



IUFoST Scientific Information Bulletin  
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## OBESITY

Worldwide there are more than one billion overweight adults (approaching 20% of the world population) of which 300 million are considered obese. This modern disease was initially associated with developed countries but now it is increasingly found in developing countries side by side with under nutrition. Obesity and being overweight appears to have no borders and cuts across all age groups, ethnic groups, gender, and social-economic classes.

In simple terms, obesity is caused by (1) excess energy intake especially from high fat foods, refined sugars, alcohol, and a limited consumption of fruits, vegetables and high fiber foods, and (2) a decrease in physical activity primarily driven by the evolution of technology and a general acceptance of activities which do not involve movement or exercise. Since 1980, obesity has increased three-fold in some areas of North America, the United Kingdom, Eastern Europe, the Middle East, the Pacific Islands, Australasia and China. Obesity is considered to be a contributing factor to chronic diseases such as heart disease, cancer, and diabetes. The significant role of obesity and obesity-related factors in cancer is considered in the 2007 World Cancer Research Fund Report Food, Nutrition, Physical Activity, and the Prevention of Cancer: a Global Perspective. Of special concern is the increasing level of child obesity. Studies have suggested that the number of overweight children worldwide will increase significantly by the end of the decade leading to a profound impact on public health care systems. If this trend continues unchecked, by 2010 almost half the children of North and South America will be overweight along with one in five in China and 38 percent of all children in the European Union.

“Obesity” goes beyond overweight and is scientifically defined by Body Mass Index (BMI), a number that shows body weight adjusted for height. BMI can be calculated simply using meters and kilograms or inches and pounds. For adults aged 20 years or older, BMI falls into four categories: underweight (BMI below 18.5), normal (18.5-24.9), overweight (25.0-29.9), or obese (BMI over 30.0). (See [http://www.food.gov.uk/healthiereating/are\\_you\\_healthyweight/bmi\\_calc](http://www.food.gov.uk/healthiereating/are_you_healthyweight/bmi_calc)).

The goals for BMI recommended by the 1997 WHO Expert Consultation on Obesity are:

- at the population level, an adult median BMI of 21 to 23 kg/m<sup>2</sup>.
- for individuals, to maintain a BMI in the range 18.5 to 24.9 kg/m<sup>2</sup> and to avoid a weight gain greater than 5 kg during adult life.

However, a false measure of "overweight" is possible if a person has significant muscle mass, ie for healthy individuals with BMIs of 25 or 26, the "excess" weight may actually not be fat. Further doubt is cast on the value of BMIs by recent US CDC epidemiological findings on the relationship between BMI and deaths (Flegal, K M et al, 2007). Recently it has been suggested that an individual's waist-to-hip

ratio (WTHR) is a better predictor of heart attack than their BMI. WTHR is calculated by measuring the waist and hips in centimeters (or inches) then dividing the waist measurement by the hip measurement. In women, the ratio should be 0.8 or less, and in men it should be 1.0 or less.

In recent years, international and national organizations have become committed to find effective means to promote healthier life styles globally or in their own countries. For example, in 2007, the Advertising Standards Authority's Committee of Advertising Practice (CAP), the body responsible for writing the UK non-broadcast advertising code, announced [new rules for food and soft drink product advertisements to children](#). The new rules are designed to help protect children's health and respond to concerns about rising levels of childhood obesity. In summary, the new rules state that advertisements for food or soft drink products should not:

- condone or encourage poor nutritional habits or an unhealthy lifestyle in children;
- encourage excessive consumption of food or drink products;
- use promotional offers in an irresponsible way;
- use "high pressure" or "hard sell" techniques;
- use licensed characters or celebrities popular with children if targeted directly at pre school or primary school children; and
- give a misleading impression of the nutritional health benefits of the product (CAP News, 2007).

