Urban and peri-urban horticulture presents specific challenges to food safety that require appropriate knowledge and management skills. Stakeholders in the horticulture chain need an enabling and rules-based policy and regulatory framework aimed at ensuring food safety. Policy and planning should facilitate the production of, and access to, inputs such as urban organic wastes and irrigation water. Training programmes and technical advisory services can help growers to better manage health risks and raise consumer awareness of rules for storing and consuming fruit and vegetables.

Urban and peri-urban horticulture represents a significant part of local supply of perishable produce of good nutritional value in many developing countries. It also plays an important socio-economic role, providing urban dwellers with sources of employment and income. However, it is important to identify the food safety implications of UPH and define strategies to protect consumers from potential risks. Implementing good agricultural practices to ensure the safety of horticultural produce can be particularly challenging in the complex urban environment. A pragmatic approach is needed, involving a mix of policy, regulatory and capacity-building approaches that target all stakeholders along the horticulture chain.

Food safety challenges

Urban and peri-urban horticultural producers need to be sensitized to the risks associated with poor hygiene, inappropriate waste disposal, cultivation in unhealthy surroundings (e.g. near drains), irrigation with untreated wastewater, improper use of organic solid wastes to fertilize soil, and the excessive use of pesticides. Food intermediaries, such as transport operators, middle men and market vendors, need to ensure proper conditions for transport and storage of highly perishable horticultural produce, while consumers must be made aware of possible risks and informed of basic rules for storing and consuming fruit and vegetables. However, to bear fruit, stakeholders’ efforts must have the support of central technical authorities and municipal authorities, who need to establish an enabling and rules-based policy and regulatory framework to ensure food safety.

Laboratory analysis of street foods in Thailand

Rather than restricting UPH out of fear of possible risks, it is important to develop strategies to reduce those risks and to implement appropriate measures for the development of safe and sustainable urban horticulture. Policy and regulatory measures, including enforcement, should go hand in hand with proper training of stakeholders and provision of facilities, e.g. for organic waste recycling.
Major food safety hazards in fruit and vegetables

**BIOLOGICAL**

- **Common pathogenic bacteria** linked to contamination of fresh fruit and vegetables include Salmonella and *E. coli*. They contaminate crops through a variety of pathways, including contact with soil, dirty containers and equipment, animal manure, contaminated water and human handling.

- **Parasites** most commonly associated with contaminated fruit and vegetables are: *Cryptosporidium*, *Cyclospora*, *Giardia*, and helminths. Water contaminated with faecal material, and infected food handlers, can be vehicles for contamination.

- **Viruses** that have been passed on to humans through contaminated produce include Hepatitis A and Norovirus.

**CHEMICAL**

- **Heavy metals**, such as lead, are absorbed by plant roots and accumulate in the leaves, or are deposited on above-ground plant parts, along with polluting atmospheric gases. Heavy metal contamination is more likely in leafy vegetables such as lettuce than in beans, peas, tomatoes and peppers, which have low uptake. Heavy metals are not only dangerous for consumers. They can also make plants more susceptible to diseases and pests, which often leads to overuse of pesticides, pushing residue levels above acceptable limits.

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Integrating health, safety and welfare into policies and planning

Enhancing cooperation and communication among farmers, municipal authorities and consumers facilitates the design of effective preventive and mitigating strategies. For example, municipal regulations could serve as a common reference for all stakeholders when deciding the minimum distance between market gardens and main roads and industries, or when defining zones for specific types of urban horticulture.

Policy and planning should aim at facilitating the production of, and access to, inputs such as urban organic wastes and irrigation water by:

- establishing low-cost facilities for sorting organic wastes and producing compost
- implementing pilot projects for decentralized collection and treatment of household wastewater, with a view to its re-use in local horticultural production
- testing agricultural soils and irrigation water for pollutants, such as heavy metals and pesticides residues

Improving the linkages among health, agriculture, waste and environmental sectors would also help improve the management of irrigation water. Policy makers need to consider wastewater treatment at source, and separating industrial and municipal wastewater streams in order to reduce risks of heavy metal contamination.

**Building capacities**

Training programmes and technical advisory services, such as extension, are crucial to enhancing technical and managerial capacities of all stakeholders along the horticulture chain. Two key approaches:

- Educating growers

  Horticultural producers may need advice on hygiene, the proper choice of crops and irrigation methods, and the wise use of pesticides. They often need training in managing health risks associated with the re-use of waste (e.g. treatment procedures to reduce pathogens in organic wastes) as well as in managing environmental risks associated with overuse of agro-chemicals.

- Raising consumer awareness

  A starting point is promotion of WHO’s Five Keys to Safer Food (keep clean, separate raw and cooked, cook thoroughly, keep food at safe temperatures and use safe water and raw materials). Consumer education should also stress the need to wash leafy vegetables with potable water to effectively reduce heavy metal contamination, and the use of disinfectants, such as chlorine, in reducing microbiological loads.

**Further information**


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