

The State of Food and Agriculture 2013: Food systems for better nutrition

Questions and Answers

What is malnutrition?

Malnutrition is an abnormal physiological condition caused by inadequate, unbalanced or excessive consumption of macronutrients (carbohydrates, protein, and fats that supply dietary energy) and micronutrients (vitamins and minerals) that are essential for cognitive development and growth.

Malnutrition can be categorized in several different ways. The main types of malnutrition discussed in this report are undernutrition, micronutrient deficiencies, and overweight and obesity. These types of malnutrition overlap and may coexist within the same country, household or individual (a person may suffer from undernutrition as a child and obesity as an adult and may have micronutrient deficiencies at any weight).

How is malnutrition measured?

There is no single way of measuring malnutrition because it includes such a wide range of conditions.

For adults, the most common way of measuring undernutrition (underweight) and overnutrition (overweight and obesity) is the Body Mass Index. The BMI equals the body weight in kilograms divided by height in metres squared (kg/m^2). Underweight = $\text{BMI} < 18.5$; overweight = $\text{BMI} \geq 25$; obesity = $\text{BMI} \geq 30$. Obesity is a subset of overweight.

For children, the most common indicators of undernutrition are underweight (low weight for age), wasting (low weight for height), and stunting (low height for age). Wasting is an indicator of acute deprivation. Stunting is the result of long-term deprivation and repeated illness. Underweight may be due to chronic or acute deprivation. SOFA uses stunting as its primary indicator of child undernutrition

Micronutrients are measured differently depending on the nutrient in question. Vitamin A, iron and iodine are the most commonly measured micronutrients and are the ones reported in SOFA 2013.

How does malnutrition differ from undernourishment and food insecurity?

Malnutrition is the *outcome* of poor nourishment (inadequate, unbalanced or excessive nourishment). Other factors such as illness and poor sanitation also contribute to malnutrition.

Undernourishment refers to food *intake* that is insufficient to meet dietary energy requirements for an active and healthy life.

Food insecurity exists when people lack access to sufficient food for an active and healthy life. The four dimensions of food insecurity are availability, access, stability and utilization.

People who are undernourished or food-insecure are likely to suffer from malnutrition (e.g. undernutrition and micronutrient deficiencies). But some people may have malnutrition (e.g. micronutrient deficiencies and overweight/obesity) even if they are neither food insecure nor undernourished in the sense normally meant by FAO.

How many people in the world are malnourished?

There is no single estimate of the number of people in the world who are malnourished because the different types of malnutrition overlap. An estimated 868 million people in the world (12.5

percent of the population) are undernourished (SOFI 2012). 160 million children under the age of five (28 percent) are stunted [Figure 2, p. 16]. About 2 billion people suffer from micronutrient deficiencies [Figure 2, p. 16 and Figure 4, p. 21]. About 1.4 billion people are overweight; 500 million of these are obese [Figure 3, p. 17].

The persistence of stunting and micronutrient deficiencies in countries that are on track to achieve the MDG target on reducing undernourishment illustrates the key point that good nutrition requires more than just consuming adequate levels of dietary energy.

Why are the trends in undernourishment, stunting and micronutrient deficiencies not necessarily aligned?

The discrepancy between some indicators of malnutrition reflects the fact that they measure different things. For example, some countries have made significant progress in reducing undernourishment and this is largely a reflection of higher levels of calorie availability. This is crucial, especially when undernutrition remains widespread, but other measures of malnutrition, as for example stunting and/or micronutrient deficiencies, may be falling more slowly in the same country. This can happen for a number of reasons. For one, if diets are monotonous they may supply sufficient energy, but not the micronutrients necessary for healthy growth and cognitive development. Moreover, stunting is connected to low birth weights, followed by inadequate breastfeeding, poor quantity and quality of diets during the first two years of life, inadequate hygiene, sanitation and care. Nutrition is key but other factors also play a role in good nutritional outcomes.

Is obesity now the biggest nutrition problem in the world?

No. Although the prevalence of overweight and obesity is rising rapidly, even in low-income countries, the economic and social burdens due to undernutrition and micronutrient deficiencies are still higher globally and much higher in the developing world. The burden due to child and maternal malnutrition is 3 times higher than that due to adult overweight and obesity in the developing world (164 million vs. 56 million years of health life lost (disability adjusted life years (DALYs) [Table 1, p. 18]).

What do you mean by “food systems”?