As from 1 April 2007, the UK communications regulator Ofcom has set limits on foods that can be advertised to children on TV using the UK Food Standards Agency's Nutrient Profiling scheme (Food Standards Agency, 2007). There has been considerable controversy about the Nutrient Profiling scheme being based on 100 g for all foods regardless of typical amounts normally consumed, and it is under review.

In October 2007 the Foresight Programme of the UK Office of Science and Technology published a comprehensive report under the title "Trends and drivers of obesity: A literature review for the Foresight project on obesity."

Other groups with similar guidelines, proposals, investigations, or regulations include the European Health Commission, the Thai National Broadcasting Commission (NBC), the United States Federal Trade Commission (FTC), World Health Organization (WHO), the New Zealand Government, Canadian Food and Drug Industry, South Korean Government, and the Brazilian National Council for Advertising Self Regulation.

Long-term weight change is a straightforward matter of balance between energy intake and energy expenditure. Weight gain results from a combination of eating too many kilojoules and not getting enough physical activity. To encourage physical activity, organizations such as [America on the Move](#), British Heart Foundation, National Heart Foundation of Australia, and others encourage walking (10,000 steps a day if possible) along with a healthy diet. Based on [scientific studies](#) and first popularized in Japan, 10,000 steps translate into about 6.5 to 8 kilometers (4 to 5 miles), so it represents a big increase in daily activity for many office workers. However, with humans, solving the problem is far from straightforward. Many factors play a part in weight control, including but not limited to genetic make up, metabolism, behaviour, environment, culture, and socio-economic factors. However any small steps (or 10,000 steps) in the right direction on a daily basis can make a difference in the long term.

While research efforts continue to improve our understanding of the genetic and metabolic factors that open up new possibilities for combating obesity, the immediate concerns are environmental and

behavioural where individual choices can be made. A serious review of current practices related to a sedentary lifestyle and an over-consumption of high fat, high energy-containing foods is required along with current marketing and advertising values and practices related to both. Additionally, a challenge for science and technology related to food and nutrition continues to be the development of equally attractive low-energy equivalents of desirable intense energy foods.

Since the turn of the 21<sup>st</sup> century, the global awareness of obesity reached an all time high but the obesity epidemic continues to grow. A continued effort from the public, private and government sectors appears essential to initiate a downward trend and a breakthrough in terms of actions, policies and results. There is no longer a need to draw attention to the obesity epidemic, there is a need to move to the next steps. Suggestions for these steps which continue to be under consideration include:

- environmental changes that offer healthy food choices and active lifestyles;
- taxes or levies on specific foods high in fat or refined sugars;
- governmental subsidies for fresh fruits and vegetables to assist in lower costs at the consumer level;
- effective consumer education for the individual and families should be particularly related to portion control, food labels, and identification of hunger signals;
- a “dietary management strategy” for the consumer for meals eaten outside of the home;
- strong partnerships (government, private sector and public) to help educate the consumer on obesity problems, good foods and diet/food/device misinformation; and
- sponsorships by individuals, foundations, universities, the food industry and governments of short and long term research programs.

Public health authorities concerned about the issue of obesity in their jurisdiction may find the following reference sites useful to obtain improved understanding of the issues. They should also be prepared to engage in dialogue with the learned society for food science and technology in their country to assist in ascertaining the extent to which food science and technology can play a role in addressing the issues. Such bodies are normally the adhering body for IUFOST, and their contact details are obtainable through the IUFOST website or through the office of the Secretary-General.

#### **IUFOST-recommended authoritative websites relating to obesity:**

America on the Move

<http://aom.americaonthemove.org/site/c.krLXJ3PJKuG/b.1524889/k.BFFA/Home.htm>

Danish National Board of Health– Obesity Backgrounder

[http://www.europa.eu.int/comm/health/ph\\_determinants/life\\_style/nutrition/documents/ev\\_20030630\\_co08\\_en.pdf](http://www.europa.eu.int/comm/health/ph_determinants/life_style/nutrition/documents/ev_20030630_co08_en.pdf)

European Nutrition Statement 10 February 2004

<http://www.food.gov.uk/multimedia/webpage/europenutritionstatement>

Experts forecast major increase in childhood obesity by 2010

<http://www.iotf.org/media/2010forecast.htm>

Flegal, K M et al (2007). "Cause-Specific Excess Deaths Associated With Underweight, Overweight, and Obesity", *JAMA*. **298** (17):2028-2037.

