-LG) are key natural emulsifiers in food and pharmaceutical systems. When used together, their interfacial interactions depend strongly on the PL's molecular structure and on processing conditions, leading to either co-adsorption or competitive displacement. Most studies focus on long-time interfacial behaviour, while in practice droplet formation and early stabilisation occur within milliseconds. Bridging these regimes is therefore essential to fully understand emulsion stability across time and processing (e.g. temperature variations).

Here, β-LG was combined with saturated (PC 18:0) or unsaturated (PC 18:1) phosphatidylcholines. Interfacial rheology, ζ-potential, SAXS, μDSC, and CLSM were complemented by microfluidic droplet coalescence experiments probing sub-second adsorption and stabilisation across 20-90 °C.

At short timescales, combining β-LG with PLs enhanced droplet stability compared to single components, revealing a pronounced synergistic effect, especially at elevated temperatures. Below 75°C, saturated PC 18:0 promoted partial unfolding and co-assembly of β-LG, forming cohesive viscoelastic films and improving long-term emulsion stability. In contrast, unsaturated PC 18:1 displaced β-LG, yielding less elastic interfaces and reduced emulsion stability. At higher temperatures (≥ 75°C), interfacial multilayer formation occurred irrespective of PL type, although β-LG retained more structure in the presence of the saturated PC 18:0.

Keyword: *Emulsion Stability, Mixed Interfaces, Phase transition, Displacement, Competitive Adsorption*

Improved Storage Stability and Long-Term Viability of Leuconostoc mesenteroides via Starch-Based W1/O/W2 Double Emulsions

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Ensuring the stability and viability of lactic acid bacteria in double emulsion systems remains challenging, particularly under freeze–thaw and storage conditions. This study investigated the effects of a starch-based internal aqueous phase (W1) on the physical stability, freeze–thaw resistance, and storage stability of W1/O/W2 double emulsions encapsulating Leuconostoc mesenteroides. For freeze–thaw evaluation, samples were initially frozen at −50 °C for 24 h and subsequently stored at −18 °C to simulate frozen food storage conditions. Emulsions were prepared with varying starch content in W1 (0% and 3%) and different concentrations of pectin (0.1% and 0.3%) and whey protein isolate (WPI; 0.5% and 1.0%) in the external phase (W2). Starch addition increased internal phase viscosity, contributing to improved droplet stability and reduced coalescence. Particle size analysis showed smaller and more uniform droplets in starch-containing systems, while increasing pectin and WPI concentrations enhanced zeta potential values, indicating improved interfacial stabilization. Starch incorporation significantly improved encapsulation efficiency (up to 83.5%) and preserved bacterial viability during storage and freeze–thaw treatment, retaining approximately 1 log higher cell counts than the control after freezing. These findings suggest that starch-structured double emulsions could serve as effective protective systems for probiotic cultures in frozen and refrigerated fermented food applications.

Keyword: *W/O/W double emulsion, Leuconostoc mesenteroides, Encapsulation, Freeze–thaw stability, lactic acid bacteria viability*

Syneresis and color change of egg white solidified by high hydrostatic pressure

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High hydrostatic pressure (HHP) treatment induces egg solidification due to protein denaturation. HHP-solidified egg white as a food material has not been studied sufficiently since its first report in 1914. In this study, egg white was subjected to a HHP treatment at 600 MPa, and properties of HHP-solidified egg white were investigated. Egg white in a dialysis tube was placed in 0 – 10 % NaCl solution and stored at 5 °C prior to HHP or heat (conventional boiling) treatment. The treated samples were stored at 5 °C and subjected to quantitative evaluations: weight, shape (height, projected area, and volume), and color. During storage, HHP-treated egg white exhibited liquid release accompanied by substantial reductions in weight and volume, and the syneresis intensified with increasing NaCl concentration. By comparison, heat-treated samples remained stable with no visible syneresis during refrigerated storage. Color of fresh egg white changed during refrigerated storage for 4 h depending on NaCl concentration. Color changes of HHP-treated samples, which was affected by NaCl concentration, were much pronounced than those of heat-treated samples.

Keyword: *high hydrostic pressure, egg white, syneresis, color, salt*

SEPARATION AND IDENTIFICATION OF MAJOR PROTEINS IN CAMEL MILK

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Characterizing the protein composition of camel milk is critical for understanding its functional and nutritional properties. However, simultaneous determination of major proteins in camel milk using chromatographic techniques remains a challenge, particularly since camel protein standards are not yet commercially accessible. In this work, an effective strategy for camel milk protein separation and identification was proposed. Reversed-phase high-performance liquid chromatography (RP-HPLC) in combination with a fraction collector was used to separate and collect 11 primary peak fractions. Each fraction was subsequently reanalyzed by RP-HPLC to validate the presence of the target peak, demonstrating the optimized gradient elution provided effective separation of the protein fractions. In addition, sodium dodecyl sulfate–polyacrylamide gel electrophoresis (SDS-PAGE) and mass spectrometry-based proteomic analysis were applied to identify the lyophilized protein fractions. Six key camel milk proteins, including alpha$_{s1}$-casein, alpha$_{s2}$-casein, beta-casein, alpha-lactalbumin, lactoferrin, and serum albumin, were successfully identified by proteomic profiling, and the findings were consistent with SDS-PAGE. This study establishes an analytical approach for camel milk protein identification and provides a foundation for further mechanistic investigations of protein behaviour and functionality.

Keyword: *Camel milk, Proteins, Separation, Identification, Proteomics*

Effect of Maillard reaction and liquid smoking on the aroma of Tenebrio molitor and Protaetia brevitarsis seulensis larvae

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Edible insects are gaining attention as sustainable alternative food sources; however, unfavorable aroma, low consumer acceptance, and potential allergenicity remain major barriers to their broader use. This study aimed to improve the aroma quality of Tenebrio molitor (T) and Protaetia brevitarsis seulensis (P) larvae through Maillard reaction (MR) and liquid smoking (LS), followed by defatting. Volatile changes were analyzed using an electronic nose (E-nose), revealing increased levels of key aroma compounds, including pyrazines and sulfur-containing compounds. A consumer test (n = 75) showed that defatting combined with MR showed the highest preference for T, while defatting combined with LS was most preferred for P. Aroma stability was monitored over five months using the E-nose, demonstrating that combined treatments (defatting + MR/LS) resulted in improved stability compared to defatting alone. Machine learning models were further applied to predict consumer acceptance based on volatile and sensory data, with XGBoost showing the best performance (R^2 = 0.80). These findings suggest that defatting-assisted Maillard reaction (MR) and liquid smoking (LS) can effectively enhance aroma quality and consumer acceptance of edible insect powders, while data-driven approaches offer promising tools for predicting sensory characteristics.

Keyword: *Edible insects, Flavor, Aroma shelf-life, Sensory evaluation, Machine learning*

EFFECT OF AUXENOCHLORELLA PROTOTHECOIDES INCORPORATION ON COOKING BEHAVIOUR, TEXTURE, AND COLOUR OF WHEAT NOODLES

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Global demand is shifting toward sustainable protein sources, and microalgal biomass represents a promising ingredient for food fortification due to its high protein content and favourable nutritional profile. Wheat noodles are an attractive staple matrix for protein enrichment; however, incorporation of microalgae may compromise gluten functionality because rigid cell walls and heterogeneous biomolecular constituents can interfere with disulfide-mediated gluten network formation. This study investigated the effects of physically treated Auxenochlorella protothecoides incorporated into wheat noodles at 6–15% (flour basis). Cooking performance, colour, and textural properties were evaluated against a control without microalgal biomass. Increasing biomass inclusion from 6% (AP-B6) to 15% (AP-B15) progressively increased noodle hardness and springiness, while cohesiveness, gumminess, and chewiness remained comparable to the control. Cooking loss increased with biomass level but remained within acceptable limits (<7%), whereas water uptake decreased. Microalgae-enriched noodles maintained stable textural performance under extended cooking (4–5 min). AP-B15 exhibited the highest chroma and lowest hue angle, corresponding to an orange-yellow appearance. Overall, AP-B15 showed quality attributes comparable to the control. These findings demonstrate the potential of microalgae-enriched noodles as protein-fortified staple foods with acceptable technological quality, supporting sustainable protein diversification and development of value-added cereal products.

Keyword: *Microalgae, Auxenochlorella protothecoides, Noodle, wheat-based cereal food*

ACCELERATED PROCESSING OF BLACK GARLIC AND A NEWLY DEVELOPED “GOLDEN GARLIC”: EFFECTS ON BIOACTIVE COMPOUNDS, VOLATILE PROFILES, SENSORY PROPERTIES, AND CONSUMER ACCEPTANCE IN FOOD APPLICATIONS

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Black garlic is heat-treated for more than one month, making it time-consuming. This research aimed to shorten processing time while maintaining high S-allylcysteine (SAC) and to evaluate aroma and sensory properties for food applications. Fresh garlic was pretreated by $CaCl_2$ soaking followed by freezing, then incubated in a 2^2 factorial design at 60 and 80 °C with 65 and 80% RH. Incubation at 80 °C and 80% RH produced black garlic with high SAC content (874.26 mg/100 g), fivefold higher 5-hydroxymethylfurfural content than commercial products (50.03 vs 9.85 mg/100 g), and strong antioxidant activity, reducing processing time to one week. The highest SAC content (1772 mg/100 g) was obtained at 60 °C and 65% RH, resulting in a newly developed golden garlic. Volatile compounds were analyzed using SPME-GC–MS, identifying 26, 20, and 32 compounds in raw, golden, and black garlic, with sulfur-containing compounds predominant. Thermal processing generated Maillard reaction products contributing to sweet, fruity, and roasted aromas. Application in garlic rice showed that golden and black garlic had milder aroma profiles, with consumer acceptance exceeding 85%. These findings demonstrate that accelerated processing of black and golden garlic enhances functional properties and active compound content, supporting consumer acceptance in food applications.

Keyword: *Black garlic, Golden garlic, S-allylcysteine, Volatile compounds, Sensory acceptance*

Fungal Fermentation of Blueberry Bagasse: Effects of Solid-State and Submerged Processes on Phenolic Recovery and Bioactivity

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Blueberry bagasse was subjected to solid-state (SSF) and submerged fermentation (SmF) to optimize phenolic recovery and bioactivity. Using Aspergillus niger and Rhizopus oryzae over 60 h, four extraction systems (SmF filtrate, aqueous buffer, methanol, and mixtures) were screened to monitor phenolic kinetics and antioxidant capacity. Based on peak yields, 24-h SSF methanolic extracts were selected for detailed phenolic profiling and assessment of intracellular reactive oxygen species (ROS), nitric oxide (NO), and cytokine responses. Results showed that SSF significantly outperformed SmF, with 24-h methanolic extraction maximizing the recovery of phenolic acids and flavan-3-ols while preserving key anthocyanins. These enriched extracts markedly reduced intracellular ROS and NO levels. Furthermore, cytokine responses were strain-dependent, indicating a tailored immunomodulatory effect rather than a generalized pro-inflammatory reaction. Overall, the integration of SSF and targeted methanolic extraction emerges as an effective circular strategy to modulate the phenolic fingerprint and enhance the biological activity of blueberry bagasse, transforming agro-industrial waste into high-value functional ingredients.

Keyword: *blueberry bagasse, solid-state fermentation, submerged fermentation, phenolic compounds*

MASLINIC ACID PROMOTES HAIR GROWTH AND MODULATES PIGMENTATION THROUGH ASSOCIATED SIGNALING PATHWAYS ACROSS IN VIVO, 2D, AND 3D MODELS

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Maslinic acid, a pentacyclic triterpene derived from olive extracts, has emerged as a multifunctional regulator of hair biology. This study investigated its effects on hair growth and the underlying molecular mechanisms using in vivo and in vitro (2D) models. Topical application of maslinic acid in mice produced hair growth comparable to minoxidil, characterized by accelerated induction of the anagen phase. At the molecular level, treatment increased protein expression of β-catenin and VEGF and upregulated key trichogenic genes CTNNB1, ALPL, and FGF1. Correspondingly, signaling pathways central to hair follicle development, including Wnt/β-catenin and angiogenesis, were significantly activated.

Hair growth and pigmentation are closely coordinated processes within the hair follicle, particularly during anagen when melanogenesis is coupled to follicular regeneration. Building on the signaling responses observed in 2D systems, the analysis was extended to a 3D melanogenic model using B16F10 cells to better capture pigment-related cellular behavior in a structured microenvironment. The 3D system recapitulated key molecular trends identified in 2D conditions and revealed modulation of pigmentation-associated activity.

Collectively, these findings demonstrate that maslinic acid co-regulates hair growth and melanogenesis via overlapping signaling pathways. The results highlight the effect of maslinic acid follicular regeneration and pigment modulation.

Keyword: *Maslinic acid, Pentacyclic triterpene, Olive, Hair growth, Melanogenesis*

EFFECT OF A WHEY PROTEIN NUTRITIONAL COMBINATION ON MUSCLE RECOVERY

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This study investigates the effect of a whey protein nutritional combination on muscle recovery in dexamethasone-induced muscle atrophy. This combination consists of whey protein concentrate, milk minerals, glucosamine, and chondroitin. Forty male C57BL/6 mice were randomly divided into control, model, and low-, medium-, and high-dose groups. The behavioral experiments showed that grip strength and rotarod endurance were significantly increased ($p < 0.001$) in all intervention groups. The results of hematoxylin-eosin staining revealed that the cross-sectional area of gastrocnemius muscle fibers was increased ($p < 0.001$) in all intervention groups. The quantitative PCR results indicated that all doses downregulated the ubiquitin ligases muscle RING-finger protein 1 and muscle atrophy F-box. The low dose upregulated the expression of AKT, myogenic differentiation 1, and myogenin. The medium dose upregulated AKT and myogenin, and the high dose upregulated myogenic differentiation 1 and myogenin. In turn, this combination attenuated muscle atrophy through coordinated anti-catabolic effects and targeted activation of myogenic pathways. This study provides insights into the application of functional products for muscle recovery.

Keyword: *Whey protein; Dexamethasone-induced; Nutrition; Muscle recovery; Anti-catabolic*

DATA-DRIVEN DOUGH MATURATION CONTROL, FOR TRADITIONAL FRIED SNACKS UNDER WHEAT FLOUR VARIABILITY: A CASE STUDY AT SAEHAN GRAIN

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Variability in the protein and ash content of wheat flours leads to inconsistencies in dough processing and final product quality in traditional fried snack manufacturing. This study developed a data-driven control framework for Saehan Grain to stabilize batter maturation. Analysis of the general components characteristics of six types of commercially available wheat flour showed crude protein content is an unreliable predictor of functional gluten, often overestimating dry gluten in high-protein flours. Each processing stage was evaluated using gelatinization, thermal, and texture analyses. Significant differences emerged between flour types: some exhibited delayed gelatinization, while others showed rapid structural formation. Notably, setback viscosity demonstrated a strong correlation (r=0.93) with retrogradation enthalpy, proving it a useful metric for predicting structural reorganization during dough maturation. At the pre-frying stage, dough hardness varied between 8.1 and 10.6 N. Based on these findings, a data-driven prediction and mixing recommendation model was constructed. With an accuracy exceeding 90%, this model optimizes ripening times and mixing ratios for Saehan Grain's product line, ensuring consistent quality despite raw material variability. This framework provides a systematic approach to managing flour inconsistencies, enhancing the stability of the traditional fried snack production process through precise, data-backed adjustments.

Keyword: *wheat flour, dough maturation, gelatinization, data-driven prediction, fried snack production*

Non-Destructive Assessment of Wine Grape Maturity Using an Overall Quality Index (OQI) and Visible–Near-Infrared Spectroscopy

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Wine Grape quality underpins wine production and is governed by primary (sugars, organic acids) and secondary metabolites (phenolics). Conventional analytical methods are time-consuming, costly, and destructive, necessitating rapid and nondestructive alternatives. This study investigated Ugni Blanc grapes from veraison to harvest, measuring seven key quality attributes. An Overall Quality Index (OQI) was constructed using min–max normalization and factor analysis to integrate multiple indicators into a single metric. Visible–near infrared (Vis/NIR) spectra were preprocessed using detrending, first derivative (FD), multiplicative scatter correction (MSC), Savitzky-Golay (SG) smoothing, standard normal variate, and normalization. Prediction models for both individual traits and OQI were developed. Feature wavelengths were selected using CARS, SPA, and UVE to reduce redundancy, and models were built using partial least squares (PLS), support vector regression (SVR), and convolutional neural networks (CNN). Results showed that preprocessing and feature selection significantly improved performance, with the FD-CARS-SVR model achieving the best results (R_p^2=0.899, RPD=3.153). The findings demonstrate that integrating OQI with Vis/NIR spectroscopy enables efficient and nondestructive evaluation of grape quality.

Keyword: *Wine grape quality, Vis/NIR spectroscopy, Chemometric modeling, Non-destructive assessment, OQI*

RESISTANT STARCH TYPE 5, GUT MICROBIOTA, AND METABOLIC-ASSOCIATED LIVER DISEASE

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Metabolic-associated fatty liver disease (MAFLD) has emerged as a global health concern, affecting 38 % of the population, yet specific therapeutic strategies remain lacking. As starch is a primary energy source, slowly digestible starch and resistant starch (RS) are linked to stable postprandial glycemic responses and support a healthy gut, offering benefits in preventing and managing chronic diseases such as MAFLD, obesity, and diabetes. However, most of the staple foods in the market are associated with a high amount of rapidly digestible starch while a minimum amount of RS, that adversely affects health. Therefore, a current challenge faced by the food industry is to develop starch-based foods with high amount of RS. To address this issue, various strategies to increase the RS content in starch-based foods, the structural characteristics of different RSs, and how they interact with gut microbiota to improve human health will be discussed, with a focus on the RS type 5 (RS5) and MAFLD. The information summarized will help future clinical research on the RS5 as a potential scalable, food-based alternative therapy for MAFLD and related metabolic disorders.

Keyword: *Resistant starch, Gut microbiota, Metabolic-associated fatty liver disease*

HOW FOAMING AFFECTS THE FREEZE DRYING BEHAVIOUR OF MUSSEL PUREE

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Foaming is a quite popular approach to reduce the drying time of many commodities, especially during freeze drying. Though the drying time of the process is reduced by the higher porosity of the foamed samples, the overall product throughput is often ignored and not widely reported. The present study investigates the drying of mussel puree with and without foaming. To compare throughput and equivalent drying time, the puree is evaluated at the same weight and thickness when frozen as a layer for freeze drying. The study revealed that the foaming approach reduces the throughput by 50% compared to the non-foamed puree. The freeze-dried puree structure was elucidated using micro-CT imaging. The porosity, pore network, and available effective surface area for drying of the foamed and non-foamed puree were compared by evaluating the internal structure of the freeze-dried puree. Analysis suggests that while foaming reduces the tortuosity of vapour flow in freeze-dried cake, it also reduces the effective available cross-sectional area for sublimation. Overall, the study suggests that the foaming approach may reduce the drying time for a sample, but the throughput is compromised.

Keyword: *Freeze Drying, Foaming, Porosity*

FROM INDIGENOUS FARMS TO FUNCTIONAL FLOURS: EFFECTS OF PRETREATMENT ON THERMAL AND PASTING PROPERTIES OF PHILIPPINE PURPLE YAM (Dioscorea alata)

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Purple yam (Dioscorea alata) flours from indigenous Philippine varieties have potential as functional food ingredients due to their starch properties. This study evaluated the thermal and pasting behavior of selected varieties and the effect of sodium metabisulfite (Mb) pretreatment. Four varieties, Kinampay (KPY), Pakpak Lawin (PL), Barak (VU-2), and Ulo ng Unggoy (UNU), were processed into flours with and without 200 mg/L Mb pretreatment. Thermal properties were analyzed by differential scanning calorimetry, while pasting properties were measured using a Rapid Visco Analyzer. Gelatinization temperatures (To: 74.70-79.00°C; Tp: 96.55-99.65°C; Tc: 128.55-132.80°C) and enthalpy (1.02-1.10 J/mg) were not significantly affected by Mb ($p>0.05$), indicating preserved thermal stability. In contrast, Mb significantly influenced pasting behavior ($p<0.05$), generally reducing pasting temperature while increasing peak, trough, and final viscosities. Increased setback viscosity indicates enhanced gel formation and retrogradation, which may benefit applications requiring firm textures but could affect storage stability. These effects were more pronounced in PL and VU-2, indicating improved swelling, viscosity development, and paste stability. These findings suggest that Mb pretreatment improves pasting functionality without altering thermal properties, with PL and VU-2 showing strong potential for high-viscosity food applications.

Keyword: *purple yam flour, thermal properties, pasting properties, sodium metabisulfite, starch functionality*

Impact of Salivary α-Amylase, Botanical Origin, and Retrogradation in Starch Gel Breakdown during Oral Simulation

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Oral processing is the initial stage of digestion, where mastication and saliva modify food structure and initiate starch hydrolysis. Salivary α-amylase (SAA) influences both texture and digestibility. However, limited attention has addressed the combined effects of mechanical deformation and SAA, particularly focused on starch structure during mastication. This study investigated how these factors influence the texture and digestibility of starch gels from different botanical sources and storage times. Oral simulation was performed using a TA-XTPlus Texture Analyzer under TPA conditions, with 26 compression cycles. Pea and potato starch gels were evaluated at 0, 24, and 48 hours, with and without saliva. Mechanical behavior was described using Peleg's equation, while microstructure, amylose content (AM), and resistant and digestible starch fractions were characterized. Pea starch gels with higher AM (~57%) and resistant starch exhibited greater initial hardness and lower deformation rates, indicating a more rigid, less elastic structure than potato gels (~43%AM), and less susceptible to SAA. Microstructural analysis revealed that pea gels formed dense networks, whereas potato gels exhibited a fragmented structure, which accounted for their greater enzymatic susceptibility. This study enhances the understanding of starch digestion in the oral phase by bridging mechanical and enzymatic dynamics in a food-relevant context.

Keyword: *Oral simulation, Salivary α-amylase, Starch gel microstructure*

EVALUATING CULTIVAR SPECIFIC BIOPROTECTIVE RESPONSES OF PEF ENHANCED CARROT PURÉES AGAINST OXIDATIVE STRESS USING A HUMAN CELL LINE MODEL

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The development of functional food systems requires rigorous validation of biological activities through integrated food science and nutritional models. This study examines the bioprotective capacity of carrot purées derived from five distinct cultivars processed with pulsed electric fields (PEF) using a human Caco-2 intestinal cell model. Cells were subjected to hydrogen peroxide to simulate oxidative damage, followed by treatment with carrot digests. Results showed that high-energy PEF at 303 kJ/kg significantly increased total carotenoids in Purple Haze and Nutri Red cultivars, reaching 83.71 and 31.47 µg/g respectively. These specific treatments completely increased cellular resistance by recovering viability and suppressing inflammatory nitric oxide production. Similarly, an improvement in bioprotective performance was observed for cells exposed to low-carotenoid Yellow Solar cultivar following PEF pre-treatment. Statistical analysis confirmed that cellular protection is directly correlated to these cultivar-specific increases in bioactive concentrations. These findings indicate that physiological benefits are influenced by both plant genetics and processing history. Specifically, PEF modulates food matrix to enhance the bioaccessibility of membrane bound lipid-soluble bioactives, facilitating more efficient cellular uptake and protection in a cultivar-dependent manner. This evidence supports integrating advanced food technology with biotechnology to create functional products capable of promoting gut health and mitigating oxidative damage.

Keyword: *Carotenoid bioaccessibility, Oxidative stress mitigation, Caco-2 cell model, Cultivar specific food processing, Pulsed electric fields*

EXTRUSION PROCESSING OF DIRECT-EXPANDED SNACKS FROM PROTEIN RICH BEAN STARCH ENRICHED WITH DRUM-DRIED MANGO PULP

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Direct-expanded snacks were developed from bean starch (18% protein) blended with drum-dried mango pulp powder, aiming to valorize plant-based ingredients. Formulations containing 8% and 16% mango pulp were processed in a twin-screw extruder at two feed rates (2800 and 3000 kg/h). Afterwards, moisture content, water activity (Aw), apparent density, and colorimetric profile (L*, a*, b*, chroma, hue, and ΔE) were evaluated. The addition of mango pulp influenced both physicochemical and color properties of the extrudates. Final products exhibited moisture values between 7.66% and 8.81% and Aw ranged from 0.57 to 0.64, which indicates appropriate shelf stability for the first formulation. Apparent density decreased with a higher mango pulp content, suggesting enhanced expansion. Color analysis revealed a significant shift decrease in lightness (L) and an increase in yellowness (b*) at 16% incorporation, resulting in more intense and appealing hues. Total color difference values (ΔE > 5) confirmed that extrusion and formulation significantly altered product appearance compared to the raw blends. The combination of rich protein bean starch and mango pulp caused desirable changes in the expansion behavior and color development, demonstrating a strong potential for the production of novel and visually attractive expanded snacks.

Keyword: *Drum-drying, Pulp powder, Plant-based ingredients, Twin-screw extruder*

STEAM AGGLOMERATION OF BEAN PROTEIN FLOUR ENRICHED WITH FREEZE-DRIED MANGO POWDER

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Powdered blends based on bean protein flour (BPF) (36% protein), enriched with freeze-dried mango powder (FDMP), were subjected to steam agglomeration to improve their technological and reconstitution properties. Three formulations with specific proportions of BPF:FDMP: F1 (75:25), F2 (50:50), and F3 (25:75) were evaluated regarding composition, particle size (D_{50}), wettability, water absorption index (WAI), solubility, water activity (Aw), color, and total carotenoids. Protein contents were 23.59%, 14.39%, and 7.23% considering F1, F2, and F3, respectively. The agglomeration process increased D_{50} up to 297.65 μm, resulting in higher solubility (61.56-76.02%) and reduced WAI (0.98-1.29%), suggesting lower water retention by the matrix and facilitating reconstitution in aqueous media. This result demonstrates improved wettability, as indicated by the reduction in wetting time (59–95%). Moisture remained < 4%, and Aw < 0.35, indicating microbiological stability. A decrease in lightness (L) and an increase in yellowness (b*) were observed, associated with the mango carotenoid content (3.90–8.86 mg/100 g), contributing to the intensification of yellow–orange hues and improved visual appeal. The combination of BPF and FDMP resulted in protein-rich ingredients with enhanced instant properties and a suitable nutritional profile, demonstrating their potential for application in food formulations, especially plant-based ones.

Keyword: *Agglomeration*, *Total carotenoids*, *Plant-based ingredients*, *Instant properties*

A roadmap to techno-functionality prediction

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Predicting techno-functional properties of food hydrocolloids, such as emulsification, foaming, and gelling, remains a major bottleneck in food structure design. While advanced modelling approaches exist, their performance is fundamentally constrained by the quality and quantity of available data. In practice, datasets are often fragmented, non-standardised, and inaccessible, limiting reproducibility and hindering the development of robust predictive tools.

This work presents a dual strategy to overcome these limitations by advancing both data quality and modelling approaches. On the data side, we highlight the role of COST Action INFOTECH-DATA, which aims to harmonise measurement protocols, define standardised metadata, and establish open-access databases for techno-functionality data. This initiative aims to enable consistent, high-quality data generation across laboratories and accelerate community-wide progress.

On the modelling side, we introduce a hybrid framework based on physics-encoded neural networks (PeNNs), designed to operate effectively under data-scarce conditions. Using oil-in-water emulsions as a case study, we demonstrate that embedding physical models into neural networks significantly improves predictive performance. Compared to standard neural networks, PeNNs reduce prediction errors by orders of magnitude while requiring 5–10× less data.

Together, harmonised data infrastructures and physics-informed AI pave the way toward predictive, interpretable, and efficient food formulation.

Keyword: *Techno-functionality prediction, Neural networks, Food Structure, Food Data Science, Hybrid modelling*

BREAKING BELOW 55 - HOW ALTERNATIVE PROTEIN SOURCES RESHAPE THE GLYCAEMIC INDEX OF DRY WAFERS

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Standard dry wafers are high-glycaemic products (GI≥75) because their starch fraction is rapidly digestible. This study compared pea flour/pea protein isolate, spirulina, and cricket flour for reducing the estimated glycaemic index (GI) of dry wafers based on wheat, spelled, and ancient wheat flours. Batters were prepared using wheat T550 and spelled flour, with pea flour (5–15%) and pea protein isolate (5–15%) substituted, spirulina (3–5%), or cricket flour (1.5–2.0 g/100 g). Additional cricket-enriched wafers with emmer and einkorn were produced at 5–30% substitution to evaluate GI changes at higher inclusion levels. GI was estimated using Aliant software; sensory quality was assessed using a 5-point hedonic scale (n=60). Pea flour combined with pea protein isolate produced the greatest GI reduction (38–46) and best acceptance. Spirulina reduced GI moderately (52–58), but algal taste and color limited acceptance. Cricket flour caused minor GI reduction at low levels (62–65); higher substitution decreased GI dose-dependently, especially in emmer and einkorn wafers; acceptance declined above 10%. Pea-based enrichment was optimal.

This study was carried out as part of the project VIVAFER - High-fiber and high-protein innovative dry wafer – NUTRITECH.1003V/22, funded by the National Center for Research and Development (NCBR, Poland) under the Nutritech I program.

Keyword: *glycaemic index, dry wafers, alternative proteins, nutritional reformulation*

PHYSICOCHEMICAL AND SPECTRAL CHARACTERIZATION OF PORK AND BEEF CUTS USING HYPERSPECTRAL IMAGING AND FOOD SCANNER ANALYSIS

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Hyperspectral imaging, which simultaneously provides spatial and spectral information, has emerged as a powerful non-destructive tool for evaluating the physicochemical and structural characteristics of meat. This study evaluated pork (loin, tenderloin, neck, and belly) and beef (loin, tenderloin, round, and brisket) using hyperspectral imaging and food scanner analysis. Colorimetric analysis, pH measurement, and water-holding capacity (WHC) assessment revealed that pork belly exhibited the highest lightness, while beef round demonstrated the lowest. Redness and yellowness differed significantly across cuts, influenced by intramuscular fat content and chemical composition. Pork neck exhibited the highest pH and WHC, confirming a positive correlation between these parameters. Food scanner analysis quantified fat, moisture, protein, ash, and collagen contents, whereby pork belly recorded the highest fat content and beef loin the highest collagen content. Hyperspectral imaging enabled extraction of mean reflectance spectra and identification of key wavelengths at 430, 541, 574, and 980 nm, associated with heme, moisture, and oxidation status. Pork exhibited higher reflectance than beef, reflecting differences in chemical composition. PLSR analysis identified key spectral wavelengths contributing to fat, moisture, and protein prediction, providing a basis for future model development. These findings suggest that hyperspectral imaging represents a promising tool for comprehensive meat quality assessment.

Keyword: *hyperspectral imaging, meat quality, physicochemical properties, partial least squares regression, non-destructive analysis*

EFFECT OF MICROWAVE SEED TREATMENT ON SILYMARIN CONTENT IN MILK THISTLE (SILYBUM MARIANUM (L.) GAERTN.) SPROUTS DETERMINED BY INFRARED SPECTROSCOPY

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Milk thistle (Silybum marianum (L.) Gaertn.) is a Mediterranean species and an important source of silymarin - a flavonolignan complex with antioxidant, anti-inflammatory, and hepatoprotective properties [1-3].

This study aimed to evaluate the effect of microwave pretreatment of seeds on silymarin accumulation in edible milk thistle sprouts. Seeds were exposed to microwave radiation at 90 and 180 W for 10, 20, 30, and 40 s. Sprouts were cultivated under controlled conditions (26°C, 90% relative humidity, 75% illumination). After cultivation, the sprouts were extracted with 100% methanol, concentrated, and freeze-dried.

Silymarin content in the extracts was determined using Fourier-transform infrared (FTIR) spectroscopy [4]. The results indicate that microwave pretreatment influences silymarin content, with higher levels observed at increased radiation power. At 180 W, a time-dependent increase in silymarin content was also observed. These findings suggest that the appropriate selection of process parameters may enhance the accumulation and bioavailability of bioactive compounds in milk thistle sprouts.

References:

1. Nurzyńska-Wierdak et al., 2018. Hortic. 28.

2. Fenclova et al., 2020. Anal. Bioanal. Chem. 412.

3. Adetuyi et al., 2021. WNOFNS 37.

4. Ropuszyńska-Robak et al., 2025. Spectrochim. Acta A 343.

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Keyword: *milk thistle, sprouts, silymarin, microwave radiation, infrared spectroscopy*

Food grade synthesis of flavone dimer library and screening of their antibacterial activity

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Biflavonoids are a class of dimeric flavonoids formed by the coupling of two flavonoid units and have been reported to possess a broad range of biological activities. Despite their health-promoting potential, the limited availability of structurally diverse biflavonoids from natural sources has hindered broader biological investigation of this compound class. We built a 66-compound biflavonoid library using a one-step oxygen-mediated oxidative coupling strategy applied to a series of structurally varied flavonoid substrates. The library was subsequently evaluated for antibacterial activity against three bacterial strains, including Bacillus cereus, Escherichia coli, and Salmonella Thompson. Selective inhibitory activity was observed against the Gram-positive strain, with 11 compounds achieving greater than 90% inhibition at a screening concentration of 64 μg/mL. These results highlight the value of oxidative coupling as a practical strategy for expanding biflavonoid chemical space and underscore the potential of synthetic biflavonoid libraries as a resource for systematic biological exploration. We are exploring other potentials of this library to maximize its potential for health promotion use.

Keyword: *biflavonoids, antibacterial activity*

Consumer Preferences towards the European Flat Oyster (Ostrea edulis) from Integrated Multi-Trophic Aquaculture (IMTA)

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Adriatic Sea represents the last refuge of the European flat oyster (Ostrea edulis), a species that requires urgent revitalization, possible by Integrated Multi Trophic Aquaculture (IMTA) as a sustainable farming approach. This sensory evaluation study investigates consumer preferences toward IMTA-farmed oysters from Adriatic Sea, Croatia, using hedonic rating and CATA (Check-All-That-Apply) methodology. A total of 110 participants (mean age 49.7 ± 13.3 years) were included, with 53.6 % reporting oyster consumption in the past year. Despite this, oysters achieved high sensory ratings on a 9-point hedonic scale: taste (7.63 ± 1.55), texture (7.61 ± 1.48), appearance (7.52 ± 1.44), odour (7.40 ± 1.40), and overall liking (7.48 ± 1.67). Correlation analysis showed that taste ($r = 0.825$) and texture ($r = 0.828$) were the strongest significant predictors of overall liking ($p < 0.001$). CATA test results indicated that oysters were most frequently described as salty (63.6%), juicy (62.7%), and having a seaweed odour (62.7%). Penalty analysis revealed juiciness (+1.28), saltiness (+1.03), clear liquor (+0.90) and seaweed odour (+0.80) as attributes which are significant positive drivers of consumers liking. Findings confirm high consumer acceptance of IMTA-farmed oysters and support their potential as a sustainable seafood product.

Keyword: *CATA, consumer preferences, European flat oyster, hedonic scale*

A colorimetric and photothermal dual-mode nanozyme platform: multimodal machine learning guided real-time freshness sensing and predicting of aquatic products under challenging lighting conditions

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The timely and accurate detection of aquatic product freshness in complex supply chains remains challenging. Hypoxanthine (Hx)-based monitoring methods that combine on-site colorimetric sensing with smartphone detection is widely used but vulnerable to variable lighting conditions, causing detection results remain susceptible to distortion and inaccuracies. In this study, a multimodal machine learning-assisted colorimetric and photothermal dual-mode Hx detection and freshness prediction platform was constructed by cascading an inexpensive, thermostable 2D Fe/Ni-MOF nanosheet with xanthine oxidase (XOD), enabling stable and sensitive detection of Hx. A linear response to Hx was exhibited in the range of 0.2-100 μM, with a low detection limit (LOD) of 0.12 μM (colorimetric mode) and 4.21 μM (photothermal mode), respectively. To address lighting variability, a dataset combining simulated lighting, colorimetric, and photothermal data was constructed for model training and testing. A light-adaptive YOLOv11-MLP multimodal fusion model achieved 98% prediction accuracy, outperforming single-mode colorimetric (89%) and photothermal (93%) models, demonstrating strong robustness under diverse lighting conditions. This work not only provided an effective approach for the early detection of freshness changes in aquatic products, but also opened up unique horizons for the design of multimodal fusion algorithms capable of handling varying lighting conditions in the food supply chain.

Keyword: *Aquatic products, Hypoxanthine, Multimodal machine learning, Freshness, Nanozyme*

Formation of Porous Chickpea Protein Gels Using Directional Freezing: Exploring the Governing Principles from Structure-Function Perspectives

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This study investigated the effects of freezing conditions (directional and non-directional), freezing temperatures (moderate and low), freeze–thaw treatment, and hydrocolloid type (gellan gum and κ-carrageenan) on the structural and textural properties of porous gel formed using chickpea proteins. Texture profile analysis revealed that gellan gum–chickpea gels exhibited significantly higher hardness (207–339 g) compared to κ-carrageenan-chickpea gels (118–273 g), indicating the formation of stronger gel networks. Directional freezing at moderate temperature increased gel anisotropy (0.86-1.14), suggesting the development of aligned structures. Furthermore, gellan gum gels exhibited better freeze–thaw stability, with lower syneresis (0.28–2.5%) than κ-carrageenan gels (1–13%). Synchrotron-based FTIR microspectroscopic images showed that freeze–thaw treatment increased α-helix content, while directional freezing enhanced β-sheet formation at moderate temperature, particularly during the second freeze–thaw cycle in κ-carrageenan–chickpea gels, indicating protein network restructuring. The characteristic polysaccharide (~967 cm^{-1}) and protein (~1670 cm^{-1}) images revealed that κ-carrageenan–chickpea gels displayed more heterogeneous spatial distributions, reflecting greater structural disruption. Overall, directional freezing at moderate temperature of gellan gum and chickpea protein formed a more anisotropic and stable gel, offering a promising strategy for making anisotropic food materials.

Keyword: *Chickpea protein; Directional freezing; Gellan gum; κ-carrageenan; Protein secondary structure; Texture analysis*

Effects of Hydrocolloid Types and Concentrations on the Textural Properties and Digestibility of Plant-Based Nuggets

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This study evaluated the effects of three hydrocolloids, methylcellulose (MC), κ-carrageenan (KC), and curdlan gum (CG), at concentrations of 2%, 4%, and 6% on the physical properties of plant-based chicken nuggets, followed by in vitro digestion analysis. All hydrocolloid additions significantly improved cooking yield compared to the control (72.48%), with 6%MC achieving the highest value (97.47%). Moisture retention was greatest in 6%MC (93.65%), followed by 6%KC (88.63%) and 6%CG (84.15%). The Hot Water Holding Capacity (HWHC) of raw nuggets increased with hydrocolloid addition, with the highest value observed in 6%CG (4.84 g/g), reflecting the strong water-holding capacity of curdlan gum. For cooked nuggets, 6%MC exhibited the highest HWHC (5.80 g/g), consistent with moisture retention trends. Hot Oil Holding Capacity (HOHC) was highest in 6%KC (0.86 g/g), a result attributed to its ability to form a thermal-reversible network that retains oil within the matrix. KC-containing formulations demonstrated the highest hardness, springiness based on textural profile analysis. In vitro digestion analysis was conducted to elucidate how hydrocolloid-induced structural modifications influence protein and fat digestibility. The control sample exhibited the highest fat recovery (2.76%), while formulations with CG showed the lowest (0.36%). This study would offer insights on hydrocolloid choices for food formulation.

Keyword: *Methylcellulose, κ-carrageenan, Curdlan gum, Plant-based nuggets, In vitro digestion*

Process Optimization of Supramolecular Solvent–Assisted Phenolic Compounds Extraction from Onion Peel

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The current study explores the development and optimization of a SUPRA molecular bio-solvent based extraction method to efficiently recover bioactive compounds from onion peel waste. SUPRA systems are sustainable and environmentally beneficial extraction techniques because of their high extraction efficiency, low toxicity, and changeable polarity. In this work, phenolic chemicals were selectively extracted from freeze-dried onion peel powder using a SUPRA molecular solvent system based on decanoic acid. For synthesis of SUPRAs, amphiphile (acid) concentration was kept constant at 5% and ethanol varied from 25, 30, 35% remaining being acidified water. This mixture was then vortexed and centrifuged, producing the supernatant as SUPRA molecules was used for extraction. The findings showed that, the tailored SUPRA conditions greatly improved the recovery of phenolic chemicals with maximum TPC content of 339.8 mg GAE/100g sample and quercetin content of 6.09mg/g. Overall, the results show that supramolecular solvent extraction is a viable green option for onion peel waste valorisation. To further increase the yield and selectivity of target bioactives, future research can concentrate on altering the supramolecular solvent composition and combining SUPRA with other extraction methods.

Keyword: *SUPRA, Onion peel, quercetin, valorization, phenolic compounds*

IMPACT OF ADDITIVE INCORPORATION ON THE FRYING PERFORMANCE AND STABILITY OF PALM OLEIN

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This study evaluated the impact of additive incorporation on the frying performance of palm olein under prolonged frying conditions. Four oil formulations were investigated: (i) palm olein with citric acid (CA); (ii) CA with tert-butylhydroquinone (TBHQ); (iii) CA with antifoam; and (iv) CA with TBHQ and antifoam. Deep-frying of French fries with oil replenishment is carried out until the oil reaches its discard point at a total polar compounds (TPC) value of 25%. Frying performance was assessed based on oxidation stability, hydrolysis, polymerization, and oil color development. Among all formulations, palm olein containing CA, TBHQ, and antifoam exhibited the greatest oxidative stability and the slowest hydrolysis and polymerization rates throughout the frying study, indicating superior frying life. This was followed by palm olein with CA and antifoam; CA with TBHQ; and CA only, which showed the highest polymerization and hydrolysis rate. Although the incorporation of additives generally enhanced frying stability, oils containing TBHQ demonstrated a faster darkening rate. Notably, the most stable formulation (CA, TBHQ, and antifoam) appeared darkest after frying, whereas palm olein with CA only retained the lightest color. These findings highlight trade-offs between frying stability and visual oil quality.

Keyword: *frying, additive, oxidative stability, polymerization, colour changes*

SACCHAROMYCES CEREVISIAE FERMENTATION-ASSISTED EXTRACTION IMPROVES FLAVOR AND FUNCTIONAL PROPERTIES OF PEA PROTEIN ISOLATE

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This study aimed to evaluate Saccharomyces cerevisiae EC1118 fermentation-assisted extraction method for pea protein isolate (PPI) during freeze drying (FD) and the relationship between volatile profiles, functional properties and antioxidant capacity of chemically extracted PPI (C-PPI), unfermented PPI (U-PPI), and yeast-fermented PPI (Y-PPI), with (-FD) or without (-Wet) FD effects, respectively.

After fermentation, the odor-active off-flavor aldehyes (OAV>1), including hexanal, 2-heptenal, and 1-octen-3-ol was significantly decreased by 81.35%, 69.68%, and 43.45%, respectively. Ehrlich pathway had the significant correlation with 2-phenylethanol, dominated the rosy note of Y-PPI. Correspondingly, sensory evaluation revealed that fermentation decreased grassy and beany sensory intensities by 2.77-fold and 3.29-fold. Contrary to expectations, fermentation slightly decreased water and oil-holding capacities and emulsifying property in Y-PPI-Wet. On the other hand, the FD results obtained from enhanced viscoelasticity and soluble protein content strongly indicated that the proteins formed porous structures, reversed these functional properties. Besides, through the antioxidant capacity, Y-PPI-FD showed the highest ORAC values of 1534.84 μg TE/g protein due to the exposure of peptides through hydrolysis or structural rearrangement. Molecular docking was performed to evaluate the interactions between pea proteins and selected flavor compounds.

Keyword: *Fermentation, Flavor science, Freeze-drying, Molecular docking, Pea protein isolate*

Shear-Induced Alignment and pH-Responsive Phase Transitions in 3D-Printed Lipid Mesophases for Precision Delivery

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Traditional oral carriers lack structural programmability. We developed a 3D-printed lipid lyotropic liquid crystal (LLC) platform (Monoolein/Linoleic acid, 97:3 w/w) for precision nutrient delivery. In simulated gastric fluid (pH 2.0), the carrier stabilized in an oriented hexagonal phase. Optimized 3D printing using a 0.16 mm nozzle induced intense shear-alignment of nano-channels, significantly enhancing physical confinement. Experimental data for water-soluble cargo release showed a minimal leakage of 4.8% in simulated gastric fluid over 2 hours. Upon transitioning to intestinal conditions (pH 7.0), deprotonation-induced repulsion triggered a topological transition into a bicontinuous cubic phase, achieving a 93.5% burst release within 60 minutes. In vitro gastrointestinal digestion confirmed complete carrier degradation and micellar solubilization within 120 minutes. Cellular studies using Caco-2 models revealed a 4.5-fold increase in uptake compared to free molecules. Compared to conventional emulsions, this platform demonstrated a ten-fold improvement in both gastric protection and bioavailability. This study underscores the superiority of 0.16 mm 3D printing in engineering oriented nano-channels for programmed nutrient release.

Keyword: *Lyotropic Liquid Crystals, 3D Printing, Shear Alignment, Phase Transition, Cubic Phase*

Anti-diabetic effect of AdipoR1 agonistic dipeptide Tyr-Pro in Spontaneously Diabetic Torii Rats

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In our previous study, we found the dipeptide Tyr-Pro as a novel natural agonist of adiponectin receptor 1 (AdipoR1). This study investigated the anti-diabetic effect of oral administration of Tyr-Pro in spontaneously diabetic Torii (SDT) rats. Tyr-Pro or Pro-Tyr was orally administered (1 mg/kg/day) to 16-week-old male SDT rats for 14 weeks. After 19 weeks of age (wk), weight loss and overeating, which are typical phenomena for SDT rats, were observed in the control and Pro-Tyr group, while there were no changes in the Tyr-Pro group. By 29 wk, fasting BGLs in the control group reached 142 ± 13 mg/dL, whereas those in the Tyr-Pro group (82–99 mg/dL) remained within the normal range. No such effect was observed in the Pro-Tyr group, suggesting the importance of peptide sequence for this anti-diabetic effect. At 22 wk, pre-diabetic stage, only Tyr-Pro intake improved impaired glucose tolerance by OGTT ($p < 0.05$). The expression of AdipoR1 and p-AMPK/AMPK in skeletal muscle in the Tyr-Pro group was significantly higher than that of the control, suggesting that Tyr-Pro exerts an anti-diabetic effect via AdipoR1/AMPK signaling. In conclusion, the present study demonstrates the in vivo anti-diabetic effects of the oral administration of Tyr-Pro as an AdipoR1 agonist.

