

## Topic Page: [Food poisoning](#)

Definition: **food poisoning** from *Philip's Encyclopedia*

Acute illness caused by consumption of food that is itself poisonous or which has become poisoned or contaminated with bacteria. Frequently implicated are salmonella bacteria, found in cattle, pigs, poultry, and eggs, and listeria, sometimes found in certain types of cheese. Symptoms include abdominal pain, diarrhoea, nausea, and vomiting. Treatment includes rest, fluids to prevent dehydration and, possibly, medication. See *also* botulism; gastroenteritis

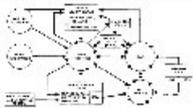


Image from:

[Salmonella poisoning - routes of infection. \(With... in Black's Veterinary Dictionary](#)

### Summary Article: **Food Contamination/Poisoning**

From *Encyclopedia of Global Health*

Food contamination or poisoning covers any disease of an infectious or toxic nature caused by the consumption of food or water. It includes cases caused by chemical contamination as well as those caused by microbes and their toxins, or any other case where harm can be done by consuming unsafe food or water.

Despite the huge developments in food production, processing, distribution, and preparation, reflecting concerns with food safety, not all populations have access to safe food and water. Nowadays, this situation is still responsible for many cases of disease and a considerable number of deaths, particularly in developing countries. Although the exact numbers are difficult to calculate, the World Health Organization (WHO) estimates unsafe food causes approximately 1.5 billion annual cases of diarrhea in children, resulting in an estimated 2.1 million deaths from diarrhea worldwide, most of them caused by contaminated food and/or water.

According to the second United Nations (UN) World Water Development Report, almost one-fifth of the world population (1 billion people) does not have access to safe drinking water. This issue is a reemerging public health problem as new foodborne disease threats occur, caused by a number of reasons. These include the current globalization as international travel and trade is flourishing, microbial adaptation, and changes in the food industry, as well as the changes in human demographics and lifestyle.

Contamination generally has a negative impact on the quality of food and may imply a risk to human health; therefore, close monitoring of this situation is vital. Surveillance of foodborne disease is a fundamental component of food safety systems, particularly in developed countries. Surveillance data can be used for planning, implementing, and evaluating public health policies. These tasks can accomplish a further development of the health of consumers, while cooperating with the food industry, which has known massive developments during the last few years. The new food and water processing techniques need to be assessed for their safety. This has created very strict regulations worldwide, thus causing severe restrictions in international commerce and some tension between exporting and importing countries.

There are many aspects connected with food contamination, and those may include chemical, microbiological, and radiological contaminations. There are several sources of contamination by chemical hazards: environmental pollution of the air, water, and soil, such as the case with toxic metals and

dioxins, or the intentional use of various chemicals, such as pesticides, animal drugs, and other agrochemicals.

Current policy has set acceptable levels of intake of certain compounds, thus ensuring food safety. Even so, there are several naturally occurring toxins, such as mycotoxins, marine biotoxins, cyanogenic glycosides, and toxins occurring in poisonous mushrooms, which periodically cause severe intoxications. Other chemicals frequently involved in food contamination are dioxins and polychlorinated biphenyls (PCBs). Dioxins are unwanted by-products of some industrial processes and waste incineration. On the other hand, metals such as lead and mercury can cause neurological damage in infants and children. Exposure to cadmium can also cause kidney damage, usually seen in the elderly. If preliminary toxicological evaluations and/or exposure estimates suggest that adverse health effects might be expected in the population, and the risk becomes sufficiently characterized, various management options may be considered, including the establishment of Codex Alimentarius standards.

Foodborne illness caused by microorganisms is considered a large and growing public health problem. Bacteria-related food poisoning is the most common, but fewer than 20 of the many thousands of different bacteria are actually the culprits. More than 90 percent of the cases of food poisoning each year are caused by *Staphylococcus aureus*, *Salmonella*, *Clostridium perfringens*, *Campylobacter*, *Listeria monocytogenes*, *Vibrio parahaemolyticus*, *Bacillus cereus*, and entero-pathogenic *Escherichia coli*. These bacteria are commonly found in many raw foods. Normally, a large number of food-poisoning bacteria must be present to cause illness. Therefore, illness can be prevented by controlling the initial number of bacteria present, preventing the small number from growing, destroying the bacteria by proper processing, and avoiding recontamination. With globalization and the thorough use of antibiotics, microorganisms are traveling faster and resulting in much more resistance, creating big problems in the control of these diseases.