<http://jama.ama-assn.org/cgi/content/abstract/298/17/2028>

Institute of Food Technologists (IFT) – Third Research Summit, February 2004: The Obesity Conundrum – Is There a Food Solution?

<http://members.ift.org/IFT/Research/ResearchSummits/>

International Association for the Study of Obesity and its International Obesity Task Force

<http://www.ietf.org/>

UK Advertising Standards Authority (2007). New Food Rules for Non-Broadcast Ads

[http://www.cap.org.uk/cap/news\\_events/news/2007/New+food+rules+for+nonbroadcast+ads.htm](http://www.cap.org.uk/cap/news_events/news/2007/New+food+rules+for+nonbroadcast+ads.htm)

UK Food Standards Agency -- Body Mass Index (BMI) calculator

<http://www.eatwell.gov.uk/healthydiet/healthyweight/bmicalculator/>

UK Food Standards Agency (2007). Nutrient profiling for tightening controls on the TV advertising of food to children

<http://www.food.gov.uk/healthiereating/advertisingtochildren/nutlab/>

UK Office of Science & Technology (2007). Foresight Programme "Trends and drivers of obesity: A literature review for the Foresight project on obesity"

[http://www.foresight.gov.uk/Obesity/Outputs/Literature\\_Review/Literature\\_review.htm](http://www.foresight.gov.uk/Obesity/Outputs/Literature_Review/Literature_review.htm)

US Centers for Disease Control -- National Center for Chronic Disease Prevention and Health Promotion

<http://www.cdc.gov/nccdphp/dnpa/obesity/>

US Surgeon General's Call To Action To Prevent and Decrease Overweight and Obesity

<http://www.surgeongeneral.gov/topics/obesity/>

World Cancer Research Fund / American Institute for Cancer Research. Food, Nutrition, Physical Activity, and the Prevention of Cancer: a Global Perspective. Washington DC: AICR, 2007.

[http://news.bbc.co.uk/1/shared/bsp/hi/pdfs/31\\_10\\_07\\_dietcancer.pdf](http://news.bbc.co.uk/1/shared/bsp/hi/pdfs/31_10_07_dietcancer.pdf)

World Health Assembly Resolution WHA57.17 – Global Strategy on Diet, Physical Activity and Health

<http://www.who.int/dietphysicalactivity/goals/en/>

White Paper on a Strategy for Europe on Nutrition, Overweight and Obesity-related health issues

[http://ec.europa.eu/health/ph\\_determinants/life\\_style/nutrition/documents/nutrition\\_wp\\_en.pdf](http://ec.europa.eu/health/ph_determinants/life_style/nutrition/documents/nutrition_wp_en.pdf)

Yusuf S *et al.* (2005) Obesity and the risk of myocardial infarction in 27,000 participants from 52 countries: a case-control study. *The Lancet*, 366 (9497):1640-9

[http://www.ncbi.nlm.nih.gov/sites/entrez?cmd=Retrieve&db=pubmed&dopt=AbstractPlus&list\\_uids=16271645&query\\_hl=8](http://www.ncbi.nlm.nih.gov/sites/entrez?cmd=Retrieve&db=pubmed&dopt=AbstractPlus&list_uids=16271645&query_hl=8)

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The International Union of Food Science and Technology (IUFoST) is the global scientific organisation representing over 200,000 food scientists and technologists from more than 60 countries. It is a voluntary, non-profit association of national food science organisations linking the world's food scientists and technologists.

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