Keyword: *Adiponectin receptor (AdipoR), Dipeptide, anti-diabetic, Anti-hyperglycemic, SDT rat*

METHOD VALIDATION FOR THE DETERMINATION OF 31 PER- AND POLYFLUOROALKYL SUBSTANCES IN ANCHOVY USING LIQUID CHROMATOGRAPHY–TANDEM MASS SPECTROMETRY

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Per- and polyfluoroalkyl substances (PFAS) are highly persistent synthetic chemicals that accumulate in marine ecosystems. Consumption of contaminated seafood, such as anchovies-a major calcium source in South Korea-poses risks to human. In particular, children (aged 1-11) consume an average of 0.03–0.04 g/kg body weight (bw), significantly higher than those of adolescents and adults intake levels (0.01–0.03 g/kg bw). This study aimed to validate an analytical method for PFASs in anchovy samples. FDA Foods Program Compendium of Analytical Laboratory Method (No. C-0.10.3) was applied for sample pretreatment and determination of 31 PFASs in anchovy. Three concentration levels (0.1–20 ng) of PFASs and isotope-labeled standards were spiked into anchovy samples for the single-laboratory validation, and extracted using QuEChERS salt packets and dSPE sorbents, cleaned up using WAX and Envi-Carb SPE columns, and analyzed using ultra-high performance liquid chromatography coupled with tandem mass spectrometry (UPLC-MS/MS). All PFASs exhibited excellent linearity (R^2>0.99). Recoveries and precision values were 66.5–120.0% and 0.92–24.4%, respectively. The method detection limits (MDLs) and method quantification limits (MQLs) were 0.011–0.302 ng/g and 0.033–0.916 ng/g, respectively. These results satisfy the CODEX guidelines (CAC/GL 71-2009), confirming the validity of this method for monitoring PFASs in anchovy.

Keyword: *PFAS, Method validation, Anchovy, LC-MS/MS*

IMPLEMENTING A FOOD SAFETY FRAMEWORK FOR 3D-PRINTED BEEF PUREE INTENDED FOR DYSPHAGIA DIETS

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Three-dimensional (3D) food printing is increasingly explored for producing personalised, texture-modified foods, particularly for vulnerable populations such as dysphagia patients. Despite its potential, the technology introduces food safety challenges that are not fully addressed by conventional meat processing frameworks, due to increased material handling, non-standard equipment (e.g., fine extrusion geometries), limited control over process temperatures, and prolonged processing times. This study describes the development and implementation of a Hazard Analysis Critical Control Point (HACCP) plan for the production of a ready-to-heat, 3D-printed beef puree in a pilot-scale facility, using a syringe-based extrusion 3D printer.

The complete production process, from raw material receipt to frozen storage of vacuum-packed products, was assessed for biological, chemical, physical, and allergen hazards. Hazard significance was evaluated using a likelihood-severity risk matrix, and control measures were established in accordance with Codex Alimentarius principles, Food Standards Australia New Zealand (FSANZ), and international meat hygiene standards. Seven critical control points were identified: cooking, cooling, blending, cartridge filling, 3D printing, metal detection, and product labelling, most of which related to pathogen survival and growth, metal contamination, and allergen cross-contact. These findings provide a practical and transferable HACCP reference to improve food safety management for 3D-printed meat products.

Keyword: *3D food printing, HACCP, Food Safety, Meat Processing, Dysphagia diets*

EFFECTS OF PULSED ELECTRIC FIELD TREATMENT ON THE PHYSICOCHEMICAL AND GELLING PROPERTIES OF PEA PROTEIN ISOLATE

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Plant-based proteins have gained considerable attention due to the growing demand for plant-based foods. However, plant-based proteins tend to have inferior functional properties compared to their animal-based counterparts. Pulsed electric field (PEF) treatment is an emerging food processing technology that applies electric field pulses onto foods for a few μs/ms. In this study, the effects of PEF treatment on the physicochemical and gelling properties of pea protein isolate (PPI) were investigated. The protein solubility increased from 6.36% to 8.73% when PPI was treated at electric field strength (EFS) of 2-3 kV/cm and specific energy input (SEI) of 200 kJ/kg. PEF-treated PPI exhibited a lower isoelectric point (pH 3.45-3.63), which is significantly lower than the untreated PPI (pH 4.00). The mean particle size of PEF-treated samples increased as the EFS and SEI increased. PEF treatment significantly increased the water holding capacity of PPI but decreased its oil holding capacity. Furthermore, PEF treatment reduced the least gelation concentration of PPI from 21% to 19%, while increasing its gel strength, especially at EFS of 3kV/cm and SEI of 200 kJ/kg. This study demonstrated the potential of using PEF treatment as a green and fast approach to improve the techno-functional properties of plant-based proteins.

Keyword: *Pulsed electric field, pea protein, gelling properties*

STAKEHOLDER-INFORMED CURRICULUM REVISION IN GRADUATE FOOD SCIENCE: A CONTINUOUS QUALITY IMPROVEMENT APPROACH

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Building on prior work capturing stakeholder insights on expected competencies and academic interventions for the Master of Science in Food Science (MSFS) program, this study examined stakeholder perspectives on a proposed curriculum revision to support continuous quality improvement and ensure the relevance of the curricular program. Guided by outcome-based and quality-assurance principles, including AUN-QA, the study integrates multi-sector stakeholder perspectives into an iterative, stakeholder-informed continuous quality improvement (CQI) process for curriculum review and refinement. Data were derived from four online focus group discussions conducted with key stakeholder groups using structured guide questions. Participants (n=22) represented students, alumni, government, and academe. Responses were analyzed using content analysis to identify recurring themes across groups. Preliminary findings identified five key areas: curriculum alignment, research capability, real-world applicability, student accessibility, and curriculum responsiveness. The revised curriculum was generally perceived as more streamlined and research-oriented. Stakeholders emphasized strengthening alignment between program outcomes and course content, enhancing integration of industry and government linkages, and maintaining flexibility for working learners. These findings highlight the value of a structured, stakeholder-informed CQI process in guiding curriculum development and informing similar program reviews.

Keyword: *food science education, curriculum development, continuous quality improvement (CQI), stakeholder engagement, graduate education*

Process Intensification of Carrot Softening Using Pulsed Electric Field Pretreatment Combined with Steaming for Texture-Modified Foods

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Pulsed electric field (PEF) processing has been studied as a non-thermal pretreatment for modifying plant tissue structure; however limitations remain in achieving targeted softening for vegetables. This study evaluates PEF pretreatment as a process-intensification strategy to accelerate thermal softening of carrot cubes upon steaming, with relevance to the preparation of softer foods meeting International Dysphagia Diet Standardisation Initiative (IDDSI) Level 6 guidelines.

Carrot cubes underwent PEF of varying specific energy inputs (20–80 J/g), followed by steaming for varying durations. Texture was evaluated with instrumental hardness measurements and IDDSI fork-pressure pass criteria, with freeze-thaw treatment as a reference. Structural changes were analyzed via scanning electron microscopy (SEM). PEF alone yielded minor hardness reduction, whereas freeze-thaw produced substantial immediate softening. Notably, steaming of PEF-treated samples revealed a synergistic effect, yielding accelerated softening and shorter steaming duration required to meet IDDSI Level 6 standards compared to untreated samples.

PEF pretreatment resulted in increased soluble solids release and electrical conductivity, with higher energy inputs causing greater temperature rise without proportional softening. SEM confirmed PEF-induced microstructural modifications, facilitating thermal degradation of the cell matrix. Overall, PEF pretreatment shows promise as an implementable alternative to the freeze-thaw method for reducing thermal processing severity in soft-food preparation.

Keyword: *Pulsed Electric Field, Texture-Modified Foods, Process Intensification, Scanning Electron Microscopy (SEM), International Dysphagia Diet Standardisation Initiative*

Rice Bran Hydrolysates as a Low-Cost, By-product Derived Substrate for Single-Cell Protein Production via Microalgae-Yeast Co-cultivation

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Expanding to more sustainable methods of food production, such as biomass fermentation for single-celled proteins, is critical to address the growing food demand and alleviate environmental concerns. However, its scalability is impeded by the high costs of conventional substrates. This study evaluates rice bran as a low-cost by-product-derived substrate for the co-cultivation of Chlorella vulgaris and Saccharomyces cerevisiae**.** Rice bran was enzymatically hydrolyzed using protease and amylase, resulting in substrates with 5.2% to 5.3% protein content and 2.3% to 11.9% reducing sugar content. Three media were tested: glucose-peptone (control), glucose + protease-treated rice bran (RBP), and peptone + amylase-treated rice bran (RBA). Growth and biomass were monitored over 11 days. No statistically significant difference was found among treatments ($p > 0.05$), demonstrating the viability of rice bran hydrolysates as alternative substrates. Notably, distinct growth profiles emerged. The control yielded higher biomass (53.33 g/L), likely due to lipid accumulation while RBA achieved the highest cell density (8.2×10^7 cells/mL) at comparable yields, suggesting enhanced cellular proliferation, which is more favorable for protein production. These findings position rice bran hydrolysates as a strategic substrate for protein-focused SCP systems, offering a scalable and low-cost platform to support global protein security.

Keyword: *biomass fermentation, single-cell protein, rice bran hydrolysates, co-cultivation, by-product valorization*

A Universal “KCl/GDL” Dual Cross-linking Strategy for Constructing Robust Protein-Polysaccharide Composite Gels as Advanced Delivery Carriers

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Protein-polysaccharide composite gels are promising co-delivery carriers for bioactive components with different solubility, yet their weak mechanical strength, high swelling rate, and limited protective and controlled-release capacity severely restrict practical applications. Herein, we developed a novel "KCl/GDL" dual-crosslinking strategy to fabricate high-performance protein-κ-carrageenan composite gels, and systematically investigated the effects of crosslinking methods and polysaccharide concentrations on gel formation, microstructure, mechanical properties, and in vitro gastrointestinal digestion behavior. The resultant dual-crosslinked gels showed 15–20 times higher mechanical strength than single-crosslinked counterparts at polysaccharide concentrations below 0.5 wt%. The gels achieved over 98% encapsulation efficiency for lipophilic α-tocopherol and amphipathic curcumin, and over 94% for hydrophilic anthocyanins, with significantly improved storage stability, reduced swelling rate, and intestinal-targeted sustained release of bioactives. This work provides a facile approach for advanced protein-based delivery systems in functional foods.

Keyword: *Double network gels*, *Structure-property relationship*, *Encapsulation*, *Bioactives*, *Protein*

OPTIMIZATION AND CHARACTERIZATION OF READY-TO-COOK RICE-SHAPED KERNELS MADE FROM WHITE CORN GRITS

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White corn, a staple crop in the Philippines, particularly in the Visayas and Mindanao regions, offers potential for nutritious food product development due to its local availability and nutritional value. This study utilized High-Temperature High-Pressure (HTHP) extrusion to transform white corn grits into ready-to-cook rice-shaped kernels, improving preparation convenience while preserving nutritional quality. Using Design Expert®, a simplex centroid mixture design generated 13 formulations with varying levels of flour mixture, thickener, and oil. Evaluated responses included moisture content, cost, appearance, and sensory attributes (texture, taste, overall liking). The optimal formulation was determined by maximizing overall liking, minimizing projected cost, and minimizing moisture content within experimental constraints. The optimized formulation, consisting of 99.4% flour mixture, 0.27% thickener, and 0.33% oil, achieved the highest desirability (0.427) and lowest production cost. After rehydration, it had a texture similar to traditionally cooked rice. Proximate analysis per 100 grams indicated an energy content of 354 kcal, with 77.5 g carbohydrates, 7.6 g protein, 1.5 g fat, 2.5 g dietary fiber, 13.1 g moisture, and 0.3 g ash. This research shows the potential of extrusion technology to produce white corn rice that is convenient to prepare during emergency situations, government feeding programs, or daily household consumption.

Keyword: *white corn, optimization, extrusion, mixture design*

IMPACT OF CITRIC ACID ON THE MAILLARD REACTION IN THE PRODUCTION OF INSTANTIZED IRON-FORTIFIED RICE USING HIGH-TEMPERATURE HIGH-PRESSURE EXTRUSION

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Objectives: High-Temperature High-Pressure extrusion was utilized to produce instantized rice. However, the thermal intensity of extrusion can trigger the formation of acrylamide, an identified Group 2A carcinogen of the International Agency for Research on Cancer, via Maillard reaction between asparagine and reducing sugars. This study investigates the inhibitory effect of incorporating 0.05% w/w citric acid to reduce the formation of acrylamide.

Methods: An intermediate amylose content rice variety flour mixture was blended with 0.05% w/w anhydrous citric acid and a moisture content of 18%. Control batches and treated batches were processed under identical parameters. The resulting instant rice extrudates were analyzed for acrylamide using Liquid Chromatography-Mass Spectrometry (LC-MS).

Results: The incorporation of 0.05% w/w citric acid significantly inhibited the synthesis of acrylamide during the extrusion process. In the iron-fortified rice extrudates, acrylamide levels decreased from a control value of <25 µg/kg to <10 µg/kg (falling below the limit of detection). The addition of citric acid hinders the nucleophilic attack required for the Maillard-driven acrylamide pathway.

Conclusions: These findings demonstrate that the 0.05% w/w citric acid is effective in reducing acrylamide content; the product remains well below international safety thresholds, such as the EU benchmark of 300 µg/kg for cereal-based foods.

Keyword: *Extrusion, Acrylamide, Food Safety, Rice*

Nano-encapsulation technology for oral musical adhesive film using by 3-D printer

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Functional foods include all ranges of food compounds such as vitamins, mineral supplement, herbs, phytochemicals (e.g. polyphenols and carotenoids), and probiotics which are tied up with disease prevention and health promotion. Among various strategies, nano-carrier systems have been popularly developed worldwide for effective delivery of lipophilic nutraceuticals. When nano-carriers are applied in food system or oral delivery system, it should be considered that they must be stable in food formulations, non-toxic, biodegradable, and applicable to various foods processing system.

Three-dimensional (3D) printing is an innovative material manufacturing technology that can be used to construct complex structures. Oral mucosal adhesive films (OMAFs) have attracted attention as delivery systems for the easy ingestion of functional substances. However, conventional casting-based production limits the potential for personalization and controllable onset of action of functional substances. Although inkjet-type substance impregnation technology has been developed, it remains challenging to control the release characteristics, and the loadable capacity is lacking. The custom OMAF system was developed using a three-dimensional (3D) printer and loaded with curcumin as a model functional substance. The 3D printing can provide customized dosages of functional substances as well as control dissolution and improve stability.

Keyword: *Nanotechnology, 3D printer, Oral mucoal adhesive film*

ENHANCING TASTE AND ANTI-INFLAMMATORY ACTIVITY OF CANOLA PROTEIN HYDROLYSATES VIA GAMMA-GLUTAMYLATION

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Canola meal, a byproduct of oil extraction, is rich in protein and produced at approximately 5 million tonnes annually in Canada. Canola protein hydrolysates (CPHs) exhibit promising bioactivities but are often limited by undesirable bitterness. This study aimed to develop CPHs with both improved sensory properties and bioactivity. Nineteen CPHs were evaluated using an electronic tongue, and four hydrolysates generated using pepsin or pepsin-based combinations showed the highest bitterness and no umami taste. Among these, pepsin-derived CPH (CPH-pepsin, 500 μg/mL,) demonstrated strong anti-inflammatory effects in tumor necrosis factor-α (TNF-α)-stimulated EA.hy926 endothelial cells by significantly reducing vascular cell adhesion molecule-1 (VCAM-1) and cyclooxygenase-2 (COX-2) expression. γ-Glutamylation of CPH-pepsin using 1% glutaminase (γ-CPH-pepsin) significantly improved taste by reducing bitterness and enhancing umami and richness. In HEK293 cells expressing type 1 taste receptor TAS1R1 or calcium-sensing receptor, γ-CPH-pepsin (2.5 mg/mL), but not CPH-pepsin, significantly increased intracellular Ca^{2+} mobilization. Peptidomics analysis is underway to identify γ-glutamyl peptides responsible for these effects. Mechanistically, γ-CPH-pepsin retained anti-inflammatory activity by suppressing the nuclear factor kappa B pathway, with no effects on mitogen-activated protein kinases. Overall, enzymatic modification improved both taste and bioactivity of CPHs.

Keyword: *Canola meal, γ-Glutamylation, Anti-inflammatory effects, Peptidomics, Calcium mobilization*

Protective Effects of Erinacine A-Enriched Hericium erinaceus Mycelium Against Reproductive Damage Induced by Polystyrene Microplastics in Male Rats

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Purpose: Plastics are emerging environmental pollutants that adversely affect human health, Microplastics (MP) enter the body, causing potential risks to reproductive health and the gut microbiome. Hericium erinaceus is a medicinal mushroom containing erinacine A, a diterpenoid known for its excellent cellular and blood-brain barrier permeability, offering potent neuroprotective and anti-inflammatory properties. **Method:** This study examined the protective effects of erinacine A-enriched Hericium erinaceus mycelium (HE) against reproductive and intestinal damage induced by polystyrene microplastics (PS-MP) in high-fat diet-induced obese male rats. **Results:** Our study showed that HE dose-dependently reduced oxidative stress by enhancing glutathione peroxidase activity and decreasing nitric oxide levels. Furthermore, HE attenuated PS-MP-induced systemic inflammation by lowering IL-6 and IL-1β levels, repaired colonic mucosal damage, and improved gut microbiota dysbiosis by increasing Lactobacillus abundance. Crucially, HE protected the hypothalamic-pituitary-gonadal (HPG) axis by restoring Kiss1 neuropeptide expression, which normalized downstream follicle-stimulating hormone and testosterone secretion, thereby rescuing sperm count and reducing sperm abnormalities. **Conclusion:** HE has the capacity to provide systemic protection and facilitate recovery through the mitigation of oxidative stress and inflammation, restoration of gut microbiota balance, and preservation of the HPG axis in the context of PS-MP-induced reproductive damage.

Keyword: *Polystyrene microplastics, Hericium erinaceus, Erinacine A, Spermatogenesis, HPG axis*

The Role of Mastication in Shaping Mood and Cognitive Performance

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Mastication has been increasingly recognized as a modifiable behavioral factor influencing both cognitive performance and emotional well-being. A growing body of research has explored gum-chewing paradigms, with studies reporting modest improvements in attention, reaction time, and stress regulation. However, most of these findings are derived from controlled laboratory settings using flavored chewing gum, which, while experimentally convenient, lacks ecological validity. In contrast, naturalistic mastication during real-world eating reflects the full spectrum of oral behaviors. This study aims to investigate whether a no-chewing diet impacts mood and cognitive function compared to a normal chewing diet. A randomized crossover design was implemented in healthy young adults, with an ongoing extension of the same protocol to older adults to examine age-related differences in responsiveness to mastication. Each participant underwent two 3-day intervention periods: (1) a liquid-based diet requiring no chewing and (2) a solid-based diet with normal chewing, separated by a 4-day washout period. Mood was assessed using the Positive and Negative Affect Schedule (PANAS), while cognitive performance was evaluated via cognitive tests focusing on reaction time, memory, and executive function. Preliminary tests showed significant negative emotions are associated with the no-chewing condition compared to the normal chewing condition.

Keyword: *Mastication, Cognition, Mood*

Nicotinate–NAD^+ axis mediates the anti-steatotic action of Lactobacillus gasseri

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The probiotic Lactobacillus gasseri TF08 was previously shown to remove cholesterol in vitro, yet its in vivo activity and mechanism in metabolic liver disease remain unclear. Here, we demonstrate that dietary supplementation with TF08 for 12 weeks protects mice from high-fat diet-induced metabolic dysfunction-associated steatotic liver disease (MASLD), significantly reducing body weight gain, dyslipidemia, hepatic steatosis, and fibrosis. Using metabolomics, we discovered a selective elevation of the NAD^+ precursor nicotinic acid, accompanied by increased hepatic NAD^+/NADH ratio in TF08-treated animals. Integrative liver transcriptomics and immunohistochemistry further revealed a coordinated upregulation of two key enzymes, ALDH1B1, an NAD^+-dependent dehydrogenase, and ETNPPL, a phospholipid metabolism regulator, both strongly correlated with improved metabolic indices and NAD^+ status. Based on these findings, we propose that TF08 remodels the gut microbiome to enhance host bioavailability of nicotinic acid, thereby expanding the hepatic NAD^+ pool. This metabolic shift transcriptionally activates a lipid-homeostatic program driven at least in part by ALDH1B1 and ETNPPL, collectively restoring hepatic lipid balance. These results establish the nicotinate–NAD^+ axis as the mechanistic foundation of TF08's probiotic action and identify it as a tractable target for MASLD interventions.

Keyword: *Lactobacillus gasseri, High-fat diet, Metabolic dysfunction-associated steatotic liver disease, Nicotinate–NAD^+ axis*

IMPACT OF COPPER ION CONCENTRATIONS ON FLAVOR QUALITY FROM GRAPES TO WINE

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Prolonged application of copper-based fungicides in the vineyard can lead to increased copper levels in the grapes and wines, affecting flavor quality. In this study, we systematically investigated the effects of copper treatment on grape and wine flavor by simulating copper-based fungicide application in vineyards. The results indicated that medium-to-high copper treatment limited berry maturity to significantly reduced the sugar-acid ratio of berries and inhibited the synthesis of total phenols and most individual phenolics and reduced antioxidant activity. And copper treatment significantly regulated the volatile compounds in the berries, with low copper treatment accelerating berry maturity and decreasing the content of C6 compounds and aldehydes, while medium and high copper treatment significantly increased their content. In addition, terpenes and C13-norisoprenoids in grape berries were the key aroma compounds that decreased with increasing concentrations of copper treatment. Thus, more careful application of copper-based fungicides will be needed in the future.

Keyword: *copper, vineyard treatment, grape, wine, quality*

Physicochemical characterization of a low-absorption structured lipid obtained by interesterification for application in biscuit fillings

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In response to the growing demand for healthier foods, this project aimed to develop a low-absorption structured lipid with anti-obesogenic properties for application in biscuit fillings. The lipid was produced by interesterification at bench scale and characterized regarding its physicochemical properties through solid fat content (SFC), fatty acid composition (FAC), and triacylglycerol composition (TAG) analyses. The results obtained for the novel lipid were compared with those of a commercial fat used for the same purpose. The structured lipid developed showed a lower saturated fatty acid content than the commercial fat (44.07% vs. 51.35%) and more than twice the level of polyunsaturated fatty acids (PUFA) (22.90% vs. 10.77%). The main triacylglycerols identified were BeOO (7.63%), OLO (6.69%), and BePO (6.14%). Both fats exhibited similar solid fat profiles, indicating the feasibility of using the developed lipid in biscuit filling formulations.

Keyword: *Functional lipids, Saturated fat reduction, Bench-scale process, Biscuit Fillings*

Modeling the growth and dynamics of the uropathogenic Escherichia coli in watermelon juice

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Uropathogenic Escherichia coli (UPEC), an emerging foodborne pathogen associated with urinary tract infections, has recently been detected in fresh fruit juices. However, its growth kinetics in fruit-based matrices remain poorly understood. This study aimed to develop predictive models describing UPEC growth in watermelon juice. Growth curves were obtained by storing UPEC-inoculated watermelon juice at 10–40 °C. Changes in the UPEC population were fitted with primary models to estimate growth parameters. Secondary models were applied to describe the effects of temperature on the maximum specific growth rate (μ_{max}), lag phase duration (λ), and maximum population density (y_{max}). Model performance was validated under dynamic temperature conditions (10 °C/4 h to 37 °C/4 h) using statistical indices, including root mean square error (RMSE) and proportion of prediction error (pPE). Results showed that UPEC grew well in watermelon juice across all tested temperatures. The Baranyi model, combined with the Huang square-root model, provided the best fit. The estimated minimum growth temperatures (T_{min}) ranged from 6.3 to 6.6 °C. Validation results demonstrated satisfactory predictive performance (RMSE: 0.64–0.68 log CFU/mL; pPE: 0.92). Overall, the developed models reliably describe and predict UPEC growth in watermelon juice, providing a useful tool for microbial risk assessment.

Keyword: *UPEC, fruit juice, predictive microbiology, food safety, foodborne pathogens*

Machine Learning-Based Classification of Wheat Cultivars Utilizing Multi-Instrumental Physicochemical Analysis

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The identification and classification of wheat cultivars are essential for maintaining the diverse functional and processing properties of their corresponding products. This study evaluates an advanced methodology for categorizing Korean wheat cultivars by integrating physicochemical data from multiple instrumental techniques, including Rapid Visco Analyzer (RVA), Fourier-transform infrared spectroscopy (FTIR), and GlutoPeak. Machine learning models were trained on these instrumental datasets, focusing on how feature-selected combinations of different analytical streams enhance predictive robustness. Experimental results indicate that RVA parameters alone provide a strong baseline accuracy of 0.95; however, the strategic integration of multiple instrumental techniques maximizes model performance. Principal component analysis further supports these findings by providing a clear delineative visualization of cultivar-specific clusters. These results establish that the synergy between instrumental profiling and machine learning offers a rapid, non-destructive, and objective screening platform for the quality standardization and industrial traceability of wheat flour

Keyword: *Artificial intelligence, classification, wheat flour, physicochemical property*

SUSTAINABLE STARCH MODIFICATION FOR CLEAN-LABEL, FIBRE-ENRICHED FOOD INGREDIENTS

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The demand for functional and sustainable food ingredients has increased interest in underutilised starch sources and dietary fibre enhancement strategies. This study investigates starches from quinoa, faba bean, chickpea, and cassava modified using environmentally friendly approaches. Acid hydrolysis improved solubility, reduced pasting viscosity and gelatinisation temperature, and increased crystallinity and oil absorption, with faba bean starch showing the greatest structural enhancement. Citric acid cross-linking significantly increased dietary fibre content while maintaining granular integrity and improving thermal stability.

Granular cold water swelling starch is also highlighted as a clean-label alternative, offering instant hydration, improved freeze–thaw stability, paste clarity, and reduced retrogradation, making it suitable for non-thermal and instant food applications.

The study further examines sustainable approaches for increasing soluble dietary fibre, including enzymatic treatment, extrusion, steam explosion, ultrasound, microwave processing, and high-pressure technologies. These methods enable structural tailoring of starch, enhancing hydration, viscosity, fermentability, and potential prebiotic functionality. Importantly, these modifications support the conversion of insoluble fibre fractions into more physiologically active soluble forms.

Overall, this work demonstrates that bioengineering of starch can enhance functionality, increase dietary fibre content, and support the development of health-promoting, clean-label food systems aligned with circular bioeconomy and sustainable processing goals.

Keyword: *Starch, Fibre, Bioengineering, Enzymatic modification, Dual modification*

CHEMICAL COMPOSITION AND SENSORY PROPERTIES OF OKPA PUDDING AND READY-TO-EAT OKPA GRITS FROM BAMBARA GROUNDNUT FLOUR SPICED WITH GARLIC

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This study evaluated the chemical composition and sensory properties of five formulations (17 g of pepper – control – MJ1, 17 g of garlic – MJ2, 8.5 g of garlic – MJ3, 4.25g of garlic – MJ4, 8.5g of pepper + 8.5g of garlic spice – MJ5) of pudding and ready-to-eat Okpa grits prepared from Bambara groundnut flour with varying proportions of pepper and garlic spice. Chemical analysis was carried out using standard methods for proximate composition, micronutrients (Vitamins A, E, Iron and Zinc) and antioxidant activity (DPPH and FRAP). Sensory evaluation was conducted using a 9-point hedonic scale. Moisture content significantly reduced while crude fat increased in spiced variants. MJ5 had the highest crude fibre (18.63 %) and ash (2.18 %). MJ1 (control) had higher Iron (9.83 mg/100g) and Zinc (9.63 mg/100g) contents, MJ4 had higher Vitamin E (0.34 mg/100g) while MJ2 had higher Vitamin A (0.44 mg/100g). Antioxidant activity values ranged from 29.48 to 41.14 and FRAP values from 2.65 to 3.23. For sensory properties, okpa pudding (MJ1 and MJ5) had the highest overall acceptability scores (8.07 and 7.37 respectively). For ready-to-eat okpa grits, formulations with added ingredients (sugar and miilk) showed varying acceptability patterns, with MJ1 consistently performing well across all preparations.

Keyword: *Legume, Traditional food, Underutilized, Malnutrition*

DEVELOPMENT OF ACTIVE FILM FROM CHITOSAN INCORPORATED WITH HERBAL EXTRACTS FOR EXTENDING THE SHELF LIFE OF MEAT

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Antimicrobial packaging are gaining popularity due to the growing demand to preserve meat products using natural ingredients. In this research, 2% chitosan (Ch) (w/v) based films were prepared containing various concentrations of green tea extract (GTE),and curry leaf extract (CLE): 5%GTE with 2%CLE, 10%GTE with 3%CLE, and 15%GTE with 4%CLE to form Ch+GTE5-CLE2, Ch+GTE10-CLE3, and Ch+GTE15-CLE4 films, respectively. The film performance was assessed through physical, mechanical and functional properties, Scanning Electron Microscopy, and Fourier Transform Infrared (FTIR) spectrometry. The Ch+GTE15-CLE4 film notably showed the most effective results including the lowest moisture content (21.26 ± 0.497%), the lowest water vapor permeability (0.0844 ± 0.0005 $g.mm.m^{-2}.d^{-1}.kPa^{-1}$) at refrigerated condition, the highest tensile strength (3.29 ± 0.003 MPa) the highest total phenolic content (31.91 mg GAE/g), and the largest inhibition zone against Staphylococcus aureus (19.70 ± 0.02mm) and Salmonella (21.88 ± 0.02mm). Changes in FTIR spectra, confirmed interactions between chitosan and polyphenols. A shelf-life assessment was demonstrated on chicken wrapped with the Ch+GTE15-CLE4 film at 4°C ± 1 and remained microbiologically allowable (below the spoilage threshold of 7 log CFU/g) until day 09. These findings revealed that the incorporation of GTE and CLE into chitosan films could be a viable solution for extending the refrigerated shelf life of chicken.

Keyword: *Active packaging, Chitosan-based film, Curry leaf extract, Green tea extract, Shelf life extension*

Microbial Fermentation of Dried Noni Fruit Slurry: Improving Aroma While Preserving Bioactive Compounds

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Noni fruit (Morinda citrifolia L.) is a tropical fruit valued for its bioactive composition, but its commercial application is limited by an undesirable flavor characterized by pungent, rancid, and fatty-acid-like notes. This work summarizes three studies investigating dried noni fruit slurry (DNFS) as a fermentation substrate for probiotic lactic acid bacteria (LAB), Saccharomyces cerevisiae, and non-Saccharomyces yeasts, aiming to improve sensory quality and functional value. Across the studies, DNFS supported satisfactory microbial growth, confirming its suitability as a versatile fermentation base. Fermentation generally preserved the functional quality of DNFS, as key phenolics and iridoids were largely maintained, with strain-dependent increases in compounds such as rutin, chlorogenic acid, deacetylasperulosidic acid, and vanillic acid. More importantly, fermentation consistently shifted the volatile profile toward desirable aroma characteristics. LAB fermentation enhanced lactic acid production and increased aroma-active alcohols, while S. cerevisiae promoted ester and higher alcohol formation and reduced rancid medium-chain fatty acids. Among non-Saccharomyces yeasts, Pichia kluyveri Frootzen and Williopsis saturnus NCYC22 enhanced fruity and floral notes. Overall, these findings demonstrate that DNFS is a promising substrate for functional fermented beverages, and that different microbial groups offer distinct but complementary routes for balancing bioactive retention and flavor improvement.

Keyword: *Fermentation, Volatile profile, Phenolics, Lactic acid bacteria, Yeast*

Effect of Cold Plasma and UV on Physicochemical Properties of Nut-based Milk

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The shift towards plant-based diets has increased the consumption of nut-based milk as dairy alternatives. However, challenges such as nutrient loss during pasteurisation, allergenicity, and limited functional properties restrict their wider application. This study explores the effects of two non-thermal technologies, ultraviolet-C (UV-C) and cold plasma, on macadamia and pecan milk, with a focus on protein structure and functionality. Both the treatments caused significant modifications in protein conformation resulting into alterations in secondary structure of protein, rearrangement in protein molecules and variations in protein bands. Moreover, cold plasma demonstrated ±40% variations in secondary structure than UV-C which was ±8% change in β- helix and α- sheet. Functionally, the structural modifications resulted in altered digestibility and some variations in allergenic potential. The effectiveness and modifications showed variability with the treatment and processing conditions, indicating differences in the underlying mechanisms of cold plasma and UV-C. Distinct responses were also observed between macadamia and pecan milk, which may be attributed to the difference in intrinsics composition including fat content. Overall, these findings show the potential of non-thermal technologies as viable alternatives to conventional thermal processing for nut-based milk systems.

Keyword: *Cold plasma, Nut-based milk, UV- C, Non-thermal processing, Structural modification*

EFFECT OF CONTINUOUS AND CYCLIC HYDROTHERMAL ANNEALING ON THE PASTING AND THERMAL PROPERTIES OF CASSAVA STARCH

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Cassava starch is widely used in food systems due to its mild flavor and desirable pasting behavior. In this study, starch was physically modified by annealing at 50 °C under continuous and cyclic regimes, with 24 h intervals, to improve its functional properties. The samples were characterized by FTIR spectroscopy, thermal analysis, pasting properties, and morphology. Morphological analysis revealed slight granule deformation and fissure formation, particularly after two and three cycles, although the overall granular shape was preserved. Pasting temperature increased with treatment intensity, reaching 70.8 °C after three cycles. Peak viscosity decreased in the modified samples, with the lowest value observed after two cyclic treatments, suggesting enhanced structural organization and resistance to swelling. Breakdown values were markedly reduced compared with native starch, indicating improved thermal and shear stability. Gelatinization temperature increased from 60.9 °C in native starch to higher values in treated samples, accompanied by increases in peak and conclusion temperatures. Enthalpy also increased, especially after 72 h of continuous treatment and three cycles. FTIR analysis indicated no major changes in chemical structure. Overall, annealing effectively modulated the technological properties of cassava starch under both continuous and cyclic regimes.

Keyword: *hydrothermal treatment, starch modification, starch structure, thermal properties*

MICROALGAE AS MORE SUSTAINABLE AND AFFORDABLE MINERAL SOURCES FOR HUMAN NUTRITION AND HEALTH: BIOACCESSIBILITY AND BIOAVAILABILITY ASSESSMENT

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Micronutrient deficiency, especially mineral deficiency, is a widespread global health problem that affects more than 5 billion people worldwide. Microalgae-derived minerals are emerging as sustainable nutrient sources for humans; however, knowledge of their bioaccessibility and bioavailability remains limited. In this project, 9 industry-produced and 3 laboratory-produced microalgae under autotrophic, heterotrophic, or mixotrophic conditions were evaluated in mineral bioaccessibility. Following, a case study about iron bioavailability was carried out using polarized human intestinal epithelial cells.

Mineral content and bioaccessibility exhibited wide variability; for instance, iron bioaccessibility ranged from 0.5% in Tetraselmis chuii to 83.4% in Chlorella vulgaris. The bioaccessibility of calcium (0-82.3%), zinc (51.9-62.2%), magnesium (68.0-92.2%), and manganese (6.8-84.3%) also showed large interspecies differences. The heterotrophic mode yielded superior bioaccessibility results (66.9% for Galdieria yellowstonensis and 76.3% for C. vulgaris) compared to autotrophic cultivation (18.4-41.8%). The iron bioavailability of Limnospira platensis and Haematococcus pluvialis is the highest, comparable to that of freshly made $FeSO_4$, which is substantially higher than those found in conventional foods. This research provides a systematic evaluation of mineral bioaccessibility and a case study about iron bioavailability with various microalgae species, highlighting their potential as more sustainable, innovative, highly bioaccessible and bioavailable mineral sources to address micronutrient deficiency.

Keyword: *Mineral deficiency, Microalgae-derived minerals, Mineral bioaccessibility, Iron bioavailability, Sustainable nutrient sources*

SUSTAINABLE ZERO-WASTE BIOREFINERY FOR BOARFISH VALORISATION

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Boarfish is an abundant yet underutilised marine biomass with low market value, highlighting its strong potential for valorisation. This study proposes a zero-waste, multi-stage cascading biorefinery approach to convert boarfish into multiple high-value products. Steam cooking was applied to disrupt the fish matrix, enabling efficient recovery of crude fish oil (98% purity) while generating two co-products, fish meal and stickwater, for further processing. The stickwater, rich in soluble proteins and low-molecular-weight compounds, was further processed through enzymatic hydrolysis under optimised conditions to produce peptide-rich hydrolysates. This process facilitated the breakdown of proteins into smaller peptides with diverse functional and biological properties. Subsequently, membrane separation using sequential ultrafiltration was employed to fractionate the hydrolysates based on molecular weight, allowing the selective recovery of low-molecular-weight peptide fractions with potential bioactive properties, including antioxidant and antihypertensive activities. The remaining solid fraction (fish meal), rich in proteins and minerals, retains significant nutritional value (protein content: 63.03%; fat content: 12.05%) and can be utilised in animal feed or further developed into functional ingredients, compared to the raw boarfish (protein content: 48.50%; fat content: 32.76%). Overall, this integrated approach Maximises biomass utilisation, reduces waste generation, and supports scalable, sustainable boarfish valorisation within a blue bioeconomy.

Keyword: *Bioactive peptides, Boarfish, Enzymatic hydrolysis, Fish oil, Membrane separation*

AI-Powered Discovery of Bioactive Peptides from Food Proteins

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The development of bioactive peptides from food proteins for nutraceutical and functional food applications has attracted increasing scientific and industrial interest. Traditional wet-lab approaches, while essential, are often time-consuming and resource-intensive. With the availability of large-scale protein and peptide datasets and advances in machine learning, especially protein large language models, it now offers powerful opportunities to accelerate the discovery. Artificial intelligence (AI)-driven methods can help identify peptides with targeted bioactivities, complementing and enhancing experimental strategies. In this presentation, I will share our recent work on both experimental derivation of peptides from food proteins and design of advanced predictive models, ranging from conventional machine learning to state-of-the-art deep learning, for more efficient peptide discovery. Together, these approaches demonstrate how integrating wet-lab and AI-based methods can advance innovation in functional foods.

Keyword: *Machine learning, Protein language models, Bioactive peptides, Food proteins, Artificial intelligence (AI)*

WIRELESS RADIO-FREQUENCY IDENTIFICATION (RFID) SYSTEM FOR SMART POST-HARVEST ETHYLENE GAS DETECTION

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The global economy is experiencing rapid growth, which has heightened demand for fresh food, yet substantial waste of fruits and vegetables, particularly overripe fruit, remains a major issue. Thus, there is a need for reliable, non–invasive, rapid methods to assess fruit quality and maturity by monitoring ethylene gas produced during ripening. To detect ethylene, a PPy-based nanocomposite polymer was synthesized via in–situ chemical oxidative polymerization method to ensure high conductivity and structural uniformity. The synthesized polymer was subsequently deposited onto the RFID tag via drop-casting to form the active sensing layer. Then, the modified RFID sensor was placed in a controlled gas sensing chamber, where ethylene gas was introduced to evaluate its detection performance. Furthermore, the chemical, structural, and morphological characteristics of the polymers were analyzed using FTIR, XRD, and SEM. The sensor response time at a 100-ppm ethylene concentration was 6 minutes, while the recovery time was 20 seconds. In addition, the developed nanocomposite RFID sensor was used to evaluate its practicality for on-site monitoring of banana freshness.

Keyword: *RFID, Ethylene sensor, Conducting polymer, Intelligent packaging, Freshness monitoring*

COLD PLASMA-MEDIATED INACTIVATION OF BACILLUS IN MILLET FLOUR: KINETICS, MECHANISMS, AND QUALITY IMPACTS

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The smaller size, tighter husk adhesion, high starch content of little millet (Panicum sumatrense) makes it susceptible to spoilage by bacteria in unsuitable storage conditions, thereby reducing its shelf life. In this study, dielectric barrier discharge cold plasma (DBD-CP) was evaluated for inactivating Bacillus subtilis in millet flour and PBS. DBD-CP at 10–20 kV for up to 15 min achieved a maximum 0.79 log reduction at 20 kV, 15 min in flour. Further, the inactivation kinetics was well described by the Weibull model. Also, matrix comparisons showed different inactivation behaviour in flour and PBS. Cold plasma generated reactive species, whose concentrations increased along with conductivity (15.5 to 156 µS cm^{-1}) resulting into decrease in pH (7.12 to 3.71), with severity in voltages. Additionally, morphological observations, leakage of intracellular contents, and FTIR spectra confirmed bacterial cell–envelope disruption and oxidative damage. Molecular docking also indicated that plasma-induced reactive species, oxidatively modified key protein active sites, contributing to loss of Bacillus cells integrity. Further, the effect of DBD-CP treatment on flour functional properties such as water absorption capacity, oil absorption capacity, swelling power and emulsion capacity was studied. Overall, the work demonstrates the application of DBD-CP for improving microbial safety of millet-based products.

Keyword: *Cold plasma, inactivation kinetics, sublethal damage, functional properties, plasma reactive species*

ANTI-CANCER EFFECTS OF FLAVONE DIMER ZHL10 AGAINST OVARIAN CLEAR CELL CARCINOMA

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Ovarian clear cell carcinoma is an aggressive subtype of ovarian cancer with limited sensitivity to conventional platinum-based chemotherapy, highlighting the need for novel bioactive compounds with improved efficacy and safety. In this study, we evaluated the anti-cancer potential of ZHL10, a novel food-derived flavone dimer prepared by food-grade oxidative coupling of dietary flavone precursors, was investigated for its anti-cancer potential, against ovarian clear cell carcinoma. The results indicate that ZHL10 significantly inhibited cell viability and proliferation in ovarian clear cell carcinoma cells and suppressed tumor growth in TOV21G xenograft model. Histological and molecular analyses showed reduced proliferative signaling and enhanced apoptosis in tumor tissues following treatment. Mechanistically, RNA sequencing and protein-level validation suggested that ZHL10 modulated the PI3K/AKT-related pathway, supporting its role in tumor suppression. In addition, ZHL10 demonstrated a favorable safety profile in vivo compared with cisplatin, with stable body weight and no obvious organ toxicity observed under the tested conditions. These findings indicate that ZHL10 is a promising food-derived bioactive compound with potential application in ovarian cancer intervention and may serve as a lead candidate for further development in functional food or nutraceutical-related research.

Keyword: *Bioactive compound, Flavone Dimer, Ovarian Cancer*

STERILISATION OF A LOW-ACID VEGETABLE SOUP: IMPACT OF STERILISING VALUE ON SENSORY AND NUTRITIONAL ATTRIBUTES

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The consumers growing demand for food with fresh-like qualities induces an increase in alternatives and development of the sterilisation process for shelf-stable ready-to-eat products. To guaranty the inactivation of thermoresistant bacteria and spores, high sterilising values (F_0 values) are applied to low-acid products. The sterilisation often negatively impacts the nutritional and organoleptic qualities of food.

This study compares the impact of five F_0 values (7 - 42 min) on nutritional and organoleptic (Just-About-Right sensory analysis) qualities of a vegetable soup. These F_0 values were obtained at temperatures between 131 and 137 °C. All soups were commercially sterile after processing. The F_0 variations did not significatively impact the content of fibres, vitamin B1 and B2. In contrast, the β-carotene content increased with higher F_0 values. Consumers did not find significant differences between the fives soupes. The most represented defects for all soups were “too salty”, “not enough odour” and “not enough aroma”.

These results show that:

- Reducing F_0 values would negatively impact β-carotene content
- F_0 values could be optimized without impacting consumer appreciation

Moreover, lowering product heating to optimize F_0 values reduces environmental impact, especially for products that don’t require additional energy consumption for cold storage during transport or shelf life.

Keyword: *Sterilisation, Thermal processing, F0 values, Nutritional content, Sensory analysis*

Post-Harvest Processing Under Extreme Constraints: Requirements and Conceptual Design for Cereal-Based Food Production in Closed Habitats

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Future long-duration space missions will require food systems capable of reducing terrestrial resupply while ensuring safe and usable food production in highly constrained environments. Although plant cultivation is widely investigated for bioregenerative life support, crop production alone does not guarantee food autonomy. Cereal and grain crops require post-harvest operations such as stabilization, cleaning, separation, dehulling, milling, and storage before conversion into edible ingredients.

This work addresses post-harvest processing as a critical engineering step between crop production and food use, using lunar habitats as an extreme case study for closed food systems. Terrestrial cereal post-harvest chains were reviewed and translated into functional requirements for compact, enclosed, and resource-efficient processing architectures. Key constraints included limited volume, energy demand, dust containment, microbial contamination, crew time, maintainability, and multi-crop adaptability.

Based on this analysis, a preliminary integrated processing concept is proposed, combining functional modules for material separation, thermal treatment, controlled transfer, route selection, and mechanical reduction. The concept aims to convert harvested granular plant materials into food-relevant fractions while reducing manual handling and particulate release. The study provides a food engineering perspective on resilient processing systems for future extraterrestrial habitats and other closed, resource-limited food production environments.

