

# The state of nutrition in the world

By Dr Kraisd Tontisirin and Dr Pattanee Winichagoon

**The global context in which Nestlé operates influences our initiatives in Nutrition, Health and Wellness and we engage with a wide range of experts when developing strategies to address nutrition needs. Here, Dr Tontisirin and Dr Winichagoon discuss the major nutrition issues confronting the world today.**

## **A complex global scenario**

Proper nutrition or nutritional well-being – or “nutrition security” as this is also known – is when people are able to access and consume enough foods with adequate nutritional quality and safety, and utilise these in the body to meet all macro- and micronutrient requirements. Thus, nutrition security, as the continuum of food security, is concerned with food availability and distribution, food hygiene and environmental sanitation, clean drinking water, and basic health protection and promotion, such as maternal and child care and immunisation.

In recent decades nutritional science has clearly demonstrated the importance of nutrition for health and general well-being. Proper nutrition provides adequate immunity to prevent infection from viruses and bacteria; enhance cognitive development and learning ability; increase physical performance and improve work productivity. Over-nutrition leads to overweight people, obesity and diet-related chronic diseases (such as high blood lipids, high blood pressure, diabetes, cardiovascular diseases and cancers). The term “malnutrition” has been used deceptively for a long time, to imply nutritional deficiencies due to prevailing ailments related to undernourishment and poverty. The recent global epidemic of over-nutrition has widely affected populations in both developed and developing countries, and across socio-economic classes. Hence, the nutrition scenario of the 21st century is more complex than in the previous few decades. Many countries currently face the challenges of the “double burden of malnutrition (DBM)”, a coexistence of under-nutrition and over-nutrition in the same population group or even in the same community, household or individual.

## **Some progress has been made but the challenges are large**

The UN Food and Agriculture Organisation (FAO) and the World Health Organization (WHO) jointly organised the International Conference of Nutrition (ICN) in 1992 to obtain

the commitment from member nations and the global community to goals and strategies for the prevention and control of malnutrition. This effort and other subsequent global movements resulted in a reduction of child under-nutrition and micronutrient deficiencies and, to some extent, maternal malnutrition during the past two decades. However, FAO recent estimates showed that more than 840 million people remain “food insecure” – a condition measured by food energy availability and access to meet the population requirements. About 20 million babies were born with low birth weight (LBW) (<2500g), indicative of maternal under-nutrition during pregnancy. LBW is an important risk factor for under-nutrition post-natally and consequently, for poor physical and cognitive performance. It is also an important risk factor for diet-related chronic diseases in later life. Stunting and underweight still prevails in developing countries, affecting 178 million and 140 million under-five children, respectively. Annually, about 5 million infants and children under five die from direct or indirect malnutrition-related causes. Food crises also aggravate the situation in countries where there is a persistent failure of development, such as in Africa, parts of Asia and Latin America.

Micronutrient deficiencies have affected 2 billion people worldwide, mainly in developing countries. Vitamin A, iron and iodine are among the most common deficiencies of public health significance, causing reduced functionality, morbidity and mortality. In recent years in some countries, deficiencies of zinc, folate and vitamin D have also emerged as public health concerns. These problems contribute significantly to the burden of disease and economic pressure. For example, vitamin A and zinc deficiencies have been estimated at 9% of global child disability-adjusted life-years (DALYs). While iron and iodine deficiencies contribute to only 0.2% of global child DALYs, the negative consequences on cognitive and learning ability have been well established. Iron deficiency as the major cause of anaemia contributes significantly to maternal mortality in less developed countries, especially in South Asia and Africa. Altogether, micronutrient deficiencies continue to take a high toll on health and human capacity in a large part of developing countries.

At the other extreme, globally 1.6 billion adults are overweight, of whom 400 million are obese. Over 70% of these overweight and obese people are middle to low socio-economic status. The alarming evidence is the rapid

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**“Concerns over nutrition and food security include people who cannot access food to meet their requirements, either by physical access or economic access, while the ‘double burden of malnutrition’ includes the co-existence of under- and over-nutrition in the same population groups, households or even individuals, such as people suffering from obesity and anaemia.”**



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increase in childhood obesity, currently affecting 20 million children under five. It is projected that by 2015, the number of overweight people will be as high as 2.3 billion, and obesity will affect 700 million. 60% of deaths will be associated with diabetes, hypertension, cardiovascular diseases and cancer of certain organs. 80% of these deaths will be in developing countries. Epidemiological evidence has also revealed that low birth weight is an important long-term risk factor of obesity and diet-related chronic diseases.

