Marie Josèphe Amiot

Food systems in relation to nutrition and health

One in three people worldwide is affected by one or more forms of malnutrition (FAO et al. 2018). After a prolonged decline, the number of undernourished people increased to 821 million in 2017, adults overweight or obese reached 1.9 billion, and approximately two billion people worldwide were classed anemic and suffering from micronutrient deficiencies. A lack of essential vitamins and minerals often result in "hidden hunger" where signs of undernutrition and hunger are less visible. A person may have access to sufficient calories but lack adequate micronutrients, vitamins and minerals. "Hidden hunger" has deleterious consequences on health (Micronutrient Initiative, 2010). The triple burden of nutrition (i.e. macronutrient deficiency, deficiency in micronutrients and excess weight) can coexist within a same country. The main drivers of malnutrition include a failing food system, leading to poor nutrition, inequality, migration and conflict.

A big challenge is child malnutrition. Child stunting and wasting affect 151 million and 51 million children respectively. The causes of stunting in children are mainly due to inadequate diet and hygiene during pregnancy and the first 2 years of life (also known as the "1,000 days"). Maternal undernutrition generally results in fetal undergrowth and underweight child at birth. Inadequate breastfeeding and inappropriate non-affordable formula milk or complementary food are major factors that contribute to malnutrition in children. A recent report suggests that only 2 in 5 children meet minimum meal frequency.

The valorization of cultivated biodiversity and neglected nutritious species would sustain healthier diets.

Adult malnutrition is multifaceted and one of the causes is the consumption of energy-dense foods rather than nutrient-dense ones. This is also characterized as 'nutrition transition' that has resulted in substantial increases in the intake of sugar, salt and saturated fats, at the expense of a reduced consumption of whole grains, pulses, vegetables and fruits. In countries across the South, dietary diversity is positively associated with nutritional adequacy (coverage of nutritional needs); however, people living in urban environment are nowadays consuming more 'western'-type food that are energy-dense, with limited dietary diversity, rather than their traditional local foods.

The broad approach to reduce all three forms of malnutrition must be based on the promotion of healthy, diversified and sustainable diets. Sustainable diets

are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable, nutritionally adequate, safe and healthy, while optimizing natural and human resources (Burlingame & Dernini, 2010). In the 2030 Agenda for Sustainable Development, nutrition is spread in the numerous Sustainable Development Goals (SDGs 1, 2, 3, 5, 8, 10, 12, 14, 17). Moreover, the proclamation of the United Nations Decade of Action on Nutrition in April 2016 provides a unique opportunity for stakeholders to strengthen joint efforts towards eradicating hunger and preventing all forms of malnutrition worldwide.

In the context of climate change, growing populations and urbanization, nutrition and food production are interconnected and all the dimensions of food security and nutrition (including food availability, access, utilization and stability) are likely to be affected. There is a consensus agriculture, environment, food and health should be reconnected (Lamine et al. 2019; IPCC, 2019). A consumption-oriented approach based on all the dietary needs has been proposed that complements a production-oriented approach, usually restricted to macronutrient supply (Verger et al. 2018). Nutrition must be introduced into all the policies at macro (national), meso (territories) and micro (households/ individuals) levels that allow changing the whole food system towards more sustainability.

Measures to ensure food and nutritional security and sustainable development

National policies can support a healthy supply of processed foods and beverages, targeting a reduction of sugar, salt and saturated fat quantities.. Food reformulation help consumers eat healthily and sustainably. Dietary guidelines and packaged food labelling policies are key to guide consumers to healthier food choices.

Biodiversity can contribute to food security and improved nutrition. The valorization of cultivated biodiversity and neglected or underutilized nutritious species, such as leafy edible plants, would be a means to sustain food systems and healthier diets (Hunter et al. 2019).

Territorial approaches can be used to implement agri-food policies that better fit with a local context for greater sustainability, including nutritional objectives. Territorial Food Projects, as developed in France, aim to provide a strategic and operational framework for partnership actions responding to social, environmental, economic and health needs.

Locally-driven development of short accessible and affordable nutrient-rich food chains like fruit and vegetables must be tailored to allow delivering key nutritional requirements and helping to prevent non-communicable diseases.

Food waste and food loss lead to the discarding of huge amounts of nutrients and there is therefore a need to reduce them by investing in technology, practices and new norms to avoid spoiling the most perishable foods along the chain.

Communication strategies must be implemented to educate consumers about the benefit of a diversified diet based on healthier foods. School meals can also help shape children preferences and attitudes towards healthy foods and eating habits.

In terms of impact, there is a need to collect more data to explore national, territorial and consumer group interventions on nutritional outcomes and sustainability indicators. In addition to quantitative change assessments of consumption and production that meet all nutrient needs without harming the environment, a qualitative approach allows us to understand the levers and obstacles that ensure sustainable food and nutritional security. Both approaches inform decision-makers to fully support sustainable food systems.

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Marie Josèphe Amiot is a Senior Scientist and Nutritionist in the Division of Nutrition, Chemical Food Safety and Consumer Behaviour of the French National Research Institute for Agriculture, Food and Environment (INRAE). Her fields of expertise include micronutrients, plant bioactive substances, preventive nutrition, dietary recommendations, food and nutritional security and sustainable food systems.