Keyword: *Post-harvest, Lunar Food Systems, Closed Habitat Food Production, Resource Efficiency, Cereal Processing*

Deep Eutectic Solvent-Mediated Extraction of Coconut Proteins from Spent Coconut Residue: Structure and Functionality Insights

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The present study investigated the green extraction of coconut proteins (CPs) from spent coconut residue (SCR), an abundant byproduct obtained during virgin coconut oil production, thus aligning with circular economy principles and supporting zero-waste strategies. Choline chloride-glycerol based deep eutectic solvents (DES) at 1:1 and 1:2 molar ratios resulted in higher degree of protein extraction (~82-86 wt.%) than conventional alkali solvent (~56 wt.%). Further, higher amino acid score (20.21→ 23.40 %), higher levels of sulfyl groups, lower levels of free amino and carbonyl groups of CPs obtained by DES compared to alkali solvents, indicate a balanced essential amino acid profile with good preservation of protein structure**.** Additionally, the observed UV (220.5→202.5 nm) and fluorescence (337.1→334.1 nm) blue shifts, coupled with more ordered secondary structure elements (α-helical, β-turns, β-sheets, and random coils) of CPs obtained by DES relative to alkali solvents, confirm the protein compaction (folding). Specific characteristics (solubility, emulsifying activity, hydrodynamic size, Zeta potential, water and oil holding capacities) of CPs extracted by alkali and DES were examined to understand the structure–function relationship. Overall, DES extraction achieved higher protein recovery (44-52 %) than conventional extraction (25%), confirming its feasibility as a sustainable approach for valorizing and efficient utilization of SCR.

Keyword: *By-product valorization, Extraction, Green solvents, Coconut Proteins, Structure and Functional properties*

INTEGRATED PROCESS DEVELOPMENT OF A FUNCTIONAL RICE BRAN INGREDIENT USING OPTIMIZED ALLIUM HOOKERI EXTRACT, ENZYMATIC PRETREATMENT, AND LACTIC FERMENTATION

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Rice bran is an underutilized cereal by-product whose food use is limited by instability and low accessibility of bound bioactives. This study established an integrated process to develop a functional rice bran ingredient using optimized Allium hookeri extract, pretreatment, and lactic fermentation. A balanced optimum for hot-water extraction of Allium hookeri was 17.7-fold water, 108.2°C, and 2.67 h, giving 16.48% solids, 13.10 μM/g thiosulfinates, and 4.26 mg quercetin equivalents/g total flavonoids. For rice bran pretreatment, 100°C heating, enzyme treatment, and 60-mesh milling increased gamma-aminobutyric acid, ferulic acid, and total polyphenols to 35.4 mg/100 g, 61.8 mg/100 g, and 336 mg gallic acid equivalents/100 g, respectively. Fermentation with strain LW at 35°C for 48 h with 5% Allium hookeri extract was selected as the most efficient condition, yielding 68.2 mg/100 g gamma-aminobutyric acid, 55.2% DPPH radical-scavenging activity, 58.4% ABTS radical-scavenging activity, and 39.8% nitric oxide inhibition in lipopolysaccharide-stimulated RAW 264.7 cells at 100 μg/mL. These results demonstrate a practical processing strategy for upcycling rice bran into a value-added functional ingredient.

Keyword: *rice bran, Allium hookeri, actic fermentation, gamma-aminobutyric acid, antioxidant activity*

UPCYCLING WHEAT BRAN THROUGH LACTIC ACID FERMENTATION TO ENHANCE SOLUBLE DIETARY FIBER, FREE FERULIC ACID, AND ANTIOXIDANT ACTIVITY

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Wheat bran is an abundant cereal by-product, but its use as a food ingredient is limited because dietary fiber and phenolics are largely present in insoluble or bound forms. This study developed an upcycling process for wheat bran using lactic acid fermentation and evaluated functionality and process stability. Pretreated wheat bran was fermented with the selected LW lactic acid bacterium under optimized conditions. Fermentation performance was monitored by viable cell counts, pH, and titratable acidity, and functional changes were assessed by soluble dietary fiber, free ferulic acid, dihydroferulic acid, and DPPH and ABTS scavenging activity. The optimal condition was 35 °C for 36 h with 5% inoculation under shaking. Under this condition, soluble dietary fiber increased from 6.10 to 8.15 g/100 g dry weight, free ferulic acid from 0.11 to 0.59 mg/g dry weight, and dihydroferulic acid from 0.015 to 0.072 mg/g dry weight. DPPH and ABTS scavenging activities increased to 46.3% and 53.6%, respectively, and viable counts reached 2.8 × 10^9 CFU/mL. After drying, the powder retained more than 10^7 CFU/g. These results show that LW fermentation can convert wheat bran into a stable, functional, and scalable ingredient for health-oriented and sustainable food applications.

Keyword: *wheat bran, Lactic acid fermentation, soluble dietary fiber, ferulic acid*

PREDICTION OF MOISTURE CONTENT IN CUT APPLES DURING HOT-AIR DRYING USING DEEP NEURAL NETWORK WITH FINE TUNING

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We developed a neural network model to estimate the moisture content of cut apples using digital images acquired during hot-air drying under dynamically changing temperature conditions. First, image data were collected using a digital camera during hot-air drying at constant temperatures of 40 °C, 60 °C, and 80 °C, and these datasets were used to train the model. Image analysis revealed that the browning of cut apples increased gradually as the moisture content decreased. Subsequently, additional image datasets were obtained under three hot-air drying conditions with unsteadily changing temperatures to evaluate the predictive performance of the model. An optimized convolutional neural network (CNN) model was applied, and Grad-CAM was used. It was found that the model effectively focused on relevant regions in the images for prediction. The predicted moisture content showed a strong correlation with the experimentally measured values. Furthermore, the results indicated that the model successfully captured both shape and color features from the images to estimate moisture content. These findings demonstrate that a CNN-based approach can accurately estimate the moisture content of fruits and vegetables solely from image information, highlighting its potential as a non-destructive and efficient analytical method in food processing and postharvest applications.

Keyword: *Moisture content, cut apples, browning, CNN, Grad-CAM*

Valorization of Blue Swimming Crab (Portunus pelagicus) Shell Waste for Chitosan Extraction

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Large volumes of crab shell waste from seafood processing are typically discarded in landfills. These shells contain chitin, which can be converted into chitosan, a biopolymer with many applications in medicine and the food industry. This study utilized chitosan from Philippine blue swimming crab (Portunus pelagicus) shell waste to compare its physicochemical and functional properties to a commercial standard and to confirm its identity via FTIR spectroscopy. Results showed a high yield of 78.97% and a superior degree of deacetylation of 88.76%. Functional analysis revealed fat and water binding capacities of 409.32% and 426.12%, comparable to the commercial standard. The extracted chitosan exhibited high solubility and low viscosity of 99.21% and 1.40 cP, suitable for drug formulations and edible fruit coatings, with a whiteness index of 80.34%. However, challenges in purity emerged, with an ash content of 20.51% and a low emulsifying capacity of 5.87%. Furthermore, FTIR analysis confirmed characteristic chitosan functional groups. Overall, these findings suggest that P. pelagicus is a viable source for high-quality chitosan, although more thorough demineralization is needed. This research may lead to a sustainable pathway for valorizing seafood waste into applications in medicine and food.

Keyword: *Chitosan, Portunus pelagicus, FTIR spectroscopy, Degree of deacetylation, Seafood waste valorization*

INTERGRATED EXTRACTION, PAPAIN HYDROLYSIS, AND ULTRAFILTRATION OF SOYBEAN, BLACK SOYBEAN, AND PEA FOR MULTIFUNCTIONAL BIOACTIVE PEPTIDE FRACTIONS

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Pretreated soybean, black soybean, and pea powders were investigated to establish an integrated process for generating health-promoting low-molecular-weight peptide fractions. Water extraction conditions were optimized by varying solid-to-liquid ratio, temperature, and time, followed by protease screening, papain hydrolysis, and sequential ultrafiltration. Practical extraction optima were 1:20, 40 °C, and 3 h for soybean and black soybean, and 1:20, 40 °C, and 2 h for pea. Papain was the most effective protease for all three legumes, and a 3 h papain reaction with 2% enzyme yielded the highest or statistically equivalent degree of hydrolysis. After fractionation, the 1 kilodalton and smaller fraction consistently showed the strongest bioactivities and reduced HepG2 lipid accumulation. In soybean, this fraction showed 72.0% angiotensin-converting enzyme inhibition at 5 mg/mL, alpha-glucosidase inhibitory concentrations of 0.90 and 1.40 mg/mL in yeast and intestinal models, and 60% relative lipid accumulation in 3T3-L1 cells. Corresponding values were 60.0% at 5 mg/mL, 0.80 and 1.20 mg/mL, and 55% for black soybean, and 60.0% at 5 mg/mL, 1.50 and 2.20 mg/mL, and 62% for pea. These results indicate that integrated extraction, papain hydrolysis, and ultrafiltration can generate multifunctional legume peptide fractions with promising antihypertensive, antidiabetic, and antiadipogenic potential.

Keyword: *soybean, black soybean, pea, bioactive peptides, ultrafiltraion*

IMPROVING FOOD WASTE RECYCLING WITH BLACK SOLDIER FLY LARVAE

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The global food system is challenged by rising demand from a growing population, while one-third of the food production is lost or wasted. Black soldier fly larvae bioconversion offers a circular economy solution by upcycling food waste into feed and fertilizer. However, variable food waste properties can result in operationally challenging temperature peaks associated with stunted larval growth or extensive climatization measures. To better understand the underlying mechanisms, we designed and validated a reactor system mimicking industry-scale (60×40 cm crates) and tracks key parameters including CO_2 and NH_3 emissions, temperature, and mass changes. We assessed the impact of physical properties and sugar availability in food waste on thermal dynamics and larval performance: Lower bulk densities (Δ 300 kg m^{-3}) increased temperature by 9 K and lowered the bioconversion rate by 19%. Sugar availability changed the temperature profile of the bioconversion. Detailed tracking of microbial and metabolic shifts revealed 4 bioconversion phases that could serve as benchmarks for process stability. Overall, results show that the interaction of larvae, the food waste matrix and its microbes determines temperature, emission, and larval growth profiles. The insights suggest measures for temperature and efficiency management of the bioconversion, supporting circular economy and food waste management.

Keyword: *Food waste management, Recycling, Black soldier fly larvae, BSFL, Insect farming*

ARTIFICIAL INTELLIGENCE GUIDED SYNTHETIC BIOLOGY FOR SCALABLE BIOSYNTHESIS OF NATURAL INGREDIENTS

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Artificial intelligence (AI) is fundamentally reshaping synthetic biology by enabling highly predictive enzyme design, comprehensive metabolic analysis, targeted strain engineering, and bioprocess optimization. Here, we present an AI-guided framework for the scalable biosynthesis of complex natural ingredients. This integrated approach synergizes computational enzyme modification, genome-scale metabolic model (GEM)-based network design, and data-driven fermentation optimization. Application of this framework to Rebaudioside M bioconversion yielded significant improvements: protein engineering enhanced sucrose synthase solubility by 60% and increased the catalytic efficiency of two glycosyltransferases by 7.0- and 1.3-fold, respectively. Furthermore, rational pathway rewiring by GEM-based algorithm increased the uridine diphosphate (UDP)-glucose supply by 2.4-fold. Systematic optimization allowed for an increase in substrate loading from 0.5% to 15% and elevated the conversion rate from 70% to 95% for Rebaudioside M. Similarly, natural vanillin from ferulic acid biocatalysis exhibited an increase in substrate loading from 1% to 12%, with conversion rates improving from 80% to 95%. Collectively, these findings demonstrate that AI-driven strategies can significantly accelerate the industrialization of synthetic biology, offering robust improvements in productivity, process stability, and sustainability for food ingredient manufacturing.

Keyword: *artificial intelligence, synthetic biology, Rebaudioside M, natural vanillin, digital biomanufacturing*

Physiological activities of six types of insect-derived oils

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Fatty acids account for over 60% of the household product market and 30% of the food industry, yet their specific functional mechanisms remain poorly understood. Rising consumer health consciousness has increased demand for functional lipids, positioning edible insect oils as promising candidates due to their high unsaturated fatty acid content, particularly omega-6 and omega-9. While species such as Tenebrio molitor, Zophobas morio, Protaetia brevitarsis, Gryllus bimaculatus, Bombyx mori, and Hermetia illucens are widely utilized for protein, their lipid fractions are often discarded without functional characterization.

Physicochemical analysis revealed distinct fatty acid profiles and color parameters (L*, 51.56–90.89; a*, -6.16–12.12; b*, 43.12–132.76). Five species contained 61.1–77.5% unsaturated fatty acids dominated by oleic acid, whereas H. illucens showed the lowest lightness (L*=51.56) and highest saturated lauric acid content (71.7%). Total phenolic and flavonoid contents were quantified, and antioxidant capacity was assessed via DPPH and ABTS assays across concentrations of 1.58–12.5%. Anti-inflammatory activity was evaluated through inhibition of nitrite production in RAW 264.7 cells, with all oils showing concentration-dependent bioactivity peaking at 12.5%. Four species showed no cytotoxicity up to 12.5%, while two were safe only up to 6.25%, supporting their potential as functional ingredients pending optimized safety concentrations.

Keyword: *Edible insects, Insect oil, Fatty acids, Bioactive compounds*

ATMOSPHERIC COLD PLASMA TREATMENTS ON AQUAPONIC WASTEWATER FOR ENHANCED MICROALGAL GROWTH

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Aquaponics is an intensive, resource-efficient food production system, but its operations could generate considerable nutrient-rich wastewater. Cultivating microalgae in wastewater is an emerging treatment method due to its dual benefits of pollutant removal and biomass production. However, the growth performance of microalgae is largely affected by the nutrient composition of wastewater and the indigenous bacteria present. In this study, atmospheric cold plasma (ACP), an advanced nonthermal technology, was applied to assist with microalgae cultivation in aquaponic wastewater, aiming to enhance their growth. Wastewater collected from tilapia-lettuce aquaponics was treated with ACP generated using nitrogen-oxygen mixtures at different ratios (4:1, 1:1, and 1:4) for 15 min, which decreased the total bacterial count by 88−98%. The treatments also increased the nitrate and nitrite contents and decreased the phosphate content, thereby raising the nitrogen/phosphorus ratio of wastewater from 0.24 to 7.3−8.8, a range more favored by microalgae. ACP-treated wastewater significantly promoted the growth of Chlorella vulgaris, by up to fourfold after 14 days. The results demonstrate that ACP treatment is effective in bacterial inactivation and nitrogen fixation in aquaponic wastewater and can convert it into a more suitable medium for microalgal biomass production, offering a promising approach toward a circular bioeconomy.

Keyword: *Atmospheric Cold Plasma, Aquaponics, Microalgae, Wastewater treatment, Chlorella vulgaris*

ATMOSPHERIC COLD PLASMA PRETREATMENT ENHANCES PLANT-BASED PROTEIN PRODUCTION FROM PEANUT MEAL THROUGH IMPROVED EXTRACTION, FUNCTIONALITY, AND REDUCED ALLERGENICITY

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Plant-based proteins have become an important trend in sustainable food choices recently. Peanuts are a protein-rich legume but also a major allergenic food. High-temperature oil processing further reduces protein functionality and extractability, limiting utilization. Atmospheric cold plasma (ACP) is a novel non-thermal technology that generates reactive species capable of modifying protein structures. This study investigates ACP to reduce allergenicity and improve functionality of peanut proteins. Fresh peanut kernels were treated with 7 kV air or nitrogen ACP for 0–60 min, followed by roasting and oil pressing. Peanut meal proteins were analyzed for allergenicity, extractability, and functional properties. After 60 min ACP treatment, ACP reduced Ara h 1 by 52.2% and decreased thermal stability; roasting further reduced it to 0.6%. α-Helix content decreased, indicating structural modification. Additionally, ACP increased oil and protein extraction from peanut by 35% and 1.86-fold, respectively, while maintaining oil quality and enhancing the water- and oil-holding and emulsifying properties of peanut protein. These effects are attributed to plasma-induced modifications of surface and internal proteins and amino acids in peanut meal. ACP pretreatment applied to peanut kernels is a simple and promising strategy to enhance the valorization of peanut by-products as plant-based protein sources.

Keyword: *Atmospheric cold plasma, Peanut meal, Plant-based protein, Allergenicity, Protein functionality*

VALORISATION OF CO-PRODUCTS FROM LEGUME PROTEIN DRY FRACTIONATION FOR APPLICATION IN TORTILLAS

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Legume protein fractionation, widely used to meet the growing demand for plant-based proteins, generates substantial side streams that remain underutilised despite their nutritional and functional potential. Dry fractionation is considered a more sustainable alternative to wet processing due to its reduced water and chemical requirements. This study investigates the proximate composition, structural characteristics, and techno-functional properties of fibre-rich and starch-rich co-products obtained from dry fractionation of five dehulled legumes (Desi chickpea, Kabuli chickpea, mung bean, faba bean and lupin), with a focus on their application in wheat tortillas.

Dry fractionation produced low-purity protein concentrates (fine fraction) and protein-deficient coarse fractions. Protein-deficient fractions showed only slightly different composition and functional properties from legume flours, indicating their suitability as partial flour substitutes in food formulations. The incorporation of legume protein-deficient fractions into wheat tortillas significantly influenced composition, texture profile and starch digestibility, similar to the effects of unfractionated legume flour. These findings highlight the potential of legume fractionation co-products as sustainable, value-added ingredients in cereal-based foods, supporting clean-label formulation and enhanced nutritional functionality. This study contributes to integrating valuable side-stream co-products into practical food applications through targeted analytical and functional evaluation.

Keyword: *Legumes, Dry fractionation, Side-stream, Tortillas, In-vitro digestibility*

Sustainable DES Extraction of Coconut Globulin: Physicochemical and Interfacial properties

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university of leeds

Deep eutectic solvents (DESs) were explored as a green strategy to isolate coconut globulin and preserve its interfacial functionality for food and bioactive delivery applications. Four choline chloride-based DESs containing D-sorbitol (CGS), glycerol (CGG), urea (CGU), and ethylene glycol (CGE) were systematically compared in terms of extraction efficiency, protein quality, structural characteristics, colloidal behaviour, and interfacial performance. All DESs selectively enriched the 11S globulin (cocosin) fraction to >90%. CGG gave the highest yield (49.31 ± 0.98%), while CGS achieved the highest protein purity (91.21 ± 4.47%). Structural analyses showed clear DES-dependent differences: CGS retained the highest α-helix content (40%), whereas CGG showed the highest β-sheet content (19%). These differences translated into functionality, with CGS and CGG showing smaller particle sizes, higher absolute ζ-potential values at neutral-to-alkaline pH, and the lowest limiting interfacial tensions (14.74 and 15.11 mN/m), indicating faster interfacial adsorption. Accordingly, CGG exhibited the highest emulsifying activity, while CGS showed the best foaming capacity. Ongoing work will further investigate cocosin–phenolic interactions, focusing on particle size, binding kinetics, surface property evolution, and digestion behaviour, to establish structure–function relationships for sustainable plant protein utilisation.

Keyword: *protein, colloidal property, structural characteristic, green extraction*

Monitoring Cell Growth and Kinetic Behavior of Saccharomyces cerevisiae during Fermentation in a BioFlo/CelliGen 115 Bioreactor

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The fermentation of Saccharomyces cerevisiae was conducted in a BioFlo/CelliGen 115 bioreactor over 120 h to monitor cell growth and evaluate the influence of operational parameters on kinetics. The culture medium included polysorbate, oleic acid, potassium phosphate, and magnesium sulfate. Growth was correlated with variables recorded throughout the process: agitation, temperature, dissolved oxygen (DO), and pH. Cell concentration was determined daily by direct counting in a Neubauer chamber to monitor population dynamics. Agitation was kept constant at 300 rpm to ensure efficient mass transfer. Temperature (28.0–30.1 °C) and pH (6.50–6.95) remained stable, favoring metabolic activity. In contrast, DO showed the highest variability (0.0–47.6% saturation), with alternating periods of limitation and reoxygenation reflecting cellular respiratory demand. Under these controlled conditions, cell growth increased progressively, reaching a maximum on day 4 (5.26×10^8 cells/mL), followed by a decline on day 6 (3.77×10^8 cells/mL), primarily due to oxygen limitation and nutrient depletion. These results demonstrate the importance of controlling operational parameters to optimize fermentation performance and understand the kinetic behavior of S. cerevisiae in bioreactor systems. This study highlights how dissolved oxygen variability impacts yeast population dynamics during long-term bioprocesses under standardized temperature and agitation.

Keyword: *Yeast fermentation, Bioprocess monitoring, Oxygen limitation, Growth kinetics, Bioreactor optimization*

Preparation of colostrum fortified camel milk-based infant formula: Its characterization, bioactive properties, and peptidomics after in-vitro simulated infant gastrointestinal digestion

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This study is based on the formulation, characterization, and simulated infant gastrointestinal digestion of colostrum-fortified camel milk-based infant formula (CIMF). CIMF was fortified with colostrum at different levels to study its effects on digestibility, bioactive properties, amino acid profiles and peptide release. Protein digestibility was evaluated using hydrolysis degree, sodium dodecyl sulphate-polyacrylamide gel electrophoresis (SDS-PAGE), and reverse-phase ultra-performance liquid chromatography (RP-UPLC). Liquid chromatography-mass spectrometry (LC-MS/MS) technique was employed to identify peptide sequence generated from CMIF after the gastric and intestinal phase digestion. The interaction of these peptides was also studied with 2FLU (Kelch-Neh2 Complex) protein using molecular docking and dynamic simulation. The study indicated an increase in degree of proteolysis and antioxidant activity after gastrointestinal digestion in all the samples. Notably, following gastrointestinal digestion of CIMF fortified with 10% of colostrum showed a significantly higher degree of hydrolysis and 2,2′-Azino-bis-3-ethyl-benzothiazoline-6-sulfonic acid (ABTS) radical scavenging activity. The selected peptides after gastrointestinal digestion of CIMF showed stable interactions with Keap1 protein, showing their antioxidant potential. The identified peptides were also analysed using an in-silico and bioinformatics approach for toxicity, antibacterial, and allergenicity prediction. The findings of this study suggest that colostrum-fortified CMIF can be a healthier alternative to conventionally available infant formulas.

Keyword: *Camel milk, Colostrum, Digestibility, Antioxidant properties, Bioactive Peptides*

ENHANCEMENT OF BETALAINS RETENTION IN SPRAY-DRIED COLORANT POWDER FROM DRAGON FRUIT PEELS VIA THE USE OF CARBON-DIOXIDE NANOBUBBLES PRETREATMENT

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Dragon fruit peels are food processing by-product that contains betalains, which exhibit potential as a natural red colorant. However, betalains are susceptible to degradation during processing, especially during extraction and drying, which are required steps to produce pigment extract and dried colorant powder, respectively. The present study therefore aimed to investigate the feasibility of using carbon-dioxide nanobubbles pretreatment to improve betalains retention during ultrasound-assisted extraction and spray drying of dragon fruit peels extract. Carbon dioxide nanobubbles pretreatment successfully generated dissolved carbon dioxide at 1782.50±99.70 ppm, with a mean bubble diameter of 284.75±47.60 nm and slightly reduced pH from 4.67±0.03 to 4.62±0.02. Total betanin (a representative betalain) content of the extract increased from 1.68±0.25 to 2.64±0.05 mg/mL after the pretreatment. After spray drying, total powder yield of the control and pretreated samples showed no significant difference (54.89±1.45% vs. 53.74±4.33%), while betanin retention increased significantly from 68.87±4.08% to 81.86±5.18%. Powders obtained from the pretreated extract also exhibited higher bulk density, higher redness and chroma values, with similarly high solubilities and short reconstitution time. These findings highlight carbon dioxide nanobubbles pretreatment as a promising approach for valorization of dragon fruit peels into a more stable natural colorant.

Keyword: *By-product valorization, Food colorants, Natural pigments, Reconstitution, Ultrasound-assisted extraction*

FERMENTATION OF FOOD PROCESSING BY-PRODUCTS FOR IMPROVED NUTRITIONAL VALUE IN SUSTAINABLE AQUAFEED

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Food processing by-products, such as soybean okara and spent grains are an abundantly available and good source of nutrients including protein (30.1%±1.8% and 25.0±1.8%), carbohydrate (50.7%±7.6% and 54.8%±11.4%) and lipid (10.7%±2.8% and 6.8%±2.4%) and rich in polyunsaturated fatty acids. However, their use in aquafeed is challenging due to low protein content, poor digestibility, amino acid composition and anti-nutritional factors.

Around 50 microorganisms, including bacteria, yeasts and filamentous fungi, were assessed for growth on the by-products in submerged fermentation, achieving up to 26.3%±1.3% higher crude protein, while in vitro digestibility increased up to 20.9±4.9%, indicating solubilisation and hydrolysis of proteins via fermentation.

A solid-state fermentation process was developed with 1kg of fresh weight by-product at 70% moisture content in trays with selected microorganism and fermented for 3 days, reaching in excess of 1×10^{10} CFU/g. Solid state fermentation with Bacillus subtilis achieved a crude protein content of 36.0%±0.0% and 22.6%±0.9%, protein digestibility of 0.95±0.01 and 0.86±0.0, with a protein digestibility-corrected amino acid score (PDCAAS) of 0.99±0.01 and 0.50±0.00 for soybean okara and spent grain respectively.

Future plans include assessing palatability and apparent digestibility coefficients (ADC) in Oreochromis niloticus and Lates calcarifer to establish proof-of-concept of utilising fermented by-products in sustainable aquafeed.

Keyword: *Food waste, Fermentation, Digestibility, Valorisation, Aquaculture*

Physicochemical property characterization and foodomic profiling of cupcakes formulated with okara

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This study evaluated the effects of raw okara (RO) and fermented okara (FO) on physicochemical, structural and nutritional properties of cupcakes. Fermentation from commercial source altered okara composition, notably increasing soluble dietary fibre with minimal impact on water-oil holding capacities. FO exhibited smaller particle size and more rough, disrupted microstructure than RO. Okara incorporation reduced specific volume (from 2.02 ± 0.25 to 1.49 ± 0.06 cm^3/g), producing denser structures, due to impaired air retention and interference of fibre and protein with the batter matrix. Colour analysis showed reduced browning in erythritol-containing samples, while okara addition darkened the cupcake. Texture results indicated increased hardness (from 758.55 ± 39.31 to 1880.17 ± 54.72g) and chewiness (from 145.08 ± 16.22 to 241.41 ± 12.25g), particularly in RO samples whereas FO resulted in a more fragmented and less cohesive crumb structure. In-vitro starch digestion revealed that combining erythritol substitution and okara incorporation significantly lowered glycaemic response by 50%, which was attributed to increased fibre content, enhanced viscosity and structural encapsulation of starch. However, increasing okara levels beyond 5% did not yield further reduction in glycaemic response. Fatty acid analysis suggested reduced lipid digestibility with okara addition. Overall, okara demonstrated potential as a functional ingredient for developing low glycaemic bakery products.

Keyword: *In-vitro digestion, Erythritol, Waste Valorisation, Amino Acid Profiling, Scanning Electron Microscopy*

MASS SPECTROMETRIC DETECTION OF DIVERSE FOOD COMPOUNDS BY GRAPHITE SHEET-ASSISTED LASER DESORPTION IONIZATION AND ITS APPLICATION TO BEER CHEMICAL PROFILING

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Conventional techniques for food chemical profiling are limited by tedious sample pretreatment, long analytical run times, and low coverage of target compounds, leading to low analytical efficiency. To address these issues, we present a new graphite sheet-assisted LDI-MS (GRAMS) method that simplifies sample preparation and enables the simultaneous detection of both hydrophilic and hydrophobic compounds. In this study, GRAMS enabled the detection of a wide range of food-related compounds, including amino acids, lipids, sugars, organic acids, polyphenols, vitamins, advanced glycation end products, pesticides, and drugs. To evaluate its performance, beer was selected as a representative food sample. GRAMS detected numerous MS signals from beer samples in both positive and negative ion modes and enabled the identification of several flavor-related compounds. Based on the chemical profiling of four commercial beer products, the samples were clearly distinguished using sparse partial least squares discriminant analysis (sPLS-DA). Furthermore, when coupled with trapped ion mobility spectrometry (TIMS), GRAMS effectively separated isomers in beer, such as maltotriose and raffinose, thereby improving the identification accuracy of untargeted compounds. Overall, the proposed GRAMS platform demonstrates broad coverage of food-related compounds and shows strong potential for applications in food safety and quality analysis.

Keyword: *Graphite sheet, Mass spectrometry, Food chemical profiling, timsTOF/MS*

IDENTIFICATION OF THE BETALAIN PROFILE IN PITAYA (STENOCEREUS SP.) AND EVALUATION OF ITS STABILITY UNDER THE EFFECT OF TEMPERATURE

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Introduction. Betalains are pigments classified as chromoalkaloids: nitrogen-containing, and hydrophilic compounds. They are of considerable interest to the food industry as colorants and have been recognized for their biofunctional properties. Red pitaya fruits (Stenocereus sp.) represent a promising alternative to beetroot (Beta vulgaris), the primary commercial source of betalains.

Methodology. A High-Performance Liquid Chromatographic method was established to characterize the betalain profile in red pitaya fruits. Additionally, the effect of temperature on this profile was evaluated. Pitaya juice was subjected to thermal treatment at 50 and 70 °C for 0, 1, 2, and 3 hours. The resulting profiles were monitored at 301, 407, 483, and 538 nm, wavelengths associated with betalains and their potential degradation products. Degradation was further quantified using spectroscopic techniques.

Results. Chromatographic conditions enabling the effective separation of betalains were established. At 50 °C, a progressive decrease in signal intensity was observed after two hours. At 70 °C, in addition to a reduction in signal, new peaks emerged, indicating the formation of degradation products. Kinetic analysis revealed that degradation followed a first-order model.

Conclusions. The developed method allowed accurate profiling of betalains. Findings suggest temperature-induced degradation during thermal treatment. Future studies will identify compounds using mass spectrometry.

Keyword: *Betalains, Stability, Pitaya, HPLC*

The Bitter Truth: PROP Taster Status, Neophobia, and Preference in Relation to Attitude Toward Alternative Foods

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Alternative foods are increasingly promoted as sustainable food options, yet their role in advancing sustainable food systems depends on consumer acceptance. This study examined whether PROP (6-n-propylthiouracil) taster status, food preference (FP), food neophobia (FN), and food technology neophobia (FTN) are associated with attitude toward alternative foods among Filipino consumers. PROP taster status was determined using PROP test strips and classified through generalized Labeled Magnitude Scale ratings, while consumer responses (i.e., Attitude, FP, FN, FTN) were collected using a structured online questionnaire. Respondents (n=125) were classified as nontasters (n=14), medium tasters (n=86), and supertasters (n=25). Overall, respondents exhibited a moderately negative attitude toward alternative foods (3.59 ± 1.61), high FN (7.00 ± 1.49), and moderately low FTN (4.48 ± 1.48) and FP (3.26 ± 1.81). Attitude was weakly associated with FN (ρ=-0.184) and moderately associated with FTN (ρ=0.519), with no significant association ($p>0.05$) with FP nor PROP taster status. General linear modeling showed a significant overall model (R^2=0.263), with FTN emerging as the only significant predictor of attitude. These findings suggest that psychological responses to novel food technologies may be a more critical barrier than bitterness sensitivity in shaping acceptance of alternative foods and, consequently, their potential contribution to more sustainable food transitions.

Keyword: *alternative foods, neophobia, PROP taster status, PROP (6-N-propylthiouracil), sustainable food systems*

VALORIZATION OF PHILIPPINE SQUASH (Cucurbita moschata Duchesne) BY-PRODUCTS FOR FUNCTIONAL COMPOSITE FLOUR DEVELOPMENT: A REVIEW

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Minimizing food loss and enhancing food security drive the valorization of agricultural by-products. In the Philippines, tropical climatic conditions constrain local wheat production, resulting in continued dependence on imports. This review examines the potential of Philippine squash (Cucurbita moschata Duchesne) by-products as raw materials for functional composite flour applications. Studies from 2020 to 2025 were analyzed to evaluate the nutritional composition, processing methods, and techno-functional properties of flour from squash peels, seeds, and pulp, and to synthesize reported functionalities and identify research gaps. Between 2020 and 2023, approximately 89,000 tonnes of squash were lost postharvest in the Philippines due to oversupply and supply chain inefficiencies. Squash peels and seeds are also generated as processing by-products and remain underutilized. These materials contain dietary fiber, vitamins, minerals, and phenolic compounds (93.40 ± 0.69mg GAE/100g peel powder), and tocopherols (633.51mg/kg). Water absorption (8.000 ± 0.100 mL/g) and oil-binding capacity (1.997 ± 0.005 mL/g) have been reported, suggesting potential relevance for improving nutritional and functional profiles of flour-based products. Evidence remains confined to laboratory-scale studies, with limited applications in composite flour systems, indicating the need for further research to clarify utilization.

Keyword: *Food Waste Valorization, Circular Economy, Functional Flour, Composite Flour, Squash By-Products*

Upcycling Insoluble Fiber-rich Resources via Wet-type Grinder: Improvements in Physicochemical Properties and Health Functions in Food Systems

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This study explored the use of wet-type grinder (WG) technology to upcycle agricultural by-products into functional ingredients. We focused on two types of nanocellulose: plant-based nanocellulose and bacterial cellulose (BC). WG technology was employed to effectively fibrillate insoluble dietary fiber-rich materials, imparting nanocellulose properties, including significantly increased dispersion, surface area, and viscosity.

Our results demonstrated that incorporating WG-treated okara (WGO) into soybean protein isolate and egg white gels improved their mechanical properties and intermolecular forces. In gluten-free rice bread, both WGO and WG-treated vegetables improved gas retention and specific volume by modulating the viscoelasticity of the rice batter, as evidenced by creep-recovery measurements. These effects were comparable to those of BC, highlighting WG's potential for functionalizing insoluble fibers.

Beyond structural improvements, WG technology enhances physiological functionality. In vivo studies have shown that WGO supplementation significantly attenuates obesity in high-fat diet-fed mice. Metabolomic and 16S rRNA sequencing revealed that WGO and BC modulated the gut microbiota and increased butyrate production. Furthermore, these materials promote bile acid synthesis and fecal excretion. Thus, WG technology is a powerful tool for transforming insoluble resources into high-value functional ingredients with nanocellulose properties, thereby contributing to the development of sustainable and healthy food products.

Keyword: *Wet-type grinder, Protein gels, gluten-free bread, Rheology, Gut microbiota*

Rapid Fluorescent Detection of Fungal Biomass during Solid-State Fermentation of Industry Byproducts

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Fungal solid-state fermentation (SSF) is a sustainable and resource-efficient platform that enables targeted biotransformations in food matrices. Widely applied to enhance protein content, bioactive compounds, and flavour profiles, SSF allows to valorise industry by-products into high-value protein ingredients. Yet, reliable methods to monitor fungal biomass accumulation during SSF remain limited. This project, hence, aimed to develop a novel approach using Fluorescein Isothiocyanate conjugated Wheat Germ Agglutinin (WGA-FITC). Following thermal acidic extraction and fluorescent labelling by WGA-FITC, biomass was quantified in 96-well plates at excitation: 495nm, emission: 520nm using pure fungal biomass as standard. For validation, canola presscake and brewer spent grain were fermented for 120h by widely applied fungi: Rhizopus microspores var. oligosporus, Fusarium venenatum and Aspergillus oryzae. Individual calibration curves using pure fungal biomass showed consistent R^2 >0.98 and <5% variation, with minimal variations between fungal organism, while optimized extraction conditions succesfully minimized background interference. Results as a function of fermentation time followed expected trends and showed strong correlations to alternative methods, demonstrating the methods robustness. The developed WGA-FITC method permits rapid screening of SSF methods, providing a cost- and time-effective alternative to conventional chromatography. This will significantly benefit research and industry applications related to SSF in functional foods.

Keyword: *Fluormetric food analysis, Fungal fermentation, Alternative protein, Process optimization*

PALM OIL-FREE STRUCTURED LIPID BASES ANALOGOUS TO PALM SHORTENING FOR MARGARINE FORMULATIONS

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Enzymatic interesterification has emerged environmentally friendly approach for producing lipids (SLs) by rearranging fatty acids, modifying physicochemical properties and enabling functional characteristics. Although palm oil is widely used. in SL production, growing social and environmental concerns have intensified alternative sources of palm oil. This study aimed to develop palm oil–free and trans fat–free lipids suitable for margarine applications. SLs were produced from blends of soybean, peanut oil, and crambe hard fat at concentrations designated SL1, SL2, and SL3. Enzymatic interesterification using Lipozyme TL IM (5%, w/w), 60 °C, 6 hrs. New lipids were characterized, triacylglycerol (TAG), solid fat content (SFC), polymorphism, thermal behavior and compared with lipids from commercial margarines containing 20–80% (w/w) fat. The main fatty acids identified in the SLs were C16:0, C18:1, C18:0, and C22:0, saturated fatty acids ranging from 25 to 39%. Interesterification promoted the formation of new TAG species, mainly di-unsaturated (43.72–46.20%) and tri-unsaturated (26.87–46.43%), tri-saturated were observed in SL3 (2.28%). TAG heterogeneity influenced crystallization behavior, producing melting ranges suitable for margarines. All SL exhibited β′ + β polymorphic forms, indicating preservation of crystalline structure after randomization and crystallization properties analogous to palm shortening, highlighting their potential for margarine formulations.

Keyword: *Lipases, Palm free lipids, margerine, new lipids*

Microbial Fermentation as a Strategy to Enhance Bioactive Compound Bioaccessibility and Intestinal Barrier Function in Yellow Peas

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This study investigated the effects of microbial fermentation on the bioaccessibility of bioactive compounds, and intestinal bioactivity of yellow peas. The fermentation was for 48 h using either Rhizopus oryzae (fungal fermentation) or Lactiplantibacillus plantarum 299V (lactic acid fermentation). Changes in pH and acidity were monitored, and the fermented products were analysed for phenolic compounds (HPLC), antioxidant capacity (FRAP and DPPH), and GABA (Gama-aminobutyric acid). To assess digestive behaviour, samples were subjected to an in vitro digestion following the INFOGEST protocol. Soluble digesta fractions were subsequently applied to 3D reconstructed human intestinal tissues (EpiIntestinalTM SMI-100) to evaluate effects on barrier integrity and antioxidative capacity.

Both fermentation strategies significantly increased GABA (6-fold in fungal fermentation) and polyphenol concentration (2- and 3- fold after bacterial and fungal fermentation respectively). The main increased in phenolic compounds was in epicatechin, vanilic acid, trans cinnamic acid and p-cumaric acid. The antioxidant capacity also increased after fermentation. In vitro digestion resulted in further release of polyphenols, indicating hydrolysis of complex phenolic compounds. Moreover, fermented samples improved intestinal epithelial barrier function and significantly enhanced cellular antioxidative capacity ($p<0.001$).

Overall, microbial fermentation represents a promising processing strategy to enhance the nutritional quality and intestinal bioactivity of plant-based foods.

Keyword: *fermentation, intestinal barrier, yellow peas, GABA, phenolic compounds*

PROFESSIONALIZING FOOD TECHNOLOGISTS IN THE PHILIPPINES: UPDATES ON THE IMPLEMENTATION OF THE PHILIPPINE FOOD TECHNOLOGY ACT

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The implementation of the Philippine Food Technology Act (Republic Act 11052) continues to advance the professionalization of food technologists through strengthened regulatory, developmental, and quality assurance mechanisms. As of December 2025, inspection and monitoring activities by the Professional Regulatory Board of Food Technology remain critical, with 19 of 48 Higher Education Institutions found to be fully or substantially compliant with the policies, standards, and guidelines (PSGs) for the Bachelor of Science in Food Technology, indicating persistent gaps in faculty competence and laboratory resources. For the first time, a computer-based Food Technologists Licensure Examination (FTLE) was conducted, achieving a 63% passing rate and reflecting improved graduate competency and institutional quality. Moreover, the Continuing Professional Development (CPD) Program has progressed through the formulation of operational guidelines and instructional design, currently under review to support continuous upskilling. The Career Progression and Specialization Program (CPSP) is likewise being institutionalized through a draft resolution with Level Alignment Matrices, establishing structured career pathways and specialization areas in Food Safety Management, Food Processing, Food Engineering, and Consumer and Sensory Science. A specialty society has drafted certification guidelines for Food Specialists in Consumer and Sensory Science. Collectively, these initiatives align with the Strategic Competitiveness Roadmap for the profession.

Keyword: *food technologists licensure examination, continuing professional development, career progression and specialization program, consumer and sensory science*

Development of energy dense, IDDSI compliant rice porridge

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Rice porridge is commonly consumed in Asia yet producing International Dysphagia Diet Standardisation Initiative (IDDSI) Level 4 and 5 rice porridge remains challenging. Level 4 rice porridge prepared at a 1:2.5 rice-to-water ratio may be excessively thick and sticky (Hong Kong Care Food Standard) while Level 5 porridge can risk mixed consistency or too sticky. Increasing water reduces thickness and stickiness but lowers energy density, highlighting a need for formulations that are energy dense and less sticky. This study evaluated how rice cultivar, water content, xanthan gum, controlled amylase hydrolysis, and oil interact to govern porridge hardness, adhesiveness, IDDSI spoon tilt and fork drip test compliance. Effects of xanthan gum, amylase, and oil were rice cultivar dependent, indicating matrix specific functionality in starch systems. Regression model was developed to map formulation to texture and IDDSI compliance. Energy dense IDDSI compliant Level 4 and 5 formulations (≥100 kcal/100 g) were identified with the model. Their instrumental hardness and adhesiveness were also comparable to values reported in published swallowing safety studies involving rice porridge. These results provide a practical, model guided pathway to formulate energy dense IDDSI compliant rice porridge without excessive dilution, supporting product development for individuals with swallowing difficulty.

Keyword: *texture modified, IDDSI, rice porridge, energy dense, regression modelling*

ANALYSIS OF SENSORY CHARACTERISTICS FROM THE PERSPECTIVE OF RAW MATERIALS AND ESTABLISHMENT OF A SENSORY WHEEL FOR 'MSALAIS', A TRADITIONAL ALCOHOLIC BEVERAGE FROM SOUTHERN XINJIANG, CHINA.

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Msalais wine is a traditional beverage originating from Northwest China, and its unique production process imparts distinctive sensory characteristics. To investigate the influence of raw ingredient combinations on the sensory characteristics of Msalais, a comprehensive analysis was conducted on six ingredient combinations. The chemical composition exhibited varying degrees of variation. Discrimination among groups was achieved based on electronic sensory characteristics. Fifty-one volatile compounds were identified as the foundational core volatiles of Msalais, which were important contributiors to its typical sensory characteristics, including raisins, jam, caramel, and floral notes. Among the volatile compounds, a variety of Maillard reaction products were detected. 5-Methylfurfural (5-MF), 5-(hydroxymethyl)furfural (HMF), and furfural were the major furan derivatives detected in Msalais wine samples. The GP group exhibited a high content of 5-MF. The content of 2-formyl-1-methylpyrrole was reported for the first time in Msalais wine. A sensory wheel for Msalais was established, comprising 56 terms. Differentiation among combinations was achieved based on the sensory intensities evaluated using the developed sensory wheel. To correlate sensory characteristics with chemical basis, predictive correlation models were established for eight typical sensory attributes, among which peach, smoky, and chocolate exhibited the best predictive performance.

Keyword: *traditional beverage, wine, Msalais, sensory wheel, discrimination*

UNVEILING SUB-REGIONAL AROMA DIFFERENCES IN CHINA'S NINGXIA REGION: CHARACTERIZATION OF KEY AROMA PROFILES AND CHEMICAL FOUNDATIONS

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Sub-regional characteristic differentiation is crucial for development of wine regions, particularly for emerging regions. In world-renowned wine regions, pronounced sub-regional stylistic differences refine regional identity and strategically support market positioning and expansion. Therefore, the characterization and demarcation of sub-regional identities are of great importance, particularly given that reinforcing the intrinsic linkage between wines and their geographical provenance can strategically influence consumer purchasing behavior while amplifying the wines' terroir-driven value proposition. To explore sub-regional aroma differentiation in Ningxia, we applied sensomics and RATA to identify/quantify key aroma-active compounds and profile Marselan wine aroma characteristics across its sub-regions. By employing GC×GC-qTOFMS and GC-O, we comparatively evaluated the contributions of the aroma-active compounds from four sub-regions. Fifty-three aroma-active compounds were identified. Seven compounds were important contributors to the fruity aroma. The omission experiments further confirmed the important contribution of ethyl hexanoate and β-damascenone to the floral and fruity characters. Yinchuan was characterized by its floral and fruity notes and methyl octanoate and ethyl octanoate were the main contributors. The differences in aroma profiles and the chemical basis across the sub-regions of Ningxia provide compelling evidence reinforcing the intra-regional micro-terroir.

Keyword: *wine, Aroma active compounds, Sensory analysis, Sub-region, micro-terroir*

EXPLAINABLE MACHINE LEARNING-BASED PREDICTION OF SHELF-LIFE AND ANTHOCYANIN ACCUMULATION IN TABLE GRAPES

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Grapes (Vitis vinifera L.) are recognized as the third most popular fruit worldwide. Nevertheless, table grapes are highly perishable. Accurate prediction of shelf-life duration and nutritional components is crucial in supply chain of fresh fruit and vegetables. In present study, we developed the machine learning models to predict the shelf-life and total anthocyanin content (TAC) of table grapes intelligently. The artificial neural network (ANN) accurately estimated shelf-life, with a mean absolute error (MAE) of 1.624 days and a coefficient of determination (R^2) of 0.9873, whereas extreme gradient boosting (XGBoost) effectively predicted TAC (MAE 0.0113 mg C3G g^{-1} ; R^2 0.9355). SHapley Additive exPlanations (SHAP)-based sensitivity analysis revealed the berry abscission rate, weight loss rate and postharvest treatment were critical factors influencing quality performance, improving model interpretability. These findings successfully provide a reliable approach for monitoring grape quality, providing novel insight into reducing the loss of fresh agricultural produce.

Keyword: *Table grapes; Shelf-life prediction; Anthocyanins; Machine learning; Explainable artificial intelligence; Sensitivity analysis*

Olive Leaf Water Extract Enhances the Physical Properties of Pea Protein Gels through Covalent Crosslinking

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The application of pea protein (PP) in gel-based foods is limited by its weak gel strength. Our group previously reported that olive leaf water extract (OLEx), a phenolic-rich ingredient, acts as a crosslinking modifier to improve the physical properties of egg white protein and fish gelatin gels. In this study, OLEx was added to the PP systems, and the physical properties of the resulting PP gels were investigated. Breaking tests of the gel samples showed that the addition of OLEX at 0.6–0.8% significantly enhanced breaking stress and breaking strain of the PP gels by 2.6-fold and 1.3-fold, respectively. Although the viscosity coefficient obtained from static viscoelastic analyses decreased in the range above 0.4% OLEx, the elastic modulus increased 1.13-fold relative to that of the control gel, suggesting that OLEx produced a stiffer and more elastic PP gel. SDS–PAGE revealed that OLEx promotes the formation of high-molecular-weight protein conjugates via non-disulfide covalent linking. Moreover, protein chemical analysis of the PP gels showed reductions in relative free amino and free thiol contents, indicating covalent interactions between phenolic compounds in OLEx and PP molecules. These results demonstrate that OLEx is useful for strengthening the gel strength and elasticity of PP gels.

