Contaminated food, a hazard for the very young
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Contaminated food is responsible for much diarrhoeal disease in young children, yet the education of mothers and care-givers about the preparation of food under hygienic conditions tends to be neglected.

When infants reach the age of four to six months, breast milk is no longer sufficient to meet their nutritional requirements and complementary foods should be given in gradually increasing amounts. During weaning, infants risk getting diarrhoea from exposure to foodborne pathogens; other effects may include reduced food intake and loss of nutrients through vomiting, fever, malabsorption and diarrhoea. The resulting deficiencies affect growth and the immune system, and the victims undergo a decline in resistance to other infections, including respiratory ones, often leading to death: it is estimated that 13 million fatalities occur annually among children under five years of age as a consequence of infectious diseases and malnutrition.

A major risk factor

Especially in developing countries, weaning foods prepared at home under unhygienic conditions are often heavily contaminated with pathogens; up to 70% of all cases of diarrhoeal diseases are due to contaminated food. Such contamination with pathogenic strains of *Escherichia coli* alone may account for up to 25% of diarrhoeal disease episodes. Food is often a vehicle for the transmission of pathogens of faecal origin and a medium for their growth.

The sources of food contamination include night soil, polluted water, flies and other pests, domestic animals, dirty utensils and pots, unwashed hands, and dust (see figure). Raw foods may also be the source of contaminants,

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Basic principles for the preparation of safe food for infants and young children

- **Cook food thoroughly**
  Many raw foods, notably poultry, raw milk and vegetables, are very often contaminated with disease-causing organisms. Thorough cooking will kill these organisms. For this purpose all parts of the food must become steaming hot, which means they must reach a minimum temperature of 70°C.

- **Avoid storing cooked food**
  Prepare food for infants and young children freshly, and give it to them immediately after preparation when it is cool enough to eat. Foods prepared for infants and young children should preferably not be stored at all. If this is impossible, food could be stored only for the next meal, but kept cool (at temperatures below 10°C) or hot (at temperatures near or above 60°C). Stored food should be reheated thoroughly. Again, this means that all parts of the food must reach at least 70°C.

- **Avoid contact between raw foodstuffs and cooked foods**
  Cooked food can become contaminated through even the slightest contact with raw food. This cross-contamination can be direct, as, for example, when raw food comes into contact with cooked food. It can also be indirect and subtle: for example, through hands, flies, utensils or unclean surfaces. Thus, hands should be washed after handling high-risk foods, e.g., poultry. Similarly, utensils used for raw foods should be carefully washed before they are used again for cooked food. The addition of any new ingredients to cooked food may again introduce pathogenic organisms. In this case, food needs to be thoroughly cooked again.

- **Wash fruits and vegetables**
  Fruit and vegetables, particularly if they are given to infants in raw form, must be washed carefully with safe water. If possible, vegetables and fruits should be peeled. In situations where these foods are likely to be heavily contaminated—for example, when untreated waste water is used for irrigation or untreated nightsoil is used for soil fertilization—fruits and vegetables which cannot be peeled should be thoroughly cooked before they are given to infants.

- **Use safe water**
  Safe water is just as important in preparing food for infants and young children as it is for drinking. Water used in preparing food should be boiled, unless the food to which the water is added has subsequently to be cooked (e.g., rice, potatoes). Remember that ice made of unsafe water will also be unsafe.

- **Wash hands repeatedly**
  Wash hands thoroughly before you start preparing or serving food and after every interruption—especially if you have changed the baby, used the toilet, or been in contact with animals. It should be remembered that household animals often harbour germs that can pass from hands to food.

- **Avoid feeding infants with a bottle**
  Use a spoon and cup to give drinks and liquid foods to infants and young children. It is usually difficult to get bottles and teats completely clean. Spoons, cups, dishes and utensils used for preparing and feeding infants should be washed straight after use. This will facilitate their thorough cleaning. If bottles and teats must be used, they should be thoroughly washed and boiled after every use.

- **Protect foods from insects, rodents and other animals**
  Animals frequently carry pathogenic organisms and are potential sources of contamination of food.

- **Store non-perishable foodstuffs in a safe place**
  Keep pesticides, disinfecting agents, or other toxic chemicals in labelled containers and separate from foodstuffs. To protect against rodents and insects, non-perishable foodstuffs should be stored in closed containers. Containers which have previously held toxic chemicals should not be used for storing foodstuffs.

- **Keep all food preparation premises meticulously clean**
  Surfaces used for food preparation must be kept absolutely clean in order to avoid food contamination. Scraps of food and crumbs are potential reservoirs of germs and can attract insects and animals. Garbage should be kept in safe, covered places and be disposed of quickly.
some pathogens coming from infected animals. During the preparation and storage of food there is an added risk of cross-contamination as well as an opportunity for pathogenic bacteria to multiply.

The latter danger is heightened by:

- the preparation of food several hours before consumption, combined with storage at temperatures favouring the growth of microorganisms and/or the production of toxins;
- insufficient cooking or reheating of food to reduce or eliminate biological contaminants.

Socioeconomic and cultural constraints

The avoidance of risk is hampered by certain sociocultural and economic factors.

- Safety is often neglected where food is in short supply or poverty exists.
- Customary practices may militate against food safety, and mothers may be unaware of the link between diarrhoea and the incorrect handling of food.
- Water supplies may be unsafe and there may be a lack of sanitation, which increase the risk of food contamination.
- There may be a shortage of fuel for cooking and an absence of refrigeration and other facilities for safe storage.
- There may be insufficient time for the preparation of food.

In order to save fuel or time, some people prepare food in larger quantities than needed for one meal and then store it at ambient temperature, and babies may be given weaning food that is cold or inadequately reheated. All such storage of food at ambient temperature in hot climates is particularly risky, encouraging the rapid growth of microorganisms.

Prevention

The WHO Golden Rules for Safe Food Preparation (1) should always be adhered to. Some food safety principles, with particular reference to infants and young children, are indicated in the box on p. 70.

Food should be thoroughly cooked and then fed to infants and young children as soon as it is cool enough. Preferably, foods for infants should not be stored at all, especially where there are no facilities for storage below 10°C or for keeping food close to or above 60°C.

Every effort should be made to enable care-givers to follow the principles of food safety. Mothers should be supported in their caring tasks, and community involvement in the application of the principles should be promoted.

The prevention of foodborne diseases generally requires improvement in both environmental conditions and the capacity of mothers to look after their children. Special attention should be given to advice on food safety for care-givers, notably mothers, and educational programmes on this subject adapted to the sociocultural conditions of every target group should be devised.

Acknowledgements


The list of basic principles for the preparation of safe food is adapted from Health surveillance and management procedures for food-handling personnel. Geneva, World Health Organization, 1989 (WHO Technical Report Series, No. 785).

Reference