Importance of safe and clean foods

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Contaminated and adulterated foods cause several food-borne illnesses, chronic diseases and may also contribute to malnutrition.

- Consumption of safe and hygienic foods is essential for maintaining good health.
- Environmental contaminants and adulterants in foods are health hazards.
- Consumption of unsafe foods can lead to food-borne illnesses, intestinal damage as well as undernutrition.
- Wash hands with soap and water before touching food, utensils or cooking.
- Buy food items from reliable sources after careful examination.
- Wash vegetables and fruits thoroughly before use.
- Wash the surface of eggs thoroughly before preserving and before preparation.
- Wash and cook meat thoroughly.
- Store raw and cooked foods separately and properly to prevent cross-contamination.
- Refrigerate perishable food items.
- Maintain good personal hygiene and keep the cooking and food storage areas clean and safe.
- Always use thoroughly cleaned utensils, knives, chopping boards.
- Consume cooked foods within 4–6 hours of preparation. If left at room temperature, reheat thoroughly before consuming.

What makes food unsafe?

Safety of foods can be compromised due to microbial contamination, chemical contamination and adulteration. Natural enzymes present in food also lead to its

deterioration over time. Besides, insects, rodents, adulterants, natural toxins and various chemical residues, present beyond permissible levels, make the food unsafe. In addition, moisture present in the food and some environmental conditions like humidity, temperature, storage time also influence the quality of the food.

- Micíobial contamination (bacterial, viral, fungal and protozoan) can occur due to unhygienic practices.
- Chemical (pesticides, fluoride) and heavy metal (lead, cadmium, mercury and arsenic) contamination can occur due to environmental pollution or presence of chemicals and heavy metals in soil and water in endemic areas.
- Adulteration could be intentional or incidental and can adversely affect the nature, substance and quality of foods. It can be due to addition, removal, abstraction, substitution or modification of a food item. Adulteration may make the food 'unsafe' or substandard. It may happen at any stage of food production, processing and handling from farm to plate.

How do we select safe food?

Selection of safe food is the first step to ensure a healthy and good quality diet. Food items purchased from reliable sources increase the chances of getting good quality and fresh food. Food should be free from infestation, moulds and foreign matter like rodent excreta and insect remains. It should be free from artificial colors. Some pre-packaged foods carry certification marks assuring good quality and purity. For example, AGMARK on some agricultural products like oils, spices, atta and honey, etc., and Bureau of Indian Standards (ISI) mark on additives like food colors and bottled drinking water.

- Vegetable cooking oils: There is a risk of adulteration when fats/oils are purchased loose from unsealed containers. Therefore, it is always safer to purchase from a reliable source.
- Milk and milk píoducts: Butter, ghee and khoa should be purchased from reliable sources only. It is advisable to buy pasteurized milk only.
- Spices: Since powdered spices are more likely to be adulterated, whole spices, uniform in color, size and shape should be preferred. Always buy certified products.
- Fruits and vegetables that are discolored, physically damaged, shrunken, bruised or wilted and decayed, with visible evidence of insects and moulds, should be avoided.
- Eggs should be fresh and free from cracks.
- Meat/Poultíy/Fish must be examined for their characteristic color, odor and texture and should be purchased fresh or frozen. Freshness of fish is indicated by a stiff body, bright, clear and bulging eyes, reddish gills, tight scales and absence of stale odor or discoloration. Fresh fish will not show any pitting on finger pressure.

What are the best practices of storage ?

Food grains should be dried adequately and stored in airtight containers to protect them from moisture and to prevent damage from microbes like bacteria and toxin-

producing moulds. Rodent attacks, and the presence of insects and microbes render the foods unsafe. Frequent and careful disinfestation of food storage areas is essential. Some traditional household practices such as placing dried neem leaves in storage bins are known to prevent some infestations.

Why do food-borne illnesses occur?

