**“FOOD SAFETY RISK ANALYSIS – INTO THE FUTURE”[[1]](#endnote-2)**

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*Disclaimer: this presentation reflects the personal views and thoughts of the lecturer. They are informed by his work over the past three decades, most recently his role as chairperson of the Codex Alimentarius Commission. But they do not represent the views of the Codex Alimentarius Commission or of any of its member countries.*

[SLIDE 1 – TITLE]

The analysis and management of risks has a long history. As individuals and in social groups, we have been making choices and decisions in uncertain circumstances – in effect classifying, prioritising and managing risks – since time immemorial. It has been an innate feature of our human survival instincts.

As a discrete discipline or approach, risk management appeared first in the scientific and management literature in the 1920s. It became a formal science in the 1950s, with most of the quantitative research initially related to finance and insurance. For example, in the case of mitigating and managing extreme events, scientists and engineers provided assessments of likelihood and impact; economists used these to develop risk management policies, often with little reference to stakeholders.

Approaches, methodologies and terminology have evolved in parallel across a range of different sectors and activities, in each case informed and driven by practices in the relevant underpinning scientific disciplines.

[SLIDE 2 – RISK ANALYSIS PARADIGM AND NORMATIVE TEXTS]

Let’s focus now on food safety risk analysis. Today, this is informed by a range of biological and analytical sciences, and characterised by some key paradigms, such as the integration of risk assessment, risk management and risk communication.

Risk assessment follows structured normative approaches such as

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EHC240[[2]](#footnote-2) for food chemical risk assessment,

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and MRA36[[3]](#footnote-3) for food microbiological risk assessment.

[SLIDE 3 – FOOD SAFETY HEADLINES]

Food safety risks and their management are perennially topical and very important. Every responsible government wants to get the balance right between protecting consumers and trade, without investing in ineffective measures. That much is a given. But the issues we face, and optimum solutions, continue to change and develop.

Today we live in a new age of threat and uncertainty, and so new approaches to risk management are required. At the same time the world has become more interconnected and interdependent. We tend to compartmentalise our approaches to the management of risks, and yet we have known for centuries that the world is complex and characterised not by neat, separate compartments that can operate independently of each other, but by the existence of interacting systems. Such as food systems.

[SLIDE 4 – RACHEL LAUDAN BLOG]

In 2017, a blog by Rachel Laudan[[4]](#footnote-4) sought to identify the origins of the term “food system”, which now seems so central to our dialogues on food safety, food security and sustainable development. Rachel is a historian, and her perspective was that it is important to know where our words and ideas come from in order to understand them. I tend to agree.

She noted that the term “system” in the sense of an association of interacting parts, has been in use for centuries. And it’s in this sense that we talk about food systems. But since the 1980s, Rachel contends, many have used the term “food system” in a more theoretical, global and critical sense.

[SLIDE 5 – FAO DEFINITION OF FOOD SYSTEMS]

And you can see this if you enter “food system” into any search engine. The first citations will usually cover neutral definitions, such as this from the Food and Agricultural Organisation: “Foodsystems encompass the entire range of actors and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption and disposal of food products that originate from agriculture, forestry or fisheries, and [importantly] parts of the broader economic, societal and natural environments in which they are embedded”,

[SLIDE 6 – FOOD SYSTEMS MAP]

Attempts to map this diagrammatically, with key interactions between these actors, processes and sub-systems are represented with sometimes bewildering complexity.

But you will also see, in the results from your searches, citations which critique this conventional articulation of food system for economic and environmental failings, calling for alternatives and for transformation. You’ll see political theorists propounding that it is global capitalism that causes urban consumers in the global north to become obese and the rural poor in the global south to have hunger pangs. You’ll see others in what might be considered alternative food movements concentrating on re-focusing local food systems, or activating consumers. You’ll also see yet others – including people from the professions represented here today – suggesting that for all its problems, our current food system is not breaking but has succeeded against all the odds at feeding an increasing proportion of an exponentially growing world population and that this system needs improving, not abandoning.

How do we develop consensus on the problem, as a prerequisite for moving forward to find a solution?

