

Compendium of WHO and other UN guidance on health and environment



Chapter 10. Safe and healthy food



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10.1 Food safety and the environment



A safe food supply contributes to food and nutrition security and supports national economies, trade and tourism, stimulating sustainable development (1). This includes proper food preparation, which can prevent a large share of foodborne diseases. Different governmental departments and agencies, encompassing public health, agriculture, education and trade, need to collaborate and communicate with each other and engage with civil society, including consumer groups, to ensure a safe food supply.

This section only covers aspects of food safety related to the environment, such as household and community hygiene practices and the use of wastewater, excreta and greywater in agriculture.



Overview

Access to sufficient amounts of safe and nutritious food is key to sustaining life and promoting good health. Safe food is not contaminated with potentially harmful bacteria, parasites, viruses, toxins, chemicals and/or radionuclides. However, food can become contaminated at any point of production and distribution. A large proportion of foodborne disease incidents are caused by foods improperly or unhygienically prepared or mishandled at home, in food service establishments or markets.

 Guidance	 Sector principally involved in planning/ implementation	 Level of implementation	 Instruments
Food safety in households and the community: awareness raising and capacity building			
1. Promote safe food handling behaviours among all consumers and food handlers (2). Key messages include the following. Keep clean • Wash hands before handling food and often during food preparation. • Wash hands after going to the toilet. • Wash and sanitize all surfaces and equipment used for food preparation. • Protect kitchen areas and food from insects, pests and other animals. Separate raw and cooked • Separate raw meat, poultry and seafood from other foods. • Use separate equipment and utensils, such as knives and cutting-boards, for handling raw foods. • Store food in containers to avoid contact between raw and prepared foods. Cook thoroughly • Cook food thoroughly, especially meat, poultry, eggs and seafood. • Bring foods like soups and stews to boiling to make sure that they have reached 70°C. For meat and poultry, make sure that juices are clear, not pink. Ideally, use a thermometer to ensure proper temperature. • Reheat cooked food thoroughly. Keep food at safe temperatures • Do not leave cooked food at room temperature for more than 2 hours. • Refrigerate promptly all cooked and perishable food (preferably below 5°C). • Keep cooked food piping hot (more than 60°C) prior to serving. • Do not store food too long even in the refrigerator. • Do not thaw frozen food at room temperature. Use safe water and raw materials • Use safe water or treat it to make it safe. • Select fresh and wholesome foods. • Choose foods processed for safety, such as pasteurized milk. • Wash fruits and vegetables, especially if eaten raw. • Do not use food beyond its expiry date.	 Health  Agro-food	Community; workplace Universal health coverage	Information, education and communication

 Guidance	 Sector principally involved in planning/ implementation	 Level of implementation	 Instruments
2. Promote growing safer fruits and vegetables (3). Key messages include the following. Practise good personal hygiene • Wash and dry hands with a clean, dry towel after toilet use, diapering a child and contact with animals. • Change clothes and bathe regularly. • Cover cuts, lesions and wounds. • Use a toilet or latrine to urinate or defecate. Protect fields from animal faecal contamination • Keep animals from roaming in a growing field. • House livestock downhill from growing fields in a fenced area. • Remove trash from in and around growing fields. Use treated faecal waste • Use faecal waste (manure and human excreta) that is properly treated. • Apply treated faecal waste to fields prior to planting. • Maximize the time between the application of treated faecal waste and harvest. Evaluate and manage risks from irrigation water • Identify all water sources relevant to the growing field. • Be aware of the risk of microbial contamination of water. • Protect water from faecal contamination. • Apply control measures when using contaminated water or water of unknown quality. Keep harvest and storage equipment clean and dry • Wash harvest and storage equipment with clean water and dry before use. • Keep containers off the ground before, during and after harvesting. • Remove visible dirt and debris from fruits and vegetables in the field. • Cool fruits and vegetables quickly after harvest or when intended for storage. • Limit access of animals, children and other non-workers to the harvest and storage areas.	 Health  Agro-food	Community; workplace Universal health coverage	Information, education and communication