In summary, the current food and nutrition challenges are associated with the double burden of malnutrition, or DBM, a concurrence of under-nutrition and over-nutrition, which is a common phenomenon in developing countries with rapid economic development. Under-nutrition and over-nutrition cannot be taken as totally separate challenges since they partly share the same origin of malnutrition in utero. Moreover, nutrition is the link between food and health which operates within a community's socio-economic, cultural and political environment, which is further influenced by globalisation. Addressing malnutrition needs to be done horizontally across several sectors (agriculture, health, education, development, trade, finance); at community-level, at all levels of administrative infrastructure and at policy level.

### **Nutrition, demographic shifts and socio-economic challenges**

The success of family planning and improvements in health care since the 1980s have brought about a major shift in the demographic profiles of several developing countries – a pattern shared with developed countries. The reduction in infant and young child mortality and longer life expectancy result in a rapidly increasing proportion of elderly citizens, especially in the newly industrialised countries. Nutritional and health care needs will change from focusing resources on programmes for mothers and young children to allocating a higher proportion for the care of the ageing population in order to promote healthy living and prevent premature disability or death.

Poverty has been a major underlying cause of food and nutrition insecurity, contributing to malnutrition and overall poor development. Nutrition illiteracy and lack of proper knowledge and caring practices by mothers for infants and young children persist in both traditional and economically improved population sectors. In addition, common infections and emerging infectious diseases, namely, diarrhoeal diseases, respiratory tract infections and parasitic infestations remain highly prevalent among countries with poor levels of development. The emerging infections, HIV/AIDS, re-emerging tuberculosis related to or independent of HIV, and malaria affect a large number of people in many countries in Africa and part of Asia. Civil strife further impedes human capacity development and worsens the food and nutrition situation in several poor developing countries.



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**Malnutrition challenges**

Poverty is a major underlying cause of food and nutrition insecurity, contributing to malnutrition in developing countries.

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**Living longer**

Greater life expectancy, especially in newly industrialised countries, means that a higher proportion of nutritional and healthcare needs will need to be allocated to the care of elderly citizens.

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**Over-nutrition**

The recent global epidemic of obesity and diet-related chronic diseases such as high blood pressure, diabetes and cardiovascular disease, has affected populations in both developed and developing countries, and across all socio-economic groups.

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**The nutrition scenario of the 21st century is more complex than in the previous few decades. Many countries currently face the challenges of the “double burden of malnutrition” (DBM), a coexistence of under-nutrition and over-nutrition in the same population group or even in the same community, household or individual.**

Recent advances in technology, transport and communications make it possible to link different parts of the world in a very short time and so called “globalisation” has a visible impact on the food system, from food production to storage, processing and distribution. In addition, the proliferation of supermarkets increases the channels for food availability while quality and safety continue to require good quality-assurance and monitoring systems. Food marketing and advertising has a strong influence on availability and choice and eventually modifies the food cultures of many traditional societies. Higher consumption of more fatty and sugary foods is a global phenomenon. Urbanisation is happening rapidly in many developing countries, at a much faster pace than it occurred in Western countries over the past century. Moreover, people in urban areas have a more sedentary lifestyle, in their living and working environments and their leisure activities. The resulting changes in dietary habits and physical activities have become more and more evident, leading to over-nutrition and diet-related chronic diseases.

During the end of 2007 and the first half of 2008, the cost of food production increased due to a tripling of fertiliser prices and a doubling of transport costs associated with increased gasoline prices. Food-producing countries immediately reacted with short-term food trade policies, such as bans on rice exports, minimum export prices, increasing minimum purchase prices, increases in subsidies for agricultural inputs, reducing import tariffs for staple grains, selling rice stock at subsidised prices or releasing public stocks. These policy interventions might have distorted the market and food prices. Although it is still speculative, higher food prices may cause households to change their purchasing and dietary patterns. Buying less of animal food sources and fruits and vegetables, skipping meals, changing cooking methods and reducing

the quality of complementary foods for children are the likely adjustments or coping strategies of food-insecure households. The prospect is increases in child under-nutrition and micronutrient deficiencies among children, women, and other vulnerable groups.