The UN Food Systems Summit, together with its two-yearly stocktake moments, is in my opinion a key and largely successful opportunity to reconcile these divides in thinking about food and food policy.

And here is what, for me, was one of the key parts of the call to action at the 2021 summit.

[SLIDE 7 – UNFSS CALL TO ACTION]

A call to change the way the world produces, consumes and thinks about food. For us here at this meeting, I propose the most important word, and where we, each one of use here in this room, can add most value…

[ANIMATION]

…is “thinks”.

And so today, I’d like to invite you all to think. Let’s think about how we can respond to the UN Secretary General’s calls to action in 2021 and at the stocktaking moment in 2023. He reminded us that broken food systems are not inevitable; they are the result of choices we continue to make. He called on us all to lead the way to transform food systems for people, for the planet and for prosperity.

For people, because we need food systems that lower the cost and increase the geographic availability of fresh, healthy food for all people. For the planet, so we feed a growing global population while reducing the unsustainable use of land, water, and other resources in food production and agriculture. For the prosperity of the billions of people globally who depend on food industries for their livelihoods.

[SLIDE 8 – FOOD SAFETY, SECURITY, SUSTAINABILITY AND THE SDGs]

So, we must think about interdependencies, rather than simple one-way flows. In the past, we have may have talked about responding to emerging issues that impact on food safety and quality. Now we must think about how food safety, food security and sustainability are inextricably interlinked. And how we need to address all three of these challenges if we are to meet the Sustainable Development Goals for 2030 – the SDGs in the diagram on this slide.

So, let’s not see food safety, security and sustainability as being competing drivers with the sense that we need to choose between actions that solely optimise outcomes for food safety, or those that optimise food security, or those that optimise food sustainability. Instead, we need to integrate our thinking and, I would say, integrate organisational processes and people, so we find those actions which balance and optimise outcomes for food safety and security and sustainability.

One of the reasons for our failure to do this to date, is that in our existing regulatory and multilateral structures, we are not able to fully and consistently apply systems thinking.

[SLIDE 9 – DEVELOPMENTS IN CODEX I]

Even within these current constraints, we are starting to see thinking change and develop. In Codex, there is a growing realisation that timely and appropriate international food safety standards may support development and implementation of initiatives that improve food security and sustainability.

As just one example, we are seeing divergence between jurisdictions on regulations relating to the use of recycled materials in food packaging, which may become a significant barrier to the wider adoption of the use of recycled material in packaging for food in international trade. In Codex, we have been scoping the food safety implications of the use of recycled materials in food packaging, with the possibility of us then developing international food safety standards to harmonise regulatory controls. Those controls would, in turn, help provide assured streams of recycled materials to reduce the dependence of the food supply on virgin materials.

Although this demonstrates that we are starting to think about the broader impacts of food safety standards when we prioritise and initiate work, it’s not truly integrative. We’re still optimising for food safety, complemented by an understanding of the mechanism by which this will drive gains in sustainability as a side benefit.

[SLIDE 10 – DEVELOPMENTS IN CODEX II]

I can recall just one example from my time as chairperson of Codex where we have explicitly and consciously integrated food safety and food security considerations in the setting of standards and associated regulatory limits, and where we can demonstrate how an appreciation of food security has changed our conclusion. This relates to the setting of maximum limits for aflatoxins in cereal-based foods for infants and young children.

After a debate that was at times contentious, Codex adopted maximum residue limits that were higher, and therefore less protective of human health, for these foods in food aid than for these foods in other situations. The interventions of three observers – UNICEF, the UN World Food Programme and Médecins Sans Frontières – are key to understanding the issues at play.

Noting that cereal-based foods are provided through food aid to children at risk of malnutrition in more than 75 countries on an annual basis, these organisations at the front line of aid programmes argued that the higher limit adopted would enable maintenance of a pipeline of nutritious food for vulnerable children in need. They noted that, in contrast, a lower limit such as that adopted for these foods in other situations could constrain humanitarian responses by impacting the availability of suitable suppliers at competitive prices, especially in the context of crises driven by conflict and climate change. UNICEF noted, explicitly, “food security should be at the centre”. Codex listened.