The food system includes production (including inputs and research), through processing, storage, transport and retailing, to consumption. Food systems encompass all the people, institutions and processes by which agricultural products are produced, processed and brought to consumers. They also include the public officials, civil society organizations, researchers and development practitioners who design the policies, regulations, programmes and projects that shape food and agriculture.

Why should we focus on food systems for nutrition? Isn't that obvious?

Every aspect of the food system influences the availability and accessibility of diverse, nutritious foods and thus the ability of consumers to choose healthy diets. The principle of shaping food systems to improve nutrition is founded on a food-based approach. Food-based interventions recognize the central place of food and diets in improving nutrition. A food-based approach also recognizes the multiple benefits (nutritional, physiological, mental, social and cultural) that come from enjoying a variety of foods. Creating a strong nutrition-enhancing food system is arguably the most practical, convenient and sustainable way to address malnutrition, as food choices and consumption patterns ultimately become integrated into the lifestyle of the individual.

What can food systems do to improve nutrition and reduce stunting in the first thousand days?

Maternal and child malnutrition is the primary pathway through which poverty is transmitted from one generation to the next. The critical window for adequate child growth and cognitive development is between conception and 24 months of age. Developmental damage that results from undernutrition during this period cannot be reversed. For this reason many national and international nutrition initiatives now focus on the first 1000 days.

Care and feeding practices are emphasized in dealing with maternal and child undernutrition. Improved hygiene and de-worming, exclusive breastfeeding for infants during the first six months, and vitamin and mineral supplements are known to be highly cost-effective interventions.

Food systems are not yet emphasized in efforts to address maternal and child undernutrition, but they should be an integral part of strategies to improve maternal and child nutrition during the first 1000 days. For example, while children should be exclusively breastfed during the first six months, after this time they need energy-dense, micronutrient-rich complementary foods, and older children gradually share what should be nutritious family diets. Food systems play an important role in providing, in a sustainable manner, diverse and nutritious food obtained from own production or from local markets. Nutrition education and counselling play a central role in promoting good prenatal and postnatal care and diets for the mother and child. This especially concerns the most appropriate types of complementary foods, as well as preparation, storage and feeding practices.

Within the food system gender roles are directly relevant for child and maternal malnutrition. Reducing the gender gap in agriculture and increasing women's control over resources and incomes has been shown to benefit their children's health, nutrition and education, as well as their own health and nutritional status.

Women in most countries also undertake most of the work related to child care, food preparation and other household responsibilities such as collecting fuel and water. Interventions need to be sensitive to these time constraints that women face as these directly impact on their ability to care for their children's nutritional needs.

How can agricultural production improve nutrition?

The most fundamental way in which agricultural production contributes to nutrition is by making food more available and affordable through agricultural productivity growth. Agricultural production is also a key determinant of dietary diversity and thus intake of micronutrient rich foods. Agricultural productivity growth in both staples and non-staples, as well as diversity in production, are the main ways in which agriculture contributes to improved nutrition.

How can food processors and retailers improve nutrition? Don't they just produce what people want?

Food processors and retailers can improve nutrition through improving their overall efficiency (reducing costs and therefore prices); in enhancing the availability and accessibility of a wide diversity of foods; by adhering to appropriate food safety standards; by reducing post-harvest nutrient losses and improving the nutritional quality of foods through fortification and reformulation. They can also contribute to better nutrition by making a greater variety of foods available to a wider consumer base throughout the year.

Are multinational food processors and retailers responsible for the obesity epidemic? (or: has the supermarket revolution contributed to the obesity pandemic by making cheap, energy-dense processed foods widely available?)

Yes and no. The most immediate cause of overweight and obesity is overconsumption of energy relative to physical requirements. Overconsumption is in part due to changes in the food system which have led to lower real food prices, changes in the relative prices of different types of food, and the increased availability of highly processed, energy-dense, micronutrient-poor foods. But there has also been a rise in demand for processed and packaged goods, often high in fats and sugars, which is associated with increasingly urban lifestyles leading consumers to demand more convenience, because they are less willing or have less time available for food production, acquisition and preparation.

It is relevant to note that multinational food processors and retailers operate also in those developed countries (for example, France and Italy) in which the obesity is not a moderate or serious public health threat.

Are current consumption patterns sustainable?