The food crisis of early 2008, which saw reduced food production and supply of cereals, is associated with climate changes and an increased demand for biofuels (from corn, sugar, palm oils) in line with increasing petrol prices. The result is drastic and marked increases in food prices. The increased demand for cereals in countries with rapid economic development outpaced food production, resulting in lower food stocks and increased price volatility. World cereal production fell by 3.6% in 2005, and worsened in 2006 with a fall of 6.9% due to recent drought in countries which have been self-adequate in cereal production. Food prices escalated in 2007/2008, with over 60% of the increase taking place during the first half of 2008. The cereal stock reached its lowest level at this time. Rising price trends have been observed for both staple (cereals and legumes) and non-staple (oils, vegetables, meat and dairy, etc.) foods. It was estimated that a 25% increase in food prices resulted in about a 10% reduction of purchasing power, with the poor spending over half of their incomes on foods.

### **Progress in scientific/technological developments**

Science and technological developments during the past few decades have brought about several changes in the field of food and nutritional sciences. Agricultural science has contributed to increasing food supply through more efficient food production, in both quantity and quality. While the green revolution has greatly increased the supply of staple grains, biofortification has been part of ongoing efforts to improve micronutrient content and availability. Recent developments include using traditional plant breeding techniques and genetic mapping; identifying breeds with high contents of micronutrients (such as, iron and zinc in rice) from gene banks; and use of genetic engineering for improved carotenoids contents of “golden rice”. Testing bioavailability of these biofortified products has been underway to ensure the bioavailability of these micronutrients. Though controversial in some countries, GMO has been used successfully in reducing the need for insecticides and pesticides, and improving the tolerance of plants to poor soil and water stress.

Various food processing and preservation techniques have been applied to improve the nutritional quality of foods. Food fortification, a less demanding behaviour-oriented strategy, has been introduced worldwide to increase micronutrients of public health importance. Other fortification including fatty acids and amino acids has also been popularised by the commercial sectors for value-added products. In addition, better animal husbandry, promotion of home gardening and improved plant protein quality (such as amino acids composition) and sensory aspects

(flavouring, texture) has increased protein food sources. Fat replacers and carbohydrates (unrefined staples, non-caloric carbohydrates, imitated fat and sugars) used in commercial food products have been developed and are being promoted for management of overweight, obesity and other diet-related chronic diseases. Continued development of prebiotics and probiotics claiming to improve gut health have now been shown to be effective for reducing diarrhoea and improved immunity.

Lastly, development and innovations in assessment tools and technology in food and nutrition have contributed to better analyses (nutrients and other functional ingredients) of food composition, the WHO has introduced a new growth standard for simpler nutritional assessment and monitoring tools, as well as making available several field test kits for food safety and developing a food quality assurance system. These tools are crucial for assessing the situation and trends, and potentially providing simpler tools for evaluating the impact of policies and programmes addressing malnutrition.

### **Global nutrition and public awareness**

Under-nutrition is well recognised because of:

- the global movement on nutrition with high publicity during the past two to three decades;
- the documentation of successful large-scale programmes;
- recent media coverage on the food crisis.

Unfortunately, in parallel with the reduction of under-nutrition, several countries “in transition” have encountered the rapidly increasing problems of obesity and diet-related chronic diseases. The roles of diets and physical fitness and exercise for prevention and control of these problems have been recognised and established. However, challenges remain in translating research knowledge into greater policy awareness, and implementing prevention and control measures. Concrete campaigns and actionable public programmes (best practice models and their effect upon nutrition and physical activities) are urgently needed. While increasing publicity for these emerging problems is important, the remaining under-nutrition in some sectors of the population or the recurrent problems related to the recent food crisis need to be realised. Thus, prevention and control of DBM will need to be strategically planned to contain the problems of both ends of the spectrum of malnutrition.

### **Policy and programmes to address the double burden of malnutrition**

Despite the importance of good nutrition for human capital and national development, advocating nutrition at policy making level has been a daunting task for many developing countries. Nutritional goals can only be achieved through multi-faceted efforts with people empowerment that require both food/nutrition and non-nutrition programmes. The lessons from successful countries

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show that as part of initiating and sustaining programmes to improve nutritional well-being, challenges need to be managed in an holistic manner and a reasonable time period is required to appreciate the impacts. Key interventions to achieve successful prevention and control of malnutrition include:

- improved efficiency of food production and ensuring a safe and nutritious food supply for consumers and traders;
- food fortification, distribution, marketing and access by the poor who are more likely to have malnutrition;
- food and dietary supplementation (focusing on energy, protein, vitamins and minerals) for high risk groups or people in emergency situations;
- food regulation and control to ensure food quality and safety;
- food and nutrition literacy and behaviour – communication and public education;
- support and protection for vulnerable groups (including a “safety-net” for disadvantaged groups);
- basic health services – maternal and child health services (ante-natal care, growth monitoring and promotion, immunisation) and basic medical care;
- improved water supply, sanitation and hygiene;
- physical activity programmes in various settings, such as schools, the work place and institutions.