Keyword: *Plant protein, gelling properties, polyphenol, neutral pH, viscoelasticity*

Beyond Traditional Tempeh: Synergistic Effects of R. oryzae and R. babjevae on Bioactive Compounds

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Swedish University of Agricultural Sciences

This study demonstrated that co-fermentation with Rhizopus oryzae and Rhodotorula babjevae substantially improved the nutritional and functional quality of tempeh-like products produced from faba bean and wholegrain oat. Compared with single-culture fermentation, co-culture yielded the highest total free amino acid concentration (24 vs 14 mg/g DM) and markedly increased GABA content in faba bean tempeh (1626 vs 942 mg/kg DM). It also enhanced the phenolic profile, with an approximately sixfold increase in sinapic acid and higher concentrations of protocatechuic acid and 4-hydroxybenzaldehyde relative to non-fermented controls. Importantly, co-culture achieved complete degradation of phytic acid, whereas single-culture fermentation achieved only 60% reduction, and vicine and convicine were reduced in all fermented samples. Structural analyses further showed that co-culture produced a cohesive and compact tempeh-like matrix, indicating strong enzymatic modification while preserving acceptable product structure. In contrast, pre-soaking with Lactiplantibacillus plantarum adversely affected several desirable outcomes, including protein content, free amino acids, GABA formation and phytic acid degradation. Overall, these findings identify the novel co-culture as a promising fermentation strategy for developing nutritionally improved legume–cereal foods from locally Swedish crops.

Keyword: *Yeast, Rhizopus, GABA, Phenolics, Lactic acid bacteria*

Vibe Researching: AI-Based One Person Food Lab

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This presentation introduces the AI X Food Lab, a pioneering framework advancing toward fully autonomous, single-person food analysis laboratories. Amid rapid AI-driven research automation, we outline a strategic development roadmap integrating hardware automation, intelligent data pipelines, and embodied robotics. Central to this vision is a five-tier classification system (L1–L5) for smart food labs, culminating in an L5 multi-agent digital brain capable of autonomous experimental design, cross-laboratory coordination, and independent method innovation. Key technical contributions include a high-precision AI dietary assessment system leveraging U-Net and VGG16 for pixel-level macronutrient estimation in complex dishes, alongside novel frameworks addressing model explainability, physical consistency, and the critical "honesty" metric in food AI. We further demonstrate how AI can independently rediscover foundational food science mechanisms, including the Maillard reaction, antioxidant pathways, colloidal emulsion stability, and next-generation food safety early-warning systems. By synergizing edge computing, remote digital twins, and closed-loop process control, the AI X Food Lab transitions traditional workflows into self-optimizing, data-driven research ecosystems. This work highlights AI’s capacity to dramatically reduce operational overhead while enhancing analytical accuracy, predictive reliability, and scientific discovery, ultimately redefining how food analysis and innovation can be conducted by a single researcher.

Keyword: *AI, One person Food Lab, Large Language Model, Agent, food analysis*

Effects of a silkworm-based complex in a VCD-induced menopausal mouse model

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Sericulture is expanding from a traditional textile industry into a source of functional food materials. Silkworms, which feed on mulberry leaves, are rich in bioactive compounds and essential amino acids. Silkworm larvae have been suggested as a sustainable and nutritious protein source. In this study, a silkworm-based complex was investigated to ameliorate menopausal symptoms. Silkworms contain 1-deoxynojirimycin (DNJ), a natural α-glucosidase inhibitor with blood glucose-lowering effects. The addition of loquat leaves to silkworm extract enhances this hypoglycemic activity. The combined extract showed stronger enzyme inhibition. The complex was administered to a menopausal mouse model induced by 4-vinylcyclohexene dioxide (VCD). During the 13-week period, the complex consistently lowered plasma glucose levels (-5.88% at 13 week vs. VCD). It reduced body weight gain (-86.27%, $P<0.001$) and body fat (-33.93%) while increasing muscle mass (+60.33%, $P<0.001$). Serum lipid profiles were also improved. In addition, estradiol levels were higher in treated mice (+78.85%, $P<0.05$), suggesting protection of ovarian function. In conclusion, the silkworm–loquat complex may help delay early menopausal changes and support metabolic health. This study highlights the potential of edible insect-based ingredients as a novel strategy for women's health.

Keyword: *silkworm, edible insect, loquat, menopause, VCD*

OCCURRENCE OF PFOS and PFOA IN FISH FROM TYPICAL COASTAL AREAS OF CHINA AND ASSOCIATED DIETARY EXPOSURE ASSESSMENT

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This study characterizes the occurrence of perfluorooctane sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) in over 200 fish samples, including both freshwater and marine species, sourced from the Bohai and South China Seas. Findings indicate that both compounds are generally detected across different regions, with the mean concentration of PFOS (1.677 ng/g ww) being significantly higher than that of PFOA (0.171 ng/g ww). Furthermore, marine fish generally exhibit higher PFOS accumulation levels compared to freshwater species, suggesting distinct distribution patterns between aquatic environments. By integrating these occurrence results with data from the China Household Dietary Consumption Survey, the study evaluates current exposure levels among various cohorts of Chinese fish consumers. Assessment results demonstrate that dietary exposure to PFOS is generally higher than that to PFOA, showing notable variations across different age groups but only minimal differences between genders. Overall, these results provide essential updated baseline data on PFAS distribution in Chinese aquatic products and highlight characteristic exposure patterns via fish consumption. Furthermore, such information is constructive for the ongoing improvement of food safety monitoring frameworks and the development of long-term environmental management strategies for perfluoroalkyl and polyfluoroalkyl substances (PFAS) in China.

Keyword: *perfluoroalkyl and polyfluoroalkyl substances (PFAS), perfluorooctane sulfonic acid (PFOS), perfluorooctanoic acid (PFOA), dietary exposure, marine and freshwater fish*

SYNERGISTIC EFFECTS OF CHIA MUCILAGE AND KONJAC GLUCOMANNAN ON STARCH DIGESTION AND GLUCOSE DIFFUSION

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Growing demand for healthier food products has accelerated the use of dietary fibres as multifunctional ingredients that provide both technological and physiological benefits. Chia mucilage (CM) and konjac glucomannan (KGM) are promising hydrocolloids with high water-binding capacity and health-promoting properties; however, their individual functionality in food systems can be limited by their distinct structural characteristics. This study investigated the synergistic interactions between CM and KGM and their impact on physicochemical properties, rheological behaviour, starch digestibility, and glucose diffusion. Freeze-dried CM/KGM mixtures at varying ratios were prepared and characterized by Fourier transform infrared spectroscopy, confirming intermolecular hydrogen-bonding interactions. Aqueous dispersions and oil-in-water emulsions (0.5% and 1%, w/w) were evaluated for particle size, stability, and viscoelastic properties, including apparent viscosity under simulated gastrointestinal conditions. The CM/KGM mixtures exhibited enhanced rheological properties and emulsion stability, particularly at a 1:3 ratio. Increased digesta viscosity during intestinal digestion was associated with a significant reduction in rapidly digested starch. Furthermore, CM/KGM mixtures reduced glucose diffusion, with CM contributing a higher glucose adsorption capacity. These findings highlight the potential of CM/KGM blends as functional ingredients to modulate starch digestion and improve metabolic responses in food systems.

Keyword: *Chia mucilage, Konjac glucomannan, Starch digestibility, Glucose diffusion*

Mechanistic Insights and Novel Formulation Strategies for Pea-, Chickpea-, and Soy protein-Based High-Moisture Meat Analogues

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This study presents a mechanistic investigation into the interactions among protein composites of pea (PI) and chick pea protein isolates (CPI) with soy protein isolate (SPI) and their suitability for fabrication of high moisture meat analogues (HMMAs) using twin screw extrusion. Blended proteins (PI+SPI and CPI+SPI) were extruded at 60% moisture, 140^{o}C of highest barrel temperature, and a screw speed of 300rpm. The textural correlations in extruded analogues were studied through textural profile analysis, cutting strengths, anisotropy index, and tensile testing. SPI composites produced harder and denser extrudates, with soy protein isolate (SPI)-based HMMAs exhibiting the highest hardness (85.53N). PI and CPI-based composites provided a softer structure to the HMMAs and can thus be used as a substitute for the dense textured SPI-based HMMAs. CPI-based HMMA showed softer texture with lower hardness (-38%), chewiness index (-37%), gumminess (-37%), tensile strength (-66%), and peak tensile force (-66%) in comparison to SPI-based HMMAs. Flow visualization revealed parabolic lamellar structures within the extrudates, with flow profiles well-described by second-order polynomial curves. Overall, heat and shear denatured the proteins which then reorganized into layered anisotropic lamellae with CPI producing softer meat-like extrudates than SPI, supporting CPI and PI as a feasible HMMA ingredient.

Keyword: *Meat analogues, Pea and chickpea proteins, fiber formation, extrusion, Textural profile*

STRUCTURE AND FUNCTION OF MULTIFUNCTIONAL FAVA BEAN PROTEIN HYDROLYSATES AND PEPTIDES

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The aim of this work was to determine the effect of peptide size and amino acid composition on the multifunctional properties of enzymatically hydrolyzed fava bean proteins. Fava bean proteins were digested with pepsin to produce a hydrolysate (FBH), which was separated by membrane ultrafiltration to give <1, 1-3, 3-5, 5-10, and >10 kDa peptides. The FBH was also subjected to reverse-phase HPLC separation coupled with tandem mass spectrometry to identify the amino acid sequence of active peptides. DPPH radical and superoxide radical scavenging activities as well as inhibition of linoleic acid peroxidation were all significantly ($p < 0.05$) improved by membrane ultrafiltration with the <1 kDa fraction showing the highest potency. Inhibition of the activities of enzymes such as α-amylase, angiotensin converting enzyme (ACE), pancreatic lipase and acetylcholinesterase was stronger as peptide size decreased. Seven novel peptides (SVAARKVL, LMCGTVGAD, TPACSLPL, VLLKKKRT, LVPPPKGVALVL, KVGRHKQ, and MELPSGSL) were identified from the FBH. All the peptides showed strong antioxidant properties but only TPACSLPL had potent inhibitory activities against α-amylase (approximately 50%) and ACE (approximately 81%). TPACSLPL acted as a competitive inhibitor of ACE and α-amylase, which means that the peptide has a strong affinity for the active site of each enzyme.

Keyword: *Fava bean, Pepsin, Protein hydrolysate, Bioactive peptides, Membrane ultrafiltration*

AROMA CHARACTERISTICS OF GRILLED SQUID EXTRACTS OBTAINED BY SUPERCRITICAL CARBON DIOXIDE AND SUBCRITICAL WATER EXTRACTION

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The aroma characteristics of edible extracts vary with extraction conditions; however, the specific effects of solvent properties and temperature have not been fully elucidated. In this study, grilled squid was used as a model sample to investigate differences in aroma characteristics among extracts obtained by supercritical carbon dioxide (40 °C) and subcritical water (120 °C, 150 °C, and 180 °C). Comprehensive GC/MS analysis of volatile compounds in the extracts identified or tentatively identified 165 compounds. Principal component analysis and analysis of variance revealed clear differences in aroma profiles depending on extraction method and temperature. Esters and nitrogen-containing compounds were characteristic of the supercritical carbon dioxide extracts, whereas sulfur-containing compounds and aldehydes were prominent in the subcritical water extracts, suggesting an influence of solvent polarity. In addition, during subcritical water extraction, ketones and aldehydes increased with rising temperature, indicating a relationship with thermally induced chemical reactions. Furthermore, gas chromatography/olfactometry (GC/O) analysis confirmed that some of these characteristic compounds significantly contribute to human aroma perception, demonstrating that chemical differences are reflected in sensory differences. This study provides useful insights for designing extraction conditions of edible extracts in terms of aroma quality.

Keyword: *Aroma, Grilled squid, Supercritical carbon dioxide extraction, Subcritical water extraction*

CELL WALL REMODELING AND SOFTENING SUPPRESSION IN FROZEN BROCCOLI VIA POSTHARVEST WATER CURING

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Our previous study demonstrated that broccoli harvested in winter is more susceptible to softening after freeze–thawing than that harvested in spring. Based on this finding, the present study aimed at evaluating the effects of a postharvest water curing treatment designed to mimic spring-like conditions on cell wall remodeling and firmness of broccoli florets. Winter-harvested broccoli heads (early-maturing ‘Pixel’ and late-maturing ‘Kombanwa’) were stored at 20 °C for up to 3 days with the stalk immersed in water. Cell wall compositions were analyzed in fresh florets, and firmness was evaluated after blanching and freezing to clarify the relationship between structural modification and texture stability. Water curing increased the moisture content of broccoli florets by approximately 3% (w.b.) and promoted increases in total pectin and strongly bound pectin fractions (sodium carbonate- and chelator-soluble pectin), expressed on a dry basis, while loosely bound water-soluble pectin remained relatively unchanged, regardless of cultivar. These changes were associated with improved firmness after freeze–thawing. Firmness of frozen florets increased by 2.0–3.5-fold following water curing compared to untreated samples for both cultivars. These findings provide the first evidence that postharvest water curing can enhance texture stability in frozen broccoli by modulating cell wall structure.

Keyword: *Broccoli, Freezing, Texture, Cell wall materials, Water curing*

Cell and Material Design for Cell based Foods: Principles and Platform Technologies

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The development of edible scaffolds is essential for cell-based foods, as they supports cell attachment, proliferation, and differentiation. In this study, we fabricated five edible scaffold variants (Control–T4) and compared their performance with a 2D cells condition (Cell). Cell proliferation was evaluated using cell counting, doubling time, and viability assays, while differentiation was assessed through myosin heavy chain (MyHC) immunofluorescence to calculate the fusion index. Cell numbers did not differ among groups on days 1 and 3; however, significant differences were observed on days 5 and 7 ($p < 0.01$). Cells cultured on edible scaffolds showed shorter doubling times than those in 2D culture, with T4 exhibiting the fastest growth rate ($p < 0.01$). Cell viability consistently increased over time across all groups, with significant differences at each time point ($p < 0.01$). During differentiation, cells grown on edible scaffolds exhibited higher fusion indices than the 2D control ($p < 0.01$), indicating enhanced myogenic differentiation. These findings suggest that the 3D architecture of edible scaffolds provides a greater surface area and spatial cues that facilitate cell–cell interactions and alignment, thereby promoting both proliferation and fusion. Overall, developed edible scaffolds represent a promising platform for supporting cell growth and differentiation in cell-based food applications.

Keyword: *Edible scaffold, muscle satellite cells, Proliferation, Differentiation*

N-Glycosylation Modulates the Digestion, Absorption, and Immunological properties of Lactoferrin

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This study investigated how N-glycosylation affects lactoferrin (LF) digestive stability, absorption, and anti-inflammatory activity using simulated infant digestion, Caco-2 monolayers, and RAW264.7 macrophages. N-glycans delayed intestinal degradation via steric hindrance and tertiary structure protection, with deglycosylated LF showing enhanced enzyme binding. Glycans facilitated Galectin-3-mediated endocytosis, as deglycosylation reduced transport efficiency and shifted internalization to clathrin-dependent pathways. Moreover, mannose-type glycans enabled LF binding to mannose receptors (MR), suppressing LPS-induced pro-inflammatory cytokines, promoting anti-inflammatory factors, and blocking NF-κB p65 nuclear translocation. These findings reveal that N-glycosylation systematically enhances LF digestive stability, intestinal absorption, and immunomodulation, providing insights for optimized LF products.

Keyword: *lactoferrin，digestion，absorption， immunity，N-glycans*

Softening Traditions: Sensory Profiling of Textured Modified Pulut Hitam Dessert

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Black glutinous rice porridge (Pulut Hitam) is a culturally significant Southeast Asian dessert enjoyed by many. However, traditional preparations pose metabolic risks and textural hazards for older adults with dysphagia, specifically aspiration risks, alongside metabolic concerns due to high caloric density. This study profiles a novel, texture-modified Pulut Hitam formulated as a high-protein dessert suitable for dysphagic patients. To benchmark our product against commercial variants available in Singapore, a trained elderly sensory panel above 55 years old (n = 10) developed a comprehensive sensory lexicon. They evaluated appearance (color intensity, thickness), aroma (glutinous rice, coconut milk), flavor (glutinous rice, sweetness, bitterness, coconut milk), and critical texture attributes (hardness, thickness, graininess, adhesiveness, ease of swallowing, oral residue, throat residue). Results indicated that our product was visually and aromatically comparable to market samples, featuring intense purple coloration and moderate thickness. While glutinous rice notes remained consistent, coconut milk flavor intensity was lower than some commercial products. Texturally, our product was softer and less grainy, with significantly reduced residue, enhancing the ease of swallowing for dysphagic patients. Future research will focus on hedonic acceptability to validate subjective preference, ensuring that nutritional improvements align with consumer palatability amongst the target population.

Keyword: *Texture-modified foods, Descriptive sensory analysis, Geriatric nutrition, Dysphagia, Sensory profiling*

DEVELOPMENT AND QUALITY EVALUATION OF AN INSTANT SOUP THICKENER FROM OKRA (Abelmoschus esculentus) AND JUTE LEAF ((Corchorus olitorius) BLEND

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DEVELOPMENT AND QUALITY EVALUATION OF AN INSTANT SOUP THICKENER FROM OKRA (Abelmoschus esculentus) AND JUTE LEAF (Corchorusolitorius) BLEND

Abstract

This study developed and evaluated an instant soup thickener from blends of okra (Abelmoschusesculentus) and jute leaf (Corchorus olitorius) powders. The aim was to produce a functional and nutritionally enhanced thickening agent using locally available materials. Samples were formulated in ratios of 100:0, 80:20, 60:40, 40:60, and 0:100 (okra:jute) and analyzed for functional, proximate, sensory, and microbial properties. Results showed that water absorption capacity and swelling index increased with higher jute leaf inclusion (3.5–4.5 g/g; 2.8–3.8), while viscosity decreased (150–110 cP). Protein (12.0–16.0%), fibre (8.0–12.0%), and ash (5.0–7.0%) contents improved with increasing jute leaf proportion. Sensory evaluation indicated that the 60:40 blend had the highest overall acceptability (7.6), reflecting a desirable balance between thickness and palatability. Microbial counts were low (1.6–2.5 $\times 10^3$ cfu/g), and shelf-life assessment showed acceptable stability over 8 weeks. The study demonstrates that a 60:40 okra–jute blend is optimal and can serve as a natural, nutritious, and stable soup thickener. Further work on large-scale production and packaging is recommended.

Keyword: *Okra mucilage; Jute leaf; Instant soup thickener; Shelf stability; Food formation*

Developing innovative jellyfish collagen-based bioplastic films for food packaging applications

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The extensive use of petroleum-based plastics in food packaging poses significant environmental and public health concerns, necessitating the development of sustainable alternatives. This study explores the valorization of jellyfish collagen (JC), an underutilized marine resource, for the production of biodegradable bioplastic films with tailored functional properties. JC solutions were blended with food-grade hydrocolloids, including chitosan and sodium alginate, at varying ratios, with glycerol as a plasticizer. Tannic acid was incorporated as a natural cross-linking agent at different concentrations. Film-forming solutions were cast and dried at 50 °C for 12–14 h. The resulting JC-based composite films exhibited uniform morphology and favorable mechanical and thermal properties. Films containing 0.5% tannic acid demonstrated optimal performance, with tensile strength (27.56 kPa) and elongation at break (124.36%) significantly ($P \leq 0.05$) higher than other formulations, approaching those of commercial linear low-density polyethylene (LLDP) films. Higher cross-linker concentrations negatively affected film performance, likely due to excessive network formation. These findings highlight the potential of JC-based bioplastics as sustainable alternatives to conventional plastics. The incorporation of chitosan and controlled cross-linking enables the design of biodegradable films with tunable properties, supporting the development of environmentally friendly food packaging solutions within the emerging blue bioeconomy.

Keyword: *jellyfish collagen, biodegradable packaging, marine collagen, marine bioplastics*

NEXT-GENERATION SCALABLE NANOCELLULOSE PRODUCTION FROM UNDERUTILISED AQUATIC BIOMASS

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Background

Nanocellulose is a versatile biomaterial with applications in packaging, composites, biomedicine, and environmental remediation. However, production relies on wood-based biomass, involving long growth cycles and energy-intensive processing. Aquatic biomass such as seaweed, duckweed, and Elodea offers a superior alternative due to rapid growth, no land or freshwater requirements, and low non-cellulosic content, enabling efficient, scalable nanocellulose production.

Methods

A unique eco-innovative method was developed to process aquatic biomass through a single workflow. Sequential fractionation removed soluble components, followed by protein recovery and purification. Cellulose was converted to nanocellulose via enzyme hydrolysis and ultrasonication. The method is under Invention Disclosure (IDF) for potential patent protection.

Results

The process delivered cellulose yields of 11–23% with high purity (89–91%). Nanocellulose recovery reached 84–93%, with 78–81% of particles below 100 nm, indicating efficient nanoscale conversion. FTIR confirmed effective removal of non-cellulosic components, while enhanced thermal stability (degradation ~285 °C) reflected material purity. XRD analysis further verified the preservation of the native cellulose I crystalline structure, confirming structural integrity across all biomass types.

Conclusion

This approach enables a single processing platform for multiple feedstocks, reducing capital investment while supporting scalable, resource efficient nanocellulose production from underutilised aquatic biomass for sustainable applications

Keyword: *Nanocellulose, Underutilised biomass, Sustainable processing, Biomass valorisation, Scalable technology*

DEVELOPMENT OF A REDUCED-FAT CAKE BAR USING JUTE (CORCHORUS OLITORIUS L.) MUCILAGE AS A FUNCTIONAL FOOD INGREDIENT

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Jute (Corchorus olitorius L.) mucilage is a pectic polysaccharide rich in galacturonic acid residues with documented water-holding, gel-forming, and surface-active properties that may function as a hydrocolloid-based fat replacer. Three cake bar formulations were prepared by substituting butter with jute mucilage extract at 0 g (control), 50 g (Formulation 1), and 100 g (Formulation 2) per 100 g butter basis. All variants underwent microbiological analysis and sensory acceptability. The selected formulation and the control were further characterized for physicochemical properties, proximate composition, and mineral content. The in vivo glycemic index (GI) of the selected formulation was also determined.

All formulations met microbiological standards. Formulation 1 showed no significant sensory difference from the control across six evaluated attributes, while Formulation 2 differed significantly. Substituting 50 g butter with jute mucilage reduced total fat by 41% and decreased energy content by 19%. Moisture, water activity, protein, calcium, and dietary fiber increased; ash and iron decreased. The in vivo GI of Formulation 1 was 55 ± 4, classified as low. The low GI and reduced-fat attributes, mechanistically explained by the galacturonic acid-mediated polysaccharide–starch composite matrix and protein–starch interactions, support the development of functional bakery products targeting consumers with metabolic health concerns.

Keyword: *Corchorus olitorius, fat replacer, hydrocolloid, bakery product, glycemic index*

ECO-INNOVATIVE ZERO-WASTE SEAWEED BASED BIOREFINERY

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Seaweed is an abundant, versatile biomass growing without land, freshwater, or fertilisers, yet its uncontrolled proliferation can cause ecological imbalances, making it ideal for valorisation. This work designs a zero-waste, multi-stage cascading biorefinery for Alaria esculenta, a common brown seaweed generating multiple high value products from a single biomass.

Hydrodynamic cavitation (HDC) was employed as a novel non-thermal extraction technology to physically disrupt the recalcitrant cell walls of seaweed. HDC (20°C, 30 min) followed by a two-step membrane-based purification process yielded fucoidan and laminarin- two bioactive polysaccharides, along with mannitol, a natural sweetener. This integrated eco-innovative extraction–purification strategy replaces traditional methods of prolonged thermal extraction and purification using large volumes of organic solvents. Subsequently, the residual biomass was used to recover sodium alginate, a popular hydrocolloid in food, packaging and biomedicine. The leftover residue was then exploited to produce polysaccharide–protein composites. Instead of aiming for resource-intensive protein isolate production, generating these composites preserved synergistic protein-polysaccharide interactions resulting in remarkable foaming and emulsification techno-functionality. The remaining fibre-rich fraction was directly converted to cellulose for biobased packaging applications.

This work thereby provides a scalable blueprint for a marine bioeconomy, sustainably transforming seaweed into multiple value chains across food, health, and biomaterial sectors.

Keyword: *Alaria esculenta, Seaweed biorefinery, Zero-waste, Hydrodynamic cavitation, Bioactive*

BIOFILM-LIKE PROBIOTIC PATCHES ENABLE TARGETED MANAGEMENT OF INFLAMMATORY BOWEL DISEASE

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The oral administration of probiotics for the management of inflammatory bowel disease faces challenges such as gastric acid, reactive oxygen species damage, and difficulties in colonising the site of inflammation. Here, inspired by the spontaneous formation of biofilms by microorganisms in nature to counter environmental stress, we propose a biofilm-like probiotic network (LBN) platform for the oral management of inflammatory bowel disease. Lactobacillus rhamnosus GG (LGG) is armed with iron-tannic acid (LGG@Fe-TA), and hyaluronic acid modified with 3-aminophenylboronic acid (HA-PBA) can induce the aggregation of LGG@Fe-TA to form LBN via click reactions and hydrogen bonding. LBN possesses biofilm-like collective defence characteristics and exhibits strong tolerance to gastric acid and ROS stress. Furthermore, the HA-PBA structure on the LBN surface can target CD44 and sialic acid, which are highly expressed at sites of inflammation, enabling ‘patch’-like adhesion and colonisation at sites of intestinal inflammation, whilst releasing anti-inflammatory components, thereby rapidly restoring barrier function and microbial balance. This strategy endows LBN with the combined advantages of gastric acid resistance, antioxidant properties and targeted colonisation, whilst being rapid and versatile to prepare. It provides an important reference for artificial biofilms and personalised therapies involving customised microbiota.

Keyword: *Biofilm-like, Probiotics, Inflammatory bowel disease, Targeted management*

HYBRID CAMEL-PLANT PROTEINS MODULATE INFANT DIGESTION AND BIOACTIVITY: INTEGRATED PEPTIDOMIC AND FUNCTIONAL ANALYSIS

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Blending animal and plant proteins offers a promising strategy to enhance the sustainability and functionality of infant nutrition, however, their impact on digestion dynamics and peptide bioactivity under infant gastrointestinal conditions remains unclear. This study investigated camel milk, chickpea, and oat proteins and their binary blends using a static in vitro digestion model representative of 6–12-month-old infants, integrating digestive characterization with peptidomic, in vitro, and in silico analyses. Protein compatibility was found to govern digestion behaviour and peptide release. The camel–chickpea blend (CCP) exhibited synergistic digestion, with enhanced proteolysis, higher amino acid release, and increased peptide yield and diversity, as evidenced by SDS-PAGE, degree of hydrolysis, confocal microscopy, and peptidomic analysis. In contrast, the camel–oat blend (CO) showed antagonistic interactions, leading to aggregation and restricted enzyme accessibility. Peptidomic analysis also revealed blend-specific peptides which were absent in single proteins, indicating altered proteolytic pathways. Functionally, CCP demonstrated the highest antioxidant activity following intestinal digestion. In silico analysis identified predominantly non-toxic peptides with predicted antioxidant and anti-inflammatory potential, while network pharmacology and docking suggested modulation of oxidative stress and inflammatory pathways. These findings highlight camel–chickpea blend as a promising candidate for sustainable, functionally enhanced infant formula base.

Keyword: *Camel, Chickpea, Digestion, Infant, Peptidomic analysis, Bioactivity, Docking*

Emerging Food Production via Extremophilic Microalgae: Advancing Sustainability, Affordability, and Nutrition

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Economic feasibility remains the primary barrier to scaling microalgae-based food systems. This study utilizes a multi-indicator sustainability assessment as a design tool to quantify performance and implement strategies to reduce CAPEX and OPEX while enhancing nutritional density. We propose utilizing extremophilic strains, such as Galdieria sulphuraria (pH 0–3; up to 56°C) and Limnospira platensis (pH 9–10), to create selective growth environments. This unique physiology inherently inhibits microbial contamination, thereby reducing costs and facilitating continuous cultivation via circular residue streams. Upstream production was further optimized using nanosecond pulsed electric field (nsPEF) stimulation, increasing biomass productivity by 20%. For downstream application, heterotrophic microalgae-based meat substitutes were developed via high-moisture extrusion. Incorporating up to 50% yellow microalgae protein concentrate yielded superior micronutrient profiles—including Vitamins E, B1, B2, B3, and B6—compared to soy isolates. Furthermore, microalgae biomass demonstrated high mineral bioaccessibility and iron bioavailability. In conclusion, integrating extremophilic strains with emerging food processing significantly lowers economic hurdles. Collaborative industry initiatives demonstrate this as a scalable, industrially relevant pathway for the next generation of affordable, nutrient-dense, and sustainable foods.

Keyword: *multi-indicator sustainability, Extremophile, Algae, Affordability, Nutrition*

CIRCULAR ECONOMY APPROACH IN FOOD SYSTEM: CONVERTING KOKUM PROCESSING WASTE INTO SAFE FUNCTIONAL INGREDIENTS.

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In India's Western Ghats, Garcinia indica, also known as kokum, is widely used; however, its rinds, which contain a variety of bioactive compounds, tend to be discarded away as processing waste. This study adopts a circular economy strategy in order to convert dried kokum rind waste into a source of safe functional ingredients. The current study focuses on minor bioactive terpenes including β-caryophyllene, D-limonene, humulene, and BHT-like derivatives with antioxidant and anti-inflammatory potential while major bioactives like hydroxycitric acid, anthocyanins, garcinol, and pectin are extensively studied.

To ensure food-grade safety and avoid heat degradation, a mild water-based extraction (<80°C) was employed. Fourier Transform Infrared Spectroscopy–Attenuated Total Reflectance and Gas Chromatography–Mass Spectrometry were used to characterise the extracts, and the DPPH assay was used to assess antioxidant activity.

While GC-MS profiling revealed β-caryophyllene retention of 14.59% along with other terpenes, FTIR verified polyphenolic and terpene functional groups. Significant antioxidant activity was shown by the extract (62.5% DPPH scavenging). The sustainable waste valorisation of dried kokum rinds into clean-label functional ingredients appropriate for functional foods and nutraceutical applications is supported by these findings.

Keyword: *Circular economy, Garcinia indica, Waste valorization, Antioxidant activity, Functional components*

Fungal-Fermented Oat Okara as a Functional Food Ingredient: Nutritional, Phenolic, and Functional Improvements

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Oat okara, a by-product of oat milk production, is a nutrient-rich substrate with strong potential for valorisation through fungal biorefinery to enhance its nutritional, phenolic, and techno-functional properties for food and feed applications. Aspergillus oryzae, Neurospora intermedia, and Rhizopus oligosporus were cultivated on oat okara in shake flasks to optimise substrate loading and fermentation time, followed by validation in bioreactors to evaluate compositional and functional changes. Optimal conditions (10% w/v, 48 h) were identified for scale-up. In bioreactors, all strains produced oat fungal biomass with strain-dependent effects. R. oligosporus achieved the highest biomass titre (60.57 ± 0.61 g/L) and increased total dietary fibre to 39.00 ± 1.37%, although β-glucan content decreased by 50%. A. oryzae showed the greatest enhancement in protein content (46.21 ± 0.99%; 1.3-fold increase) and quality, improving essential and sulphur-containing amino acids, with PDCAAS increasing from 0.62 to 0.70. A. oryzae and N. intermedia enhanced avenanthramide content, increasing total phenolic content (6-fold), FRAP capacity (11-fold), and DPPH capacity (4-fold). Fermentation reduced solubility but improved water- and oil-holding capacities, while N. intermedia enhanced emulsion activity (57%) and stability (261%). This study demonstrates the potential of fermentation to improve nutritional and functional properties of oat okara as a value-added ingredient.

Keyword: *circular economy, waste valorisation, fermentation*

Low-acyl gellan gum for structuring glucono-δ-lactone triggered cold-set emulsion gels

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Flavour is a key barrier to consumer acceptance of plant-based meats, partly because flavour addition and high-temperature processing, while most emulsion-gel fat analogues are heat-set and unsuitable for heat-labile volatiles. This study developed a heat-free, glucono-δ-lactone (GDL)-triggered cold-set pea protein emulsion gel platform, reinforced with low-acyl gellan gum, as a tuneable fat-mimetic template for encapsulation and subsequent cooking. Emulsion gels were prepared using gellan gum (0.0125-0.3%) and GDL (0.25-1.5%), and characterised via morphology, texture, oscillatory rheology (linear and non-linear), and stability testing. Gelation was achieved across the tested formulation range studied. Microstructural imaging showed well-dispersed oil droplets immobilised within a particulate protein-rich matrix, and an apparent core-shell structure with a thin layer of polysaccharide shell wrapping oil droplets (~50 nm) and nanoscale mesh/granular features. Increasing gellan gum produced higher hardness and higher viscoelastic moduli, and shifted yielding to higher strains, indicating improved resistance to large deformations. The reinforced gels displayed freeze–thaw stability and formulation-dependent thermal behaviour, enabling a range of fat-like cooking responses comparable to animal fats. Overall, gellan gum reinforcement mitigates the limited strength typically associated with cold-set plant-protein gels, enabling a heat-free emulsion-gel platform with processing stability, with potential for flavour encapsulation and cooking-triggered release.

Keyword: *Gellan gum, pea protein, cold-set emulsion gel, food rheology, cooking performance*

MECHANISMS UNDERLYING THE ENHANCED PHYSICAL STABILITY OF ALMOND MILK BY PROTEIN-GLUTAMINASE

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Plant milk is widely utilized for various foods and beverages as a substitute for bovine milk. Although bovine milk can be blended with hot coffee, mixing plant milk such as almond milk with hot coffee rapidly results in severe phase separation due to protein aggregation and oil droplet flocculation, probably via thermal denaturation and charge neutralization, respectively. Such unfavorable phenomena are a large barrier to designing clean-label plant milk-based products without additives.

Herein, we propose an enzyme-based approach to modify physical properties of plant milk. Almond milk was extracted from raw almond seeds and treated by protein-glutaminase, which catalyzes deamidation of glutamine residues, at 50°C for up to 24 h, followed by heating at 85°C. The samples were then subjected to blending tests with hot coffee at 90°C, particle size measurements after heating/acidification, and analyses of zeta-potential and surface hydrophobicity.

The stability of hot coffee-almond milk mixtures against phase separation was outstandingly improved by appropriate deamidation. Appropriate deamidation of completely prevented heat-induced aggregation of almond milk and improve its dispersibility under weakly-acidified conditions. Analyses of zeta-potential and surface hydrophobicity suggest that the balance between the attractive and repulsive interactions probably played the key role determining the macroscopic behavior.

Keyword: *Protein-glutaminase, Almond milk, Coffee, Physical stability*

CHALLENGES IN ISOCHORIC FREEZING: EXPERIMENTAL INSIGHTS INTO THE ICE FORMATION MECHANISMS AND APPLICATION TO SEAFOOD PRESERVATION

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Isochoric freezing, a constant-volume preservation technique, has gained increasing attention as an alternative approach that may minimise ice crystal damage and better maintain food quality during sub-zero storage. However, experimental validation of its ice formation mechanism remains limited. Pure water was frozen in a sealed isochoric chamber, with temperature and pressure continuously monitored to identify nucleation and phase transitions. The prevailing theory based on hexagonal ice (Ih) solid–liquid equilibrium predicts that at −10°C, 27% of the water in the chamber will freeze. Our experiments revealed up to 52% ice formation. This discrepancy was consistent across the range of freezing temperatures evaluated, suggesting the potential formation of non-hexagonal ice and implications for future system design.

While this technique alleviates ice crystal damage to food, the relatively high pressure generated may negatively affect food texture. Fresh New Zealand King salmon was stored under isochoric freezing, conventional freezing, and chilled conditions, and physicochemical and structural properties were monitored over 10 days. Isochoric freezing, due to the pressure, led to hardening of the salmon meat. This suggests preservation applications may be limited to a narrow temperature range in which all the water remains unfrozen, thereby avoiding the generation of high pressure in the system.

Keyword: *Isochoric freezing, Ice nucleation, Food preservation, King salmon quality*

DE NOVO PEPTIDE SEQUENCING BY N-TERMINAL COUMARIN DERIVATIZATION AIDED LIQUID CHROMATOGRAPHY–TRAPPED ION MOBILITY SPECTROMETRY–QUADRUPOLE TIME-OF-FLIGHT MASS SPECTROMETRY AND ITS APPLICATION IN PEPTIDOMICS

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De novo peptide sequencing using LC–MS/MS enables database-independent sequence determination and facilitates the discovery of novel bioactive peptides and biomarkers for peptidomics. However, conventional MS/MS analyses often produce fragment ions that are insufficient for complete sequencing. Here, we established an LC–MS/MS workflow using N-succinimidyl 7-methoxycoumarin-3-carboxylate (Me-Cou) as an N-terminal tag to improve de novo sequencing performance.

Me-Cou derivatization generated highly informative fragment ions, particularly b_1–b_3 ions for $(Gly)_4$, and further produced abundant b_1–b_9 ions for $(Gly)_{10}$, surpassing the performance of established tags, such as 2,4,6-trinitrobenzenesulfonic acid, 3-aminopyridyl-hydroxy-succinimidyl carbamate, and N-succinimidyl [tris(2,4,6-trimethoxyphenyl)phosphonio]acetate bromide. In a 132-peptide standard mixture (86 dipeptides and 46 oligopeptides), intact de novo sequencing identified only 74 peptides with 32 misidentifications, whereas Me-Cou-aided de novo sequencing correctly identified all peptides with no misidentification. Applying this approach to casein peptone yielded the identification of 328 peptides, compared with 262 identified in intact analysis. Overall, Me-Cou-based LC–MS/MS significantly improved sequence determination and peptide identification compared with conventional LC–MS/MS analysis of intact peptides, highlighting its potential for untargeted peptidomics of protein hydrolysates and biological samples.

Keyword: *De novo sequencing, N-terminal derivatization, Coumarin, LC–MS/MS, Peptidomics*

Utilization of filamentous fungi in 3D-bioprinted structured food products

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There is a pressing need to produce novel food ingredients from sustainable sources to support a growing population. Filamentous fungi can be readily cultivated from low-cost agricultural byproducts to produce functional proteins for food biomanufacturing of structured products. Three-dimensional bioprinting is an emerging technique in food manufacturing that creates precise 3D shapes with customizable dimension/shape, flavor, texture, and nutritional profiles and is increasingly used to provide personalized nutrition, delivery of sensitive/easily degradable bioactive compounds, modification of food textures (e.g., for individuals suffering from dysphagia), printing 3D foods in remote locations (e.g., astronauts or soldiers), and in the creation of cultivated meat and other pure or hybrid alternative protein products. However, the utilization of fungal biomolecules as scaffold, gelling agent, and sensory and nutritional component in 3D bioprinted foods is underexplored. We have developed a consolidated biomanufacturing system that combines filamentous fungi and microalgae to create analogue salmon filets and have also leveraged the fungal scaffold for creation of cultivated meat and encapsulated probiotics. This talk will provide an overview of 3D bioprinting technologies and their strengths and limitations in food production and will specifically focus on the utilization of filamentous fungi and other microbial cells in these systems.

Keyword: *3d bioprinting*, *Filamentous fungi*, *Microalgae*, *Sustainable protein*, *Structured foods*

The magic of starch – a scientific journey with starch for food applications

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Starch has long been recognized as a raw material of strategic importance, primarily for meeting the nutritional needs of people around the world. Year by year, the demand is growing not only for traditional foods, but also for functional foods based on starch and its derivatives. During the presentation, research conducted by Innovative and Pro-Health Food (InnoFood) Research Centre at JDU on the development, characterization, and implementation of new food products with health-promoting properties will be presented. In particular, the team's achievements in the preparation and characterization of novel starch-based preparations with the properties of dietary fibre and prebiotics will be discussed, along with the development of new food products enriched with these components. The production of food, especially health-promoting food based on both natural and functionalized starch, is a priority and a strategic goal from an economic point of view. For this reason, the use of this biopolymer is primarily directed toward food applications. Methods of starch modification, including its esterification with fatty acids, will also be presented. Solid-state esterification by microwave irradiation, biocatalyzed esterification with lipase enzymes, and esterification in "green" solvents will be discussed, with emphasis on their potential relevance for food-related applications.

Keyword: *starch, prebiotics, starch esters, functional foods, dietary fibre*

Plant proteins as alternative natural emulsifiers in food emulsions

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The growing interest in plant-based ingredients in food production has increased the demand for effective alternatives to animal-derived emulsifiers. In this study, the physicochemical and functional properties of selected commercial plant protein preparations as natural emulsifiers in food emulsions were assessed. Emulsifying activity and stability (EA, ES), foaming capacity and stability (FC, FS), water and oil absorption (WAC, OAC), color (CIE Lab*), viscosity, surface tension, and zeta potential were analyzed. Pea (PP1–PP4), rice (RP1, RP2) and chickpea (CP1) proteins showed the most favorable properties, characterized by high EA values (58.3–62.5%) and emulsion stability during storage (62–65%) after 6 days. Emulsions formulated with these proteins were significantly lighter (L* > 69). PP1 exhibited more than twice the viscosity of the other samples. The lowest surface tension values (<45 mN/m) were observed for RP2 and PP1, indicating strong surface activity. Pea proteins PP1, PP2, and PP4 showed the highest system stability, with zeta potential values below –35 mV. Overall, the selected plant protein preparations, particularly pea, rice, and chickpea proteins, showed promising functional properties, confirming their potential use as natural emulsifiers in clean-label plant-based formulations and providing a basis for further product development.

Keyword: *rice proteins, pea proteins, chickpea proteins, emulsion stabilization, foaming properties*

Glucosinolates in different organs of choy sum (Brassica rapa var. parachinensis) and indoor far-red light strategy to increase their contents

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Glucosinolate (GLS), served as anti-cancer/antioxidant agents when broken down into bioactive compounds (isothiocyanates), are sulfur-rich, nitrogen-containing glycosides mainly found in cruciferous vegetables like choy sum, a popular vegetable consumed in Asia. Therefore, information about GLS distribution in choy sum and adopting efficient tools to enhance their content are essential yet little is known hitherto. In this study, GLS in indoor soil-cultivated choy sum leaf/stem/floral organs were analyzed using UHPLC-QQQ-MS. Among those organs harvested on day 30 from sowing, floral organs contained the highest GLS content (6981.3 μg/gDW), followed by stems (3165.4 μg/gDW), and then leaves (519.1 μg/gDW). Furthermore, far-red light, an efficient tool in regulating plant metabolites biosynthesis, was selected as a strategy to induce GLS synthesis. Results showed that red/far-red light ratio at 1:0.5 applied for 16 days enhanced whole plant's GLS content to 4046.4 μg/gDW, compared with far-red-light-free control (1577.3 μg/gDW). For 30 days, ratio at 1:1 enhanced whole plant's progoitrin (an aliphatic GLS) to 1138.8 μg/gDW, compared with far-red-light-free control (383.2 μg/gDW), while floral gluconapin (another aliphatic GLS) increased to 4925.7 μg/gDW, compared with far-red-light-free control (987.3 μg/gDW). Adopting far-red light is thus recommended as an effective strategy to boost GLS accumulation in choy sum.

Keyword: *Glucosinolates, Choy sum, Floral organs, Far-red light, Gluconapin*

Molecular Mechanism of Bitterness and Functional Evaluation of Wheat Gluten-Derived Peptides

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Wheat gluten is a globally significant plant protein; however, the industrial application of its enzymatic hydrolysates is frequently hindered by the release of undesirable bitter peptides. This study investigates the structural basis of bitterness and explores the functional potential of peptides derived from wheat gluten via papain hydrolysis. Using in silico simulated hydrolysis, 35 dipeptides and one tripeptide were identified and characterized through toxicity prediction, ADMET profiling, and molecular docking with the bitter taste receptor T2R14. The results demonstrate that peptides containing Pro, Phe, or Trp residues significantly enhance bitterness intensity, whereas Gly and Glu residues act as taste mitigators. Notably, the dipeptide Glu-Glu (EE) was identified as a potent candidate for bitterness inhibition. Molecular docking revealed that Asn157, Ile262, Trp89, and Phe247 constitute the primary binding pockets on T2R14, with high binding energies and LibDock scores confirming stable peptide-receptor interactions. Furthermore, most identified peptides exhibited high water solubility and favorable ADMET profiles, suggesting low toxicity and high bioavailability. These findings provide a theoretical framework for understanding the taste mechanisms of wheat gluten hydrolysates and offer a strategic basis for developing taste-masking technologies and functional food ingredients.

Keyword: *Wheat gluten, Bitter peptides, T2R14, Molecular docking, Papain hydrolysis*

RASPBERRY KETONE MODULATES GLIAL INFLAMMATION AND LIPID METABOLISM IN MICE

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Neuroinflammation, driven by activated glial cells and closely linked to metabolic dysregulation, contributes to the development of neurodegenerative diseases, stroke, and mood disorders. Raspberry ketone (RK), a food-derived phenolic compound with antioxidant and metabolic regulatory properties, remains poorly understood in glial-mediated neuroinflammatory responses. Here, we show that RK suppresses neuroinflammatory signaling in both in vivo and in vitro models. In an LPS-induced mouse model, RK reduced circulating cytokines and attenuated inflammatory responses in the cortex, hippocampus, and hypothalamus. In microglial and astrocytic models, RK suppressed LPS-induced inflammatory activation without detectable cytotoxicity. Transcriptomic analysis revealed that RK partially reversed the LPS-induced inflammatory gene program in microglia, including TNF, NF-κB, and cytokine-cytokine receptor signaling pathways, with Il6, Il1b, and Tnf identified as central hub genes. Mechanistically, RK inhibited TLR4/NF-κB signaling, reduced p65 phosphorylation, and decreased pro-inflammatory mediators, nitric oxide, and reactive oxygen species. RK also improved lipid homeostasis in activated microglia by reducing lipid droplet accumulation and Plin2 expression. In a microglia-astrocyte co-culture model, RK further attenuated glial inflammatory responses and reduced GFAP expression. Together, these findings identify RK as a food-derived bioactive that modulates inflammatory and metabolic responses in glial cells, supporting its potential relevance in nutritional strategies targeting neuroinflammation.