Sustainable diets imply a change in dietary preferences to reduce overconsumption, and a shift to nutritious diets with lower environmental footprints. They also mean a reduction of losses and waste throughout the food system. Ultimately, the aim of a successful transition to healthier and sustainable diets is for people and the ecosystem to be healthier.

Is eating meat necessary for good nutrition? Is it environmentally sustainable?

Animal foods are recognized as having high energy density and as good sources of high-quality protein and important vitamins and minerals. Increasing access to affordable animal source foods could significantly improve nutritional status and health for many poor people, especially children. However, excessive consumption of livestock products is associated with increased risk of overweight and obesity, heart disease and other non-communicable diseases.

Furthermore, the rapid growth of the livestock sector means that competition for land and other productive resources puts upward pressure on prices for staple grains as well as negative pressures on the natural resource base, potentially reducing food security in the longer term.

Aren't overweight and obese consumers responsible for their own problems? Why should the government be involved?

Overweight and obesity are important risk factors for non-communicable diseases and in those countries which they have become significant public health concerns these diseases are imposing a high cost, both in direct health care costs, as well as in indirect social and economic costs. This cost to society imposed by overweight and obesity justifies government intervention.

Do we need to consider gender roles within food systems?

Yes. Within the food system, gender roles are directly relevant for child and maternal malnutrition. Increasing women's control over resources and incomes has been shown to benefit her children's health, nutrition and education, as well as their own health and nutrition. Agricultural production and food processing are the main sources of employment for women in most developing regions, yet women typically control fewer resources and earn lower incomes than men, so closing the gender gap in agriculture could produce significant nutritional gains for society. Women in most countries also undertake much of the work related to child care, food preparation and other household responsibilities such as collecting fuel and water.

Women thus face multiple trade-offs in the allocation of their time that directly impinge on their own and their children's health and nutritional status.

What do we mean by dietary diversity and how important is it?

Healthy diets are diverse, contain a balanced and adequate combination of macronutrients (carbohydrates, fats and protein) and essential micronutrients (vitamins and minerals). They are essential for good nutrition. Nutrition guidelines generally maintain that diverse diets that combine a variety of cereals, legumes, vegetables, fruits and animal-source foods will provide adequate nutrition for most people to meet energy and nutrient requirements. Nutritionists consider dietary diversity, or dietary variety – defined as the number of different foods or food groups consumed over a given reference period – as a key indicator of a high-quality diet.

But diversity in itself does not guarantee that a diet is healthy. A diverse diet containing items that are high in fat or sugar may lead to overweight.

Is the BMI a good measure of overweight and at which point does overweight impair health?

The BMI is a convenient and widely available measure of overweight and obesity. It is a proxy measure of excessive body fat. BMI does not distinguish between weight from fatty tissue and that from muscle tissue; nor does it indicate how an individual's body mass is distributed

A high body mass index is recognized as increasing the likelihood of incurring various non-communicable diseases and health problems, including cardiovascular disease, diabetes, various cancers and osteoarthritis.

BMI classifications were established based on risks of type 2 diabetes and cardiovascular disease, but populations and individuals vary in terms of how BMI relates to both body fat composition and the prevalence of disease

What is the nutrition transition? Does it always end with overweight becoming a public health problem?

The nutrition transition refers to changes in activity and dietary patterns that, in many countries, lead to the emergence of overweight, obesity and related non-communicable diseases as public-health problems, while still dealing with undernutrition and micronutrient deficiencies .

This transition corresponds closely to rises in income and the structural transformation of the food system, as seen primarily in industrialized and middle-income countries. Economic and social development lead to the gradual transformation of agriculture, characterized by rising labour productivity, declining shares of population working in agriculture and rising urbanization. New modes of transportation, leisure, employment and work within the home cause people to lead more sedentary lifestyles and to demand more convenient foods. As the food system transforms, centralized food-processing facilities develop along with large-scale wholesale and logistics companies, supermarkets emerge in the retail sector and fast-food restaurants become widespread. The transformation thus affects the whole system, changing the ways food is produced, harvested, stored, traded, processed, distributed, sold and consumed.

The nutrition transition does not always end with overweight becoming a public health problem. A number of developed countries, such as Denmark, France, Italy, Republic of Korea and Mauritius, do not have an obesity-related public health problem.

Do the prevailing high levels of undernutrition in India show that the focus on productivity growth was misguided?