 Guidance	 Sector principally involved in planning/implementation	 Level of implementation	 Instruments
3. Promote safer aquaculture products (3). Key messages include the following. Practise good personal hygiene • Use a toilet or latrine to urinate or defecate. • Wash and dry hands with a clean, dry towel after toilet use, diapering a child and contact with animals. • Cover cuts, lesions and wounds when working around fishponds. • Wash hands and change clothes after working around the fishponds and harvesting fish. • Locate fishponds away from latrines, livestock and poultry. • Choose a pond site where the chance of contamination with heavy metals or other harmful chemicals is low. • Remove weeds, rubbish chemical containers and old equipment from pond site. • Keep livestock and poultry in an area that prevents access to the fishpond. Manage water quality • Select a water source that has a very low chance of contamination with heavy metals, other chemicals and harmful microorganisms. • Prevent people and animals, including ducks, geese and pets, from flying over, wading or swimming in fishponds. • Keep rubbish, food and faecal waste removed from the home away from the fishpond. • Do not pen animals over the fishpond. Keep fish healthy • Stock ponds to the proper density with healthy fish seed stock from a certified hatchery or reliable supplier. • Maintain stock at the proper density in the growing pond. • Remove and dispose of sick and dead fish daily. • Avoid using unapproved chemicals to maintain fish health. Use clean harvest equipment and containers • Wash harvest containers and equipment with clean water. • Harvest fish early in the day and transport live or cool quickly. • Use clean water to wash harvested fish. • Keep harvested fish in clean containers on non-porous material.	 Health  Agro-food	Community; workplace Universal health coverage	Information, education and communication
4. Promote healthy and safe food markets (4). Many of the key messages listed in the three sections above apply here. Additional points include the following. Healthy and safe food markets • Ensure the provision of safe and nutritious food. • Seek to improve food safety from production to consumption. • Foster partnerships between suppliers, government and consumers. More detailed information on food hygiene can be found in the WHO/FAO Codex Alimentarius basic texts on food hygiene (5).	 Health  Agro-food	Community; workplace Universal health coverage	Information, education and communication; other management and control

 Guidance	 Sector principally involved in planning/implementation	 Level of implementation	 Instruments
Use of wastewater, excreta and greywater in agriculture/aquaculture: policies and actions			
5. Develop or update national standards and regulation for the safe use of wastewater, excreta and greywater in agriculture and aquaculture in line with the WHO guidelines (4). This includes the setting of health-based targets that define a level of health protection relevant to each hazard. For setting and achieving the health-based targets the following steps are important. • Routinely assess health risks associated with the use of wastewater, excreta and greywater in agriculture or aquaculture, for example through microbial and chemical laboratory analysis, epidemiological studies and quantitative microbial (and chemical) risk assessment. • Identify health protection measures (covered below). • Monitor and assess the system (covered below). Note: The WHO guidelines generally apply to the use of domestic wastewater. Industrial wastewater usually poses greater risks, which may require different precautions and measures (4).	 Water/sanitation  Agro-food  Health	National	Regulation; assessment and surveillance
6. Implement risk management strategies/health protection measures/control strategies for achieving the health-based targets related to the use of wastewater, excreta and greywater in agriculture or aquaculture (4). Often a combination of measures will be needed. Examples of key measures and messages include the following. For the protection of consumers • Treat wastewater and excreta used in agriculture/aquaculture. • Use lower quality effluents to irrigate non-vegetable crops or those that are not eaten uncooked (crop restriction). • Apply wastewater application techniques that minimize contamination (e.g. drip irrigation). • Allow pathogen die-off after the last wastewater application. For the protection of workers and their families • Treat wastewater and excreta used in agriculture/aquaculture. • Use PPE during handling. • Provide access to safe drinking-water and sanitation facilities. • Implement disease vector and intermediate host control. • Reduce vector contact. For the protection of local communities • Treat wastewater and excreta used in agriculture/aquaculture. • Restrict access to irrigated fields, hydraulic structures and aquacultural facilities. • Provide access to safe recreational water, especially for adolescents. • Provide access to safe drinking-water and sanitation facilities. • Implement disease vector and intermediate host control. • Reduce vector contact.	 Water/sanitation  Agro-food  Health	National; community; workplace Universal health coverage	Other management and control; regulation; infrastructure, technology and built environment