Keyword: *Functional foods, Neuroinflammation, Lipid Metabolism*

URCHIN-SHAPED COFS EMPOWER DUAL-MODE SENSOR INTEGRATING MULTIPLE SIGNAL AMPLIFICATION FOR ULTRASENSITIVE NUCLEIC ACID DETECTION

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MicroRNAs (miRNAs) are widely recognized as representative nucleic acid biomarkers that reflect multiple biological processes in living systems and food-related matrices. However, their extremely low abundance in complex environments poses significant challenges for sensitive and reliable detection. Herein, we report a fluorescence–electrochemical dual-mode biosensing platform integrating multiple signal amplification strategies for ultrasensitive nucleic acid detection. MXene-AuNPs composites were first modified on the electrode surface to enable efficient probe loading and enhanced electron transfer to amplify signal. The urchin-shaped covalent organic frameworks (COFs) facilitated more efficient methylene blue loading, with the unique structure further enhancing signal response. Combined with the EDC–DNAzyme cascade amplification, the sensor realized a multi-level synergistic signal enhancement, demonstrating remarkable sensitivity. Notably, the urchin-shaped COFs served dual roles as both fluorescent reporters and nanocarriers, facilitating dual-mode signal readout. The developed platform exhibited a wide linear response from 1 to 10^5 fM with detection limits down to sub-femtomolar levels. This work provides a versatile biosensing strategy for ultrasensitive nucleic acid detection and demonstrates strong potential for applications in food safety and biological analysis.

Keyword: *Multiple signal amplification, Dual-mode sensor, Nucleic acid detection, Urchin-shaped COFs*

MOLECULAR MECHANISM OF BACTERIAL OUTER MEMBRANE LYSIS THROUGH COLD PLASMA REACTIVE SPECIES EVOLUTION

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Gram-negative bacteria, especially Salmonella typhimurium (S. typhimurium), poses a significant threat to public health. Cold atmospheric plasma (CAP), the emerging sterilization method, has shown promise in overcoming bacterial infection due to reactive species generation; however, its molecular mechanisms in outer membrane (OM) remain poorly understood. In this study, the relationship between OM components and CAP-induced bacterial lysis is investigated from the perspective of OM proteins and lipopolysaccharides (LPS). An integrated simulation and experimental approach, including biological effect, proteomics, plasma numerical simulation, and molecular simulation is utilized to elucidate the bacterial lysis induced by CAP through the destruction of the OM components mediated by the reactive species evolution. The reactive species produced by CAP cause bacterial cell lysis by disrupting OM proteins and LPS, which is subsequently verified by molecular dynamics simulations. Notably, the bacteria resist the lysis by regulating rescue pathways related to fatty acid biosynthesis, LPS synthesis and transport, and OM proteins assembly. Additionally, CAP might disrupt the dense OM structure by attacking divalent metal ions used for bridging LPS molecules. This work represented the first exploration of molecular mechanisms of the interplay between CAP and OM, with potential implications for the development and engineering of CAP technologies.

Keyword: *Bacterial outer membrane, Cold atmospheric plasma, Salmonella typhimurium, Reactive species, Lysis mechanisms*

EFFECT OF TECHNOLOGICAL PROCESSES ON OROTIC ACID CONTENT IN MILK AND DAIRY PRODUCTS

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The study determined the content of orotic acid in selected dairy products using liquid chromatography coupled with mass spectrometry (LC-MS). Samples were pretreated by heating to 37°C, sonication, intensive mixing, and centrifugation, which enabled effective extraction of the analyte and removal of interfering components. The obtained results revealed significant variation in orotic acid content depending on the type of product and the degree of technological processing. In milk, the orotic acid content was approximatly 80 µg/mL and served as a reference point for further analyses. The highest levels were observed in whey, where the content was approximately 6.7% higher than in milk. In kefir, a decrease of about 54.1% relative to milk was noted, indicating a significant impact of fermentation processes leading to partial utilization or degradation of this compound by microorganisms. The greatest reduction was observed in butter, where the orotic acid content was approximately 80.0% lower compared to milk, which is related to its fat-rich nature and the removal of hydrophilic components during production. The results highlight the importance of technological processes and raw material fractionation in shaping the bioactive composition of dairy products and indicate milk and whey as important dietary sources of orotic acid.

Keyword: *orotic acid, dairy products, technological processing, bioactive compounds, food analysis*

ANTI-INFLAMMATORY EFFECT OF LACTIC ACID BACTERIA-FERMENTED SOY MILK

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Inflammation is a vital immune response, but excessive inflammation can cause diseases like dementia and diabetes. Macrophages, key players in innate immunity, produce inflammatory mediators. In this study, the anti-inflammatory effects of lactic acid bacteria-fermented soy milk (FS) and intact soy milk (SM) were examined by using RAW264.7 cells and primary peritoneal macrophages (P-Mac) treated with lipopolysaccharide (LPS). Each sample was added to DMEM medium containing LPS and 10% FBS, and the effects on the production of inflammation mediators such as IL-6, TNF-α and nitric oxide (NO), as well as on gene expression, were evaluated.

FS and SM showed no cytotoxicity up to 5.0 mg/mL and suppressed IL-6, TNF-α, and NO production by downregulating related gene expression. FS was more effective than SM, indicating the active substances in FS are derived from both SM and its fermentation by lactic acid bacteria. The activity of FS was enhanced by dialysis treatment, indicating that the active substance is a macromolecule greater than 14,000 Da. FS also suppressed the production of inflammation mediators by P-Mac.

FS exhibited more potent anti-inflammatory effects than SM. One of the active substances in FS was identified as macromolecules produced by lactic acid bacteria fermentation.

Keyword: *Fermented soy milk, Anti-inflammatory activity, Lactic acid bacteria, Macrophage*

SUSTAINABLE NANO-NUTRIENTS FOR PRECISION NUTRITION AND AS AN ALTERNATIVE TO ULTRA PROCESSED FORMULATIONS

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Malnutrition and the growing reliance on ultra processed foods (UPFs) are increasing chronic disease risk and dietary inequality. To support precision nutrition, this study proposes nano- nutrients as nanoscale assemblies formed naturally in foods, or through simple processing, from at least two nutritional components. As a representative case, chicken bone broth was identified by AI large language model based on nutritional value and sustainability criteria. Collagens, hyaluronic acid, chondroitin sulfate were found to co-assemble during broth heating into nanogels of 30 to 200 nm. These components are themselves relevant to women's health, joint health, and healthy ageing. LC-MS identified over 28 collagen related components, mainly I-type. After concentration, the nano-nutrients showed good lubricity and low oral fragmentation, friendly for elderly swallowing foods. Hyaluronic acid was enriched at the particle surface, enabling controlled collagen hydrolysis and release during in vitro gastrointestinal digestion. Additionally, these nano-nutrients served for effective DHA delivery. Compared with synthetic surfactants such as Tween-80 and monoglycerides, they improved DHA bioaccessibility and reduced lipid oxidation-induced intestinal mucosal damage during digestion by over 76%. Overall, nano-nutrients combine nutritional and delivery functions, support precision nutrition across multiple scenarios, and offer a natural alternative to UPF formulations.

Keyword: *Chicken bone broth, collagen, precision nutrition, ultra processed food, hyaluronic acid*

BROADER DEVELOPING-COUNTRY ENGAGEMENT IN RESHAPING CODEX ALIMENTARIUS COMMISSION STANDARDS FOR ULTRA-PROCESSED FOODS COULD ADVANCE DIETARY EQUITY

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The Codex Alimentarius Commission (Codex) shapes how foods are classified, labelled and regulated, making it central to emerging debates on ultra-processed foods (UPFs). As UPFs become more prominent in global food governance, standards will influence not only public health objectives but also broader questions of market entry and competition conditions.

Developing countries, however, remain disadvantaged in both Codex participation and domestic implementation, even though many offer distinctive food resources, production pathways and products that could support healthier and more sustainable food systems. Limited scientific and institutional capacity reduces their influence over rule formation, while constraints in infrastructure and compliance resources raise the cost and increase the risk of exclusion from higher-value markets. The dominance of developed countries and transnational firms in this process could deepen concentration at critical points in the food chain and harm its resilience.

Broader developing-country engagement is therefore essential to the legitimacy and effectiveness of any emerging Codex approach to UPFs. Strengthening participation, implementation capacity and continuity of engagement would help ensure that future standards are more evidence-based, inclusive and responsive to diverse food system realities. This would support healthier food transitions while promoting dietary equity in fairer global food markets.

Keyword: *Ultra-processed foods*, *Codex Alimentarius Commission*, *Developing countries*, *Food standards governance*, *Dietary equity*

Performance Evaluation and Quality Management of Commercially Available Colloidal Gold Test Strips for the Detection of Pesticide and Veterinary Drug Residues in Agricultural Products

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Colloidal gold immunochromatographic test strips are widely used in China for on-site detection of pesticide and veterinary drug residues in agricultural products due to their simplicity, speed, and low cost, playing a key role in farm gate release and market access. However, inconsistent product quality often compromises detection accuracy. This study evaluated 13 commercial pesticide strips and 9 veterinary drug strips available on the Chinese market. The overall pass rate was 69.23%. Products for carbofuran, enrofloxacin, five nitrofuran metabolites, florfenicol, and chloramphenicol showed relatively high pass rates, indicating mature technology. In contrast, strips for fipronil, cyromazine, and chlorpyrifos had low compliance rates, warranting cautious use. Notably, even among validated products, inaccuracies persisted during real-market applications due to multiple factors, including operator proficiency, heavy daily workload, batch-to-batch variation, and matrix incompatibility. Therefore, although the overall pass rate is acceptable, significant performance variations exist across different products, and on-site accuracy is constrained by multiple factors. These findings highlight the need for more systematic and scientific efforts—encompassing product development, batch consistency, matrix adaptability, operator training, and workflow management—to improve detection accuracy, particularly within the context of China's agricultural product safety supervision system.

Keyword: *Colloidal gold immunochromatographic test strips, Agricultural product quality and safety, Commercial kit performance, Pesticide residues, Veterinary drug residues*

NUTRITIONAL QUALITY AND MARKETING INDICATORS OF FOOD BARS IN MALAYSIA: CLASSIFICATION OF FOOD BAR CREDIBILITY USING THE WORLD HEALTH ORGANIZATION SOUTH EAST ASIA REGION NUTRIENT PROFILE MODEL

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Food bars are commonly perceived as healthy due to industry-led product indicators, although
these features may not reflect actual nutritional quality. This study evaluated the credibility of food bars in Malaysia using the World Health Organization Nutrient Profile Model for the South-East Asia Region (SEARO), Category 3 (Cereals). Products were classified as “absolutely credible” (3/3 criteria met), “credible” (2/3), “less credible” (1/3), or “not at all credible” (0/3) based on thresholds for total fat (≤12 g), total sugars (≤9 g), and sodium (≤350 mg per 100 g). A cross-sectional survey of 106 food bars (52 cereal, 41 nut, 13 protein) was conducted in Klang Valley from June to December 2025. Overall, 95.3% of products carried at least one product indicator. Non-nutrition-related marketing claims (e.g., health-related, environmental, and ingredient-based claims) were most prevalent (68.3%), followed by front-of-pack nutrition labelling (52.5%) and nutrition claims (39.6%). Among products with at least one marketing indicator, 81.2% were classified as having low credibility (“less credible” or “not at all credible”), while only 1% were “absolutely credible.”These findings highlight a mismatch between marketing features and nutritional quality, potentially misleading consumers and underscoring the need for stricter regulation.

Keyword: *Food bars, WHO SEARO nutrient profile model, Marketing claims, Nutrient profiling, Front-of-pack labelling*

Enhanced extraction of ashwagandha antioxidants using response surface methodology and their stabilization in O/W emulsions: A study with reference to glucose modulation

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This study investigated the optimization of extraction conditions for the formulation of oil-in-water (O/W) emulsions to encapsulate ashwagandha, with a focus on enhanced antioxidant activity and glucose-modulatory potential. The Box-Behnken design using response surface methodology was employed to evaluate four independent variables with different levels, including stirring time (10-30 min), temperature (40-60 °C), ultrasonication power (50-90%), and ashwagandha to oil ratio (1-10% (w/w)). The extract prepared with optimized extraction conditions was used to formulate O/W emulsions. The TPC ranged from 53.76 to 146.28 mg GAE/g, TFC ranged from 3.96 to 85.83 mg QE/g, DPPH ranged from 20.93 to 74.17%, and ABTS ranged from 34.51% to 108.63%. Optimization of these extraction parameters yields the optimal conditions: 24 min of stirring, 45 °C, 90% ultrasonication power, and a 10% (w/w) ashwagandha-to-oil ratio. Furthermore, the optimized extract demonstrated 77% alpha-amylase inhibition and 67.7% alpha-glucosidase inhibition, suggesting glucose-modulating abilities. These findings provide valuable information in designing nutritional products aimed at glucose modulation.

Keyword: *Ashwagandha, Optimization, Response surface methodology, O/W emulsions*

QUANTIFICATION OF TOTAL RESIN GLYCOSIDES IN SWEET POTATO AND RAPID IDENTIFICATION OF SWEET POTATO CULTIVARS WITH HIGH RG CONTENTS FROM LARGE SAMPLE POOLS

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Sweet potatoes (Ipomoea batatas) are a globally cultivated crop whose resin glycosides (RGs) exhibit diverse biological activities, including anti-obesity and anti-cancer effects. However, due to the structural diversity of resin glycosides, current quantitative methods for their mixtures remain inadequate. We found that alkaline hydrolysis of complex RGs generated simplified hydrolysis products, with simonic acid B as the major component. These hydrolysis products were prepared as reference standards and used for the quantification of total RGs by the phenol–sulfuric acid colorimetric method. The developed method demonstrated satisfactory sensitivity, precision, and accuracy. In addition, the sample preparation procedure was optimized to enable high-throughput analysis. The developed method was further applied to the large-scale screening of 235 sweet potato samples. The results showed that the RG content ranged from 0.0032 to 0.0346 μmol RG·g^{-1} sample, with the highest value observed in sample CX52 (0.0346 ± 0.0004 μmol RG·g^{-1} sample). These results demonstrate the utility of the developed method for large-scale screening and rapid identification of sweet potato samples with relatively high RG contents.

Keyword: *Ipomoea batatas*, *Resin glycosides*, *quantification*, *alkaline hydrolysis*

Novel Engineering Approaches to Scaffolding Prolamins for Cultivated Meat Production

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The development of structured biomaterials is a critical bottleneck in advancing cultivated meat, where scaffolds must support cell growth, enable mass transfer, and remain compatible with food-grade processing. My research work presents sustainable materials engineering approaches based on cereal prolamins to address these challenges.

The valorization of climate-resilient cereals and underutilized cereal processing by-products, particularly sorghum and corn, offers a sustainable approach to obtain prolamins as functional biomaterials. Building on the unique self-assembly properties of prolamins, innovative and non-toxic fabrication strategies have been developed to transform these proteins into porous scaffolds and microbeads with controlled architectures. These approaches include 3D printing, sugar cube-template leaching, and gas-foaming inspired by baking processes. The resulting materials exhibit interconnected porosity, adjustable mechanical properties, and favorable surface characteristics for cell growth, highlighting their suitability as edible scaffolds for meat culture. Besides, these structures also function as texturizing matrices in hybrid protein systems and as microstructured carriers for nutrient and flavor delivery.

Overall, the work establishes a scalable platform for transforming grain-derived prolamins into functional structural biomaterials. By coupling protein self-assembly with sustainable processing, the approach advances the design of next-generation food systems while aligning with circular economy principles through the upcycling of agricultural side streams.

Keyword: *Cereal prolamins, Edible scaffolds, food processing byproducts, cultivated meat*

AI-ENABLED DYNAMIC CATECHOL–BORONATE POLYSACCHARIDE FILMS FOR ADAPTIVE FRUIT PRESERVATION

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The transition from passive biodegradable packaging to adaptive, predictive systems remains a critical challenge in food preservation. Here, we report an AI-driven design of dynamic polysaccharide films based on reversible catechol–boronate ester crosslinking between chitosan–catechol and alginate–phenylboronic acid, enabling pH-responsive structural reconfiguration and controlled antimicrobial release. Sorbic acid was incorporated as a model food-grade antimicrobial, and its release behavior was governed by a coupled mechanism of network relaxation and diffusion under acidic fruit microenvironments. To overcome the lack of predictability in conventional active packaging, machine learning-assisted models were developed to quantitatively map the relationships among network structure, environmental pH, and release kinetics. Experimental and modeling results revealed that dynamic B–O bonding dictates stimulus-responsive transport pathways, allowing precise modulation of antimicrobial activity. The films exhibited effective inhibition of spoilage microorganisms, particularly yeasts and molds, and extended the shelf life of strawberries and blueberries by 3–5 days. Notably, this study establishes a structure–function–environment predictive framework that integrates dynamic covalent chemistry with data-driven modeling. The proposed approach provides a scalable paradigm for intelligent packaging systems capable of adaptive response and predictive control, advancing precision preservation in sustainable food systems.

Keyword: *Intelligent food packaging, Dynamic covalent networks, Controlled release, pH-responsive materials, Fruit preservation*

Marigold Flower Protein as a Sustainable Food Ingredient for Future Food Applications

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The global demand for alternative and sustainable food protein sources is on the rise. Valorization of traditional culinary flowers has not been explored in-depth for potential applications as future food ingredients. The primary objective of this study was to investigate marigold flower proteins for their potential as a sustainable, functional food ingredient for novel food applications. Experimental studies demonstrated that the Calendula officinalis flower yielded 92.17% of the crude protein. Extraction of different protein fractions yielded albumin as the dominant fraction (65.47%) and exhibited the highest protein functionality, including water-holding capacity (2.37 g/g), oil-holding capacity (2.49 g/g), and emulsifying capacity (65.22 mL/g), followed by globulin, glutelin, and prolamin from marigold flower. Among protein fractions, glutelin exhibited high emulsifying and foaming capacity (EC: 59.13 mL/g; FC: 16.23%). The LC-MS/MS identified 33 short-chain proteins, including oxidoreductase proteins and lipid-transfer proteins. Differential scanning calorimetry revealed high thermal stability for albumin (T_p = 105.28°C) and glutelin (T_p = 97.6°C). Sodium Dodecyl Sulfate–Polyacrylamide Gel Electrophoresis and Liquid Chromatography-Mass Spectrometry confirmed the presence of abundant low-molecular-weight polypeptides (<37 kDa). The research findings provide essential insights for evaluating marigold protein performance in future food applications and for understanding its structural and functional behaviour during industrial processing and commercial formulations.

Keyword: *Marigold flower protein, Protein functionality, Functional food ingredients,, Plant protein performance, Alternative protein source*

Enzymatic hydrolysis of collagen obtained from pork bones by-products for the generation of bioactive peptides

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Animal bones are rich in collagen and once extracted, they can be hydrolyzed by peptidases for the release of peptides, some of them with different types of bioactivity. The goal of this work was to hydrolyze collagen from pork bones with specific peptidases in order to obtain cardioprotective peptides.

Defatted bones were milled and pretreated for 3 h with pepsin (37°C, pH 3.6) and then enzymatically hydrolyzed during 2 h with 4% Alcalase 2.4L (65°C, 8.0). The hydrolyzate at 10 mg/mL exerted a noticeable inhibitory activity of 64.5% for neprilysin and 94.0% for ACE. After fractionation through RP-HPLC, 185 potential bioactive peptide sequences were analyzed using the BIOPEP-UWM bioinformatics tool in order to simulate gastrointestinal digestion. Also the prediction of cell permeating capacity of the obtained fragments was determined in silico, showing that dipeptides PR, GR, GAR, GPR, and TW were good candidates, confirming 15.2- 33.6% inhibition of neprilisin activity and 16.1-82.0% of ACE activity. TW was the most active peptide with 82.0% ACE inhibition and an IC_{50} value of 86.71μM.

The results confirmed that pepsin pretreatment followed by further hydrolysis with Alcalase is a sustainable alternative for the production of cardioprotective bioactive peptides from animal bones.

Keyword: *bones, collagen, hydrolysis, bioactive peptides, cardioprotective peptides*

Replacing imported soy with local pulses: Consumer acceptance and willingness to pay for tofu-like products in Sweden

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Tofu traditionally from soybean, a crop poorly suited to northern Europe. Locally adapted legumes such as faba bean, yellow pea and grey pea may provide regional alternatives. This study examined how these legumes change the sensory properties and consumer acceptance of tofu-like products. Soybean, faba bean, grey pea and yellow pea were used to produce eight tofu samples, with and without Lactiplantibacillus plantarum during soaking. 102 participants in Sweden assessed sensory attributes using Check-All-That-Apply, overall liking, willingness to use, food choice motives and willingness to pay under blind and informed conditions about the origin of the ingredients. Tofu with the highest liking was driver by neutral flavour and firm texture. Faba bean and grey pea tofu were more often described as earthy, musty or bitter, whereas yellow pea tofu was characterised as crumbly and dry. LAB pre-treatment did not mitigate these sensory traits. Faba bean tofu showed the second-highest liking, indicating potential as a regional alternative. Willingness to pay increased when ingredient identity and origin were disclosed, highlighting the value of local sourcing. Gender differences were also observed: women responded more positively to local pulses, whereas men penalised imported products more strongly. Locally produce improve acceptance of plant protein foods

Keyword: *consumer, plant-based protein, liking, faba bean, Sweden*

OZONE PRESERVES POSTHARVEST QUALITY OF STRAWBERRY FRUIT BY STABILIZING MEMBRANE INTEGRITY AND MODULATING OXIDATIVE STRESS

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Controlling membrane integrity is a critical challenge in postharvest preservation, and ozone offers a promising non-thermal approach to address this at the cellular level. This study evaluated the effectiveness of gaseous ozone treatment (10 ppm for 10 min) as an advanced preservation strategy to maintain quality and membrane stability in strawberry (Fragaria × ananassa cv. Benihoppe) fruit during 8 days of storage at 1 °C. Quality attributes, including weight loss, color, and firmness, were monitored, while membrane integrity was assessed using electrical impedance spectroscopy (EIS), including membrane capacitance (C_m), extracellular resistance (R_e), and intracellular resistance (R_i). Ozone-treated fruit showed significantly lower weight loss, higher firmness, and delayed color changes compared to the control. EIS analysis revealed more stable C_m, R_e, and R_i values, indicating improved preservation of membrane structure. In addition, ozone treatment reduced oxidative stress, as evidenced by lower hydrogen peroxide (H_2O_2) and malondialdehyde (MDA) levels, while increasing total phenolic content (TPC). These results demonstrate the effectiveness of ozone as a non-thermal processing technology to preserve postharvest quality through membrane stabilization and modulation of oxidative responses.

Keyword: *Electrical impedance spectroscopy, Membrane integrity, Non-thermal preservation, Ozone treatment, Strawberry*

Top-Down Proteomics for Proteoform Characterization in Food Products: Applications in Allergenicity and Authentication

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Recent advancements in top-down proteomic analysis have enabled precise identification and characterization of intact proteoforms, including post-translational modifications and sequence variants, in complex food matrices. The advancements are particularly important in food science, where intentional processing (e.g., enzymatic hydrolysis) and unintentional degradation (e.g., thermal treatment) generate diverse proteoforms that affect product quality, nutrition, and allergenicity. Here, we apply top-down proteomics to resolve proteoform in food products. We examine profiles of protein fragments and peptides in 4 different bands of partially hydrolyzed infant formulas available in Hong Kong market, revealing that some bands still contain cow milk's protein fragments and peptides that are potentially allergenic to patients with cow's milk protein allergy. In addition, top-down proteomics was applied to identifying proteoform biomarkers for authenticating edible bird's nests from different Southeast Asian origins. These biomarkers enable distinction between authentic products and counterfeit or substitute materials. Collectively, this work highlights the utility of top-down proteomics as a powerful analytical strategy for quality control, allergen risk assessment, and authentication in modern food analysis.

Keyword: *Top-down Proteomics, Allergenicity, Edible bird's nest, Partially hydrolyzed infant formula, Proteoform*

INFOGEST in vitro digestion of Nordic faba bean–oat Tempeh: roles of microstructure and composition in digestive behaviour

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Tempeh, a traditional fermented food, provides a useful model for developing plant-based protein foods from Nordic crops. We investigated whether solid-state fermentation improves the nutritional quality of tempeh produced from Swedish faba bean, alone or in combination with wholegrain oat. Substrates were soaked, with and without Lactiplantibacillus plantarum, boiled and fermented with Rhizopus oryzae. Raw materials, pre-treated substrates and tempeh were analysed for composition, free amino acids, fatty acid profile, GABA, free phenolics, anti-nutritional factors, in vitro static digestibility and microstructure. Fermentation substantially reshaped the food matrix. It increased free amino acids, GABA, free phenolics and soluble fibre fractions, while markedly reducing phytic acid, vicine and convicine. During in vitro digestion, fermented samples showed greater protein hydrolysis correlated to higher free amino acids, particularly in faba bean–oat tempeh, together with lower glucose and maltose release than non-fermented controls. Microscopy showed disruption of cotyledon and cereal cell structures related to nutrient accessibility. Multivariate analysis associated fermented products with protein digestibility, amino acid release and soluble fibre, whereas pre-treated samples remained associated with anti-nutritional factors and rapid starch breakdown. Tempeh fermentation provides a means of developing more nutrient-dense plant foods for sustainable and diverse plant-based diets.

Keyword: *Tempe, in vitro Digestion, Nordic, Fermentation, legumes*

A HYDROGEL-BASED "NUCLEIC ACID PLATE CULTURE" TECHNOLOGY FOR RAPID DETECTION OF FOODBORNE PATHOGENS IN FRUITS AND VEGETABLES

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Fresh fruits and vegetables are often consumed raw or minimally processed and are therefore vulnerable to contamination by foodborne pathogens during harvesting, processing, transportation, and storage. However, conventional culture-based methods are time-consuming for rapid screening. Here, we developed a hydrogel-based digital nucleic acid amplification method, termed "nucleic acid plate culture", for rapid pathogen detection. In this method, a nanoporous hydrogel serves as the reaction matrix to spatially confine the products generated from each target nucleic acid molecule during loop-mediated isothermal amplification (LAMP), resulting in the in-situ formation of discrete fluorescent spots after dye binding. Analogous to the formation of single bacterial colonies on an agar plate, each nucleic acid molecule can produce a single fluorescent spot within the hydrogel nanopores. Therefore, this method is aptly named the "nucleic acid plate culture" technique. Using this strategy, rapid detection of Escherichia coli O157:H7, Listeria monocytogenes, Salmonella, and Staphylococcus aureus was achieved. The assay required only 15 min for amplification and less than 30 min overall, with a detection limit of 1 copy/μL. This method provides a rapid, simple, and highly sensitive strategy for foodborne pathogen screening in fresh produce.

Keyword: *fresh fruits and vegetables, foodborne pathogen detection, hydrogel, nanoconfinement, food safety*

Scalable Extrusion Processing of Canola Protein-Based Nanocomposite Films with Improved Mechanical and Barrier Properties

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The development of sustainable bioplastics is gaining momentum as alternatives to petroleum-based materials. Canola meal, a major byproduct of oil milling, is rich in canola protein (CP), a biodegradable and renewable biopolymer with film-forming potential. However, solvent-cast CP films exhibit limited mechanical and barrier properties, and their use in extrusion molding remains underexplored. In this study, alkaline-extracted CP was plasticized with glycerol (65:35 w/w, optimized formulation) and modified with ammonium persulfate (APS), modified nanocrystalline cellulose (TMNCC), graphite oxide (GO), and polyvinyl acetate (PVA). Films were produced via twin-screw extrusion followed by compression molding, and their mechanical, barrier, thermal, and optical properties were evaluated. The CP/TMNCC blend exhibited the highest tensile strength, with a 150% increase over the control, while elongation improved significantly ($p < 0.05$) in CP/APS and CP/TMNCC films. GO incorporation reduced water vapor permeability by up to 500%. The highest transparency (62%) was observed in CP/PVA films, whereas GO-containing films were opaque, suitable for light-sensitive packaging. Thermal and dynamic mechanical analyses indicated enhanced stability and elasticity in modified blends. APS pre-treatment prior to extrusion yielded better performance than reactive extrusion. Overall, this study demonstrates the scalability and potential of CP-based materials for sustainable packaging within a circular bioeconomy.

Keyword: *Canola Protein, Extrusion Molding, Nanocomposite Film, Environmental Sustainability*

Sustainable Extraction and Processing Technologies for Tailoring Hemp Protein Structure-Function Activities

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Hemp protein represents a versatile, sustainable biomolecule whose structural and functional properties can be altered through synergistic extraction and non-thermal processing. In this study, hemp meal (50.89 ± 1.17% protein) was subjected to alkaline (ALK), divalent-salt (DS), and deep-eutectic (DES) extractions, yielding proteins with purities of 88.74 ± 0.40%, 90.43 ± 0.80%, and 94.22 ± 1.04%, respectively, and recovery rates of 12.52 ± 0.14%, 19.00 ± 0.33%, and 21.08 ± 0.61%. High-voltage atmospheric cold plasma (HVACP) treatment under Jet Plasma (JP) and Dielectric Barrier Discharge (DBD) configurations selectively modulated protein oxidation and structure. Moderate plasma exposure enhanced solubility, emulsifying activity (EAI), foaming capacity, water/oil retention, and gelation and digestibility up to 98% (apparent IVPD), whereas excessive treatments increased β-sheet-rich aggregation. FTIR and SDS–PAGE analyses revealed controlled unfolding, disulfide-linked network formation, and particle size reduction ($D_{4,3}$ decreased from 208.5 μm to 2–70 μm depending on treatment), correlating with improved techno-functional and nutritional performance. DES-DBD and DS-JP treatments achieved the highest balance of purity, solubility, and amino acid score (AAS up to 0.675; PDCAAS 59.86%), highlighting the potential of integrating green extraction with non-thermal plasma processing for precise protein design. This approach establishes a tunable platform for transforming hemp protein into functionally active ingredients.

Keyword: *Hemp protein, Cold plasma, DES extraction, Protein functionality, Structural tuning*

THE OPTIMIZATION OF 5'-MONONUCLEOTIDES FROM NATIVE HERICIUM ERINACEUS PROTEIN HYDROLYSATE USING RESPONSE SURFACE METHODOLOGY

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Protein hydrolysates from Hericium erinaceus are gaining attention as sustainable sources of umami compounds that contribute to flavour development and functional food applications. A response surface methodology (RSM) approach was utilised to optimise enzyme-assisted ultrasound processing conditions for producing H. erinaceus protein hydrolysates (HEPHs) that are rich in flavour-enhancing mononucleotides. Yield, and 5'-mononucleotides (i.e., 5'-guanylate (GMP) and 5'-inosinate (IMP)) concentrations were selected as response variables. The independent factors investigated using RSM were enzyme concentration (2–4 %), hydrolysis time (1–3 h), and ultrasound amplitude (20–60 %). Through RSM analysis, optimal processing conditions that maximised selected responses were identified to be enzyme concentration of 2 % (v/v), hydrolysis time of 2 h 14 min, and ultrasound amplitude of 55 %. Under these conditions, the enzyme-assisted ultrasound-treated HEPHs exhibited an improved yield of 42.11 ± 0.42 %, alongside enhanced GMP and IMP concentrations of 58.36 ± 2.13 ppm and 64.80 ± 1.4 ppm, respectively. These findings indicate the effectiveness of combining enzymatic hydrolysis with ultrasonication for flavour-oriented hydrolysate production. Overall, this study demonstrates the applicability of RSM for optimising enzyme-assisted ultrasound processing parameters and highlights the potential of HEPHs as value-added, flavour-enhancing ingredients.

Keyword: *Umami taste, mushroom flavour, green extraction, Food ingredients*

Development of a Roasted Wolffia Latte Enriched with Plant Protein for Functional Beverage Applications

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Wolffia (Wolffia spp.) has emerged as a promising sustainable plant-based protein source due to its high nutritional value and potential application in future foods. However, its characteristic green, bitter, astringent, and seaweed-like flavor may limit consumer acceptance in beverage products. This study aimed to develop a roasted Wolffia latte enriched with plant protein as a novel sustainable functional beverage inspired by Japanese Hojicha. Based on preliminary roasting optimization, dried Wolffia was roasted at 160°C for 10 min, which provided the most desirable roasted aroma and a balanced sensory profile, as evaluated by the sensory team, with a rich protein content of 30.97%. The selected roasted powder was formulated into an instant Hojicha-style latte with added plant protein (Soy Protein: Pea Protein) and evaluated for physicochemical properties and consumer acceptance. The developed latte exhibited desirable color, acceptable solubility, and enhanced protein content (up to 10%). Sensory evaluation with 30 panelists (n = 30) showed an overall liking score of 6.14 ± 1.57, corresponding to slightly to moderately liked, with a consumer acceptance rate of 66.7%. The findings demonstrate the potential of roasted Wolffia as an innovative ingredient for value-added plant-based beverages, supporting sustainable food systems and future functional beverage development.

Keyword: *Wolffia, plant protein, functional beverage, product development*

Electrospinning of proteins from faba bean leaves (Vicia faba L.) and red betroot leaves (Beta vulgaris L.) after Internet of things (IoT) ultrasound extraction

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High-power ultrasound (US) integrated with IoT sensor hardware and cloud-based software was applied for continuous protein extraction from bean leaves and red beetroot. Ultrasound technology was selected as a sustainable and environmentally friendly extraction method. The extraction process used a water-to-leaf ratio of 50:1, consisting of 500 mL of water and 10 g of ground leaves.

Protein-enriched polymer nanofibers were produced by electrospinning using a Spinbox Systems device developed by Bionicia. Electrospinning parameters included a solution flow rate of 1 mL h^{-1}, collector rotation speed of 300 rpm, and a nozzle-to-collector distance of 22 cm. Protein extracts were incorporated into the polymer solutions at concentrations of 10% and 15%.

Different polymers were investigated, including poly(ethylene oxide) (PEO), poly(vinyl alcohol) (PVA), and zein (Ze). Various formulations were prepared, such as 2% PEO/8% PVA/1% Tween 80/10% bean extract and 2% PEO/8% PVA/1% Tween 80/15% red beet extract in deionized water. Morphological and chemical analyses, including TGA, DSC, IR, and SEM, demonstrated that PVA produced fibers with larger diameters than PEO. Processing duration influenced nanofiber stretching, while electrospinning time had no significant effect on mesh transparency or layering.

This research was funded by the Croatian Science Foundation through the DEEP project (HRZZ-IP-2022-10-2207).

Keyword: *internet of things, electrospinning, waste leaves, ultrasound*

Modulating Starch Retrogradation in Fresh Rice-based Noodles: Effects of Hydrocolloids and Emulsifiers on Textural Stability During Storage

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Fresh rice-based noodles, known as kway tiao in Singapore, is highly susceptible to textural deterioration during storage due to starch retrogradation, which limits its shelf-life and eating quality. This study evaluated the effectiveness of selected hydrocolloids and emulsifiers, namely xanthan gum, sodium carboxymethyl cellulose, sucrose ester, and sodium stearoyl lactylate, at varying concentrations in improving the textural stability of kway tiao over a five-day storage period.

Physicochemical properties of rice slurry and textural attributes, including hardness and tensile strength, were analysed alongside moisture content and water activity. Results showed that all samples exhibited increasing hardness and decreasing tensile strength over time, indicating progressive starch retrogradation. However, the incorporation of additives significantly modulated these changes.

Among the additives tested, 0.05% xanthan gum demonstrated the most effective performance, exhibiting the lowest increase in hardness and the highest overall sensory acceptability. CMC at 0.2 - 0.4% was also effective in reducing hardness and maintaining textural stability, while sucrose ester showed moderate improvements at higher concentrations (0.5 - 0.8%). In contrast, sodium stearoyl lactylate showed limited effectiveness in enhancing tensile strength despite reducing hardness.

Overall, hydrocolloids were more effective than emulsifiers in retarding retrogradation and maintaining product quality, particularly in extended shelf-life and maintaining sensory quality.

Keyword: *fresh rice-based noodles, starch retrogradation, hydrocolloids, shelf-life, texture*

Illuminating Food: Moving Beyond Optical Interference in Fluorescence Spectroscopy

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Fluorescence fingerprint (FF) has emerged as a promising non-destructive approach for quality assessment and visualizing component distributions in food matrices. However, optical interference — including inner filter effects and multi-component fluorescence overlap — limits reliable quantification, particularly in polyphenol-rich plant materials. This presentation integrates three complementary investigations that define these challenges across diverse sample forms. In intact grape and persimmon tissues, FF imaging with Machine Learning (ML) integration successfully captured spatial distributions of fluorescent components across ripeness stages and cultivars. In both cases, however, optical interference was profound: aromatic amino acids confounded polyphenol signals in grape flesh, while co-existing polyphenols suppressed catechin fluorescence in persimmon. In spice extracts, a multi-dilution FF strategy revealed that single-concentration measurements systematically misrepresent complex fluorescence landscapes in predicting polyphenol, flavonoid, and antioxidant contents under the effects of similar optical phenomena. Collectively, these findings demonstrate that standard signal acquisition and wavelength selection — typically performed on single-concentration extracts — create a critical bottleneck in FF workflows. This research highlights a compelling frontier for future investigation, suggesting that the integration of multi-dilution analysis and computational corrections is essential for advancing the accuracy of non-destructive food sensing.

Keyword: *machine learning, optical interference, multi-dilution, spatial distribution, fluorescence fingerprint*

NUTRITIONAL AND POTENTIAL HEALTH BENEFITS OF LACTOSE-FREE AND CITRUS-WASTE DIETARY FIBRE FORTIFIED ICE CREAM

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The prevalence of lactose intolerance, dairy allergies, and evolving dietary habits has accelerated demand for plant-based dairy alternatives. This study evaluated the nutritional profiles of lactose-free ice creams made from almond and coconut milk and compared them with conventional cow's milk-based ice creams. To enhance health benefits, the formulas were fortified with 2% citrus-waste dietary fibre. Fibre fortification significantly ($p<0.05$) increased crude fibre, phytochemicals, vitamins C, B3, B6, P, and Zn across all samples. Almond milk ice cream emerged as the most nutrient-rich plant-based option. Plant-based and fibre-fortified variants showed a significant decrease in energy value (approximately 133.47-137.74 kcal/J), making them lighter alternatives. While cow's milk retained superior protein (6.37-6.87%) and calcium (1,647.10-2,146.00mg/100 g), the fortified coconut variant achieved the lowest Na/K ratio (0.35), which is beneficial for cardiovascular health. Fortification improved antioxidant activity, peaking in the almond milk ice cream (60.63%DPPH and 1.03mg/100gFRAP). Although cow's milk variants scored highest overall acceptability (range 6.93-7.47) on a 9-point hedonic scale, the plant-based versions were well-received. Fortified almond milk ice cream represents a promising functional dessert that effectively bridges the gap for lactose-intolerant and health-conscious consumers by combining the indulgence of ice cream with the antioxidant and fibre benefits of plant-based ingredients.

Keyword: *Lactose-free ice cream, Citrus waste dietary fibre fortification, Nutritional composition, Phytochemical and antioxidant properties, Sensory acceptability*

PHYSICOCHEMICAL, NUTRITIONAL, AND POTENTIAL HEALTH BENEFITS OF WHOLE ORANGE FRUIT IN A CUBE PRODUCT

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Traditional orange processing majorly involved juice extraction, resulting in the loss of valuable fibre and bioactive compounds to the generated waste. This study examined the physicochemical, nutritional, and potential health benefits of whole orange fruit cubes created by combining juice, peel, pith, and seeds into a single product. The process involved juice extraction, matrix formulation, gelation, molding, and drying at 55°C to produce chewable cubes. Findings show a significant ($p < 0.05$) reduction in moisture content from 85.59% in juice to 10.26% product. Crude fibre increased from 0.24–45.77%, indicating successful incorporation of all fruit components. °Brix decreased from 12.50% in the juice to between 0.73-0.90% matrix due to fibre increase. Vitamin A decreased due to its sensitivity to processing, but vitamins C, B3, B6, P, and Zn significantly improved, reflecting the contribution of whole-fruit components. High antioxidant activity range (48.53–60.82%) DPPH, indicating radical scavenging ability, and moderate specific enzyme inhibition, α-glucosidase (40.55–59.66%) and ACE (20.04–32.94%) suggest potential anti-diabetic and antihypertensive effects, respectively. Sensory testing revealed moderate overall acceptability, with the A2B1 product being the most preferred (4.97). The study demonstrates enhanced nutritional value, potential health benefits, and sustainable food processing of whole-orange products while valorising citrus waste.

Keyword: *Whole-fruit utilisation, Nutritional properties, Health benefits, Sustainable food processing, Orange cube and citrus waste valorisation*

MICROBIAL SAFETY OF ULTRA-SHEAR TECHNOLOGY FOR LIQUID FOOD PROCESSING

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Ultra-shear technology (UST) is an emerging semi-continuous high-pressure-based preservation method to produce clean-label liquid foods while retaining desirable quality attributes. This study systematically evaluated the microbial safety of UST by investigating the combined effects of pressure, temperature, shear, and shear valve design on bacterial spore inactivation. Using Clostridium sporogenes PA3679 endospores as model organisms, the study demonstrated a synergistic sporicidal effect of target pressure (400 MPa), pressure-holding time, elevated discharge temperatures (up to 125 °C), and shear. Combining the inactivation data of Bacillus cereus endospores with computational fluid dynamics (CFD) modeling, the study further showed that discharge (shear) valve with high-shear configurations (shear rate ~10^7 s^{-1}) generates greater elongational and shear stresses, leading to enhanced microbial inactivation compared to low-shear designs (shear rate ~10^6 s^{-1}). Additionally, a clean-in-place (CIP) sanitation protocol was developed and validated for a pilot-scale UST processor. The protocol effectively reduced microbial loads at critical test points below safety thresholds after processing representative liquid matrices. Collectively, this work provides critical insights into mechanisms governing UST microbial lethality and establishes practical guidelines for safe-harbor operation. The findings support UST advancement as a scalable alternative for liquid food pasteurization and sterilization, contributing to innovation in sustainable food systems.

Keyword: *Advanced food preservation and processing technologies, Ultra-shear technology, Food safety, Food engineering, Cleaning and sanitation*

DIETARY CYCLIC ORGANOSULFIDES as H2S DONORS: MODULATING NF-κB SIGNALING PATHWAY to EXERT ANTI-INFLAMMATORY ACTIVITY in RAW264.7 MACROPHAGE

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Sacrificial layers of reticulated polymeric foams are frequently used for shock mitigation and impact energy dissipation. Cyclic organosulfides (COSs), naturally occurring in fungi and plants, have attracted increasing attention due to their capacity to release hydrogen sulfide (H_2S). However, their underlying bioactive mechanisms remain poorly understood. In this study, three COSs including 1,2,4-trithionine (TTL), 1,2,4,6-tetrathiepane (TTP) and lenthionine (LEN), were investigated for their H_2S-releasing properties, antioxidant and anti-inflammatory effects. TTL and TTP gradually released H_2S, whereas LEN exhibited a markedly higher H_2S-releasing rate due to dual reaction pathways with GSH. LC-MS analysis further identified multiple reactive sulfur species derived from COSs-GSH interactions, suggesting that dynamic sulfur exchange processes may contribute to their biological activities. In LPS-stimulated RAW264.7 macrophages, COSs treatments significantly attenuated inflammation by reducing nitric oxide production and downregulating the expression of iNOS and COX-2. Transcriptomic analysis, immunofluorescence, western blotting, and pharmacological inhibition collectively indicated that the anti-inflammatory effects were associated with suppression of the NF-κB signaling pathway. These findings suggest that the anti-inflammatory and redox-related effects of COSs are associated with their H_2S releasing properties, underscoring their potential as functional food ingredients.

Keyword: *cyclic organopolysulfide, antioxidant, anti-inflammation, hydrogen sulfide donors, NF-κB pathway*

Innovative Biodegradable Antimicrobial Nanocomposite Packaging for Sustainable Food Systems and Food Loss Reduction.

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Sustainable food packaging emerged as a strategy to reduce environmental pollution and post-harvest food losses from conventional petroleum-based plastics. The study focuses on the development of biodegradable antimicrobial nanocomposite films based on chitosan and polyvinyl alcohol (PVA) for sustainable food packaging applications. Chitosan, gelatin, and PVA solutions were prepared and blended in different compositions to produce polymeric films. Green synthesized nanoparticles were incorporated into the chitosan-PVA matrix to enhance antimicrobial and barrier properties. The films were evaluated for antibacterial activity against Escherichia coli and Staphylococcus aureus using agar diffusion and turbidity assay methods.

Shelf-life performance of food samples packed in polymeric films was compared with unwrapped samples to evaluate the effectiveness of developed packaging material. Results indicated that chitosan-PVA based films exhibited improved antimicrobial activity by reducing bacterial growth and enhanced preservation characteristics compared to conventional packaging materials.

The developed nanocomposite film demonstrated promising potential as an eco-friendly alternative to synthetic plastic packaging materials. The findings confirm that chitosan-PVA nanocomposite films can serve as sustainable packaging materials for active food packaging applications, contributing to reduction of food spoilage and plastic waste. This study supports the development of environmentally responsible packaging technologies aligned with sustainable food systems and circular bioeconomy principles.