The Green Revolution saved millions from undernourishment and starvation. It has been estimated that world food and feed prices would be 35–65 percent higher, average caloric availability 11–13 percent lower and the percentage of children malnourished in developing countries 6–8 percent higher had the Green Revolution not occurred. The Green Revolution reduced hunger also in India, but it is not enough to raise yields, other, complementary interventions in the food system and other sectors are also important.

Why are seasonal factors so important for malnutrition and what can we do about them?

Much of the undernutrition in the world is due to the annual “hunger season”. Particularly in areas dependent on rain-fed cultivation the year-to-year availability of food is the key determinant of fluctuations in undernutrition and short-term deprivation. The higher labour demand at harvest time can weaken women’s nutritional status and cause low-birth weight. In some countries, such as Malawi and the Niger, strong seasonal food price variations are a major determinant of child malnutrition. Seasonal fluctuations can be reduced with investment in irrigation, storage at the community and household levels, adequate credit availability, strategic food reserves as well as food assistance.

Are medical interventions more relevant than food-based interventions for the first thousand days?

When functioning properly, food systems are the sustainable way to provide adequate nutrition for all on a daily basis. Medical interventions supplement food systems interventions when malnutrition problems are very severe and require immediate attention, or when there is a special need, as for certain populations, such as pregnant women, who can benefit from targeted supplementation.

How much of a problem are losses and waste and what can we do about them?

Globally about 1/3 of food production for human consumption is lost or wasted. In developing countries most losses occur at the farm level and along the supply chain before they arrive at the consumer. With such large losses, reducing postharvest losses could increase food supplies, reduce food prices significantly (assuming efforts to reduce waste generate greater benefits than their costs) and reduce pressure on land and other scarce resources.

In developing countries reducing losses means improving farm level, storage, processing and distribution practices. In developed countries the greater focus should be on consumer education and information.

If it is so cost-effective why don’t we eliminate micronutrient deficiencies through fortification in poor countries?

Fortification is particularly effective when many people consume the particular food that is fortified. It is not feasible to fortify one staple with all key micronutrients. Moreover rural consumers are often more difficult to reach with processed/packaged foods as distribution is more costly and networks are limited.

Won’t taxing fat and sugar solve the obesity problem?

When a food is taxed consumers tend to eat less of it. Simulation studies do indicate that targeting specific foods, for e.g. soft drinks or fast foods, may lead to healthier diets for the at-

risk population, i.e. less energy-dense and more fruit and vegetables. But consumers may also switch to other foods which may or may not be less energy-dense. The end effect, in terms of diet composition, of a tax is difficult to predict. Moreover, available evidence indicates that taxes would have to be quite high, even for a small impact. Taxation may also be difficult to target. For example, taxing pork in China could reduce consumption of excess energy and saturated fats by high-income consumers who are at risk of overweight and obesity, while at the same time cause an undesired decline in protein consumption by the poor.

What is a healthy diet?

Very broadly, healthy diets are diverse, containing a balanced and adequate combination of energy, fat and protein, as well as micronutrients. What actually constitutes a healthy diet is a matter of great debate. The concept of a healthy diet remains fuzzy and is difficult to measure. Nutrition guidelines generally maintain that diverse diets that combine a variety of cereals, legumes, vegetables, fruits and animal-source foods will provide adequate nutrition for most people to meet energy and nutrient requirements, although supplements may be needed for certain populations. There are no unhealthy foods, but within the context of balanced and adequate, certain foods may be identified as good choices to redress balance and adequacy.

Which countries are doing badly?

In nearly all countries one type of malnutrition or another constitutes a public health threat. The report does not focus on specific countries but does note that countries facing protracted crises have a disproportionate number of malnourished adults and children.

Which countries are doing well, and what are they doing right that the others can learn from

The report does not focus on the experience of particular countries. It draws on evidence from reviews and studies that indicate more general validity. The interventions identified in this report as successful in reducing malnutrition are all linked to food systems. It is important to remember that other sectors also play a key role: poor health services and sanitation can themselves cause or contribute to malnutrition. With regard to food systems a number of key interventions are: promoting agricultural productivity growth through research and development; promoting cropping and dietary diversity; making interventions gender sensitive; focusing on the first thousand days; mitigating the impact of seasonal variations; enhancing the nutrient content of staple foods through, for example, biofortification; improving the efficiency of supply chains; reducing waste and losses; enhancing the nutritional quality of foods through fortification and reformulation; proving food assistance; using nutrition education, public information campaigns and regulating advertising and labelling to help consumers make healthier choices; providing good governance at all levels.