[SLIDE 11 – A GLOBAL FORESIGHT REPORT ON PLANETARY HEATLH AND HUMAN WELLBEING]

So, turning to the future, how do we design integrative structures and approaches that help us to make the best decisions and take the right actions to reach these overarching global goals? This is not an abstract, academic question. Nor is it a question where we have the luxury of time. It is a question of real and pressing urgency as we see acceleration in the triple planetary crisis of climate change, nature loss, pollution and waste, according to new analysis by the UN Environment Programme and the International Science Council.[[5]](#footnote-5)

The nature, scope and urgency of the threats to population and planetary health have changed substantially since the Codex purpose was set by FAO and WHO. Some therefore argue that in order to help transform food systems towards the UN Sustainable Development Goals, we need to modulate the flow between inputs in the Codex system. That is the process flow between identification of issues for international standardisation by Member countries and the outputs in the form of adopted food safety and quality standards.[[6]](#footnote-6) This modulation would then aid us in better prioritising issues for action, and for taking decisions in Codex informed by food safety, security and sustainability considerations.

[SLIDE 12 - INPUTS, OUTPUTS AND DECISION-MAKING IN CODEX]

The proponents of this approach acknowledge that it would require reorientation of some or all of the decision-making elements that influence how Codex sets food standards — mandates, governance and risk assessment. And as Codex is a member-driven organisation, with member countries the decision-makers, it would need agreement and consensus across those member countries before such a change could be envisaged.

Recent work by the Codex Executive Committee on a blueprint for the future of Codex has been the subject of extensive consultation with Codex Member countries, which demonstrated a lack of widespread acceptance among the membership of any case for change to mandates and governance. A range of concerns was raised by Members opposing change to the Codex mandates and governance, including the lack of access to expertise in areas that would be needed to maintain a science- and evidence-based approach to standard setting, and the potential overlap and duplication of the work of other multilateral and international organisations. Some may argue that this conclusion is short-sighted or just plain wrong – but we should remember that consensus is one of the cornerstones of Codex and, in the absence of consensus, we cannot move forwards.

This leaves risk assessment, and the potential for developing approaches and methodologies that extend the nature and scope of the current risk assessment procedures to encompass what proponents term a ‘true cost accounting perspective’—that is, one that accounts for the health, social and environmental consequences of food production and consumption.

This would be a very significant undertaking. The issues of access to relevant expertise and potential overlap with the remit of other multilateral and international bodies, discussed earlier, would apply here too. We would also need to decide who would set the models that define the boundaries of true cost accounting – analogous discussions relating to approaches to life cycle analysis have demonstrated how contentious such discussions are likely to be.

Rather than making Codex fit for the future, it is more likely to make Codex grind to a halt.

[SLIDE 13 – REPEAT OF SLIDE 8]

And so my thesis is different - this is not about abandoning what we have developed in recent decades or changing well-established approaches for the assessment of specific attributes of components of food, for example human health risk assessment. We need to recognise how much we have all invested in these normative approaches and the quality of decision-making that they drive. Nor should we simply give in to mission creep and add more and more to the mandate of any specific body already creaking under the weight of current agendas.

We instead need to find a way of integrating the outputs of established and emerging approaches to the assessment of different attributes of foods and their components by sectoral experts – primarily across food safety, security and sustainability as these are factors which map onto the UN Sustainable Development Goals.

Let me explain why current Codex risk management conclusions, in the form of numerical standards, are not fit for this purpose.

[SLIDE 14 – HOW RISKS CHANGE EITHER SIDE OF THE REGULATORY LIMIT]

Even if we just look at the food safety domain, there are challenges we need to overcome before we have outputs that can be integrated with others.

One is the need to move away from a binary system which sets numerical limits – better than this limit, and the food is compliant and can be consumed freely in any amounts and by anyone; worse than this limit and the food is non-compliant and is destroyed or wasted. Even worse, in doing so we encourage stakeholders to make binary determinations of safety based on these regulatory compliance limits – and to assume that foods that fail to meet a numerical limit are by definition unsafe. This drives, among other things, unnecessary food waste and unneeded costs on food businesses and, ultimately, consumers.