Keyword: *Sustainable food packaging, antimicrobial packaging, chitosan, nanocomposite film, PVA, circular bioeconomy principles*

DIGESTIVE ENZYME INHIBITORY POTENCY AND GASTROINTESTINAL FATE OF SPENT COFFEE GROUND-DERIVED CHLOROGENIC ACIDS AS MODULATED BY MANNOOLIGOSACCHARIDES

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Despite the bioactivities of spent coffee ground (SCG)-derived chlorogenic acids (CGAs), their gastrointestinal fate and modulation by co-existing mannooligosaccharides (MOSs) remain poorly understood. This study compared crude SCG hydrolysate, solid phase extraction-purified CGAs (SPE-CGAs), caffeoylquinic acid standard as a model (CQA), and CQA–MOS mixture. Samples were evaluated for digestive enzyme inhibitory activities, followed by simulated digestion to monitor CGA bioaccessibility, isomerization, and hydrolysis. Although CGA bioaccessibility declined progressively during digestion, ester bond hydrolysis liberated phenolic acids that increased antioxidant capacity. SPE-CGAs exhibited the highest bioaccessibility (60.24%) and digestive enzyme inhibitory potency (361.69 and 281.25 μg/mL acarbose equivalent for α-amylase and α-glucosidase, respectively; 0.34 μM pepstatin A equivalent for pepsin; and 19.48 μg/mL soybean trypsin inhibitor equivalent for trypsin), demonstrating compositional diversity and selective enrichment synergistically enhanced functionality. The presence of MOSs suppressed CQA isomerization and enhanced digestive enzyme inhibitory activities. Computational analysis identified hydrogen bonding as the primary interaction stabilizing CGA–enzyme and CGA–MOS complexes. These findings offer mechanisitic insights into the gastrointestinal behavior of SCG-derived CGAs, supporting their valorization as functional ingredients with sustained potency under physiological conditions.

Keyword: *Waste valorization, Caffeoylquinic acids, In vitro digestion, Bioaccessibility, Digestive enzyme inhibitor*

ENHANCED STABILITY AND BIOACCESSIBILITY OF MINOR GINSENOSIDES VIA NANOEMULSION AND MICROENCAPSULATION

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This study optimized acidolysis conditions (110 °C, 3 h, pH 2.0) to convert major ginsenosides into minor ones—Rg3 (2.16 mg/g) and compound K (2.80 mg/g). To improve bioaccessibility, ginsenoside nanoemulsions were prepared using whey protein isolate (WPI) and Tween 80 as co-emulsifiers. Increasing Tween 80 from 0.1% to 0.5% (with 0.5% WPI) reduced droplet diameter from ~740 nm to ~310 nm, increased encapsulation efficiency by ~8%–9%, and enhanced centrifugal stability by ~50%. The optimal nanoemulsions (0.5% WPI + 0.5% Tween 80) exhibited excellent stability during freeze-thaw cycles, heat treatment, and storage. Subsequently, ginsenoside microcapsules were produced via spray drying using maltodextrin combined with inulin or lactose. Adding inulin or lactose improved wettability (from 409 s to 54 s and 103 s, respectively) and solubility (from 83.10% to 88.58% and 92.10%). Reconstituted ginsenosides emulsions showed enhanced physicochemical stability and bioaccessibility with 15% inulin or lactose. Overall, Tween 80 as a co-emulsifier stabilizes nanoemulsions, while inulin/lactose improves microcapsule rehydration and reconstituted emulsion performance, potentially increasing the bio-accessibility and industrial applicability of minor ginsenosides.

Keyword: *ginsenosides; emulsion; microencapsulation; bioaccessibility;*

BEYOND THE FIRST CUP: UNTARGETED METABOLOMICS REVEALS METABOLITE DEPLETION AND PERSISTENCE ACROSS MULTIPLE COFFEE BREWING CYCLES

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Coffee brewing is a dynamic solid–liquid extraction process, yet the fate of metabolites beyond the conventional single brewing cycle remains unclear. Here, untargeted UPLC-QTOF-MS/MS–based metabolomics was applied to systematically profile metabolites depleted and retained across multiple coffee brewing cycles under three roasting levels. The results showed that the brewing cycle exerted a stronger influence on metabolite features than the well-established roasting level, with 97% of features significantly affected by the brewing cycle. Multivariate analysis indicated that the first cycle differed most distinctly from subsequent cycles. A total of 1030 negative and 360 positive features differed significantly across brewing cycles. Key depleted metabolites were confirmed using authentic standards as phloretic acid, shikimic acid, quinic acid, and caffeine, each decreasing over tenfold from the first to the second cycle. Notably, the second cycle was dominated by caffeoylquinic acids and their derivatives (dimer, lactone, and methyl ester), caffeine, cysteinesulfenic acid, and levoglucosan, suggesting selective persistence of bioactive compounds. This study provides scientific evidence supporting the effectiveness of conventional single-cycle brewing. Meanwhile, by revealing the retention of bioactive compounds beyond the initial brew, it highlights the potential of their targeted recovery from coffee by-products, thereby contributing to sustainable waste valorization and functional ingredient development.

Keyword: *Untargeted metabolomics, Chemometrics, Spent coffee grounds, Bioactive compounds, Caffeoylquinic acid*

Understanding Amino Acid Profiles and Taste Detection of Mushroom and Algae Extracts Using an Electronic Tongue

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Instrumental taste-sensing technology provides an objective and reproducible approach for evaluating complex taste attributes, such as umami, without relying on human sensory panels. This study investigated the relationship between amino acid composition and taste detection in protein extracts from shiitake mushrooms and spirulina obtained using green extraction methods. Three techniques: maceration extraction (MAE), ultrasound-assisted extraction (UAE), and enzyme-assisted extraction (EAE) were applied to compare protein recovery and amino acid profiles associated with umami taste. The results showed that extraction methods influenced protein recovery and amino acid composition, while the electronic tongue effectively detected differences in umami intensity and aftertaste. Spirulina exhibited higher protein content than shiitake mushrooms across all methods. UAE produced the highest protein content (524.03 ± 4.53 mg/g dry raw material) and amino acid levels, particularly Asp (1.6495 g/100 g) and Glu (2.0564 g/100 g), resulting in the strongest umami intensity (12.18). In contrast, EAE-treated shiitake mushroom yielded a protein content of 11.38 ± 0.39 mg/g dry raw material, with Asp (0.1034 g/100 g) and Glu (0.2801 g/100 g), contributing to notable umami intensity (9.78) and aftertaste (2.37). These findings demonstrate a relationship between amino acid composition and umami perception, and highlight spirulina as a sustainable source of umami.

Keyword: *Electronic tongue, Umami intensity, Amino acid composition, Green extraction methods, Protein sources*

A data-driven approach to developing structurally and sensorially complex plant-based oyster analogues

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The global seafood industry is facing increasing sustainability challenges. Oysters, as one of the most widely farmed and consumed molluscs, represent an important target for the development of plant-based alternatives. This study presents a data-driven formulation approach to develop a plant-based oyster analogue with comparable textural and flavour attributes.

A comprehensive characterisation was conducted on six batches (n = 216) of Pacific oyster and Sydney rock oyster, collected fortnightly between March and May 2026. Texture profile analysis was performed on parts of intact oysters, followed by dissection into adductor muscle, mantle and belly for detailed compositional analysis. Macronutrient composition and mineral content were determined, with minerals quantified by ICP–OES. Flavour-relevant metabolites were analysed using GC–MS and LC–MS/MS.

The resulting dataset informed the rational selection of plant-based ingredients and guided subsequent formulation of oyster analogues. In contrast to current plant-based seafood products, which are typically homogenised gels with uniform texture and flavour, this work establishes a pipeline for designing structurally and sensorially complex analogues. This study demonstrates the potential of integrating texture and compositional profiling to advance the development of next-generation plant-based seafood with improved physicochemical and sensory similarity to conventional products.

Keyword: *plant-based, oyster, metabolomics, texture, flavour*

HYDROCOLLOID-STABILISED CAMEL MILK ACID GELS

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HYDROCOLLOID-STABILISED CAMEL MILK ACID GELS

Camel milk forms relatively weak acid-induced gels due to its unique casein micelle structure and protein composition. In this study, camel milk gels were prepared using glucono-δ-lactone (GDL) at two protein concentrations (4% and 8%) to investigate the effects of protein level and hydrocolloid addition on gel structure. Carboxymethyl cellulose (CMC) and high-methoxyl pectin (HMP), alone or in combination, were incorporated to modify gel properties. Increasing protein concentration from 4% to 8% enhanced gel firmness and viscoelastic behavior, as indicated by higher storage modulus values. Gels prepared at 4% protein exhibited syneresis, reflecting a weaker and less cohesive protein network. In contrast, 8% protein gels demonstrated improved water-holding capacity and structural integrity. HMP-added camel milk gel exhibited lower stability than that with CMC addition, indicated by higher serum separation, at low protein concentration (4%). CMC-added gel developed elastic gel with less frequency dependent, signifying increased protein-CMC interactions in acidic environment. These findings suggest that protein–hydrocolloid interactions under acidic conditions critically influence gel stability. Overall, both protein content and hydrocolloid incorporation played key roles in improving the structural stability of GDL-induced camel milk gels. This study provides insights on development of stable camel milk gel-based products.

Keyword: *Camel milk, Pectin, Carboxymethyl cellulose, Gels*

Mechanosensitive channel (MS) proteins as potential targets for foodborne Pseudomonas fluorescens control: ultrasound active MS proteins and transport vanillin cross membrane

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Pseudomonas fluorescens is a major spoilage bacterium in foods and food-processing environments, posing significant risks to food quality and safety. Developing efficient, safe, and low-residue antimicrobial strategies is of great importance. Mechanosensitive (MS) channels, particularly MscL and MscS, are key regulators of bacterial responses to membrane tension and represent promising antimicrobial targets. In this study, we systematically elucidated, for the first time, how ultrasound modulates bacterial metabolism and membrane homeostasis through MscL and MscS and thereby enhances the antibacterial activity of vanillin.

Ultrasound induced combined thermal and oxidative stress, leading to extracellular polysaccharide degradation, enhanced lipid metabolism, and activation of energy reserve pathways. Using MscL/MscS deletion mutants, Ca^{2+} fluorescence labeling, and antibacterial assays, we identified a field strength-dependent regulatory mechanism in which MscL mainly maintained ion and osmotic homeostasis at moderate ultrasound intensities, whereas higher intensities caused channel dysfunction and severe metabolic imbalance. Molecular docking, gene expression analysis, antibacterial assays, and molecular dynamics simulations further demonstrated that ultrasound-activated MS channels promoted vanillin uptake and strengthened its interaction with MscL/MscS, thereby amplifying oxidative stress and metabolic disruption. These findings provide a theoretical basis for developing ultrasound-enabled physical-chemical synergistic antibacterial strategies for food preservation.

Keyword: *Pseudomonas fluorescens*, *Mechanosensitive channels*, *Ultrasound*, *vanillin*, *cross membrane*

A METHOD TO GENERATE ANIMAL-BASED BROTH-LIKE FLAVORS FROM SOY PROTEIN VIA COMBINED PROTEASE AND MAILLARD REACTIONS

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With the growing demand for alternative foods, technologies for producing animal-like flavors from plant proteins are required. Maillard reaction products (MRPs), obtained by adding cysteine and ribose to the hydrolysates produced via the protease treatment of soy proteins, exhibit meat-like aromas. However, the effects of protease treatment and Maillard reaction conditions on the aromatic composition of MRPs are not well-understood. We previously reported that protease reaction conditions affect the composition of volatile compounds in MRPs. In this study, we aimed to identify the key aroma compounds of MRPs and clarify the effects of preparation conditions on the production of these components. Sensory evaluation comparing the MRPs prepared under the two conditions showed that one had a significantly stronger animal-based broth-like aroma. Aroma extract dilution analysis identified 2-methyl-3-furanthiol and methional as the main contributors to this aroma. GC/MS analysis of 32 MRPs prepared under various conditions showed that 2-methyl-3-furanthiol was highest at pH 5.0 and 120°C for 30 min, whereas methional peaked at pH 5.0 and 120°C for 90 min. Correlations between the production of other compounds and preparation conditions were observed. These results offer insights into the development of alternative flavor products.

Keyword: *Soy protein, Protease reaction, Maillard reaction, Animal-based broth-like aroma, Alternative food*

Seasonal Variation and Multi-target Biological Activities of Rosmarinus officinalis L. Extracts: Phenolic Profile, Antioxidant

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This study examines the influence of seasonal variation on the phytochemical composition and biological activities of Rosmarinus officinalis L., a widely used aromatic and medicinal plant. Aerial parts were collected in spring, summer, autumn, and winter, and their ethanol extracts were analyzed by LC-ESI-MS/MS for chemical profiling, total phenolic content (TPC), total flavonoid content (TFC), and a broad range of in vitro and in vivo bioactivities. Across all seasons, luteolin, kaempferol, rutin, and biochanin A were consistently detected. The highest TPC and TFC were observed in autumn. Antioxidant assays (DPPH, ABTS, FRAP, ADS, SNP) showed that the autumn extract had the strongest DPPH scavenging activity, whereas the spring extract exhibited the highest FRAP value.

Keyword: *Rosmarinus officinalis, seasonal variation, phenolic compounds, antioxidant activity*

GENOMIC AND PHENOTYPIC ANALYSIS OF STRESS-TOLERANT, AROMA-PRODUCING YEAST SCREENED UNDER LOW-WATER ACTIVITY, LOW-MOISTURE CONTENT FOR LOW-SALT CHILI FERMENTATION

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Developing low-salt foods is important for reducing health risks associated with high-salt diets, but maintaining microbial safety under low-salt conditions is challenging because achieving low water activity (a_w) requires reducing substrate moisture, which can inhibit conventional fermentative microbes. In this study, yeasts adapted to low-salt (4–12% d.b.), low-a_w (0.87–0.92), and low-moisture conditions were isolated from controlled fermentations of two chili varieties. Microbial succession and its relationship with volatile flavor profiles were analyzed, and 72 indigenous yeasts were obtained through multi-stage phenotypic screening. Among them, strain M13 showed the highest aroma-producing capacity, with 1.42 g/kg total esters, and strong tolerance to low pH (2.0), ethanol (9%), and elevated temperature (40°C). Whole-genome sequencing indicated that these traits were associated with a metabolism- and stress-related genomic architecture, including a 12.97 Mbp genome with 54.5% of annotated genes assigned to metabolic categories. These findings identify a promising functional yeast and provide a screening framework for improving flavor quality and microbial control in low-salt fermentation.

Keyword: *Microbial community dynamics, Whole-genome sequencing, Fermentation optimization, Flavor enhancement*

Dietary Exposure to Glyphosate from Breakfast Cereals and Snacks among Lebanese Children and Adolescents

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Glyphosate, a broad-spectrum herbicide widely used in agriculture, has raised concerns regarding its persistence in food and potential health risks. Data on its presence in cereal-based foods consumed by Lebanese children and adolescents remain limited. This study assessed glyphosate residues in breakfast cereals and wheat-based snacks available on the Lebanese market and estimated dietary exposure among children and adolescents. A total of 62 stock keeping units (SKUs), including breakfast cereals (n=21) and wheat-based snacks (n=41), were collected from major supermarkets in Beirut and Mount Lebanon between 2022 and 2024. Glyphosate residues were quantified using ELISA. All samples (100%) contained detectable residues, yet none exceeded the Codex maximum residue level (30 mg/kg). Breakfast cereals showed significantly higher concentrations (median: 44.45 ppb) than snacks (36.38 ppb) (p=0.003). Imported snacks had higher levels than locally produced ones (49.7 vs. 30.6 ppb) (p=0.0015). Dietary exposure was minimal, with the highest level in children aged 4–8 years representing less than 0.031% of the most conservative Acceptable Daily Intake. Despite widespread detection, exposure levels do not indicate immediate health risks. Continuous monitoring and further research on total dietary exposure are recommended.

Keyword: *Glyphosate, Children, Exposure assessment, Breakfast cereals, Snacks*

Occurrence and Exposure Assessment of Glyphosate Residues in Cornflakes from Lebanon and the United Arab Emirates

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Glyphosate, the most widely used herbicide worldwide, has raised concerns due to its persistence and potential health risks. Despite its extensive use in cereal crops, data on residues in foods consumed in the Arab region remain limited. This study assessed glyphosate residues in cornflakes marketed in Lebanon and the United Arab Emirates (UAE) and evaluated dietary exposure relative to international safety thresholds. A total of 97 stock keeping units (SKUs) (76 UAE, 21 Lebanon) were identified. Residues were quantified in duplicates using ELISA (LOD: 7.5 ppb). Estimated Daily Intake (EDI) values were calculated using national cereal consumption data and compared with Acceptable Daily Intake (ADI) values established by Codex (1 mg/kg/day), EFSA (0.5 mg/kg/day), and BfR/APVMA (0.3 mg/kg/day). Glyphosate residues were detected in all samples, with median concentrations of 34.9 ppb (UAE) and 44.4 ppb (Lebanon), none exceeding maximum residue limits. Significant differences were observed by origin ($p < 0.001$), with the highest levels in USA products and lowest in French products. Refined cornflakes showed higher residues than whole grain. Maximum EDI represented only 3.3% of Codex ADI and 11.1% of the most conservative ADI, indicating no immediate health risk.

Keyword: *Glyphosate, Cornflakes, Food safety, Dietary exposure*

Lefty or Righty: Chirality of ethyl lactate matters in Baijiu Aroma

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We intestigated the enantiomeric composition of ethyl lactate (EL), a chiral ester linked to Baijiu Aroma, across 83 commercial Baijiu samples representating 12 aroma types, plus rauce-aroma "round" base liqors (2016-2019) and aged products. Using diret injection chiral (GC_MS, we quantified (R)-EL and (S)-EL and evaluated sensory properties via trained panelists. MOst pure-grain, solid state fermented Baijiu showed a clear predominance of (R)-EL, with significant defferences between (R)-and (S)-EL contents ($P < 0.001$). In contrast, serveral products indentified as non-naturally fermented or solid-liquid blended (with added flavours) were dominated by (S)-EL, suggesting enantiomeric ratios can help discriminate product types. In sauce-aroma Baijiu rounds, (R)-EL exceeded (S)-EL consistently across years, but concentrations varied by round and year reflecting the influence of process and fermentation environments. Sensory tests in 46% ethanol found (R)-EL had a lower odor threshold (103.92 mg/L) than (S)-EL (214.22 mg/L) and was described as fruity sweet, while (S)-EL was more sour/rancid/creamy。 Odor activity values analysis indicated (R)-EL generally contributed more to Baijiu aroma, supporting (R)-EL as an important driver of fruity perception and a potential quality marker.

Keyword: *Ethyl Lactate*, *Baijiu*, *Baijiu aroma*, *Baijiu quality*

PROCESS OPTIMIZATION OF UV-C ASSISTED ATMOSPHERIC COLD PLASMA FOR AFLATOXIN B1 MITIGATION IN CAPSICUM ANNUUM

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Aflatoxin B_1 (AFB_1), a potent carcinogenic mycotoxin produced by Aspergillus spp., poses a significant food safety concern in spices such as red chili (Capsicum annuum). This study evaluates a non-thermal decontamination approach integrating ultraviolet (UV-C) irradiation with atmospheric cold plasma for effective AFB_1 reduction in naturally contaminated samples. Process parameters including treatment time, temperature, moisture content, surface area, and air density, were optimized using response surface methodology with a central composite design.

The combined treatment achieved up to 71.99% AFB_1 degradation under optimized conditions (17.5 min, 42.5 °C, 10% moisture content, 94.245 cm^2 surface area, and 1.125 $kg \cdot m^{-3}$ air density) at about 70 kJ energy input, indicating process efficiency. The reduced quadratic model showed strong statistical significance ($p < 0.0001$). Quantification by high-performance thin-layer chromatography confirmed toxin reduction, while scanning electron microscopy and energy-dispersive X-ray analysis revealed structural and compositional changes following treatment.

The findings highlight the potential of this integrated approach as an energy-efficient, scalable strategy and sustainable alternative to conventional methods for mycotoxin mitigation in spices, supporting improved food safety and quality preservation in high-value commodities.

Keyword: *Aflatoxin B1, Spices, UV-C irradiation, Cold plasma, Sustainable*

AMINO ACID PROFILING OF SELECTED INDIGENOUS NIGERIAN SPICES FOR TRADITIONAL, INNOVATIVE AND GLOBAL FOOD APPLICATIONS

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Nothwithstanding the profound dietary and sociocultural significance of indigenous Nigerian spices, they remain under-researched, facing potential extiction due to lack of proper documentation and domestication efforts. This data gap currently hinders their commercial development and innovative applications. To bridge this gap, spectrophotometric quantification of six underutilized spices -Irugege, Gbafilo, Njangsa, Ataiko, Omilo and Country onions was conducted. Twenty (20) amino acids were identified in each spice and Glutamic acid was most prevalent in all the spices, with Njangsa having the highest (8.150%), while Aspartic acid (1.252%) was abundant in Gbafilo. These amino acids were further categorized into groups including essential and non-essential, acidic, basic, aliphatic, aromatic and sulphur-containing - all of which detect the spices' functional properties. Remarkably, Njangsa and Irugege contained high concentrations of branched amino acids (isoleucine, leucine and valine), suggesting superior emulsion capacity due to their hydrophobic nature. Njangsa sjhowed the highest concentrations of bitter (20.096%), sweet (9.534%), and umami (12.152%) amino acids. In contrast, Irugege contained the highest levels of tasteless amino acids. With umami-contributing glutamic and aspartic acids ranging from 2.22% to 12.152%. The research concludes that these amino acid profiles are fundamental to the distinct flavors, culinary and potential industrial applications of these spices.

Keyword: *amino acids profiling, indigenous, Nigerian spices, flavor, innovative,*

Evaluation of Wickerhamomyces onychis as a potential biocontrol agent against postharvest losses in tomato (Lycopersicum esculentum) fruit

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This study examines the biocontrol potential of epiphytic yeast, specifically 44 isolates sourced from healthy fruit surfaces, against Alternaria alternata, a fungal pathogen associated with postharvest rot in tomatoes. In vitro evaluations revealed that several isolates effectively inhibited the radial growth of A. alternata, with the most prominent isolate, identified as Wickerhamomyces onychis (YFSL-3) via 18S rDNA sequencing, selected for further analysis. Over 28 days, W. onychis was tested in vivo under controlled conditions (21-25 °C and 43-66% relative humidity) to assess its efficacy in mitigating postharvest fungal losses. Application of W. onychis significantly reduced the severity of A. alternata infections, as evidenced by increased salicylic acid levels, total phenolic content (TPC), and enhanced antioxidant activity relative to both a 1% sodium benzoate positive control and negative controls. Biochemical assays indicated heightened activity of antioxidant enzymes (ascorbate peroxidase, peroxidase, superoxide dismutase) and defense-related enzymes (phenylalanine ammonia-lyase, chitinase, β-1,3-glucanase) in the biocontrol-treated fruit. These findings position W. onychis as a promising candidate for managing Alternaria rot in tomatoes, warranting further investigation across various cultivars and environmental conditions to reinforce its application in postharvest management.

Keyword: *Epiphytic yeast, tomato, Wickerhamomyces onychia, biocontrol agent, defensive enzymes*

INTERACTION BETWEEN NOVEL HYDROCOLLOIDS FROM INDIGENOUS NEW ZEALAND FERNS WITH κ-CARRAGEENAN AND LOW-ACYL GELLAN GUM

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Driven by the need for sustainable hydrocolloids, attention has turned to New Zealand's diverse fern flora (>200 species) as a source of novel plant polysaccharides. This study investigates interactions between polysaccharides extracted from Sphaeropteris medullaris, mamaku gum (MG), and Parablechnum novae-zelandiae, kiokio gum (KG), with κ-carrageenan (κC) and low-acyl gellan (LAG), selected from shortlisted gums. MG and KG are non-gelling anionic glucuronomannans exhibiting unusual shear-thickening behaviour, but their interactions with other non-starch polysaccharides remain unexplored. Mixtures were characterised using rheology, TPA, FTIR, cryo-SEM, syneresis, water-holding capacity and freeze–thaw stability across different blend ratios, ionic strengths, pH and storage. Gels containing crude MG or KG were significantly firmer, with functionality dominated by endogenous ions. In contrast, gels with purified MG and KG were softer, heterogeneous, and displayed microphase separation, indicating an independent phase separated gel network. These findings demonstrate that purified fern polysaccharides can modulate gel microstructure and functionality independently of ionic effects, offering advantages for ion-sensitive formulations such as dairy gels, and plant-protein systems. Notably, blends of LAG with purified MG showed excellent freeze–thaw stability, highlighting potential for frozen food applications. Overall, these fern-derived polysaccharides provide new opportunities for tailoring texture and stability in mixed hydrocolloid systems.

Keyword: *Ferns, Polysaccharides, Interactions, κ-carrageenan, low-acyl gellan*

THE POTENTIAL OF MICROALGAL LIPID DROPLETS AS NATURAL EMULSIONS

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Microalgal lipid droplets (LDs) offer a promising, potentially sustainable alternative to conventional seed oils for food applications. This study investigates the aqueous extraction and techno-functional stability of LDs from a cell wall-deficient microalga Chlamydomonas reinhardtii. Pulsed electric field processing enabled solvent-free extraction, achieving 81 ± 1 wt% lipid recovery. The resulting LD emulsions were systematically evaluated under processing-relevant conditions.

LDs consisted of 96.4% lipids and 3.6% proteins and had a median size of 1.2 μm. They exhibited high stability during pasteurisation and mechanical processing, maintaining structural integrity for minimally 30 days. In contrast, sterilisation and freeze–thawing induced droplet coalescence. Stability across pH (2 – 6.5) and ionic environments (0.02 – 3.5 M NaCl) indicated that electrostatic repulsion is the dominant stabilisation mechanism, with steric contributions. Compared to plant-derived LDs, microalgal LDs showed a broader pH stability range but reduced steric stabilisation.

Volatile formation, likely initiated during cell disruption, suggests oxidative processes that require mitigation for food applications. Despite this limitation, microalgal LDs can function as natural, additive-free emulsions with competitive stability. Their production offers sustainability advantages, including reduced land and fertiliser use compared to terrestrial oil crops.

Overall, this work highlights the potential of microalgal LDs as a novel food ingredient.

Keyword: *Lipid droplets / oil bodies, Solvent-free lipid extraction, Pulsed electric fields, Emulsion stability, Techno-functional properties*

STUDY ON THE EFFICACY AND MECHANISM OF BOVINE LACTOPONTIN IN PROMOTING BONE GROWTH AND DEVELOPMENT

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Lactopontin (LPN) is a critical functional protein in breast milk, yet its mechanism of action on skeletal development remains unclear. This study systematically elucidated the efficacy and mechanisms of bovine LPN in promoting skeletal development using rat models, in vitro digestion assays, and multi-omics technologies. The results demonstrated that a medium dose of LPN (15 mg/kg) significantly improved bone microstructure, increasing bone mineral density by 9.8% and maximum load by 22.9%. Mechanistically, LPN activates the "microbiota-bile acid-bone" axis by enriching short-chain fatty acid-producing bacteria and promoting the synthesis of secondary bile acids (e.g., GCDCA). Concurrently, digestive peptides derived from LPN, specifically calcium-chelating peptides (e.g., IE12) and osteogenic active peptides (e.g., WS7), function by enhancing calcium absorption and directly activating osteoblasts. Furthermore, LPN maintained significant osteogenic activity within a complex protein matrix. These findings reveal the molecular mechanisms by which LPN regulates skeletal development via the gut-bone axis and bioactive peptides, providing a scientific basis for the precise nutritional optimization of infant formula.

Keyword: *Lactopontin, bone health, digestion, infant formula*

Multi-Omics Insights into Salmonella Thermal Resistance at Different Water Activities and Temperatures and Evaluation of E. faecium NRRL B-2354 as a Surrogate

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Low-moisture foods (LMFs) remain microbiologically vulnerable because Salmonella can survive desiccation and exhibit increased heat resistance. This study investigated the effects of water activity (a_w) on the thermal resistance of Salmonella Enteritidis PT30, characterized desiccation adaptation using multi-omics, and evaluated Enterococcus faecium NRRL B-2354 (E. faecium) as a surrogate for process validation. A filter-paper carrier equilibrated to a_w 0.11, 0.32, 0.43, 0.65, and 0.84 was established, and overlapping adsorption-desorption isotherms together with a near-linear moisture-a_w relationship confirmed its suitability. Salmonella remained recoverable for 100 days at all aw levels, with the greatest reduction of 3.30 ± 0.08 log CFU/mL at a_w 0.65. Isothermal heating showed that lower a_w increased D-values and z_T, confirming a_w as a key determinant of heat resistance. Multi-omics revealed extensive transcriptomic remodeling, weak transcript-protein correlation after prolonged equilibration, and a recurrent core of genes linked to transport, respiratory energy management, and envelope stress adaptation. Comparative kinetics showed that E. faecium was comparable to or more resistant than Salmonella under several low-a_w conditions, supporting its conservative use with condition-specific verification. These findings provide a mechanistically informed and practically applicable framework for validating thermal control strategies in LMFs.

Keyword: *Low-moisture foods, Water activity, Salmonella Enteritidis PT30, Thermal resistance, Surrogate validation*

Initial Encapsulation Concentration Regulates Microcolony Formation, Stress Resistance, and Transcriptomic Responses of Lactiplantibacillus plantarum LP124

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Initial encapsulation concentration critically regulates microcolony architecture, stress tolerance, and transcriptomic reprogramming of Lactiplantibacillus plantarum LP124 during in situ cultivation in calcium alginate microgels. LP124 was encapsulated at 10^5–10^8 CFU/mL using a coaxial microfluidic platform and cultured for 24 h. Lower initial concentrations generated larger and better-organized microcolonies and showed stronger overall resistance to acid, bile salt, heat, freeze-drying, and simulated gastrointestinal stresses. Transcriptomic analysis further revealed 82 commonly upregulated and 90 commonly downregulated genes shared by all encapsulated groups versus planktonic cells, with enriched functions related to transport, localization, quorum sensing, beta-lactam resistance, pyruvate metabolism, and glycolysis/gluconeogenesis, while downregulated genes were mainly associated with the two-component system. Meanwhile, increasing encapsulation concentration drove progressive transcriptome remodeling, shifting from protective adaptation toward growth expansion and metabolic redistribution. These findings identify initial encapsulation concentration as a key regulator of microcolony development and probiotic robustness.

Keyword: *Probiotics viability, Lactiplantibacillus plantarum, Microgels, Microcolony, Transcriptomic responses*

Production of microbial astaxanthin for food applications

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The project's aim is to develop a scalable and effective fermentation process for the production of red-pigmented yeast biomass, which can be blended with plant-based protein concentrates to develop high moisture extruded products through an end-to-end process and product design. The production of astaxanthin-producing Xanthophylomyces dendrorhous cells has been optimised in 2-L aerated bioreactors under dissolved oxygen control. To this end, a range of defined media (using glucose or glycerol as carbon and energy source) and complex media consisting of agricultural residues (e.g. rapeseed meal hydrolysates) were evaluated, as well as batch and fed-batch fermentation strategies, reaching a maximum dried yeast biomass of ~40 g/L and an astaxanthin yield of ~3.5 mg/g of dried cells. Mechanical, enzymatic (using b-glucanase) and enzymatically-assisted supercritical fluid extraction methods were also assessed to partially disrupt the cells and increase the dispersion of astaxanthin during subsequent formulation, ensuring that limited cell lysis takes place and the colour is retained. It was shown that the enzymatic method was effective as after treatment small particles (<5 mm) were produced compared with the intact cells before disruption, which resulted in an increased surface area for subsequent solvent extraction, leading to potentially higher astaxanthin dispersion within a food matrix.

Keyword: *Fermentation, Yeast, Astaxanthin, Alternative proteins, Downstream processing*

Microalgae biorefineries for sustainable food systems: circular cultivation, energy-efficient processing, and scalable downstream integration

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Microalgae can support more sustainable food systems by providing nutrient-rich biomass with low-land demand, but large-scale implementation remains limited by costly cultivation, energy-intensive processing, and limited understanding of ingredient functionality. This study developed an integrated microalgae biorefinery that combines circular cultivation on hydrolyzed side-streams, pulsed electric field (PEF) disruption, cross-flow microfiltration, and digital process optimization for scale-up. Microalgae grown on local side-streams, including brewer's spent grain and soy whey, achieved productivity comparable to standard medium while maintaining high protein and lipid contents. Compared with high pressure homogenization, PEF reduced the energy demand for protein extraction by 40% and increased protein transmission during microfiltration from 54.5 to 141.75 g m^{-2} h^{-1}. Digital simulations supported process optimization across flow rates and biomass concentrations, enabling consistent treatment during scale-up. By integrating circular resource use, energy-efficient processing, and scalable separation, this work addresses key barriers to microalgae-based food production. The recovered protein fractions were further evaluated for their technofunctional properties and suitability for formulation, advancing a structure-process-property perspective on how cultivation and downstream processing shape the behavior of food-relevant materials. The approach is relevant to sustainable protein innovation internationally, particularly in regions seeking resilient and resource-efficient food manufacturing systems.

Keyword: *microalgae biorefinery, circular cultivation, pulsed electric fields, digital process optimization, downstream processing*

SALT-INDUCED MICROSTRUCTURING EFFECTS ON PLANT PROTEIN GEL PROPERTIES

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Protein gels are widely used in food industry, though inadequate protein intake is a challenge for certain population groups. As outlined in our review (Dong et al., 2026. Comprehensive Reviews in Food Science and Food Safety; 25:e70424), high-protein gel represents a promising strategy. Due to weak gelation of plant proteins, developing plant-based high-protein gels with improved functionality remains a key challenge. Health concerns over high-sodium intake have driven interest in reduced-sodium and sodium-replacement strategies.

A salt-driven microstructuring strategy was developed to improve the functionality of high-concentration pea protein-curdlan composite gels, incorporating low-concentration inorganic/organic salts. Curdlan-induced gel network entrapped discrete pea protein particles as inactive gel fillers. Salts altered gel structures/properties by modifying protein micro-aggregate structure. Mg glycinate (MgGly) induced fibrillar-stranded gel structure by transforming protein particles into active structure-forming components, exhibiting superior texture and stability, compared to other salts-induced granular structures. Rheological analysis indicated MgGly promoted gel formation, whereas salts like $CaCl_2$ interrupted gelation process during cooling stage. Unfolded protein structures induced by MgGly showed higher surface hydrophobicity, promoting the transition from α-helix to β-turn structures. These findings provide insights into structure-property relationships of plant-based high-protein gels and the use of alternative salts to replace sodium salts in food systems.

Keyword: *High protein, Plant-based gels, Fibrillar microstructure, Gel properties, Sodium replacement*

Valorization of Tamarind Seed By-Products: Carbon Dot–Reinforced Xyloglucan Nanocomposite Films

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More than 0.3 billion tons of plastic are produced globally each year, largely from non-renewable resources and with limited biodegradability, resulting in persistent environmental accumulation and the formation of micro- and nanoplastics. Considering that India is the world's largest producer of tamarind, this study explores tamarind kernel–derived xyloglucan (XG) as a sustainable biopolymeric matrix for multifunctional nanocomposite films. Carbon dots (CDs) were synthesized from tamarind seed coat biomass and incorporated into the XG matrix at 1–5% (w/w) to enhance film functionality. The CDs, enriched with oxygen-containing functional groups, were characterized using fluorescence spectroscopy. Rheological analysis of the film-forming solutions showed non-Newtonian shear-thinning behavior due to polymer chain entanglement and alignment under shear. FTIR and XRD analyses confirmed enhanced intermolecular interactions through hydrogen bonding between CDs and hydroxyl-rich XG chains, leading to improved structural integrity. Among the formulations, the XG/CD4% exhibited the most balanced performance, with improved tensile strength (8.34±0.89 MPa) and elastic modulus (156.96±22.01 MPa), reduced water vapor permeability ($2.59\pm0.29\times10^{-11}$ g·m/m²·s·Pa), increased hydrophobicity (88.07±2.97°), strong UV-blocking ability, antioxidant activity (88.68±0.58% DPPH inhibition), and antimicrobial activity against E. coli and B. subtilis. These results highlight the potential of XG/CD nanocomposite films as eco-friendly active food packaging materials.

Keyword: *Tamarind seed, Xyloglucans, Carbon dots, Sustainable packaging*

STRUCTURE–FUNCTION RELATIONSHIPS IN EXTRUDED FABA BEAN PROTEINS FOR MEAT ALTERNATIVES APPLICATIONS

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Air injection during extrusion provides a controllable oxidation strategy to modify proteins and tailor techno-functionality across processing scales. This work integrates findings from low- and high-moisture extrusion systems to establish how air, acting as an in situ oxidizing agent, influences structure–function relationships. In low-moisture extrusion, air injection promoted protein oxidation, leading to significant changes in techno-functional properties. Extrusion processing increased water solubility and water binding capacity through protein denaturation and starch gelatinization, while air injection further enhanced emulsion capacity and stability, particularly at elevated temperatures (140–160 °C). Concurrently, air injection altered process parameters by reducing torque and specific mechanical energy, indicating a plasticizing effect, while increasing die pressure due to gas expansion within the melt. These combined effects resulted in ingredients with improved techno-functionality, suitable for complex food matrices. Extending this approach to high-moisture extrusion, compressed air injection (0–450 kPa) further modified protein structure and product architecture. At higher pressures (≥350 kPa), bubble formation introduced controlled porosity and increased structural heterogeneity. These changes translated into softer matrices with tunable mechanical properties and textural attributes. Air injection serves as a scalable oxidation-driven processing tool linking ingredient functionality developed in low-moisture extrusion to structure formation in high-moisture meat analogues.

Keyword: *Air injection-assisted extrusion, Protein oxidation, Pulse protein techno-functionality, Meat alternatives*

Re shaping Pureed Foods: Sensory Acceptability of Asian Softer Meals for Older Adults

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Pureed meals are commonly associated with poor sensory appeal, which can negatively affect acceptance among older adults. This study evaluated the sensory acceptability of softer meals developed using enzymatic texture modification and food moulding of pureed foods.

Four culturally familiar Asian foods were developed: teriyaki chicken with porridge, stir-fried cabbage, prawn dumplings in thick soup, and marble cake. Meals were prepared using enzymatic texture modification followed by moulding into defined shapes. Sixteen community-dwelling older adults (37.5% males, 63.5% females; mean age 71.1±5.8 years; mean BMI 23.2±3.1 kg/m^2) participated in a within-subject sensory evaluation. Appearance, texture, taste, and smell were assessed using hedonic scales, alongside measures of overall acceptability (0=least acceptable, 10=highly acceptable) and behavioural intention to incorporate, prepare and purchase softer meals.

Overall acceptability was high (mean score 8.13±1.41). Prawn dumplings in thick soup and marble cake were rated significantly higher than the vegetable dish for appearance ($p<0.001$), texture ($p=0.002$), and taste ($p<0.001$). Behavioural intention outcomes showed willing to incorporate (68.8%), purchase (81.3%), and prepare (93.8%) softer meals.

These findings demonstrate the feasibility of moulding pureed foods into culturally familiar Asian softer meals with high sensory acceptance, supporting further development for textured-modified meal solutions for older adults.

Keyword: *Softer meals, Textured-modified foods, Sensory evaluation, Older adults, Pureed meals*

MICROENCAPSULATION OF IRON-RICH AMARANTHUS GANGETICUS L. LEAF EXTRACT AND VITAMIN C USING SPRAY-DRYING AND FREEZE-DRYING TECHNIQUES

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Iron deficiency anemia remains a leading nutritional concern globally, yet conventional iron fortification is limited by poor bioavailability and organoleptic challenges. This study investigated the co-microencapsulation of iron-rich Amaranthus gangeticus L. leaf extract with vitamin C to enhance non-heme iron bioavailability for food fortification. Maltodextrin at 20 % and 25 % w/v was used as wall material, with vitamin C added at 50, 100, and 250 times the iron content. Microcapsules produced by spray-drying and freeze-drying were evaluated for encapsulation efficiency, moisture content, solubility, hygroscopicity, storage stability, and morphological characteristics (SEM, PXRD, FT-IR). Iron content was quantified by atomic absorption spectrophotometry and vitamin C by the 2,4-DNPH method. The freeze-dried 20 % w/v maltodextrin sample (20FH) achieved the highest encapsulation efficiency (85.23 ± 0.08 %), highest vitamin C retention (11.19 ± 0.04 mg/g), lowest moisture content (3.85 ± 0.03 %), and lowest hygroscopicity (10.87 ± 0.08 %), alongside the highest vitamin C:iron mass ratio 149.20 ± 0.02. Spray-dried microcapsules showed higher solubility (76.2 ± 0.2 %) but greater moisture uptake. PXRD confirmed an amorphous structure in spray-dried samples versus crystallinity in freeze-dried samples, contributing to better stability. These findings indicate that freeze-dried 20FH microcapsules are promising iron-fortification vehicles to combat iron deficiency anemia.

Keyword: *fortification, non-heme iron, ascorbic acid, iron deficiency anemia*

THE CHALLENGES OF FOOD SAFETY AND EMERGING CONTAMINANTS IN NIGERIA

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Food safety has become a significant public health, economic, and developmental concern in Nigeria. The country faces growing exposure to both traditional contaminants such as pathogens and mycotoxins, as well as emerging contaminants including microplastics, endocrine-disrupting chemicals, pesticide residues, and veterinary drug residues. This report examines the current status of food safety in Nigeria, identifies major contaminants, analyses their sources and health impacts, and highlights systemic challenges that weaken national food safety control. It concludes with recommendations aimed at strengthening food surveillance, regulatory frameworks, research capacity, and public health interventions.

Keyword: *pathogens, mycotoxins, contaminants and pesticide residues*

Phenolic profiling and mechanistic insights into the antioxidant potential of australian sorghum bran phenolics

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Sorghum bran is a promising source of bioactive phenolics with notable antioxidant potential. However, current evidence for its antioxidant effects is largely limited to in vitro chemical and cellular assays, while the underlying in vivo mechanisms remain poorly understood. Herein, phenolic profiling combined with network pharmacology and molecular docking was applied for the first time for predicting the mechanistic potential of sorghum bran phenolics against oxidative stress-related diseases. In this work, five Australian sorghum bran genotypes including red and brown types were investigated. The results showed that fifty phenolic compounds were annotated based on HPLC-DAD-ESI-QTOF-MS/MS. Network pharmacology identified several core targets, including SRC, AKT1, EGFR and MAPK1, which were mainly enriched in the PI3K-AKT signaling pathway. Molecular docking analysis revealed that the phenolic compounds from sorghum bran could potentially modulate the PI3K-AKT signaling pathway by attenuating the activation of SRC, EGFR, AKT1, and other associated targets including MAPK1 and ESR1. These findings not only offer new insights into the investigation of the physiological roles of sorghum bran phenolics, but also shed light on the valorization of sorghum bran, highlighting its potential as a natural antioxidant ingredient in cereal-based foods or as a raw material for nutraceuticals targeting oxidative stress-related disorders.

Keyword: *Functional Foods, Pharmacology, Health Promotion*

Redox-active conjugated fatty acids as functional food bioactives for regulating human T helper 17 (Th17)-mediated inflammation

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Bioactive lipids are key modulators of immune function and health. This study investigated the immunomodulatory mechanisms of conjugated fatty acids (CFAs), including conjugated linoleic acids (CLAs) and conjugated linolenic acids (CLnAs) derived from pomegranate and bitter gourd seed oils, as well as their nitrated derivatives (nitro-CLAs), in the context of T helper 17 (Th17)-mediated inflammation, a central driver in the pathogenesis of inflammatory bowel disease (IBD). An ex vivo human peripheral blood mononuclear cell (PBMC) Th17 model was developed to assess CFA structure-function effects on Th17 activation and effector responses. CFAs (1.25-10 μM, non-toxic) showed clear structure-activity relationships, with 9- and 12-nitro-CLA displaying the greatest bioactivity, significantly suppressing CD25, IL-2, and IL-17A, while non-nitrated CLAs had minimal effects. Th17-polarised naïve $CD4^+$ T cells isolated from PBMCs of healthy human volunteers were used to investigate underlying mechanisms. Both 9-nitro-CLA and 12-nitro-CLA attenuated Th17 differentiation, evidenced by reduced intracellular IL-17A and RAR-related orphan receptor-γ (RORγt) expression. Mechanistically, both nCLAs inhibited signal transducer and activator of transcription 3 (STAT3) phosphorylation (Tyr705), a key regulator of Th17 differentiation, indicating a redox-mediated mechanism. This study identifies nCLAs as electrophilic lipid bioactives that modulate Th17 differentiation, highlighting their potential in chronic inflammatory diseases such as IBD.

Keyword: *Bioactive lipids, conjugated fatty acids, T helper 17 cells, nitro-conjugated fatty acids, inflammatory bowel disease*

Cold plasma modified taro (Colocasia esculenta) starch based active packaging film functionalized with betel leaf (Piper betle L.) essential oil for shelf-life extension of grapes

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The rising demand for sustainable food packaging has accelerated the development of biodegradable materials from underutilized agro-resources. Taro starch (TP) is a promising biopolymer; however, its native form exhibits poor functional properties for packaging. Cold plasma (CP) modification provides a green, non-thermal approach to tailor starch structure and improve film performance. TP was modified by cold plasma at 30 kV for 10 min. Active packaging films were prepared using optimized concentrations of plasma-modified TP (5 g), guar gum (1.4 g), glycerol (21.40%), and betel leaf essential oil (1%), obtained through an ANN–GA optimization approach. CP treatment significantly improved starch properties, with reduced amylose content (22.32–16.88%) and improved syneresis (31.10–45.58%), and enhanced paste clarity (25.43–32.77%), solubility (5.10–67.24%), and color characteristics. The active film showed low opacity (1.68), moderate water solubility (40.43%), thickness of 0.92 mm, low WVTR of 0.87 g/m²/day, reduced tensile strength of 2.45 MPa, and elongation at break of 34.65% as compared to native starch film. SEM, AFM, and XRD analyses confirmed a semi-crystalline structure with 40.81% crystallinity. The films were applied for grape preservation for up to 12 days at 25 ± 3 °C, and grape juice quality attributes were analyzed at 3-day intervals.

Keyword: *Active packaging, Cold plasma modified starch, Betel leaf esential oil, Grapes preservation*

PHYTOCHEMICAL PROFILING OF NTURUKPA (PTEROCARPUS SANTALINOIDES) LEAVES: IMPLICATIONS FOR FOOD SECURITY AND NUTRACEUTICAL DEVELOPMENT

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Pterocarpus santalinoides (nturukpa) is an underutilized indigenous leafy vegetable found in the wild in West Africa. The leaves are rich in phytochemicals such as flavonoids and phenolic compounds, which exhibit antioxidant, antidiabetic, and antimicrobial properties. This study evaluates the phytochemical profile of nturukpa leaves to promote their integration into modern functional foods and nutritional interventions aimed at addressing hidden hunger, improving dietary diversity and public health outcomes.

