



Food quality and safety

KEY FACTS

- In industrialized countries, up to 30 percent of people suffer from food-borne illnesses every year.
- An estimated 70 percent of the approximately 1.5 billion annual cases of diarrhoea in the world are caused by biological contamination in foods.
- Contaminated food plays a major role in the epidemiology of cholera and other forms of epidemic diarrhoea, substantially contributing to malnutrition.
- The incidence of food-borne diseases may be 300 to 350 times higher than the number of reported cases worldwide.
- Overuse of antibiotics has led to the appearance of resistant strains of bacteria. Factors contributing to this include overuse of antibiotics in farm animals and crops, overprescription by medical doctors and improper use by patients.

CODEX ALIMENTARIUS: GLOBAL STANDARDS

Since 1963, an international food code has been in place to ensure food safety worldwide. Codex Alimentarius, jointly administered by FAO and the World Health Organization, sets standards for pesticide and veterinary drug residues, additives, food imports, inspections and food sampling methods, among other issues. It serves as the basis for many national food standards.

Codex has established such well-known safeguards as the "Best if used before" food label and definitions for low-fat and light food. Evolving constantly, it is now meeting the new challenges of organic farming and biotechnology. For example, a Codex task force is currently drawing up recommendations on labelling standards for genetically modified ingredients.

Codex considers independent scientific advice from such bodies as the Joint FAO/WHO Expert Committee on Food Additives, the Joint FAO/WHO Meeting on Pesticide Residues and the Joint FAO/WHO Consultation on Biotechnology and Food Safety.

Public concern over food safety has increased dramatically in the last five years. Internationally accepted, science-based food standards are critical to protect public health. These standards are also evolving to address consumer concerns about new products such as genetically modified foods. A farm-to-consumer approach to food production, processing and preparation can control contamination at every link in the food chain.

EMERGING FOOD SAFETY CONCERNS

Food safety hazards arise principally from:

- bacteria and other microbial agents resulting from improper food handling;
- environmental contaminants;
- residues of substances used in agricultural production and processing, such as pesticides.

The public generally perceives agricultural residues, pesticides and veterinary drugs as the major sources of health risks, but they are not. In Europe, for example, they account for just 0.5 percent of food-borne illnesses. More common, and possibly increasing in frequency, is contamination by bacteria, protozoa, parasites, viruses and fungi or their toxins, introduced during food handling.

Recent high-profile cases of food-borne illnesses, such as those caused by dioxin contamination and cattle infected with bovine spongiform encephalopathy (BSE), or mad-cow disease, have raised public concern about food safety. But there are not yet enough data to determine whether food is more or less safe today than before. What is clear is that more effective rapid alert and response mechanisms are required to protect public health fully.

Other emerging food safety concerns include:

- Antibiotic resistance in certain pathogens, including some types of salmonella,

making them hard to treat.

- Use of genetically modified organisms (GMOs) in food production, which can lead to the transfer of allergens and antibiotic resistance (*see overleaf*).
- Organic foods, which do not contain chemical preservatives and therefore carry a greater potential risk of contamination (*see overleaf*).

DEVELOPING WORLD: SPECIFIC ISSUES

- Microbial contamination is commonplace where hygiene is poor, frequently because of lack of access to clean water. It is a major source of illness, especially among children.
- Misuse and excessive use of pesticides sometimes lead to dangerously high residue levels in food.
- Where inspection systems are weak, countries are vulnerable to dumping of unsafe food by unscrupulous traders.
- Exports of poor-quality food to developed countries can lead to rejection of shipments, depriving the exporting countries of foreign exchange and causing hardship in farming communities.



Cattle inspection in Uruguay.

FARM TO CONSUMER: THE HACCP APPROACH

The Hazard Analysis Critical Control Point (HACCP) system, which monitors critical steps in the food chain, has had a major impact on reducing contamination during food processing. Introduced in the food industry in the United States in the 1970s, HACCP has been recommended by Codex Alimentarius since the mid-1990s. It is now required by regulators in many countries such as those of the European Community, and the United States.

The adoption of HACCP in poultry processing plants in the United States probably contributed to a 26 percent decline nationwide between 1997 and 1999 in the incidence of illness caused by *Campylobacter*, the most common food-borne bacterial pathogen.

HACCP does not rely on end-of-the-line product inspection. Instead, it identifies exactly where problems *might* occur and the food handler takes appropriate precautions

to prevent contamination. For example, a plan for mushroom canning lists all the steps needed to produce a safe product. At the step in which filled cans are weighed, the plan describes the potential hazard as "overfilling resulting in underprocessing" and calls for technicians to remove mushrooms as needed. Finally, a control report must be filed at each step to ensure continual quality control.