We have for some time seen calls from forward-thinking food businesses to reform food safety systems globally to be truly risk-based and to move away from continued use of hazard-based food safety approaches and the concept of “zero risk” food systems.[[7]](#footnote-7) This is particularly warranted given our ability to generate significant volumes of data, for example through -omics approaches, that yield increased identification of potential hazards that, in practice, may represent minimal risks. After all, “zero risk” is nothing but an illusion. It does not exist. The discussion across all stakeholders should instead be about what risks are acceptable.

This requires mature reflection and, ultimately, a recalibration of risk appetites relating to food safety. The narrow and specific example of limits for aflatoxins in cereal-based food for infants and young children in food aid gives us some pointers as to how this might be achieved, the voices we need to listen to, and how to root our discussions in practical considerations and lived experience.

In order to do this, critically, we need not just a single, all-purpose numerical regulatory limit. We need to be able to describe how risks change either side of this value. The narrow and specific example of limits for aflatoxins in cereal-based food for infants and your children in food aid gives us some pointers as to how this might be achieved, and how to root our discussions in practical considerations.

In order to do this, critically, we need not just a single, all-purpose numerical regulatory limit. We need to be able to describe how risks change either side of this value.

The example of limits for aflatoxins in cereal-based food for infants and young children in food aid also, however, indicates the likely level of contention we will need to work through. To succeed, we will also need some humility, and preparedness to recognise we cannot achieve these new agendas without change for all of us.

[SLIDE 15 – OUR TWO-PART OBJECTIVE]

We have a new problem, and need new thinking and new solutions.

The first task for us, as food safety risk managers, is to provide useful food safety risk advice to those who are competent and empowered to make wider food policy choices. In the absence of any established multilateral body for doing so at present, for the time being at least this is a national-level issue.

My belief is that we should not do that and just walk away. We should play our part in the design of the new system, and the search for a common scale among the various dimensions that would guide us towards an optimum outcome. We should use our experience of applying the risk analysis paradigm within our own area, to support those whose task it is to adapt the paradigm to the task of making food policy choices that balances food safety and other considerations.

If we are to take up this second challenge, we need to acknowledge the gaps that exist in current approaches, for example the lack of any common scale we can use to compare improvements in food safety, security and sustainability. In addition to recommitting ourselves to the work that would allow us to fill those gaps in the medium term, we need a conceptual and theoretical basis to guide fit-for-purpose and workable approaches to integrate thinking across food safety, security and sustainability for the short term, given the urgency of the challenges that we face.

I accept that this is indeed challenging. It is transformational, and potentially even revolutionary. It is and certainly open to misuse if we allow assertion and counter-assertion to take the place of science and evidence.

We need to incorporate relevant learning from other disciplines so that our advice is scientifically and socially robust.

Central to this transformation of risk management will be the need to improve individual and collective decision-making processes. Learnings from a wider series of disciplines need to be integrated – including political science, psychology, and sociology – in order to develop effective strategies for the future. We need in particular to learn from decision science, which in the last fifty years has grown from niche research to integrate analytical and behavioural approaches, to a mature field with learned societies, journals, meetings, classes and websites that sit alongside those we are familiar with as food scientists and technologists.

[SLIDE 16 – BARUCH FISCHHOFF QUOTE]

How can decision science help? For me, this was encapsulated by one of the longstanding great thinkers in the field, Baruch Fischhoff, when he said “Ideally, encounters with our work will make people better decision-makers, by helping them to recognise decision points, devote proper resources to them, estimate risks and benefits, balance intuitive and reflective responses, assess uncertainties in their beliefs, resolve ambiguities in their preferences, and defend themselves from needless regret, knowing that they have done what they could to make the best choices possible in complex, uncertain and sometimes unfriendly circumstances.”[[8]](#footnote-8)

And if as regulators and risk managers we are to step outside of current normative approaches informed by a narrow range of sciences that contribute to human health risk assessment, and enter the world of intuition, beliefs, and preferences we need to design in safeguards to ensure our decisions continue to be consistent, predictable and based on the best available science and evidence.

Chief among these, from my perspective, must be a recognition that we need to engineer at least as much transparency into how we reach risk management decisions as we have in recent decades engineered into food safety risk assessment.