Three hundred grams of fresh leaves from two nturukpa varieties were plucked, sorted, washed with potable water, dried at ambient temperature for five days, pulverized using a blender, and stored in an airtight plastic container. Phytochemical analysis was conducted, and triplicate data were statistically analyzed using SPSS version 23. Mean values were calculated, and Three-Way ANOVA followed by Fisher's Least Significant Difference test was used to separate the means at $P \leq 0.05$.

Mean phytochemical values (mg/100g) of black and white nturukpa varieties respectively were: saponin (4.56, 0.54), alkaloid (6.22, 3.14), flavonoids (4.56, 3.48), phytate (0.48, 0.43), oxalate (0.45, 0.37), anthocyanin (2.38, 0.93), steroid (14.91, 24.56) and phenol (2.44, 2.89).

Nturukpa leaves contain health-promoting phytochemicals with antioxidant and antimicrobial properties, indicating their potential use in food preparation and the management of chronic diseases.

Keyword: *nturukpa,varieties, phytochemical,nutraceutical,antioxidant*

Global Ochratoxin A Occurrence in Foods: A Probabilistic Dietary Risk Assessment for Risk-Based Food Safety Management

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Background: Ochratoxin A (OTA) is a foodborne mycotoxin of concern because repeated dietary exposure is associated with nephrotoxicity and potential carcinogenicity. OTA has been reported in many commodities, but published occurrence data differ across countries, food groups, and reporting practices. These differences limit direct comparison and create challenges for risk-based food safety management.

Scope and approach: This study synthesized OTA occurrence data from 98 published studies, producing 244 eligible occurrence datasets from 36 countries. OTA concentrations were reconstructed from reported summary statistics and left-censored values. Benchmark exceedance was assessed using European Union maximum limits. Dietary exposure modeling generated 4,057 age- and sex-specific strata by matching OTA concentration, intake rate, and body weight. These strata were integrated through summed lifetime average daily dose (ΣLADD) calculation across age groups up to 80 years of age, producing 424 final exposure and risk scenarios. Cancer risk and margin of exposure (MoE) were used as complementary risk-characterization metrics to support comparative, risk-based prioritization of country-commodity combinations.

Key findings and conclusion: Europe contributed the largest share of eligible OTA records, with Italy, Croatia, and the Czech Republic providing the highest numbers of country-level records. OTA exceedance and dietary risk were concentrated in wheat, infant cereal products, pistachios, chili, packed spices, black pepper, raisins, beer, and dry-cured meat products. The highest concern scenarios included wheat from Canada, wheat products from Pakistan, cereal products from Algeria, beer from the Czech Republic, dry-cured fermented sausage from Italy, rice from Iran, and pistachios from the USA, with several patterns observed in both females and males. MoE identified more potential concern scenarios than cancer risk, while both metrics consistently highlighted the highest-priority country-commodity combinations. The findings provide prioritization evidence for targeting OTA surveillance, supplier verification, import monitoring, and preventive control toward commodities and country-commodity combinations with higher exceedance, exposure, and toxicological concern.

Keyword: *Mycotoxin, Lifetime average daily dose, Cancer risk, Margin of exposure, Exposure assessment*

Aqueous extraction optimisation of okra (Abelmoschus esculentus) mucilage for food processing applications: rheological, FTIR, and TGA characterisation

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Hydrocolloids, such as plant mucilage, are increasingly utilised in food and non-food applications due to their multifunctional properties, including thickening, emulsifying, and foaming. However, limited availability and processing challenges have prompted exploration of alternative sources and optimised extraction techniques. This study aimed to optimise the extraction conditions of crude okra (Abelmoschus esculentus) mucilage using Response Surface Methodology (RSM) and to characterise its rheological properties and structural composition via Fourier-transform infrared (FTIR) spectroscopy. A Central Composite Design was used to evaluate the extraction temperature (X_1), okra mass (X_2), and water volume (X_3) as independent variables, with mucilage yield (Y) as the response variable. Rheological measurements were performed using a Brookfield RST-SST Rheometer and modelled with the Herschel–Bulkley equation. FTIR spectroscopy was used to identify functional groups in the mucilage. The quadratic polynomial model reliably predicted mucilage yield ($R^2 = 0.8673$ and adjusted $R^2 = 0.7578$, $p < 0.0001$). Extraction water ($p = 0.0001$) and okra mass ($p = 0.0294$) significantly influenced yield, while temperature showed no significant linear effect. Optimal extraction conditions were 619.3 mL of extraction water and 131.4 g of okra, at 80 °C, resulting in a predicted yield of 11.87%.

Keyword: *Crude mucilage extract, ; Functional food ingredients*

SYNERGISTIC EFFECTS OF PULSED LIGHT TREATMENT IN CONTROLLING AFLATOXIN B1 CONTAMINATION IN RICE

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Rice (Oryza sativa L.) is a global staple essential for dietary energy but remains highly susceptible to Aflatoxin B1 (AFB1) contamination produced by Aspergillus flavus. As a potent Group 1 carcinogen, AFB1 requires robust mitigation strategies. This research investigates a synergistic, chemical-free detoxification approach by combining Pulsed Intense Light (PIL) with hermetic storage.

A laboratory-scale PIL system was fabricated using a broad-spectrum xenon lamp (200–1100 nm) to induce photochemical and photothermal effects, specifically targeting the C8=C9 double bond of the AFB1 coumarin ring. Experimental data demonstrated that while an 80-second treatment reduces AFB1 by 85%, optimized 15-second exposure achieves 90.3% degradation. To ensure long-term stability, PIL-treated grains are transitioned to hermetic storage, such as IRRI Super Bags, which deplete oxygen to inhibit microflora respiration.

Methodological validation via HPLC (Nova-Pak C18 column) showed high linearity (1–100 ppb) in samples from various FCI godowns, with the Agra sample exhibiting superior nutritional and physicochemical profiles. Scanning Electron Microscopy (SEM) confirmed that while high-voltage treatments (10 kV) cause structural etching, optimized non-thermal PIL interventions preserve grain integrity. This combined approach provides a scalable, sustainable strategy for enhancing food safety and reducing economic losses in the rice supply chain.

Keyword: *Aflatoxin B1, non-thermal decontamination, food preservation, sustainability, food safety, rice supply chain*

Emerging Leaf Proteins: Bridging Sustainability, Functionality, and Industrial Scale

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The global demand for sustainable, plant-based protein ingredients is accelerating, driving interest in valorising underutilised agricultural biomass within a circular bioeconomy framework. Leafy by-products of vegetables harvest and processing are typically discarded despite being rich in proteins, fibre, minerals, and bioactive compounds. Converting these materials into leaf protein concentrates (LPCs) for human nutrition presents a promising pathway to reduce food waste while generating functional ingredients for food and pharmaceutical applications.

This presentation outlines a holistic approach to the production, characterisation, and scale-up of LPCs as an emerging protein source. It examines how different extraction strategies, ranging from non-thermal technologies such as ultrasound-assisted extraction to conventional and continuous thermal processing, affect physicochemical, structural, and techno-functional properties. Ultrasound pre-treatment significantly enhances protein recovery and dispersion through improved cell disruption and mass transfer, while optimised thermal processing enables targeted protein enrichment and functional performance.

Importantly, the work bridges laboratory and pilot-scale studies, providing critical insights into scalability and industrial feasibility. Although LPCs currently do not match the purity of conventional protein isolates, they demonstrate competitive functional properties. Overall, this research establishes a framework for transforming green biomass into high-value ingredients, supporting sustainable protein innovation and future circular food systems.

Keyword: *Leaf Protein, Sustainability, Novel Food Ingredient, Zero Waste*

Carbon-Source Driven Biotransformation and Structural Organization of Cellulose-Rich SCOBY Pellicles during Kombucha Fermentation

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Kombucha fermentation is a complex biotransformation process driven by a symbiotic culture of bacteria and yeast (SCOBY), leading to the formation of cellulose-rich pellicles with unique structural properties. This study investigates how carbon source composition modulates biochemical pathways and influences the chemical fingerprint and multiscale organization of SCOBY-derived cellulose. Pellicles were produced using media supplemented with either white sugar or cane sugar. Characterization included ATR-FTIR spectroscopy, CIELAB color analysis, and image-based quantification of microstructural heterogeneity. Results showed that increased carbon source complexity enhances biotransformation, reflected in a stronger FTIR signal in the carbohydrate region (1500–1000 cm^{-1}) and increased hydrogen bonding. These changes were accompanied by improved structural organization, including reduced defect density, higher microstructural homogeneity, and lower entropy. Colorimetric analysis further indicated increased yellowness and reduced spatial variability, consistent with a more ordered cellulose network. These findings demonstrate that carbon source composition plays a key role in regulating cellulose biosynthesis and assembly during kombucha fermentation. Enhanced metabolic stabilization promotes more uniform fibril organization and improved material properties, highlighting the potential of fermentation-driven strategies for tailoring SCOBY-derived biomaterials.

Keyword: *Kombucha fermentation, SCOBY, bacterial cellulose, biotransformation, carbon source complexity, FTIR spectroscopy, microstructural heterogeneity, hydrogen bonding, cellulose biosynthesis, functional biomaterials*

Sustainable Camel Meat Preservation Using Individual and Synergistic Essential Oil Bioactive Compounds Against Listeria monocytogenes

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Camel meat is an emerging and sustainable meat with a favorable nutritional profile; however, it is highly susceptible to microbial contamination, particularly Listeria monocytogenes. This study assessed the antimicrobial efficacy of four essential oil (EO) bioactive components—linalool, eugenol, α-pinene, and α-terpinene—used individually and in binary combinations against L. monocytogenes in vitro and in minced camel meat stored at 4 °C for 12 days. Minimum inhibitory concentration (MIC) assays revealed that eugenol showed the strongest antibacterial activity (1.25 mg/mL), followed by linalool (5 mg/mL), while α-pinene and α-terpinene exhibited weak activity (40 mg/mL). Checkerboard analysis identified four synergistic combinations—linalool + α-pinene (LP), linalool + eugenol (LE), eugenol + α-pinene (EP), and eugenol + α-terpinene (ET)—with fractional inhibitory concentration index (FICI) values ≤ 0.5. Based on these findings, individual EO components (1% w/w) and their synergistic combinations (1% and 2% w/w) were incorporated into minced camel meat inoculated with L. monocytogenes. Eugenol achieved the highest individual reduction by day 12 (3.9 log CFU/g), followed by linalool (2.3 log CFU/g), while α-pinene and α-terpinene were ineffective. All 2% combinations completely inhibited L. monocytogenes from day 3 onward, and the LE1 treatment achieved complete inhibition by days 9 and 12.

Keyword: *Camel meat, Bioactive compounds, Synergistic antimicrobial activity, Listeria monocytogenes*

HARMONIZING FOOD SCIENCE EDUCATION IN AFRICA: THE AAU-IUFoST COLLABORATION WITHIN A GLOBAL FRAMEWORK FOR EDUCATION

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The transformation of global food systems depends on a well-trained workforce equipped with relevant, harmonized, and future-oriented competencies. In Africa, disparities in food science education and limited alignment with global standards present challenges to workforce mobility, innovation, and food safety outcomes. The collaboration between the Association of African Universities (AAU) and the International Union of Food Science and Technology (IUFoST) addresses these gaps by advancing a coordinated framework for food science education across the continent. This paper presents the AAU–IUFoST partnership as a strategic platform for aligning curricula, strengthening food safety systems, and enhancing capacity building in African higher education institutions. Through initiatives that support curriculum benchmarking, academic mobility, and professional development, the collaboration promotes the adoption of globally relevant competencies while maintaining sensitivity to regional contexts. It also facilitates knowledge exchange and fosters linkages between academia, industry, and policy actors. By situating African food science education within a global framework, the partnership contributes to improved graduate employability, stronger research ecosystems, and enhanced participation in international food safety and innovation agendas. This model demonstrates how global–regional collaboration can drive harmonization, inclusivity, and excellence in education for sustainable food systems transformation.

Keyword: *Food Science Education, Academic Mobility, Capacity Building, Higher Education in Africa, Sustainable Food Systems*

BRIDGING REGULATORY GAPS IN INFORMAL FOOD SYSTEMS: FOOD SAFETY AND ANTIMICROBIAL RESISTANCE CHALLENGES TO GLOBAL HARMONIZATION IN AFRICA

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Global efforts toward harmonized food safety regulations increasingly recognize the need for inclusive systems that reflect the diversity of food environments. However, informal food markets, central to food distribution in many low- and middle-income countries, remain weakly integrated into regulatory frameworks. This study examines microbial contamination, antimicrobial resistance (AMR) profiles, and hygiene practices associated with ready-to-eat fruits and vegetables in traditional markets in Southwest Nigeria, with implications for regulatory alignment. Over 500 samples were analyzed using phenotypic and molecular techniques to identify key foodborne pathogens, resistance determinants, and virulence genes. Findings revealed widespread contamination with Escherichia coli, Salmonella spp., Listeria spp., and Bacillus spp., along with notable multidrug resistance. While many vendors reported adherence to basic hygiene practices, observed contamination patterns indicate systemic regulatory gaps linked to infrastructure deficiencies, inconsistent water quality, and limited enforcement capacity. The study highlights critical mismatches between existing international food safety standards and the operational realities of informal markets. It underscores the need for context-sensitive regulatory approaches that support progressive harmonization without excluding informal actors. Strengthening surveillance systems, capacity building, and infrastructure investment will be essential to align local practices with global food safety expectations and mitigate AMR risks across interconnected food systems.

Keyword: *Food Safety Regulations, Global Harmonization, Antimicrobial Resistance (AMR), Informal Food Systems, Fresh Produce Safety*

Scaling Up Traditional Fish Salting and Drying: A Community-Based Process Control Framework for Artisanal Systems

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Salted, dried fish are widely consumed in Southeast Asia and remain vital to Philippine fishing communities. However, artisanal processing systems lack control over key unit operations, resulting in variability in water activity (aw), moisture content (MC), salt concentration (%NaCl), and microbial load, thereby affecting product quality, shelf stability, and regulatory compliance. Baseline data from a previously published study at Pandawan Fish Port, Philippines, showed that salted dried fish contained 0.80 aw, 39.10% MC, 8.43% NaCl, and 8.36 log CFU/g aerobic plate count, indicating inadequate control of processing parameters and gaps in hygienic practice.

This study proposes a community-based process control framework that translates traditional fish salting and drying into controllable unit operations to support scaling up. Process gap analysis, guided by Codex Good Hygienic practices and prerequisite program principles, identified key control points in brining (25% NaCl), drying (0.78 aw), and handling.

The framework adopts a modular approach integrating salinity-guided brining, controlled drying protocols, enclosed solar drying systems, and sanitation controls to manage variability in product safety and quality attributes. Participatory engagement with fisherfolk and the local government unit is recommended to promote adoption, enable scale-up, and strengthen food safety while preserving traditional practices.

Keyword: *Artisanal fish processing, Process control, Food safety, Scaling up, Modular approach*

EVALUATION OF THE GLYCEMIC INDEX OF COMPOSITE BREADS FORMULATED BY SUBSTITUTING 30% OF WHEAT FLOUR WITH YAM FLOUR RICH IN RESISTANT STARCH

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In many developing countries, the use of food as a natural approach to managing chronic diseases is increasing, offering significant opportunities to improve nutrition and public health. In this context, yam varieties rich in resistant starch (RS) are gaining attention for their potential as functional ingredients. This study aimed to develop low-glycemic index composite breads by substituting 30% of wheat flour with RS-rich yam flour. Two yam varieties, TDA 95/00010 (Dioscorea alata) and Kponan (Dioscorea cayenensis–rotundata), cultivated in Côte d'Ivoire, were used in the formulations. Breads were evaluated through specific volume measurement, proximate composition, energy value, and glycemic index determination. Results showed that the incorporation of yam flour reduced the specific volume compared to 100% wheat bread. However, it significantly improved nutritional profile. Bread formulated with TDA 95/00010 exhibited a low glycemic index (GI = 49.93), while that containing Kponan showed a moderate glycemic index (GI = 64.02). To maintain an appropriate glycemic load, recommended daily consumption should not exceed 200 g and 294 g for TDA 95/00010 and Kponan breads, respectively. Overall, composite breads enriched with resistant starch–rich yam flour represent a promising dietary strategy for the prevention and nutritional management of type 2 diabetes.

Keyword: *glycemic index, yam flours, resistant starch, wheat, composite breads*

BIOTECHNOLOGICAL UPCYCLING OF GRAPE POMACE: ENHANCING ANTIOXIDANT POTENCY AND PHENOLIC DIVERSITY VIA SELECTIVE ENZYMATIC HYDROLYSIS

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Grape pomace (GP) is a major winemaking byproduct rich in polyphenols often trapped within the cell wall matrix. This study investigated Enzyme-Assisted Extraction (EAE) as a sustainable strategy to maximize the recovery of bioactive compounds from Vitis labrusca pomace. Using a simplex-centroid design, pectinase (Pectinex Ultra SPL®) was identified as the most effective catalyst, outperforming enzymatic mixtures containing cellulase and hemicellulase due to antagonistic effects. Comparative analysis between optimized EAE and aqueous extraction (AE) revealed that enzymatic treatment increased total phenolic content by 20.6%. FRAP and DPPH assays confirmed a significant increase in antioxidant capacity, with FRAP values rising from 61.47 to 84.07 mMol TE/100g. Crucially, the phytochemical composition obtained by UHPLC-MS/MS demonstrated that EAE provided the exclusive release of sinapic acid, naringenin, morin, and kaempferol, while doubling gallic acid concentrations. These results prove that selective pectin hydrolysis not only enhances yield but fundamentally alters the extract's chemical complexity. This biotechnological approach supports the development of high-value functional ingredients, aligning with circular economy principles in the food industry.

Keyword: *Enzyme-assisted extraction, pectinase, phenolic compound, bioactive compounds*

Seasonal Dynamics of the Nutritional and Metabolomic Profile in Atriplex nummularia: Implications for Functional Food Optimisation

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Atriplex, a notable genus of halophytes, represents a promising resilient crop for climate change mitigation due to its exceptional salt tolerance and dense nutritional profile. While valued for their high protein, fibre, and mineral content, seasonal biochemical and metabolic changes remain underexplored. This study investigated the impact of seasonal variations on the phytochemical and nutritional profiles of A. nummularia harvested in four seasons. Untargeted metabolomics (LC/MS) revealed that terpenoids constitute the predominant metabolite class. Principal component analysis (PCA) and hierarchical clustering revealed clear seasonal differentiation in metabolic profiles, with the first two principal components explaining 67.4% of the total variance. Winter harvests maximised crude protein content (23.0%) and total free amino acid content, featuring an excellent Amino Acid Score and high-quality lysine. Furthermore, winter conditions triggered a maximum accumulation of photoprotective carotenoids, acting as a physiological safety valve against cold-induced light stress. Autumn enhanced dietary fibre (34.3%) and antioxidant capacity, with FRAP reaching a peak of 91.41 µmole Fe^{2+}eq/g DW. Winter harvesting is optimal for protein-rich and carotenoid-dense applications, whereas Autumn is superior for maximising dietary fibre and antioxidant yields. These findings provide a scientific basis for the targeted utilisation of halophytes in the functional food and pharmaceutical industries.

Keyword: *Halophytes, Climate-smart, Seasonal variation*

Baking of rice cake (mochi) using an infrared radiation oven - Experimental and computer simulation analysis

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In this study, the Multiphysics behind the baking process of mochi were experimentally analyzed and simulated using a simulation model to optimize the processing conditions and elucidate the mechanism of those changes.

Temperature, color, swelling ratio, and moisture content were monitored during the baking process of mochi inside an infrared radiation oven. The state changes of the samples were evaluated using a DSC and an NMR at several time intervals. A creep test was performed to distinguish the difference in terms of viscoelasticity among samples. A three–dimensional model of the system was established using COMSOL Multiphysics. To accurately describe the volumetric expansion of a porous viscoelastic material such as mochi during baking, the model used two-way coupling between mass, momentum, and energy transport equations, non-linear solid mechanics, and surface–to–surface radiation. For starch re–gelatinization, one-way coupled to the temperature field within the mochi domain was used.

Heating caused re–gelatinization of the sample, internal pressure increment, and water release by evaporation, pushing–up against the mochi's surface, resulting in a soft and chewy expanded mochi with a browned surface. Optimal conditions such as swelling extension, volumetric re–gelatinization distribution, surface browning, and softness were identified.

Keyword: *Rice cake (mochi), Swelling simulation, Finite-element method, Porous media*

Predictive modeling of selective reheating in a multi magnetron microwave system of multi-component meal trays

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Targeted microwave heating to varying final temperatures within a single cavity using low-cost components and a simple system architecture is highly valuable for food-service operations. In this study, we combine computer simulation and experimental measurements to optimize the functioning of a recently introduced multi-magnetron microwave reheating cart for targeted reheating of multi-component meal trays.

Electromagnetic and thermal field equations were coupled to simulate the reheating of food samples placed at each designated tray position at 2450 MHz. The model was validated against experimental data. Temperature distributions and heating rates were evaluated for samples placed in the targeted and non-targeted positions of the tray to assess the system's space-selectivity. Additionally, simultaneous selective reheating of a meal consisting of three different foods of varying geometry and physical properties was simulated at varying heating times and contrasted with experimental results.

The results show that non-targeted tray positions experience low heating rates, whereas targeted zones exhibit rapid and relatively uniform heating. Near-field effects appear to play a significant role in shaping the temperature distribution and overall space-selectivity of the system. Accurate prediction of multicomponent meal reheating with varying target temperatures was possible within a single cavity.

Keyword: *microwave, food service, simulation, selective reheating, modeling*

OPTIMIZATION OF THE UVB IRRADIATION CONDITIONS FOR THE VITAMIN D2 BIOFORTIFICATION OF OYSTER MUSHROOM (PLEUROTUS OSTREATUS) USING RESPONSE SURFACE METHODOLOGY

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The rising prevalence of vitamin D deficiency is a growing concern due to the increasing preference for indoor activities, limiting vitamin D production. To address this, the study aimed to optimize the UVB-induced vitamin D_2 biofortification process of oyster mushrooms. This approach provides consumers with a protein-rich, vitamin D-fortified food product while also supporting the mushroom industry. The study employed Response Surface Methodology with a Central Composite Rotatable Design to optimize three key parameters: temperature, time of exposure, and distance from the UVB source. Results indicated that the optimal irradiation conditions were 34.93 °C, 100 minutes, and 30 cm, yielding a predicted vitamin D_2 concentration of 18.28±0.38 µg/g. However, confirmatory analysis revealed a significantly higher concentration of 20.46±0.80 µg/g, supporting the validity of the predicted model and the radiation chamber. This suggests that one gram of biofortified oyster mushroom could supply the recommended daily intake of vitamin D for Filipino adults. A slight browning effect was observed in irradiated mushrooms, with ΔE values of 7.53 for caps and 13.23 for gills compared to fresh samples. Despite the discoloration, the study successfully demonstrated the efficacy of the biofortification process and the industrial applicability of the custom-designed radiation chamber.

Keyword: *Oyster Mushroom, Biofortification, UVB, Vitamin D2, Response Surface Methodology*

ORGANIC ACID PRE-TREATMENT AS A CLEAN-LABEL ALTERNATIVE TO SULFITE IN OSMOTICALLY DEHYDRATED PHILIPPINE CARABAO MANGO (MANGIFERA INDICA L.)

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Sulfite preservatives are widely used in dried fruit processing to maintain product quality and safety. However, increasing sulfite sensitivity and growing demand for clean-label products drive the need for sulfite-free alternatives. This study evaluated organic acid pretreatment as a substitute for sulfite in the production of non-sulfited osmodehydrated Philippine Carabao mango (Mangifera indica L.). Seven treatments were tested: 0.1% metabisulfite, untreated control, 1% ascorbic acid (AA), 1% citric acid (CA), and combinations of AA+CA. Physicochemical properties, color parameters (L*, a*, b*), moisture content, and microbial quality were analyzed. Acid-treated samples showed significantly lower pH values than the control ($p < 0.05$), with 1% CA producing the greatest acidity. Total soluble solids ranged from 62–80 °Brix, with the untreated control showing the highest value ($p < 0.05$). Lightness values were comparable across treatments, while redness (a*) increased in acid-treated samples relative to the sulfite control. Moisture content ranged from 9–28%, with the untreated samples showing the highest level. Escherichia coli was below detectable limits (<10 CFU/g) in all samples, while aerobic plate counts varied among treatments. These findings demonstrate the potential of organic acid pretreatment as a clean-label alternative to sulfite in osmodehydrated mango processing.

Keyword: *Philippine Carabao mango (Mangifera indica L.), sulfite alternative, clean label preservative, organic acid pre-treatment, dried fruit quality*

PHILIPPINE FOODBORNE DISEASE OUTBREAKS (2018-2024): EPIDEMIOLOGICAL TRENDS AND FOOD SAFETY IMPLICATIONS

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Foodborne disease outbreaks (FBDOs) continue to be a significant public health issue both globally and locally, highlighting persistent difficulties in food safety monitoring and regulation. This study examined 90 reported foodborne disease outbreaks (FBDOs) in the Philippines from mid-2018 to December 2024 to analyze epidemiological patterns, implicated food sources, and causative agents. Outbreaks were most frequently associated with toxin-containing or inedible materials (n = 23) and multiple implicated food dishes (n = 22), followed by beverages (n = 11). Households (n = 38) and communal environments (n = 50), including offices, public gatherings, correctional facilities, and orphanages, were identified as common outbreak settings. A substantial proportion of outbreaks involved unknown causative agents (65.48%), reflecting gaps in laboratory confirmation and local and national surveillance capacity. It was also noted, however, that reports indicated that Escherichia coli, Staphylococcus aureus, Staphylococcal enterotoxin A, and Entamoeba histolytica were likely the microbes that caused several outbreaks. Moreover, cases of human intoxication were also linked to methanol, tetrodotoxin, saxitoxin, and amphibian toxins. These findings highlight the need to strengthen food safety monitoring and control measures in high-risk settings to reduce the occurrence of FBDOs in the country.

Keyword: *foodborne disease outbreak, Philippines, food safety surveillance, epidemiological trends, foodborne illness*

Improving the Quality of a Novel and Sustainable Edible Lipid Black Soldier Fly Larvae Oil (BSFLO) Through Bleaching with Selected Adsorbents

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Utilization of Black Soldier Fly Larvae Oil (BSFLO) as a commercial food product is limited by the presence of impurities and undesirable color and odor, thereby necessitating a purification process. In this study, the purification of Black Soldier Fly Larvae Crude Oil into BSFLO focused on the bleaching process using different adsorbents. The aim of this research was to evaluate the effects of adsorbent type on the chemical and sensory characteristics of BSFLO. Four adsorbents, i.e., synthetic zeolite, bleaching earth, activated carbon, and silica gel, were applied at a concentration of 7.5% (w/v) during the bleaching process. Statistical analyses indicated that variations in adsorbent type significantly affected bleaching yield, peroxide value, free fatty acid content, smoke point, protein content, moisture content, fat content, as well as sensory ranking and hedonic responses. Color intensity was markedly lower in the bleaching earth–treated oil, consistent with reduced protein content, while the fatty acid profile remained largely unchanged. Among the treatments, bleaching earth was identified as the most effective adsorbent, producing BSFLO with superior chemical stability, improved color and aroma characteristics, and higher overall sensory acceptance. These findings contribute to the improved design and optimization of purification strategies for the commercial production of BSFLO.

Keyword: *Black soldier fly larvae oil, Bleaching process, Adsorbent, Oil purification, Sensory characteristics*

Food Informatics: Leveraging Data and Knowledge to Advance Food Systems

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The increasing availability of large-scale data and computational tools is transforming food research, giving rise to the emerging field of **Food Informatics**. However, the concept remains inconsistently defined, limiting its development as a coherent interdisciplinary discipline. The goal of this poster is to clarify what Food Informatics is, the scientific questions it addresses, and how it complements existing areas such as AI in Food Science and Food Computing.

We define Food Informatics as an interdisciplinary field integrating **food science, informatics, and computational science** to systematically acquire, organize, and analyze food-related data and knowledge. It operates across multiple interconnected levels of the food system, including molecular composition, food products and processing, and system-level supply chains.

Representative examples illustrate the potential of this framework. At the molecular level, analysis of **over 70,000 food-related molecules** reveals the remarkable chemical diversity of food. At the product level, machine learning applied to food images enables accurate classification and grading of fruits. At the system level, analysis of **38,700 farms worldwide** shows up to **50-fold variation in greenhouse gas emissions** among producers of the same food product. Using examples, this poster demonstrates how Food Informatics can generate scientific insights across the food system.

Keyword: *Food Informatics, AI in Food Science, Food Computing, Computational Gastronomy*

Domain knowledge, just evaluation, and robust data standards are required to advance AI in food science

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Artificial intelligence (AI) is rapidly expanding in food science, supporting applications in flavor optimization, nutrition analysis, and food safety monitoring. However, translating these advances into reliable scientific and industrial impact requires stronger integration between computational approaches and food science knowledge. In this presentation, we discuss key challenges and practical strategies for advancing AI in food science, drawing on recent perspectives and empirical analyses.

First, we highlight the importance of embedding domain knowledge into AI models to address the complex interactions among food molecules, processing conditions, and food matrices. Second, we discuss the need for transparent and fair evaluation. For example, our analysis of **27 AI models for predicting food flavor shows that 81% are not open source and 63% lack experimental validation**, limiting reproducibility and real-world adoption. Third, we examine the importance of robust data standards and accessible infrastructures. Among **25 examined food flavor databases, only about 20% allow unrestricted data downloads**, while many datasets remain fragmented or inaccessible. Building on these observations, the talk outlines practical directions for developing impactful food AI systems, emphasizing the alignment of **high-quality datasets, tailored algorithms, and meaningful applications**.

Keyword: *Artificial intelligence, Domain knowledge, Food chemistry, Food flavor, Food safety*

Molecular atlas of key food odorants reveals structured aroma organization and enables generative aroma design

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Food aromas arise from complex combinations of odorants, yet how these combinations are organized across foods to define aroma identity remains unclear. Decoding this “aroma code” could help bridge the sensory gap between traditional foods and sustainable alternatives, which often struggle with off-notes or to replicate consumer-expected flavor profiles. Here we present KFO-Atlas, a molecular atlas of 896 key food odorants curated from 2,282 food aroma formulations. Analysis shows that food aromas are built from sparse and structured sets of odorants. Plant-derived foods span a broad and diverse aroma space, whereas animal-derived foods tend to exhibit more similar odorant sets. In specific cases, distinct plant- and animal-based foods converge on similar odorant compositions through shared reaction pathways. Building on these insights, we develop a generative AI model that learns the latent organization of odorant combinations and produces category-targeted aroma formulations. In blinded sensory evaluations, 30 assessors consistently recognized 100 AI-generated formulations as their intended aroma categories. As a proof of principle, the model reconstructs meat-like aromas using exclusively plant-derived odorants, demonstrating a data-driven route to address sensory bottlenecks in sustainable food products.

Keyword: *Food aromas, odor perception, artificial intelligence, sustainable proteins, flavor chemistry*

Evaluation of Terminalia arjuna Leaf Mucilage as a Natural Gelatin Substitute in Set Yogurt Formulation

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The rising demand for plant-derived food ingredients has increased interest in replacing animal-based additives such as gelatine with sustainable alternatives. This study evaluated the potential of mucilage powder extracted from leaves of Terminalia arjuna (Kumbuk) as a plant-based substitute for gelatine in set yogurt production. Mucilage was extracted from harvested leaves and dried using three methods: freeze drying, microwave drying, and oven drying. The obtained powders were analyzed for physicochemical characteristics, solubility, and viscosity before incorporation into yogurt formulations at concentrations of 0.6%, 0.8%, and 1.0%. A control yogurt containing 0.6% gelatine and a formulation using fresh mucilage were also prepared. The yogurt samples were evaluated for textural properties, syneresis, water-holding capacity (WHC), sensory quality, and microbial stability. Freeze-dried mucilage demonstrated superior functionality, producing the highest WHC (58.40 ± 0.10%) and lowest syneresis (25.50 ± 0.10%), indicating improved gel structure and stability. Yogurt containing 1.0% freeze-dried mucilage showed the best firmness, creaminess, and overall sensory acceptability. FTIR analysis confirmed preservation of functional groups essential for gel formation, while microbial analysis indicated product stability during 14 days of refrigerated storage. These results suggest that freeze-dried Terminalia arjuna mucilage (1.0%) can serve as an effective plant-based alternative to gelatine in yogurt formulations.

Keyword: *Freeze drying, Gelling, Mucilage, Terminalia arjuna, Yogurt*

EFFECT OF FERMENTATION METHODS ON THE ESSENTIAL AMINO ACID PROFILE OF PROTEIN CONCENTRATES FROM TIGERNUT, PIGEON PEA, AND AFRICAN YAM BEAN: IMPLICATIONS FOR MILK AND COMPLEMENTARY FOOD FORTIFICATION

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Protein-energy malnutrition in Nigerian children under five is worsened by underutilisation of protein-rich local crops. This study evaluated the effect of solid state and yeast fermentation on essential amino acid profiles of protein concentrates from tigernut (Cyperus esculentus), pigeon pea (Cajanus cajan), and African yam bean (Sphenostylis stenocarpa), to assess suitability for milk and complementary food fortification.

Protein concentrates were prepared by alkaline extraction (pH 9.0) and isoelectric precipitation (pH 4.5). Treatments comprised an unfermented control, solid state fermentation (25°C, 20 hours), and yeast fermentation (3% Saccharomyces cerevisiae). Essential amino acid profiling used high-performance liquid chromatography. Data were analysed by ANOVA with Duncan's multiple range test ($p<0.05$).

Both methods significantly increased essential amino acid content versus unfermented controls. Yeast fermentation produced greatest improvements: pigeon pea phenylalanine rose from 4.53 to 8.36mg and lysine from 3.98 to 5.36mg; tigernut valine increased from 2.38 to 4.13mg; African yam bean tryptophan increased from 1.03 to 3.23mg. Solid state fermentation yielded higher tryptophan and methionine in tigernut, and higher isoleucine and valine in African yam bean.

Fermentation, particularly yeast fermentation, improves essential amino acid density in underutilised Nigerian legume protein concentrates, supporting incorporation into complementary foods and milk formulations for under-five children.

Keyword: *fermentation • essential amino acids • tigernut • pigeon pea • African yam bean • protein concentrate • complementary food • Nigeria*

Internet of things (IoT) ultrasound extraction of proteins from sugar beet leaves

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Sugar beet (Beta vulgaris L.) is rich in various bioactive compounds and is used in food industry to produce sugar. During cultivation processes there is generation a large amount of waste, like leaves. In this study, high power ultrasound (US) was with integrated with IoT hardware and software and used in the extraction of proteins, from leaves.

The total protein content of the samples was assessed using both the Bradford and Lowry methods. In both tests, the sample treated by 100% amplitude for 9 min (sblp/US/9/100), had a significantly higher protein content than heath treated sample for 9 min at 40ºC (sblp/H/9). Specifically, sample treated by 100% amplitude for 9 min (sblp/US/9/100) contained slightly below 50 mg BSA eq./g d.m. according to the Bradford method and slightly above 60 mg BSA eq./g d.m. according to the Lowry method. In contrast, sblp/H/9S had a lower protein content, with about 33 mg BSA eq./g d.m. according to Bradford and 46 mg BSA eq./g d.m. according to Lowry.

This research was funded by the Croatian Science Foundation under the project “Digitalisation of nonthermal Extraction of proteins from plant by-products and Electroforming as output Product – DEEP” [HRZZ – IP-2022-10-2207].

Keyword: *Internet of things (IoT), ultrasound extraction, proteins, sugar beet leaves, circularity*

ASSESSING THE NET CARBON BALANCE OF COMMERCIAL GROUPER AQUACULTURE INTEGRATED WITH SOLAR PHOTOVOLTAIC SYSTEMS: A COMPARATIVE LIFE CYCLE ASSESSMENT IN TAIWAN

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Sustainable food systems require decoupling high-value seafood production from intensive carbon emissions. This study evaluates the carbon footprint of commercial hybrid grouper aquaculture in Taiwan, comparing a traditional earthen pond with a ground-mounted aquavoltaic facility.

Employing a cradle-to-gate Life Cycle Assessment (LCA) based on ISO 14040/14067, we established a functional unit of 1 kg of live fish. The analysis reveals that in the traditional system, electricity for aeration and commercial feed production are the primary environmental hotspots, driving a total carbon footprint of 3.02 kg CO2e per kg.

Conversely, the aquavoltaic structure creates a buffered environment that significantly reduces the need for continuous aeration, inherently lowering grid electricity consumption. This operational efficiency reduces the overall footprint to 1.80 kg CO2e, a 40% mitigation. Furthermore, while the generated solar energy is exported to the grid rather than consumed on-site, its substantial volume presents a promising opportunity to achieve farm-level carbon neutrality in the future. Crucially, the LCA highlights that as operational energy impacts are minimized, feed supply chain emissions remain the dominant challenge. This study demonstrates that aquavoltaics enhance the water-energy-food nexus, aligning with global net-zero goals.

Keyword: *Aquavoltaics, Life Cycle Assessment (LCA), Carbon Footprint, Sustainable Food Systems, Water-Energy-Food Nexus*

STARCH FUNCTIONALITY-DRIVEN STANDARDIZATION OF TRADITIONAL KOREAN BUGAK USING THERMALLY PROCESSED RICE FLOURS

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Traditional Korean bugak production is largely experience-based, resulting in inconsistent coating stability, puffing behavior, and storage quality. This study investigated how thermal processing alters rice flour starch functionality and how these changes can be used to standardize bugak manufacture. Dry-milled non-glutinous rice flour, wet-milled rice flour, steamed rice flour, and glutinous rice flour were treated at 80, 100, and 120 °C for 10, 20, and 30 min. Differential scanning calorimetry, rapid visco analysis, degree of gelatinization, swelling, gel strength, coating performance, oil uptake, oxidative stability, and microbial safety were evaluated. Steamed rice flour showed the lowest enthalpy change and the smallest viscosity fluctuation, indicating high process reproducibility, whereas glutinous rice flour improved adhesion but caused excessive viscosity at higher ratios. A solids content of 10% and a steamed rice flour:glutinous rice flour ratio of 90:10 provided the best balance of viscosity stability, coating uniformity, and adhesion. Material-specific optimums were identified for kelp, burdock, and mushroom substrates. Frying produced a low-water-activity product, and nitrogen plus moisture-barrier packaging improved oxidative stability. These findings provide a starch science-based framework for reproducible bugak processing.

Keyword: *bugak, rice flour starch, thermal processing, coating stability, shelf life*

FERMENTATION-DERIVED DIHYDROFERULIC ACID FROM RICE BRAN ATTENUATES DEXAMETHASONE-INDUCED MUSCLE DYSFUNCTION AND EXHIBITS DOSE-DEPENDENT NEURONAL DIFFERENTIATION RESPONSES

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Dihydroferulic acid (dFA), generated from rice bran through optimized fermentation using kimchi-derived lactic acid bacteria, was evaluated as a fermentation-derived functional bioactive for neuro-muscular health in cellular and murine models. Process optimization established rice bran pretreatment and ferulic acid-to-dFA bioconversion conditions, and ferulic acid-supplemented co-fermentation yielded the highest dFA production. During retinoic acid-induced differentiation of SH-SY5Y cells, 10 μM dFA promoted neurite outgrowth and neuronal network formation, whereas 20 μM dFA increased cyclooxygenase-2 and interleukin-1β expression, indicating a dose-dependent response. In C2C12 myotubes, dFA showed no overt toxicity up to 50 μM and did not markedly alter basal myogenic, atrophy, or autophagy pathways. Under dexamethasone challenge, however, dFA attenuated structural myotube damage and significantly restored Myogenin expression. In a dexamethasone-induced muscle atrophy mouse model, dFA administration (10 or 20 mg/kg) improved grip strength and rotarod performance, restored serum albumin, and partially normalized bone marrow immune-cell composition despite no significant change in gross muscle mass. These findings support fermented rice bran-derived dFA as a promising functional ingredient for muscle health.

Keyword: *fermented rice bran, dihydroferulic acid, fermentation-derived bioactive, muscle atrophy, neuronal differentiation*

High humidity Thermal Stress for Storability Enhancement of Sweetpotato

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High humidity thermal treatment of sweetpotato, named as curing, has been a well known method to reduce the risk of postharvest loss as well as to prolong the storage time. Curing is able to minimize the deterioration of its quality. To investigate sweetpotato quality during storage as curing conditions, we fabricated the sweetpotato curing facility equipped with the forced air circulation system. The controlled air was supplied to the main curing chamber through circulation ducks. The temperature, humidity, and retention time of curing were 35 ℃, 95 %, and 3 days, respectively. Under given conditions, the quality change during 6 month storage period was repeatedly measured in once a month including sugar content (Brix), corruption rate (kg/total weight), weigh loss rate (weight/initial weight). Sugar content decreased in 2 Brix compared to those values of initial storage at all experimental conditions. The representative diseases occurring in the storage decreased, such as dry rot, soft rot, and fungal disease in all experimental curing conditions. Cured at the 2.1±0.7 m/s of wind speed, corruption rate and weight loss rate have decreased by 25.5 % and 1.9 %, respectively. Dry lot occurring after 100 days of storage significantly was reduced in comparison with that of the experimental control.

Keyword: *sweetpotato, curing*

EVALUATION OF NUTRITIONAL QUALITIES, SORPTION PROPERTIES AND DRYING KINETICS OF GERMINATED COWPEA SEEDS (Vigna unguiculata (L.) Walp.)

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The island of La Réunion relies heavily on imported food, making food sovereignty a key challenge for its sustainable development. Moreover, diet-related metabolic disorders occur twice as frequently as in mainland France. Legume seeds thus represent promising local resources due to their high nutritional value and the island's rich but underexploited biodiversity. Previous studies within the QualiSud research unit have highlighted low-tech processing strategies for pulse valorization. Controlled germination has shown substantial nutritional benefits in species such as cowpea and lentil, including up to 98% reduction of anti-nutritional α-galactosides and significant increases in vitamins B1 and B9. However, subsequent processes like drying remain essential to ensure product stability, extend shelf life, and obtain versatile functional ingredients. Since controlled germination modifies the seeds' biochemical structure, this study investigates how these changes influence water sorption isotherms and drying kinetics of cowpea seeds. Furthermore, the study quantifies and models the kinetic degradation of heat-sensitive nutrients during mild-temperature drying. This work aims to elucidate the balance between technological performance and nutritional preservation, contributing to the development of shelf-stable, functional and nutrient dense legume-based ingredients supporting local food autonomy in tropical insular contexts.

Keyword: *Cowpea, Sorption isotherms, Drying kinetics, Nutrients*

EFFECTS OF OZONE TREATMENT ON GERMINATED (Vigna unguiculata (L.) Walp.) FLOUR.

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Reunion Island's food sovereignty and public health represent major challenges. Indigenous pulses constitute a promising resource to contribute to these issues. The germination bioprocess has demonstrated numerous nutritional benefits for pulses by reducing antinutritional factors and enhancing nutritional compounds. Despite these advantages, germination conditions are favorable to microbial growth, and conventional sanitization methods remain insufficient to ensure product safety. Ozone is a promising alternative sanitizer due to its strong oxidative capacity, broad-spectrum antimicrobial activity, and chemical residue-free decomposition into oxygen. This study investigated two ozone-based decontamination strategies applied at different stages (post-soaking, post-germination, and post-drying) in the processing of germinated cowpea flour. Results showed that raw cowpea seeds (5.4 log CFU/g) reached high levels of total aerobic mesophilic flora, TAMF (9.8 log CFU/g) after germination if left untreated.. Both post-soaking and post-germination ozone treatments reduced TAMF by up to 1.7 log CFU/g. However, microbial counts in post-soaking–treated samples increased again during germination. Post-germination ozonation effectively lowered both total microbial load and pathogen levels, achieving values close to the French regulatory threshold for flours (7 log CFU/g). Consequently, ozone treatment - specifically after germination - emerges as a key strategy for the safe valorization of local pulses.

*Both authors contributed equally

Keyword: *Cowpea, Germination sensu stricto, Ozone, Food safety*

PHYTOCHEMICAL PROFILE AND SENSORY EVAULATION OF FUFU ANALOGUE FROM COCONUT-MILK RESIDUE.

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Evaluation of fufu analogue from coconut milk residue were studied. Coconut milk residue was combined with different quantities of food binders (psyllium husk and gelatin) for the production of fufu analogue. Phytochemical profile, proximate composition and sensory attributes of the fufu analogue were determined using AOAC standard methods. Moisture content values of fufu analogues ranged from 3.29% to 5.94%, crude protein 4.01% to 5.02%, crude fat contents 8.62% to 10.16% ash contents 5.82 to 8.06% crude fibre 65.32% to 69.03% and carbohydrate 4.54% to 9.99%,respectively. The phytochemical analysis recorded tannins content within the range of 0.27 to 0.55mg/100g, oxalate 0.02 to 0.16mg/100g, saponin 0.73 to 1.07mg/100g, phytate 0.07 to 0.28mg/100g,alkaloids 0.04 to 0.08mg/100g and trypsin inhibitor 0.06 to 0.15TUI/mg respective,,ly. The sensory results of the fufu analogue showed that the fufu analogue made of 5-10g of the psyllium husk rated highest (7.00) in terms of appearance, taste, hand-feel and overall acceptability. It was observed that ten grams (10g) of the binders formed a fufu dough that was accepted by all the panelists. There were no significant differences at ($p<0.05$) in the odour analysis of fufu analogues. The results showed that all the fufu analogues had good sensory ratings.

