

# Food Contaminants

Food contaminants are harmful chemicals and microorganisms found in food which have the potential to cause illness in consumers, they are not normally present in the human body. In developing countries there is significant exposure of the general population to pesticide residues in food. Also mycotoxins and other naturally occurring toxins present acute and chronic health hazards and are a worldwide problem. As a result of these occur toxic effects and late effects such as congenital defects, cancer and allergies.

## Pesticides and Weedkillers

Pesticides are chemical substance that protect plants from other harmful plants or animals. The three basic groups are insecticides, fungicides and herbicides. -The most widely used group was and still is in some developing countries organochloride insecticides such as DDT. Ingestion of 1-5 g cause acute intoxication and the lethal dose is 5-10 g. It can persist for close to 7 years in soil and can be to meat and milk of farm animals. -carbamates and organophosphate pesticides are more toxic but less persistent hence are less of a problem to consumers. Organophosphates mimic or block the action of natural estrogens therefore disrupt the endocrine system playing a role in regulating sexual and reproductive development.

## Antibiotics and Hormones

Antibiotics are used to treat infectious diseases in farm animals, they have been incorporated in foodstuff for growth promotion and preservation but are now banned because they lead to bacterial resistance and must not be given to milking cows. Hormones are used to increase the growth rate of animals in order for them to reach market earlier. The most effective growth hormones are natural sex hormones or substances which mimic the action of these natural hormones. If they are used appropriately, the residues in food should be very low or undetectable and not result in any significant hormonal effect. In some countries, abuses in the use of these hormones resulted in high residues in poultry, veal and eggs and has led to breast enlargement, premature cessation of pubertal development and ovarian cysts in children.

## Industry

Industrial poisons contaminate food by improper disposal of industrial waste, accidents and crime at a plant. - failure to dispose of mercury and cadmium in a safe way causes food contamination. Cadmium can also contaminate food through phosphate fertilizers, cigarettes and water. It then accumulates in the liver and kidneys with a biological half-life of 33 years. Acute intoxication was described in Japan as Itai-Itai disease manifesting as tubular proteinuria with osteomalacia and pseudofractures. Methyl mercury is the most toxic form of mercury and is found in fish, it causes irreversible encephalopathy and leads to parakusis, incubation period is 2-5 weeks. It is easily absorbed through the gastrointestinal tract and readily enters the brain. It also affects vision, hearing, muscle coordination and memory in adults. Alkyl mercury poisoning occurred in Iraq in 1972 due to use as fungicide in food grains. -Lead in soil is taken up by plants for example cereals and vegetables, or lead particles in air may be deposited on the surfaces of leaves and stems. sea food animals, e.g shellfish, accumulate lead from contaminated waters and sediments. Food lead may also be associated with introduction of unleaded petrol, non-soldered can seams and from food additives. Short term exposure to high levels causes abdominal pain, vomiting and anaemia, whereas long term low-level exposure can cause retarded cognitive and intellectual development in children. The most sensitive to toxic effects of lead are infants and young children with damage to the central nervous system - Polychlorinated biphenyls were widely used in the past but are now banned in the food chain due to their persistence.

## Radioactive Fallout

the main potentially dangerous radioisotopes are iodine-131, strontium-90 and cesium-137. Animal food is more dangerous to humans than plant animals since milk and meat concentrates the radioactive material. strontium - 90 is mostly concentrated in milk so it is especially dangerous for infants, caesium - 137 is mostly concentrated in muscle and therefore all meats may be contaminated

## Links

- Minerals and Trace Elements in Human Nutrition

## Bibliography

- BENCKO, Vladimir, et al. *Hygiene and epidemiology : selected chapters*. 2. edition. Prague. 2008. ISBN 80-246-

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- LENER, J, et al. *Medical hygiene*. 1. edition. Prague : Karolinum, 1997. ISBN 80-7184-260-5.