 Guidance	 Sector principally involved in planning/ implementation	 Level of implementation	 Instruments
7. Consistently monitor and assess health risks of wastewater, excreta and greywater use in agriculture and aquaculture (4). The most effective means of consistently ensuring safety in wastewater, excreta or greywater use in agriculture or aquaculture is through the use of a comprehensive risk assessment and risk management approach that encompasses all steps in the process, from the generation and use of wastewater, excreta or greywater to product consumption. System assessment aims to establish a comprehensive understanding of the system, the range and magnitude of hazards, the magnitude of risk levels and the ability of existing processes and infrastructure to manage actual or potential risks.	 Water/sanitation  Agro-food  Health	National; community; workplace Universal health coverage	Assessment and surveillance
8. Seek community and stakeholder participation early on and in all phases of wastewater, excreta or greywater use in agriculture or aquaculture (4).	 Water/sanitation  Agro-food	National; community; workplace	Governance
9. Implement management strategies for reducing negative environmental impacts of wastewater, excreta and greywater use (e.g. contamination of surface waters, groundwater and increase in soil salinity). Strategies are dependent on the polluting agent and are further detailed in <i>Guidelines for the safe use of wastewater, excreta and greywater in agriculture and aquaculture</i> (4).	 Water/sanitation  Agro-food  Environment	National; community; workplace	Other management and control
Use of wastewater, excreta and greywater in agriculture/aquaculture: awareness raising and capacity building			
10. Communicate and educate communities and other stakeholders about potential health risks and health protection measures related to the use of wastewater, excreta or greywater in agriculture and aquaculture (4).	 Health  Water/sanitation  Agro-food	Community; workplace Universal health coverage	Information, education and communication

Selected tools

WHO 2006: *The Five keys to safer food manual* (2)

This guidance provides key messages, resources and training materials about safer food practices.

FAO/IFAD/UNICEF/WFP/WHO 2020: *The state of food security and nutrition in the world 2020. Transforming food systems for affordable healthy diets* (6)

10.2 Healthy diets and the environment



Overview

Access, intake and uptake to sufficient amounts of safe and nutritious food is key to sustaining life and promoting good health (1). A healthy diet protects against malnutrition as well as NCDs such as diabetes, IHD, stroke and cancer (7).

With regard to health, much of the food that is consumed contains too little whole plant foods (fruits and vegetables) and too much added sugars and salt, saturated fats and trans-fatty acids. Shifting to more healthy diets would reduce a great disease burden mainly from NCDs (6, 8).

With regard to the environment, current patterns of food production and consumption use much of the world's resources on land and water and contribute significantly to climate and ecosystem change through for example deforestation, loss of biodiversity and GHG emissions (9). This is aggravated by the fact that about one third of food produced for human consumption is wasted (10).

Which diets are sustainable and healthy?

Sustainable healthy diets are diets that promote individuals' health and well-being and have low environmental impact. They are based on a great variety of plant-based, and unprocessed or minimally processed foods. These foods must be made available, accessible, affordable, safe and desirable to the whole population including the most vulnerable (11). They need to be accessible, affordable, safe and culturally acceptable.

SDG 2 "End hunger, achieve food security and improved nutrition and promote sustainable agriculture" includes the following selected targets (12).