Keyword: *Advanced food (fufu)processing,Coconut Milk residue, phytochemical, sensory analysis*

UPCYCLING COCONUT RESIDUE VIA HOT WATER EXTRACTION: TECHNO-FUNCTIONAL DIETARY FIBER FOR FOOD APPLICATIONS

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Virgin coconut oil (VCO) production generates large amounts of coconut residue, which remains underutilized despite its high dietary fiber content and potential for food applications. This study investigated the recovery of coconut dietary fiber (CDF) from coconut residue via hot water extraction, a safe, low-cost, and sustainable method, and assessed its techno-functional properties. Coconut residue (50 kg) from two VCO production runs in Quezon Province, Philippines, was thermally pretreated. Dietary fiber was extracted at a water-to-solid ratio of 20:1 at 80°C for 2h and analyzed for water-holding capacity (WHC), oil-holding capacity (OHC), swelling capacity (SC), and bulk density (BD), with results compared with commercial wheat fiber. CDF was obtained at 49.73% yield, with 75.45% dietary fiber content (dry basis). It showed WHC of 6.61 g/g, OHC of 4.54 g/g, SC of 4.10 mL/g, and BD of 0.26 g/mL. While the WHC and OHC of CDF were significantly lower ($p<0.05$) than those of wheat fiber (8.10 g/g and 8.48 g/g, respectively), CDF exhibited techno-functional properties relevant for food applications. This work demonstrates a practical and sustainable approach to valorizing coconut residue into functional food ingredients. Modification strategies may further enhance the techno-functional characteristics of hot water-extracted CDF for diverse food formulations.

Keyword: *coconut residue, dietary fiber, by-product valorization, hot water extraction*

Self-Assembled Metal–Phenolic–Agar Microparticle Coating for Fresh Produce Preservation

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Sustainable postharvest technologies are needed to reduce spoilage of highly perishable produce without relying solely on energy-intensive refrigeration. In this work, a scalable metal–phenolic–agar coating was developed through zinc–tannic acid coordination within an agar matrix, generating stable microparticles that formed an effective surface barrier on fresh produce. The coating significantly delayed strawberry deterioration and also improved quality retention in grapes and fresh-cut apples by reducing moisture loss and maintaining firmness, nutritional quality, antioxidant activity, and visual appearance. It also exhibited strong antibacterial activity, no cytotoxicity toward Caco-2 cells, and could be largely removed by brief water rinsing, supporting consumer-friendly use. The formulation remained effective when prepared with commercially available food-grade agar, indicating practical scalability. Life cycle assessment further showed a reduced carbon footprint and markedly lower freshwater ecotoxicity relative to conventional refrigeration for strawberry preservation. These findings identify the coating as a promising, washable, and sustainable platform for postharvest produce preservation.

Keyword: *Metal–Phenolic Networks, Postharvest Preservation, Food Waste Reduction, Sustainable Food Packaging, Life Cycle Assessment*

EFFECT OF EXTRACTION TECHNOLOGIES ON THE COMPOSITIONAL AND MICROSTRUCTURE OF SORGHUM-MILLET BLENDED MILK

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The growing demand for plant-based dairy alternatives has intensified research into sustainable plant-based milk alternatives. Millets are climate-resilient grains with high nutritional potential; however, their use in plant-based milk remains limited due to technological challenges, including high starch content, low extraction efficiency, and instability of dispersed components. Consequently, effective processing strategies are required to produce nutritionally enriched and stable millet-based milk. This study evaluated the influence of different extraction technologies on the compositional and structural characteristics of sorghum-millet blended milk. Sorghum, pearl millet, and proso millet were used in equal proportions as a baseline formulation to assess the effects of different extraction technologies. Thermosonication, enzymatic hydrolysis, and alkaline-assisted treatments were compared with conventional grinding. The resulting beverages were analysed for physicochemical characteristics, including proximate composition, viscosity, and stability indices, while microstructural organisation of dispersed components was examined using confocal microscopy. The processing methods significantly influenced both compositional yield and structural characteristics of millet milk. Enzymatic hydrolysis produced the highest total solids compared with the control, whereas alkaline-assisted treatment resulted in the lowest solids due to the removal of insoluble fractions. Microstructural observations revealed distinct differences in the distribution of carbohydrate, protein, and lipid domains among treatments.

Keyword: *Plant based milk alternative, Millet milk, Thermosonication, Enzyme hydrolysis*

A Zero-Waste Approach to Snack Bar Formulation: Utilising Dry-Fractionated Defatted Cake From Durum Wheat Milling By-Products

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Introduction: Growing demand for plant-based and vegan foods has prioritised the search for sustainable ingredients. Embracing a circular economy and zero-waste approach, this study upcycles the defatted cake from durum wheat (Triticum turgidum L. var. durum) milling by-products—a nutrient-dense resource often discarded after lipid extraction.

Methods: A dry-fractionated fine fraction (DFFF) of this cake was utilised to create a clean-label cereal bar. Using a mixture Design of Experiments (DoE), an optimal formulation was developed containing 10% DFFF, 30% glucose syrup, and 60% cereal flakes. Physical and sensory attributes were then compared against a control.

Results: The addition of DFFF enhanced the bar's structural integrity, increasing cutting stress to 1.2 N/mm² and fracture stress to 12.9 N/mm² due to a densifying effect. The enriched bars were characterised by a more vibrant yellow-brownish colour and a heightened caramel-like flavour profile compared to the control.

Conclusion: The DFFF-fortified snack meets EC Reg. 1924/06 standards for "low fat" and "source of fibre" claims. This research demonstrates that valorising milling residues can successfully produce functional, eco-friendly food products that align with modern dietary and environmental trends.

Keyword: *Upcycling, source of fibre, ready-to-eat food, vegan food*

Zero-waste virgin coconut oil (VCO) processing waste through upcyling (VCØ-UP): a framework for biocircular food system

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The Philippines is one of the major producers and exporters of virgin coconut oil (VCO). The VCO industry generates large amounts of agro-industrial by-products annually. These are often discarded as waste which represent a massive, untapped resource. Coconut husk containing the coir, is rich in lignocellulosic compounds and can be extracted for dietary fiber for food application. Another good source of dietary fiber is the coconut residue. We developed CoFBR™ which contains 72% dietary fiber with good bulk density, water and oil-holding capacity. Mature coconut water making up 15% of the coconut's weight, is a nutrient-rich liquid with higher mineral content than tender coconut water. Its antioxidant potential makes it a promising functional beverage. Coconut skim milk (CSM), a by-product contains protein and carbohydrates thus we extracted CoProtina™ containing 70% protein content with good functional properties. Upcycling of VCO processing wastes can lead to environmental stewardship, economic empowerment and social justice. It can also push the Philippines into global relevance by leading in coconut-based innovation especially in the area of plant-based food products.

Keyword: *Biocirculat food system, upcycling, virgin coconut oil, plant-based food products*

Fate of Salmonella enterica in sprouted peanut and almond butter affected by the use of ellagitannins from aqueous and ethanolic extracts of pomegranate peels

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The University of Georgia

The demand for sprouted nut butter is rapidly increasing due to its appealing nutritional profile. However, sprouted nuts have been involved in several enteric disease outbreaks. This study evaluated the inhibitory effects of aqueous and ethanolic pomegranate peel extracts against Salmonella enterica serotypes Tennessee and Enteritidis in sprouted nut butter. Raw, organic peanut and almond seeds inoculated with one of the Salmonella strains were sprouted in deionized water containing 10% of the aqueous or ethanolic extract for 24 h at 25 ℃. Sprouted nuts were rinsed with sterile deionized water and dried at 45 ℃ for 12 h. Dried nuts were then ground with olive oil and sea salt. Salmonella population was determined at each processing step. The peanut samples treated with either aqueous or ethanolic extract had significantly ($P \leq 0.05$) lower Salmonella Tennessee populations compared to the controls after sprouting and rinsing. After drying and seasoning, significant differences in the populations of both Salmonella strains compared to their controls were only observed in sprouted peanut and almond seeds/butter containing ethanolic extract, with reductions reaching up to 3.2 log CFU/g. However, the extract could not eliminate Salmonella from sprouted nut butter. Thus, additional antimicrobial intervention is needed.

Keyword: *Sprouted nut butter, Salmonella, ellagitannins, ethanolic and aqueous extracts, pomegranate peel*

Improve the hygiene status of washer/waxer brush rollers in a custom-made peach packing line prototype

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The University of Georgia

Brush rollers in the overhead spray-washing/waxing system are a source of microbial contamination for peaches that pass through. This study evaluated the effectiveness of using a cleaner and/or sanitizer in warm or pressurized water to improve the hygiene status of brush rollers. Sections of naturally contaminated washer and waxer rollers were fit into a custom-made peach packing line prototype and treated with an alkaline degreaser and/or sanitizer in cold or warm water at the default or added pressure (24 MPa) level for 5 min. The cleaner and/or sanitizer were left on the rotating rollers for 10 min and rinsed for 5 min. Populations of total aerobes (TA), total yeasts and molds (YM), total coliforms (TC), and the presence of fecal coliforms (FC) and enterococci (EC) on roller surfaces were determined. Waxer rollers had higher ($P \leq 0.05$) microbial loads than the washer rollers. The use of warm water, pressurized water, and the degreaser or sanitizer, alone or in combination, significantly reduced microbial counts on brush rollers compared to untreated rollers. The FC was detected in 7.7% of the samples, whereas no EC was detected. Using cleaners/sanitizers in warm, pressurized water can significantly improve the hygiene status of brush rollers.

Keyword: *Fresh peach packing line, Washer and waxer rollers, Cleaning and sanitation, Warm and pressurized water*

DEVELOPMENT OF A FUNCTIONAL MEAL FROM GERMINATED PEARL MILLET, SORGHUM AND BAMBARA GROUNDNUT FORTIFIED WITH CARROTS

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Germination improves nutrient bioavailability and reduces antinutritional factors, thereby enhancing the nutritional quality of crops. This study was aimed at developing a functional meal from germinated pearl millet, sorghum, and bambara groundnut fortified with carrot. The raw materials, pearl millet, sorghum, bambara groundnut and carrot were procured from Wazo market, Ogbomoso, Oyo State, Nigeria. The cereal grains were germinated, processed into flours and blended with carrot flour in varying proportions. The samples were evaluated for proximate, minerals, microbial, functional, pasting, amino and sensory properties. Proximate composition, protein, fibre, fat,ash, moisture content and carbohydrate were in the range of 14.45 -15.81 % , 1.57 - 4.23 %, 75.09 - 70.22 %, 1.57-4.23%, 0.89- 0.98% ,70.22-75.09% respectively. A functional nutrient dense meal with acceptable sensory characteristics has been developed.

Keyword: *Pearl millet, sorghum, Bambara groundnut, germination, functional meal*

AMINO ACID PROFILE OF OPTIMIZED AND LACTIC ACID FERMENTED COMPOSITE FLOURS FOR MASA PRODUCTION

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Masa, a fermented cereal snack widely consumed in Nigeria and other West African countries, is traditionally produced by spontaneous fermentation, which often results in variation in product quality. In this study, an improved composite flour was developed from germinated rice flour (33.4%) and germinated Bambara nut flour (2.24–2.60%) using lactic acid bacteria (LAB) fermentation (1.90–2.0%) for 4 hours. The amino acid profile of optimized and LAB-fermented composite flours formulated for masa production was evaluated. Optimized flour samples (A, B, and C) were compared with control flours (RRF, GBF, and GRF) with corresponding masa samples. Total essential amino acids (EAA) in optimized flours ranged from 23.50 to 26.23 mg/100 g, compared to 28.20 mg/100 g in raw rice flour and 38.00 mg/100 g in germinated Bambara nut flour. Lysine content in optimized flours (3.79–3.98 mg/100 g) was higher than in raw rice flour (1.80 mg/100 g). LAB fermentation increased total EAA in masa samples (38.66–38.95 mg/100 g) compared to laboratory (27.01 mg/100 g) and commercial masa (27.74 mg/100 g). The optimization process and LAB fermentation significantly enhanced the amino acid quality of composite flours and masa products, highlighting their potential as protein-enriched functional ingredients to improve the nutritional value of masa.

Keyword: *masa, lactic acid bacteria, germinated rice, germinated bambaranut, composite flour*

IMPACT OF DRYING TECHNOLOGIES ON MOISTURE SORPTION, FUNCTIONAL PROPERTIES, ANTIOXIDANT ACTIVITY, AND PROTEIN DIGESTIBILITY OF DUCKWEED (WOLFFIA GLOBOSA)

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Duckweed (Wolffia globosa) is a promising plant-based protein source; however, the impact of industrial-relevant drying methods on its functional and nutritional quality remains unsuccessfully characterized. This study provides the first systematic comparison of freeze-drying (FD), tray drying (TD), fluidized-bed drying (FBD), and microwave-vacuum drying (MVD) on the moisture sorption behavior, physicochemical characteristics, functional properties, antioxidant capacity, protein profile, and in-vitro protein digestibility of dried W. globosa, offering critical data to guide ingredient processing decisions. Moisture sorption isotherms were well described by Peleg, BET, GAB, and double-log polynomial models, with the Peleg model showing the best fit ($R^2 > 0.9999$). FD samples exhibited superior rehydration capacity, solubility, suspension stability, and functional properties, including foaming, oil-holding, and emulsion stability, attributed to their porous structure and minimal thermal damage. MVD resulted in the highest bulk density, fastest wetting behavior, and strongest antioxidant activity, while FBD and TD effectively preserved color and enhanced protein digestibility, producing a higher proportion of low-molecular-weight peptides (<500 Da). SDS-PAGE revealed similar protein band patterns across all treatments. Overall, FD best preserved functional quality, whereas MVD and FBD offered advantages in antioxidant retention and digestibility, highlighting the importance of drying method selection for optimizing W. globosa-based protein ingredients.

Keyword: *Wolffia globosa, Drying methods, Moisture sorption isotherms, Functional properties, Protein digestibility*

MICROBIOLOGICAL QUALITY AND SAFETY ASSESSMENT OF KULI-KULI PRODUCED IN SELECTED LOCATIONS IN OGUN- STATE, NIGERIA.

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Kuli-kuli, a traditional groundnut-based snack, is widely consumed in Nigeria but highly susceptible to microbial and chemical contamination. This study evaluated the microbiological, chemical, and physical quality of kuli-kuli from local producers and street vendors across four towns in Ogun State, Nigeria. Samples were collected at various processing stages, while laboratory-prepared samples served as controls. Microbial counts were assessed using standard culture techniques, and isolates were identified morphologically, biochemically, and molecularly. The total bacterial counts ranged from 1.10±0.08 to 3.66±0.00 Log_{10} CFU/g, while fungal counts ranged from 0.50±0.01 to 10.01±1.99 Log_{10} CFU/g. Isolated organisms included Pseudomonas spp., Proteus vulgaris, Staphylococcus aureus, Escherichia coli, Aspergillus spp., Mucor, Rhizopus spp., and Saccharomyces cerevisiae. Heavy metals such as cadmium (0.01–7.45 mg/kg), arsenic (0.10–12.05 mg/kg), and lead (0.03 mg/kg) were detected, along with high mycotoxin levels including AFB_1 (162 µg/kg) and FB_1 (154 µg/kg). Observations also revealed poor handling and environmental hygiene during production and vending. The findings indicate significant microbiological and chemical hazards, underscoring the urgent need for improved processing hygiene and safety regulation of traditionally produced kuli-kuli.

Keyword: *Food safety, Microbiological quality, Heavy metals, Mycotoxins, kuli-kuli.*

DEVELOPMENT AND CHARACTERIZATION OF A PROTEIN-FORTIFIED PLANT-BASED BEVERAGE FROM BAMBARA GROUNDNUT (VIGNA SUBTERRANEA): IMPACT OF VARIETY AND ENZYMATIC HYDROLYSIS

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This research aims to develop a plant-based, protein-fortified bambara groundnut (BG) beverage. Two varieties, “local” and “Songkhla 1," were analyzed for their composition and properties. The BG flours differed in composition, with carbohydrates at 66.60% and 64.93% and protein at 16.99% and 19.64%, respectively, as main components. Fat content was 11.93% and 10.95%, respectively, indicating both varieties are well-balanced nutrient sources. Songkhla 1 variety showed higher protein content and bioactive compounds, including phenolic compounds and antioxidant activity, making it the most suitable for development. The effects of starch and protein hydrolysis on the BG starch solution were studied. Starch hydrolysis using hemicellulase with alpha-amylase and protein hydrolysis using protein-glutaminase for 3 hours showed optimal hydrolysis at pH 3.2-6.1. Enzymatic hydrolysis increased soluble solids as enzymes converted starch to sugars, with optimal conditions of 3 hours at 50°C and 15% W/V. Protein hydrolysis reduces pH and precipitate formation by increasing enzyme-substrate affinity and promoting the breakdown of proteins into amino acids, thereby improving solubility. The 3-hour degradation time was suitable for beverage development. Sensory evaluation using the 9-Point Hedonic Scale showed the highest preference for the 3% pea protein formula, scoring 5.60-6.60, indicating slight liking despite an undesirable BG flavor.

Keyword: *Plant-based protein, Bambara groundnut, Alpha-amylase, Protein hydrolysis*

DEVELOPMENT OF LOW-GLYCEMIC INDEX MEAL REPLACEMENT BARS USING NATIVE AND PREGELATINIZED GREEN BANANA FLOUR

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This research aimed to study the properties of banana flour and pregelatinized banana flour and to apply them to meal replacement bars. The study examined under-mature green banana flour, mature green banana flour, and their pregelatinized versions. Results showed carbohydrates as the main component at 84.75%, 85.30%, 89.37%, and 89.80%, with mineral, protein, fiber, and fat content at 1-2%. Pregelatinized flour was prepared using a twin-roller dryer with a banana flour-to-water ratio of 40:60 (w/w). It showed decreased protein content and slightly increased fat, fiber, and minerals, with a higher carbohydrate ratio than unpregelatinized flour ($p<0.05$). Pregelatinized flour had higher water absorption, water solubility index, and oil absorption, resulting in lower viscosity at low temperatures. Raw banana flour had lower rapidly digestible starch than pregelatinized flour but higher slow-digestible starch content. Unripe banana flour showed a lower glycemic index than pregelatinized flour. Three formulations were tested: F1 (unripe flour), F2 (mature flour), and F3 (combination). Carbohydrate content was primary at 63.57%, 66.76%, and 64.89%, respectively. F1 had the lowest pGI, F2 the highest, while F3 showed reduced pGI. F2 showed the highest hardness, F3 intermediate, and F1 was the least crumbly.

Keyword: *Green banana flour, Glycemic index, Meal replacement, Pregelatinized*

Sensory characterization and stability of iron-fortified spiced coconut (Cocos nucifera) water vinegar in different storage times and packaging materials

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Iron deficiency anemia (IDA) remains a significant nutritional concern in the Philippines, particularly among women and older adults. This study investigates iron-fortified spiced coconut water vinegar (IF-SCWV) as a culturally appropriate solution to address IDA while valorizing coconut water, an agricultural by-product, into a marketable product.

IF-SCWV contained in different packaging materials (GLASS, PET, LLDPE) and stored at room temperature was analyzed for its sensory profile and iron content by using quantitative descriptive analysis (QDA) and inductively coupled plasma-optical emission spectroscopy (ICP-OES), respectively, for a period of 6 months. IF-SCWV was also tested in chicken adobo through triangle test and consumer acceptability test. Principal Component Analysis (PCA) was used to statistically determine the effects of packaging and storage.

Seven sensory attributes were identified: orange color, turbidity, acidic aroma, spicy aroma, spiciness (mouthfeel), sourness, and absence of off-flavors. Notably, the orange color intensified, while the iron content remained stable over time. Fortification did not impart sensorial changes to the chicken adobo, which was still highly acceptable to consumer panelists.

These findings support the potential of IF-SCWV as a functional food intervention addressing IDA while valorizing coconut water into a high-value, marketable product. Efficacy of IF-SCWV and market testing can be explored.

Keyword: *coconut water vinegar, iron fortification, sensory characterization, shelf-life stability*

Quantifying the magnitude of TAS2R38-mediated bitter sensitivity in shaping adult diet quality and eating behaviour: Evidence from a 407-participant Australian cohort

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Background: Variation in TAS2R38-mediated bitter taste perception may influence food acceptance and dietary behaviour, yet its impact on overall diet quality in adults remains unclear.

Methods: In a cross-sectional study of 407 Australian adults, participants were classified as phenylthiocarbamide (PTC) tasters (n=211) or non-tasters (n=196). Diet quality was assessed using the Australian Recommended Food Score (ARFS), and eating behaviours were measured using the Adult Eating Behaviour Questionnaire (AEBQ). Linear regression estimated adjusted mean differences controlling for age, sex, education, income, and smoking. Heteroskedasticity-consistent (HC3) standard errors were applied, with false discovery rate correction for multiple outcomes.

Results: Adjusted differences between tasters and non-tasters were small for BMI (0.77 kg/m²; 95% CI −0.27, 1.82) and ARFS total (−0.82 points; 95% CI −2.74, 1.09). Domain-level differences in vegetables and fruit were modest and not significant after correction. AEBQ composite scores showed minimal separation. Food Responsiveness was nominally higher in tasters but did not remain significant following adjustment.

Conclusions: TAS2R38-mediated bitter sensitivity demonstrated minimal association with overall diet quality or appetitive traits in this adult cohort, suggesting limited influence of sensory-genetic variation within contemporary food environments.

Keyword: *TAS2R38, bitter taste, Diet quality, eating behaviour*

Comparative Studies on the Functional Groups and Selected Functional Properties of Protein Concentrates Obtained from Differently Dried Senecio biafrae Leafy Vegetable

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Senecio biafrae leaves were harvested and dried using ovendrying, sundrying and airdrying techniques. The dried leaves were milled to fine particle while the fresh leaf (control) was communited to slurry. Protein concentrates were extracted from the samples using established and improved methodologies. The samples were subjected to water absorption capacities (WAC), Oil absorption capacities (OAC), swelling capacity (SC), foaming and emulsion acapaicites (FC & EC) as well as determination of existing functioal groups using fourier transform infrared method. The results showed that the WAC, OAC, SC, FC and EC ranged between 234.75 to 265.94 %, 189.54 to 203.45 %, 295.94 to 301.55 %, 105.84 to 119.54 and 0.632 to 0.783 m^2/g respectively. The FTIR results showed that amide I (C=O stretching vibrations of amide group) and Amide II (N–H stretching vibration) dominated the samples with different intensities. The results also showed that fresh and airdried samples resulted in better functional properties when compared with the oven and sundried samples. The result concluded that protein concentrated from Senecio biafrae leaves demonstrated good functional properties that could enhance its utilization in improving the protein and nutritional properties of some protein deficient food.

Keyword: *Post harvest losses, Functional ingredient, Fortification, Protein malnutrition*

ASSESSMENT OF THE IMPACT OF PASTEURIZATION ON THE PHYSICOCHEMICAL PROPERTIES AND MICROBIAL SAFETY OF COCONUT SKIM MILK (CSM)

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Coconut skim milk (CSM) is a by-product of virgin coconut oil (VCO) processing with potential applications as a functional food ingredient. However, its high moisture and nutrient content make it highly susceptible to microbial contamination and rapid deterioration, requiring thermal stabilization. This study evaluated the impact of pasteurization on the microbial safety, physicochemical properties, and nutritional quality of CSM using a 2 × 2 factorial design with two temperature levels (i.e., 70 °C and 80 °C) and two holding times (i.e., 5 and 10 min). Two-way factorial ANOVA revealed that temperature, time, and their interaction significantly reduced microbial growth ($p < 0.01$) and titratable acidity ($p < 0.01$) of CSM, confirming the synergistic effect of thermal severity. Proximate composition remained largely unchanged ($p > 0.01$), indicating preservation of nutritional integrity. However, exposure to 80 °C accelerated protein denaturation and coagulation, as observed by the formation of visible protein aggregates and partial coagulation of CSM, indicating increased thermal sensitivity of coconut proteins at elevated temperature. These findings support the application of pasteurization as a safe and effective intervention for the valorization of CSM.

Keyword: *Coconut Skim Milk, Valorization, Virgin Coconut Oil, By-products*

PROXIMATE, AND FUNCTIONAL PROPERTIES OF DOUGH MEAL FROM CARROT AND ORANGE-FLESHED SWEET POTATOES

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Food industries face challenges in producing foods with functional ingredients to meet nutritional needs and prevent health issues. Carrot (Daucus carota L.), a widely cultivated root vegetable in the Apiaceae family, is valued for its high content of carotenoids, flavonoids, polyacetylenes, anthocyanins, dietary fiber, vitamins, and minerals, which enhance the nutritional quality of foods. Orange-fleshed sweet potato (OFSP) is also a rich source of provitamin A due to its β-carotene content. This study evaluated the proximate composition and functional properties of flour blends from carrot and OFSP to assess their suitability for food applications. Five formulations were prepared: 90:10, 80:20, 70:30, 60:40, and 50:50 ratios of carrot to OFSP flour. Proximate analysis showed moisture ranged from 8.94% to 9.95%, protein from 10.24% to 12.74%, and fat from 0.75% to 1.00%. Increasing OFSP proportion significantly improved protein and carbohydrate content. Functional properties indicated that swelling capacity and bulk densities increased with higher OFSP levels (4.65–5.06 g/g swelling; 0.51–0.54 g/g loose bulk; 0.71–0.74 g/g tapped bulk), while water holding capacity decreased (3.92–3.24 g/g). These findings demonstrate that carrot–OFSP blends offer enhanced nutritional value, good water absorption, and thickening potential, making them suitable for diverse food applications.

Keyword: *Carrot, Proximate, Orange-fleshed Sweet Potatoes, Functional properties*

PROXIMATE AND MICROBIAL ASSESSMENTS OF YOGHURT PRODUCED USING CHILLI PEPPER (Capsicum annuum) WITH ITS STALK AS STARTER CULTURE

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Yoghurt is a nutritious dairy product known for its health benefits. This study assessed the proximate composition and microbial quality of yoghurt produced from reconstituted full cream milk fermented with chili pepper (Capsicum annuum) and its stalk as a natural source of lactic acid bacteria. Powdered milk was reconstituted in a 1:4 ratio (milk to water), pasteurized at 90°C, and cooled to 40–45°C. Different quantities (50 g, 70 g, and 90 g) of cleaned chili pepper and stalk were added to 400 mL portions of cooled milk to prepare inocula and incubated at 40°C for 24 hours. Each inoculum was used as a starter culture for 1200 mL of pasteurized milk, while yoghurt made with a commercial starter served as control. Fermentation was carried out at 38°C for 18 hours. Proximate and microbial analyses were performed in triplicate, and data were analyzed using one-way ANOVA at $p < 0.05$. Moisture, protein, fat, and carbohydrate contents ranged from 85–87%, 3.5–4.2%, 3.0–3.8%, and 4.5–5.2%, respectively. Total Plate Count ranged from 2.5×10^5 to 3.5×10^5 CFU/mL, while coliform counts were 3–10 CFU/mL. Results suggest chili pepper and its stalk are sustainable fermentation alternatives.

Keyword: *Yoghurt, Chilli pepper and stalk, Fermentation, Proximate*

Food Protein Nanofibrils for the Design of Sustainable Food Systems, Nutrition and Drug Delivery

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Food protein nanofibrils, derived from edible food proteins such as milk β-lactoglobulin, egg white lysozyme, oat globulin, and soy protein, have recently emerged as a promising strategy for enhancing protein functionality and developing sustainable biomaterials. These nanofibrils are highly ordered, linearly aligned protein assemblies formed through controlled processing conditions, resulting in nanostructures with diameters of only a few nanometers. Their core architecture is stabilized by β-sheet formation, which confers remarkable structural stability. Food-grade protein nanofibrils possess several intrinsic advantages, including a high surface-to-volume ratio, versatile surface chemistry, excellent mechanical strength, biocompatibility, and biodegradability. These properties make them attractive building blocks for advanced functional materials. (more info www.jiangtaozhoulab.com)

In this talk, I will present our recent research progress on sustainable food protein nanofibrils, focusing on sustainable protein sources, novel mechanisms governing their self-assembly and stimuli-triggered disassembly, and their emerging applications in food science including cultivated meat scaffolding, nutrition delivery systems, as well as the development of innovative biomaterials for drug and biomedical applications.

Keyword: *Food protein nanofibrils, Functional food, Nutrition and drug delivery, Cultivated meat*

EFFECTS OF PROCESS CONDITIONS ON THE PHYSICOCHEMICAL AND SENSORY PROPERTIES OF AN HEIRLOOM RICE (ORYZA SATIVA L.) SOYBEAN (GLYCINE MAX) BLEND BEVERAGE

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Heirloom rice, valued for its aroma and anthocyanin content, has limited use due to its texture and slow starch digestion; pretreatment methods improve beverage sensory quality. Among the screened varieties, Chong-ak—selected for its high sensory acceptability—was blended with soybean for its protein content and market presence. This study evaluated the effects of pretreatments (roasting-soaking, gelatinization, and enzyme-mediated fermentation) along with raw material-to-water ratios (1:5, 1:10) and heirloom rice-to-soybean formulation ratios (30:70, 70:30). The influence of these factors on physicochemical and sensory properties was evaluated using analysis of variance, diagnostic tests, and model graphs. Color, pH, viscosity, and titratable acidity were significant, with R^2 of 0.7036 to 0.9376, non-significant lack-of-fit, and adequate precision ratio ≥4.0. Despite variations in physicochemical properties, no significant differences in consumer acceptability were observed. Numerical optimization further demonstrated that the ideal treatment depends on the intended application. Gelatinization with a 70:30 rice-to-soy ratio was suitable for dairy analogs, while fermentation at a 30:70 ratio was intended for functional food applications. These adaptable formulations allow production flexibility during seasonal raw material shortages, providing a robust framework for commercial utilization of rice-soybean blend beverages.

Keyword: *plant-based beverages, heirloom rice, soybean, process optimization, rice-soybean blend*

Recover, Extract and Eat: biosafety assessment of water-based DES extracts from spent coffee grounds

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The recovery of bioactive compounds from agri-food by-products represent a critical challenge and opportunity for developing functional ingredients. Spent coffee grounds (SCGs) represent a massive global residue rich in alkaloids, such as caffeine, and phenolics, including chlorogenic acids. This study investigates the safety of water-based deep eutectic solvents (aquoDESs) for SCGs extraction, thus aquoDESs could be applied not only as extraction solvent but also as a direct food ingredient without the need for complex removal processes.

Following optimized ultrasound-assisted extraction, the resulting ready-to-use extracts were evaluated for chemical and biological safety. Chemical analysis confirmed that furanic compounds and acrylamide levels remained within acceptable safety limits. Antibacterial tests indicated a strong potential to inhibit microbial growth, particularly against P. aeruginosa and S. aureus. Toxicological screenings on intestinal epithelial cell lines demonstrated no cytotoxic effects; conversely, specific concentrations even enhanced specific cell viability. Finally, the INFOGEST static in vitro digestion protocol was employed to assess the accessibility in the epithelium of bioactive molecules, results confirmed that these compounds are effectively released and remain bio -accessible during digestion. These findings validate SCG-aquoDES extracts as safe without requiring solvent removal, highlighting a possible future innovation for the food ingredient industry.

Keyword: *biosafety assessment, zero waste, deep eutectic solvents, food ingredient, spent coffee grounds*

RHEOLOGICAL CHARACTERIZATION AND OPTIMIZATION OF CHOCOLATE INK FORMULATION FOR 3D FOOD PRINTING

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Three-dimensional (3D) food printing enables the customised food fabrication; however, chocolate extrusion requires precise control of rheological and thermal properties to ensure smooth flow and structural stability. This study focuses on the development and rheological characterisation of a chocolate-based printable ink, and optimising its printability for extrusion-type 3D food printing. Chocolate inks were prepared by varying cocoa solids (20–28%), cocoa butter (30–34%), sugar (23.4–32.4%), with other ingredients (milk powder, palm oil, lecithin, PGPR, vanilla extract) kept constant to ensure proper flow and shape retention. The rheological (viscosity, amplitude and frequency sweep tests, thixotropic analysis, temperature sweep test), thermal, and textural properties were systematically analysed. Printability was evaluated based on extrusion consistency, filament formation, layer stacking, and dimensional accuracy. Among all the formulations, the ink containing 24–26% cocoa solids and 32–33% cocoa butter achieved successful prints with the desired shape fidelity, highlighting the importance of viscosity recovery and elastic dominance ($G' > G''$) for high-quality printing. Furthermore, controlled cooling during printing is essential to accelerate solidification, enabling faster layer deposition and high-fidelity prints without compromising structural integrity. These insights guide the design of chocolate inks with improved printability, supporting applications in personalised nutrition, confectionery design, and advanced food manufacturing.

Keyword: *Chocolate ink; extrusion 3D printing; rheology; cocoa solids; viscoelasticity; customized foods.*

Influence of Processing Methods on the Technological, Bioactive, and Digestibility Properties of Babassu Mesocarp Flour

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The search for alternative food sources has increased interest in babassu mesocarp (BM), an underutilized by-product of the babassu almond oil industry. Although previous studies have highlighted its potential for human consumption, information regarding the influence of processing conditions on its properties remains limited. This study investigated the effect of different processing methods on the characteristics of babassu mesocarp flour (BMF), aiming to expand its potential use as a food ingredient. Four processing strategies were applied to produce distinct flour: convective drying (BMF-CD), cooking followed by convective drying (BMF-CCD), freeze-drying (BMF-FD), and cooking followed by freeze-drying (BMF-CFD). The flours were evaluated for their physicochemical properties, bioactive compounds, antioxidant activity, structural characteristics, and in vitro digestibility. The results demonstrated that processing significantly affected the properties of the flours. Freeze-dried samples exhibited more desirable attributes, including better preservation of phenolic compounds, higher antioxidant activity, lighter color, smaller particle size, and greater protein hydrolysis during digestion. In contrast, the cooking step reduced tannin content and increased iron levels. These findings demonstrate that processing strategies can be used to tailor the functional, nutritional, and technological properties of BMF enabling its application in different food systems while adding value to an underexploited plant resource.

Keyword: *Freeze-drying, Bioactive compounds, Antioxidant activity, In vitro digestibility*

PHENOLIC PROFILE OF BRS VIOLETA GRAPE POMACE EXTRACTS OBTAINED VIA PRESSURIZED LIQUID EXTRACTION

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Grape pomace, generated during wine and juice production, retains nutrients and phytochemicals, particularly phenolics, which are associated with bioactive properties. Various extraction techniques have been studied to improve the recovery of these compounds. Pressurized liquid extraction (PLE) has been explored to enhance their recovery by improving solubility and diffusion under controlled temperature and pressure.This study aimed to determine the phenolic profile of BRS Violeta grape pomace obtained by PLE, addressing a gap in the literature due to limited data on this by-product. Pomace from juice production was dehydrated, milled (20–28 mesh), and extracted using 70% acetone at 10 MPa, with a flow rate of 5 mL/min for 30 min. Extracts were analyzed by HPLC-DAD. A total of 24 phenolic compounds were identified (including 16 flavonoids, 6 phenolic acids, and 2 stilbenes), with caftaric acid (2.823 ± 0.029 mg/g of dried extract) as the predominant compound, followed by gallic acid (0.755 ± 0.013 mg/g), hesperidin (0.723 ± 0.006 mg/g), myricetin (0.655 ± 0.005 mg/g), and naringenin (0.640 ± 0.001 mg/g). Studies show that these compounds exert metabolic effects, including gut microbiota modulation, antihyperglycemic activity, and anti-obesity potential, supporting its use as a functional ingredient.

Keyword: *Grape byproduct, Phytochemical characterization, Bioactive compounds*

Effect of Xanthan Gum–Micellar Casein Aeroform Systems on Protein Digestibility, Bioavailability, and Physiological Parameters in Rats Fed a Western Diet

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The increasing prevalence of diet-related metabolic diseases underscores the need to identify food ingredients and structural formats that support nutritional disease prevention. Polysaccharides are of particular interest, as they can shape functional properties of food products while serving as active components of functional foods. This study evaluated the effect of xanthan gum–micellar casein aeroform systems on in vitro protein digestibility, bioavailability, and physiological parameters in Sprague-Dawley rats fed a Western diet, using the INFOGEST 2.0 protocol. Increasing the proportion of xanthan gum reduced protein digestibility, suggesting potential applications in controlling peptide release kinetics and developing products with targeted physiological effects. The physiological response was sex-dependent, highlighting biological sex as a key variable in nutritional research. These findings suggest polysaccharides can serve a dual technological and nutritional-physiological role, supporting body weight regulation through modifications in digestibility, satiety, and metabolic response, without relying solely on GLP-1 receptor agonists.

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Keyword: *aeroform systems, polysaccharide-protein interactions, sex-dependent response, bioavailability*

Digital Services Integrated with Food Products – A Market Readiness Assessment: The Case of the Dairy Industry

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Digital services associated with food products are analysed as separate technologies, although they can form part of product servitization by extending physical products with informational, interactive and service functions. The aim was to assess possibilities for implementing digital services associated with dairy products in Poland by comparing consumer acceptance with the technological, organizational and competence maturity of dairy enterprises.

A two-module CAWI study covered Generation Z dairy consumers and dairy enterprise representatives. The consumer module used the UTAUT2 model extended with trust to assess intention to use and purchase readiness. The enterprise module assessed technological and organizational maturity, digital competences and strategic orientation. Results from both modules were integrated in an acceptance-feasibility matrix for technology-based service scenarios.

The highest implementation potential was found for services increasing product transparency, trust and convenience. More advanced services showed lower feasibility due to varied digital maturity, implementation costs and competence gaps. The results indicate that implementation should begin with solutions combining consumer value with realistic enterprise capacity in this sector.

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Keyword: *consumer adoption, food innovation, digital transformation, service integration, purchasing behaviour*

Evaluation of Radio Frequency Heating Characteristics and Disinfestation Efficacy in Wheat Flour

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Radio Frequency (RF) heating offers a rapid, volumetric, and chemical-free technology with potential for controlling pests in cereal products. This study evaluated the effects of flour load weight (1–4 kg), electrode gap (10–15 cm) in the 5 kW and 10 kW RF systems on heating characteristics and disinfestation efficacy. Increasing the flour loading weight resulted in greater RF power output than reducing the electrode gap, while flour temperature increased linearly during RF heating ($R^2 > 0.96$). At a loading weight of 3 kg, the optimal heating conditions were an electrode gap of 11 cm for the 5 kW system and 12 cm for the 10 kW system. The corresponding heating models were $T = 0.2913t + 29$ ($R^2 = 0.996$) and $T = 0.635t + 32.883$ ($R^2 = 0.990$), respectively. In practical disinfestation tests, 3 kg of flour was heated at 5 kW RF for 60 s and 120 s, reaching 43.8°C and 62.5°C, resulting in pest mortality of 75% and 100%, respectively. At 10 kW RF, heating for 30 s and 60 s increased the flour temperature to 44°C and 61.3°C, achieving 65% and 100% mortality, respectively. Therefore, RF heating can provide rapid and effective pest control in wheat flour.

Keyword: *Radio Frequency, Temperatrue, Wheat flour, Disinfestation*

Design of Smartphone Automation for Counting and Live/Dead Discrimination of Stored Product Pests

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Process efficacy against stored-product pests is commonly evaluated by sieving insects from rice or flour and manually classifying them as live or dead. This procedure is time-consuming, observer-dependent, and limits the throughput of efficacy testing. This study aimed to develop a mobile application for automated insect counting and live/dead discrimination using a smartphone. The application uses a fully local, non-neural-network image-processing pipeline, eliminating the need for training datasets, model files, or server connections. Uneven illumination is corrected by local background subtraction, followed by adaptive thresholding based on background statistics. Morphological processing, connected-component analysis, and shape filtering are used to identify individual insects, while distance-transform-based core detection separates touching insects. A single-insect calibration step establishes size and contrast references. Live/dead discrimination is based on movement: insects are tracked across consecutive frames, camera drift is compensated using collective background motion, and sustained displacement exceeding a predefined fraction of body length is classified as live. The same processing pipeline supports photographs, live-camera images, and recorded videos. The proposed smartphone-based approach provides a portable, training-free, and server-independent tool for 100% accurate mortality determination for radio frequency disinfestation of pests in rice and wheat flour.

Keyword: *Image, Pests, Smartphone automation counting, Mortality*

Application of Hot Air-Assisted Radio Frequency Drying to a Hericium erinaceus Solid-State Fermented Product

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Because hot air-assisted radio frequency (HARF) drying generates heat rapidly through molecular oscillation of polar water molecules and ionic movement, this study investigated the application of 5 kW radio frequency (RF) drying to a solid-state fermented product of Hericium erinaceus cultured for three weeks on a rice bran-to-corn substrate at a ratio of 3:1. The fermented product contained various bioactive compounds, including crude polysaccharides, crude triterpenoids, erinacine A, polyphenols, and flavonoids. The results showed that the RF power output increased with increasing fermented-product loading. Although reducing the electrode plate gap increased the RF power output, the variation was relatively small. At an electrode plate gap of 13 cm, HARF drying reduced the moisture content of the fermented product from 50% to below 15% within 40, 28, and 29 min for loading weights of 500, 1000, and 1500 g, respectively. During drying, the product temperature gradually increased to above 90°C. Therefore, HARF not only achieves pasteurization but also provides optimal drying conditions, drying 1 kg of the fermented product within 28 min and reducing processing time and energy consumption.

Keyword: *radio frequency, drying, pasteurization, Hericium erinaceus, solid-state fermented product*

THREE-DIMENSIONAL LIVER EXTRACELLULAR MATRIX SCAFFOLDS AS A PLATFORM TO STUDY CANCER METABOLISM AND NUTRITION-RELATED MODULATION

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Liver metastasis is a major cause of cancer morbidity and mortality. However, physiologically relevant in vitro platforms for studying metastatic adaptation are limited. This study establishes a mouse decellularized liver extracellular matrix scaffold as a three-dimensional model to investigate how cancer cells remodel metabolism in a liver-like microenvironment. Breast cancer MDA-MB-231 and colorectal cancer HT-29 cells were cultured on conventional plastic and on the liver scaffold to compare metabolic phenotypes. Cancer cell growth, mitochondrial organization, and oxidative metabolism were assessed using immunocytochemistry, mitochondrial staining, and Seahorse extracellular flux analysis. By recreating extracellular matrix architecture more closely than two-dimensional culture, this platform enables mechanistic evaluation of metabolic vulnerabilities that may be targeted by nutrition-related strategies, including functional food ingredients, food-derived bioactives, and metabolic modulators. Ongoing work will apply targeted metabolomics to define time-dependent metabolic adaptation during colonization of the scaffold, followed by studies of cancer cell behaviour under altered nutrient and metabolic conditions. This model provides a bridge between food science, nutrition, biotechnology, and cancer biology by offering a relevant preclinical tool for assessing how nutritional and bioactive interventions may influence metastatic cancer cell metabolism in the liver microenvironment.

Keyword: *cancer metabolism, liver metastasis, three-dimensional liver model, extracellular matrix scaffold, nutrition-related modulation*

A NOVEL SUNFLOWER-DERIVED BIOACTIVE PEPTIDE AS A FUNCTIONAL FOOD INGREDIENT FOR MANAGING HYPERTENSION AND DIABETES

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Global demand is growing for functional foods to manage metabolic disorders. Plant-derived bioactive peptides offer sustainable, safe ingredients for such dietary interventions. This study evaluates a novel sunflower-derived peptide for its therapeutic potential against hypertension and diabetes. The peptide was identified through enzymatic hydrolysis, liquid chromatography-mass spectrometry, and in silico bioactivity prediction, then synthesised for in vitro validation.

Antihypertensive potential was determined through angiotensin-converting enzyme inhibition, and antidiabetic activity through α-amylase and α-glucosidase inhibition. Antioxidant capacity and Caco-2 cell viability were also evaluated.

The peptide demonstrated potent inhibition of α-amylase (IC_{50} = 6.06 µM), α-glucosidase (IC_{50} = 53.93 µM), and angiotensin-converting enzyme (IC_{50} = 53.32 µM), suggesting multifunctional activity relevant to the management of metabolic disorders. Modest antioxidant activity (ABTS IC_{50} = 810.86 µM; ORAC = 8.50 µmol Trolox equivalents at 500 µM) indicates target-specific enzyme inhibition. Furthermore, no significant cytotoxicity in Caco-2 cells was observed up to 853.53 µM, supporting safety for oral delivery.

These findings identify this peptide as a promising functional food ingredient and nutraceutical candidate for dietary management of metabolic syndrome. Future work will investigate renin and DPP-IV inhibition, Caco-2 glucose uptake, and effects on lipid metabolism to further characterise its metabolic potential.

Keyword: *Bioactive peptide, sunflower seed, metabolic syndrome, antidiabetic, antihypertensive*

From Structure to Function: Decoding Prebiotic Potential, Antioxidant and Anti-inflammatory Efficacy of Pleurotus tuber-regium Polysaccharide-Protein Complexes

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Pleurotus tuber-regium, an edible and medicinal mushroom, are valued as a functional food source rich in polysaccharides and proteins with demonstrated health-promoting properties. This study investigated the structure-function relationships of Pleurotus tuber-regium polysaccharide-protein complexes (PTRPs), focusing on their prebiotic potential, antioxidant, and anti-inflammatory activity. PTRPs with distinct compositions were obtained through optimized extraction protocols. Several predominant monosaccharides, including glucose, galactose, and mannose were identified by HPLC, while structural variations in glycosidic linkages and surface morphologies were examined by FT-IR and SEM analyses. The protein-rich complexes (PTRP-PC) showed strong antioxidant effects, exhibiting 2.4-fold higher DPPH· scavenging rates compared to low-protein complexes. In vitro fermentation assays revealed that PTRP-PC selectively enhanced the growth of Bifidobacterium infantis, which correlated with improved antioxidant activity and reduced molecular weight. Using PTRP-PC as the sole carbon source in fecal fermentation significantly enhanced SCFAs production, predominantly comprising acetic acid and propionic acid. Additionally, modulation of gut microbiota was observed in PTRP-PC fermented group, including increased abundance of Bacteroides and Parabacteroides. Anti-inflammatory activity was observed in LPS-stimulated RAW 264.7, where PTRP-PC reduced NO secretion and downregulated Il-6 and Tnf-α expression. These findings elucidate the structure-function relationships and highlight the critical role of protein-polysaccharide complexes in their bioactive performance.

Keyword: *Pleurotus tuber-regium, Polysaccharide-protein complexes, Prebiotic, Bioavailability, Fermentation*

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