Recent outbreaks of H5N1 avian influenza in poultry in Asia and, more recently, in Europe and Africa, have quickly raised awareness about new sources of infection and the risk to humans from various exposures. The vast majority of cases reported are connected with direct contact with infected poultry and airborne transmission. Although there is a possibility that the virus could also spread to humans through consumption of contaminated poultry products, so far, there is no scientific evidence that eating properly cooked food can be responsible for contamination of humans with avian influenza.

In the last years of the 20th century, bovine spongiform encephalopathy (BSE), more commonly known as mad cow disease, was making headlines on a daily basis. This fatal, neurodegenerative disease in cattle is caused by the accumulation of a misfolded cellular protein, and is also thought to be the cause of variant Creutzfeldt-Jakob disease (vCJD), a human brain-wasting disease. The misfolded protein accumulates in the central nervous system and is responsible for a rapidly progressive dementia and some patients manifest a cerebellar ataxia. The discovery of this new model of infection mechanism entitled Dr. Stanley Prusiner the 1997 Nobel Prize for Medicine.

Recent concerns have arisen concerning radioactivity, which has always been around and exists naturally in the atmosphere, soil, seas, and rivers. It is also created by human activity during energy production and military operations. Inevitably, some of this radiation contaminates food. Being invisible, tasteless, and not mentioned on food labels, it is frequently overlooked, but levels in food are strictly monitored and controlled.

Contamination from nuclear contamination from radionuclides is still a particularly present problem in

Chernobyl, more than 20 years after the nuclear reactor exploded. Close monitoring of radioactivity in products coming from that region is usual and, for instance, in dairy products, special attention is being taken to ensure that the amount of radioactivity is compliant with government regulations.

In order to monitor the quality and safety of food and water, frequent analysis of different components, including elements (toxic and nutrient), pesticide residues, industrial chemicals, volatile organic compounds, and radionuclides, must be performed. These analyses are costly and often have economical sanctions should an abnormal value be found. This has led to strong opposition from the food industry and heavier restrictions on worldwide trade.

There have been several efforts to implement worldwide policies to prevent disease attributable to unsafe food or water. These policies cover the entire food chain from production to consumption and will make use of different types of expertise, including strengthening food safety systems, promoting good manufacturing practices, and educating retailers and consumers about appropriate food handling.

Education of consumers and training of food handlers in safe food handling is one of the most critical interventions in the prevention of foodborne illnesses. Taking this into consideration, the UN General Assembly has decided to designate March 22 as World Water Day. In 2007, the theme was “Coping with Water Scarcity,” highlighting the significance of cooperation and importance of an integrated approach to water resource management of water at both international and local levels, as well as taking into account the need to provide easy and inexpensive solutions that can ensure sources of safe drinking water to all populations.

There were also some worldwide programs taking into account that most food-related illnesses can be avoided by some simple, inexpensive measures and common-sense hygiene.

The “Five Keys to Safer Food” campaign supported by WHO is one of the best examples, trying to set simple rules to improve food safety, such as keep clean; separate raw and cooked; cook thoroughly; keep food at safe temperatures; and use safe water and raw materials.

As with so many diseases, food poisoning is more likely to affect people with lowered resistance to disease. Therefore, people most at risk are children, pregnant women, and the elderly. Extra care should be taken when preparing food for these vulnerable groups to minimize the risks of their developing symptoms.

Clinical management of patients with acute symptoms of foodborne disease is generally the same regardless of cause (rest and rehydration). However, in more complicated cases, hospital care may be needed and prompt action must be taken to ensure the swift solution of these cases.

#### **SEE ALSO:**

Drinking Water; Foodborne Diseases; Joint FAO/WHO Expert Committee on Food Additives (JECFA); Lead Poisoning; Mercury.

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