### **Strategic implementation**

Integrated, community-based programmes with people’s participation are essential for full coverage of all groups. Large-scale community-based programmes have been successfully implemented at local levels (districts and below) in Thailand, Indonesia, Vietnam and China, among others. An essential element is the national commitment – devising sound food and nutrition improvement strategies and setting nutrition as a developmental goal. Although

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**Sustainable agriculture**

Improving agricultural productivity requires the conservation of natural resources, the expansion of rural infrastructure and a greater capacity for knowledge generation and dissemination.



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**Food or fuel?**

An increased demand for biofuels from crops such as corn, sugar and palm oils contributed to reduced food production and a sharp rise in the cost of food in early 2008.



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**Staple diet, unstable supply**

The increased demand for cereals in countries with rapid economic development has outpaced production, resulting in reduced access and greater price volatility.

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infrastructure may not be readily available in most developing countries, optimising and institutionalising the relevant resources to suit local contexts has been shown to be feasible and effective. At the community level, actions should include basic services, mass mobilisation, and mutual efforts/actions to reach all people in the prevention of DBM. Keys to success include availability of basic social services, community ownership and participation, adequate population coverage, targeted intervention and capacity development at all levels.

Improvement of agricultural productivity and reducing hunger require sustainable agriculture and rural development. Some key activities are: development and conservation of natural resources, expansion of rural infrastructure, strengthening the capacity for knowledge generation and dissemination. Access to food for the most needy through “safety nets” should be ensured. Interventions to improve food availability and access for the poor may include food production, income generating activities and safety net programmes to provide the most needy families direct access to and consumption of adequate food. Food and nutrition education should include promotion of good practices in agriculture, food supply and nutrition, and may be implemented through agriculture, health, education services and other development systems. A food chain approach may be used to ensure a safe and nutritious food supply for consumers and trade, and interventions should be done at different management levels and different points of the food chain.

Effective food control systems should be equipped with appropriate food laws and regulations, and food control management. Inspection and laboratory services need to be established for monitoring of foods in the markets and collecting epidemiological data on food poisoning outbreaks. Risk-based and right-to-food approaches may be applied to ensure that adequate quantity and quality is accessible by all people.

Food-based strategies/actions for prevention and control of DBM include ensuring food security, safe and nutritious food supply for consumers, and consumer education and communication in food, diet and nutrition. For alleviating micronutrient deficiencies, specific direct nutrition intervention, such as food supplementation, feeding programmes and food fortification may be needed.

Due to the close inter-relations between nutrition and infections, provision of primary health care and basic health and medical services are essential components for a successful nutrition programme. Nutrition indicators can be used for goal setting and monitoring of the impacts. Other essential public health measures include: health/nutrition education, immunisation, clean water supply, hand washing and basic sanitation, deworming as needed, insecticide-treated bed nets (in malaria areas), treatment of malaria and other common diseases. In addition, control of tobacco consumption, promotion of exercise and physical activity,

and community and household care will also be important components in the prevention and control of diet-related chronic diseases.

### **Alliances and partnerships: public and private sector**

The goal for public and private partnerships should be food and nutrition security for all – that is, people should be physically or economically able to access, consume and utilise nutritious and safe foods, leading to nutrition wellbeing throughout the human life cycle.

Public and private partnerships may begin with dialogue, building trust and responsibility to produce and supply a variety of healthier foods and diets for consumers. Such partnerships will be an excellent context within which to carry out food and nutrition education and communication, giving consumers the factual and credible nutrition information they need to buy and consume healthy diets for an active and healthy life. One could envisage many more collaborative projects or activities that aim to improve nutrition within vulnerable population groups, who have been suffering from double-burden malnutrition. Those actions could include fortification with vitamin A, iron and other essential micronutrients, promoting school meals and physical activity programmes in schools, community-based projects in agriculture and food production, linked with engaging working people for income generation, environmental conservation. Capacity development at various levels of project and programme formulation and implementation could be strengthened by education and training; “learning by doing” could be a key component of such a partnership, which would in turn lead to sustainable development.