Food-borne illnesses are common particularly with consumption of foods prone to spoilage/contamination such as milk products like khoa, meat, poultry and even improperly stored cooked foods (like rice). Improper processing, handling and cooking, and keeping cooked food in warm conditions for several hours promote bacterial growth and bacterial toxin production, which when consumed can cause food-borne illnesses.

How should perishable foods be handled?

Perishable foods like milk, meat, fruits, vegetables and cooked foods, are prone to spoilage due to microbes. These foods should be refrigerated, preferably at a temperature of less than 5^{o}C, which retards multiplication of microorganisms.

However, even refrigerated foods, if stored for long, can get stale. In case of cooked food that has to be stored for some time prior to consumption, it should be kept either hot (more than 60^{o} C) or be cooled quickly (below 5^{o} C). Most microorganisms multiply at temperatures between 5^{o}C and 60^{o}C. Refrigerated, cooked food should be heated thoroughly before consumption. However, repeated heating of stored, cooked food should be avoided.

Bacterial contamination from raw foods such as greens, vegetables, meat, fish can occur if cooked food is not kept separately in the refrigerator.

Why is personal hygiene of food handlers important?

Traditionally in India, food is touched with bare hands while preparing and serving. Clean spoons and ladles should be used to serve food and to avoid contamination. Those who prepare and handle foods should observe good personal hygiene to maintain food safety. Washing hands well with soap and water, for at least 20 seconds, prior to touching cooking utensils or food is essential. In addition, hands should be free from obvious signs of poor hygiene such as dirty nails, wounds and sores.

Hands should be washed thoroughly with soap and water (for at least 20 seconds) before preparation of food and after every interruption, as well as before consumption. Keep domestic animals away from places where food is cooked, stored and served.

What are the common adulterants?

Foods may be adulterated with non-food material or inferior quality products. Frequently adulterated food items are milk and milk products, cereals, pulses and their products, edible oils and spices. At times, spoilt, stale or poor-quality food is made attractive and fresh in appearance by adding harmful colors or other chemicals. The different classes of adulterants include non-permitted colors like metanil yellow; non-edible oils like castor oil; extraneous matter like husk, sand and sawdust in spices; and metal contaminants like aluminum foil on sweets or iron filings in tea.

How to minimize effects of pesticide residues?

Pesticides, used during cultivation of crops, can remain as residues in foodstuffs, especially vegetables and fruits. Exposure of the population to pesticide residues may be harmful and can be minimized by washing the food stuffs thoroughly in running water or by peeling. Cooking and other processes can also reduce such residues. Insect control operations such as disinfestation in the kitchen by spraying pesticides is another source of contamination. Utmost care should be taken to ensure that food is well covered and protected from exposure to such harmful agents.

How to ensure safety of foods stored in refrigerators?

- Store raw and cooked food items in refrigerator separately in different compartments.
- Cut the roots of green leafy vegetables before storing in refrigerator.
- Preserve eggs in refrigerator after washing them thoroughly.
- Maintain safe refrigerator temperature at $<5^0$C.
- Store cooked food in refrigerator in containers with lids, preferably in small portions.
- Clean the refrigerator once a fortnight.

Safe use of cookware

A variety of cookware used in the kitchen are made of different materials like

aluminum, iron, brass or copper. Small amounts of these materials that are likely to leach into food during cooking or storing need not be a cause of concern. However, storing acidic foods like pickles, chutneys, sambaí, solkadi, khatta dal and others in aluminum, iron, untinned brass or copper vessels for prolonged time can make consumption of such foods unsafe.

Non-stick pans coated with Teflon are a risk if they are heated to temperatures greater than 170°C. This might happen if an empty pan is left on a burner for some time. In this case, the coatings can give off irritating or poisonous fumes, which when inhaled over long periods of time can also cause health hazards.

Source: ICMR - National Institute of Nutrition, Hyderabad - Dietary guidelines for Indians

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