[SLIDE 17 – TRANSPARENCY]

Transparency in risk management is especially important when factors beyond human health risk assessment are considered. And transparency goes beyond the effective communication of decisions to those outside of the community of decision-makers. It requires openness in how we frame risk management questions, and in discussions about the weightings that different factors have when choosing between alternative risk management solutions. Without this, transparency can perversely be exploited to give the illusion of democracy and equal participation in decision-making. We need to remember that true democracy and equal participation requires agency to be given to all to participate in consultations and to have their interests, beliefs and views genuinely considered in decision-making.

This should not be seen as a new challenge. The FAO reminded us in 2017 that decision-makers therefore need to consult broadly, consider a wide range of evidence, and balance health, trade, food and agriculture, and food security considerations” [[9]](#footnote-9) We just need to do it better, and more consistently.

We also need to exploit the ability of risk assessors to express uncertainty in ever more sophisticated ways by developing a reasoned and consistent approach to how we then deal with uncertainty in risk management decisions. This is not about undue precaution, or a reversion to hazard-based approaches. It is about better understanding how we can make decisions that are proportionate.

It is also about avoiding pitfalls. Trust and credibility are undermined when risk managers and decision-makers selectively interpret or misrepresent the scientific aspects of risk assessments, particularly with regard to uncertainty, to justify decisions which are really based on political, social, economic or other factors. It is important that we avoid the misrepresentation of risk assessment and uncertainty to justify risk management decisions based largely on other factors.

[SLIDE 18 – WEIGHING RISK MITIGATION]

But – and I cannot stress this enough – that does not reduce the legitimacy of those other factors. Weighing the risk mitigation provided by a risk management action against social impacts, costs and benefits of that action is an important, enduring and integral component of risk management. Instead, the social, economic and ethical factors that are inextricably bound up in national risk management decision-making should be identified explicitly and transparently.

The factors used by different countries will differ, and transparency aids communication, providing a means of reaching a shared understanding between trading partners. Once these factors are identified explicitly and transparently, they should then be assessed in a rigorous and consistent manner – and that assessment should be based on quantitative and qualitative evidence rather than anecdote or supposition, and the quality of the evidence and any inherent uncertainties should be documented and communicated.

[SLIDE 19 – PRELIMINARY RISK MANAGEMENT ACTIVITY]

But we shouldn’t only focus on the risk management discussions and decision that take place once all the available evidence has been collected and assessed. Just as importantly, we need to look upstream, to preliminary risk management decisions, otherwise known as problem formulation, and the way we frame the scope of the questions that we, the risk managers, pose to the risk assessors. If we want our eventual decisions to be socially robust, we need to ensure we ask the “right” questions with the “right” scope, including all relevant considerations and excluding those that are irrelevant.

We need to better understand the implications of deliberative theory and practice, a rapidly developing field, for how we might improve transparency and opened throughout the risk analysis process.

[SLIDE 20 – SOME TAKE AWAYS]

So, to summarise:

* New approaches to risk management are required, if we are to respond to complexity and change in the world around us
* As prompted by the UN Food Systems Summit, we need to think how we will optimise our impacts across food safety, security and sustainability.
* This isn’t about changing our normative approaches to food safety risk assessment – it’s about integrating the outputs of established and emerging approaches to the assessment of different attributes of foods.
* And there are significant challenges we need to overcome before we have outputs that can be integrated with others. We need a greater level of sophistication in how we describe risk management conclusions, in which we propose not just numerical regulatory limits, but also describe how risk changes each side of this limit.
* To succeed, we need to incorporate learnings from other disciplines, including decision science.
* We also need to ensure safeguards are engineered into new approaches – chief among these are transparency and the application of deliberative theory and practice.

And finally, I would like to acknowledge the colleagues who have influenced and contributed to this thinking and to the development of the narrative arc of this lecture, including Markus Lipp, Roy Kirby, Ragnar Lofstedt, Michelle Patel, Mark Lawrence, Quincy Lissaur, John O’Brien, Moez Sanaa.

1. Acknowledgements, [↑](#endnote-ref-2)
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