NEW CHALLENGES FOR REGULATORS

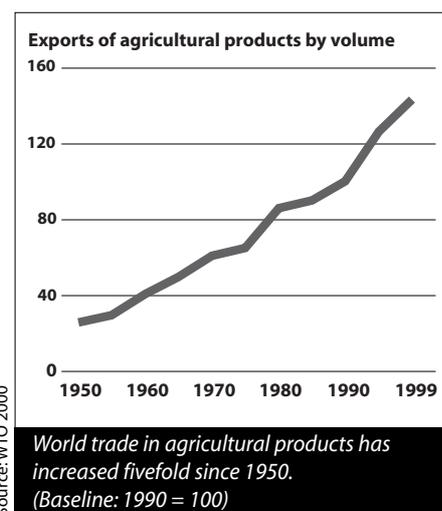
Genetically modified (GM) foods can harm consumers if the modification transfers allergens from one organism to another. For example, someone allergic to groundnuts might react to a completely different food into which the groundnut-allergen has been transferred. Regulations should require that food labelling specify any GM ingredients that transmit commonly known allergens.

Organic farming expanded by 25 percent a year in Europe in the 1990s and is making steady inroads throughout the world. While it reduces chemical residues, the absence of preservatives results in a theoretically higher risk of microbial contamination. In practice, organic produce is at least as safe as conventional foodstuffs, but there have been outbreaks of poisoning, and even deaths, from unpasteurized fruit juice. As organic farming spreads into regions with varying regimes of food standards, Codex Alimentarius will be needed more than ever to ensure food safety. Guidelines already cover production, processing, labelling and marketing of organic foods.

GROWING TRADE HIGHLIGHTS FOOD SAFETY

The growing volume of international trade in agricultural products makes the rapid transmission of food hazards more likely – and responses more urgent. Rejected food shipments cause considerable economic hardship and, if sold elsewhere, can harm human health. In 1991 in Peru, a cholera epidemic linked to the fisheries sector led to lost export orders for US\$700 million in fish and fish products. Every year, African countries lose US\$250 million in export earnings because groundnut products fail to meet international guidelines for the contaminant aflatoxin.

The Agreement on the Application of Sanitary and Phytosanitary Measures (SPS), negotiated during the Uruguay Round of multilateral trade negotiations, entered into force in 1995. SPS requires that Codex Alimentarius food safety standards be applied; if a World Trade Organization mem-

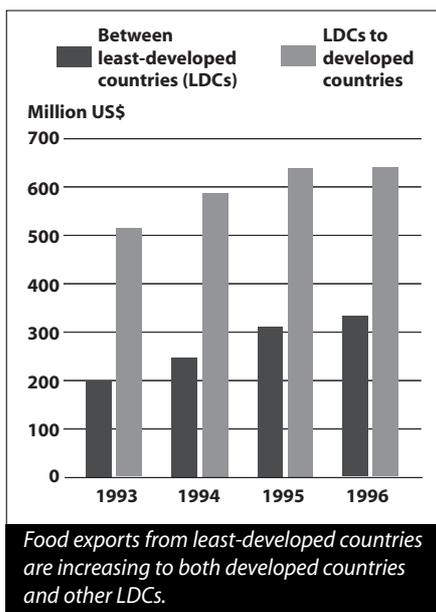


ber country requires more stringent standards it must justify them.

The main problem for poorer countries is the cost of meeting the standards. The HACCP approach in particular, with its need for trained and literate operators, can be expensive to implement. FAO has proposed a food safety and quality fund to provide grants to the least-developed countries to strengthen their systems.

Under a new Codex-promoted approach called "equivalence," which is recognized by the SPS, countries recognize other nations' inspection systems if they have broadly the same effect. This allows lower-income countries to use labour-intensive systems instead of capital-intensive ones.

Developed countries also benefit. The manufacture of raw-milk cheese in Europe is accepted internationally, provided on-farm safety measures are maintained. So is the New Zealand meat-inspection system, which is government supervised but operated by private contractors.



CONTACTS

For further information, contact:

Food Quality and Standards Service
Tel. +39 06 570 55858
Fax +39 06 570 54593
foodquality@fao.org

Media inquiries
Tel. +39 06 570 53625
Fax +39 06 570 53729
media-relations@fao.org

Food and Agriculture Organization of the United Nations
Viale delle Terme di Caracalla
00100 Rome, Italy
www.fao.org