- Target 2.1: By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round.
- Target 2.2: By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons.
- Target 2.4: By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.
- Target 2.5: By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed.

 Guidance	 Sector principally involved in planning/ implementation	 Level of implementation	 Instruments
Policies and actions			
1. Develop or update national food-based dietary guidelines through the full integration of environmental sustainability elements in each of the guideline's recommendations, according to national contexts (11).	 Health  Agro-food  Environment	National	Regulation
2. Integrate sustainable healthy diets in existing food systems (11). Possible actions include the following. • Support the production, processing, distribution, labelling, marketing and consumption of foods that contribute to sustainable healthy diets (such as plant-based foods and unprocessed foods). • Align food policies across sectors, such as health, agriculture, education, environment, water and trade. • Collect information on current diets across different population groups. • Identify availability of different foods, mismatches in food supply and demand, and required changes in the existing food system. • Improve access to local healthy food choices (13). • Implement restrictions on unhealthy food in and around open public spaces, schools and sports facilities (13). • Pay special attention to the poor and their access to healthy and sustainable food. • Develop national food-based dietary guidelines that define context-specific sustainable healthy diets. • Minimize the use of antibiotics and hormones in food production. • Minimize the use of plastics and derivatives in food packaging.	 Health  Agro-food  Environment	National	Regulation; taxes and subsidies
3. Improve storage, preservation, transport and distribution technologies and infrastructure to reduce seasonal food insecurity, food and nutrient loss and waste (9).	 Agro-food	National; community	Infrastructure, technology and built environment
4. Support the diversification of crops including underutilized traditional crops, applying sustainable food production and natural resource management practices (14, 15).	 Agro-food  Environment	National; community	Taxes and subsidies; other management and control
5. Support agrobiodiversity and the use of integrated pest management to reduce the need for chemical pesticides and herbicides (15).	 Agro-food  Environment	National; community	Infrastructure, technology and built environment
6. Support healthy soils/healthy soil management (15). This can be achieved through the following examples. • Use cover crops, legumes, composting and agroforestry. • Curb land clearing. • Prevent further land degradation and loss of soil fertility (e.g. through reduced monocultures and increased crop rotation).	 Agro-food  Environment	National; community	Infrastructure, technology and built environment

 Guidance	 Sector principally involved in planning/ implementation	 Level of implementation	 Instruments
7. Support and enhance sustainable local food production and processing, especially by small-holder and family farmers (15).	 Agro-food  Environment	National; community	Infrastructure, technology and built environment; taxes and subsidies
8. Preserve fish habitats and support sustainable fisheries (15). • Maintain/restore catchment vegetation to reduce runoff erosion. • Reduce water pollution from for example industry and urban areas. • Restrict destructive fishing methods.	 Agro-food  Environment	National; community	Infrastructure, technology and built environment; taxes and subsidies
Awareness raising and capacity building			
9. Educate consumers about healthy and sustainable food (11).	 Agro-food  Health  Environment	National; community Universal health coverage	Information, education and communication
10. Promote sustainable healthy diets that are high in whole grains, pulses, a variety of fruits and vegetables, and nuts and seeds; low in energy-intensive animal-sourced and discretionary foods (such as sugary beverages); and with a carbohydrate threshold (11, 16).	 Health  Food	National; community Universal health coverage	Information, education and communication
11. Promote healthy dietary changes towards less emission-intensive food products (9, 16). Key messages may include the following. • Reduce the consumption of meat, other animal-sourced foods and processed foods, while increasing the consumption of unprocessed and plant-based foods such as whole grains, legumes, fruits, vegetables, nuts and seeds. • Buy and consume locally produced food.	 Health  Environment  Food	National; community Universal health coverage	Information, education and communication
12. Raise awareness about the benefits of local food production related to community development, climate change and health and provide appropriate training on local food production (15).	 Health  Environment  Food	National; community Universal health coverage	Information, education and communication

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