

JSR IAS ACADEMY

GENERAL SCIENCE

BIOLOGY

Health

முயற்சி - பயிற்சி - தேர்ச்சி

Food Hygiene

Poor personal hygiene may allow pathogenic microorganisms to cause food spoilage

Food spoilage is an undesirable change in the normal state of food and is not suitable for human consumption.

Signs of food spoilage include a

- changes in appearance,
- colour,
- texture,
- odour
- taste.

Factors responsible for Food Spoilage are given below.

Internal factors:

- enzymatic activities
- moisture content of the food.

External factors:

- adulterants in food,
- contaminated utensils and equipment,
- unhygienic cooking area
- lack of storage facilities.

Food Preservation

Food is preserved to: „

- increase the shelf life of food „
- retain the colour, texture, flavour and nutritive value „ increase food supply „
- decrease wastage of food



India has the second highest number of obese children in the world after China, according to a study that has found that 14.4 million children in the country have excess weight.

Methods of Food Preservation**Drying:**

Drying is the process of preservation of food by removal of water/moisture content in the food.

- sundrying, (e.g. cereals, fish)
- vacuum drying (e.g. milk powder, cheese powder)
- hot air drying (e.g. grapes, dry fruits, potato flakes).

Drying inhibits the growth of microorganism such as bacteria, yeasts and moulds.

Smoking:

In this process, food products like meat and fish are exposed to smoke.

Irradiation:

Food irradiation is the process of exposing food to optimum levels of ionizing radiations like **x-rays, gamma rays or UV rays to kill** harmful bacteria and pests and to preserve its freshness.

Cold storage:

It is a process of storing the perishable foods such as vegetables, fruits and fruit products, milk and milk products etc. at low temperature.

Preserving the food products at low temperature **slows down the biological and chemical reactions and prevents its spoilage.**



Bananas are best stored at room temperature. When it is kept in a refrigerator, the enzyme responsible for ripening becomes inactive. In addition, the enzyme responsible for browning and cell damage becomes more active thereby causing the skin colour change from yellow to dark brown.

Freezing:

Freezing is one of the widely used methods of food preservation.

This process involves storing the food below 0°C at which **microorganisms cannot grow, chemical reactions are reduced and metabolic reactions are also delayed.**

Pasteurization:

Pasteurization is a **process of heat treatment of liquid food products.** e.g. For preservation of milk and beverages.

This process also involves boiling of milk to a temperature of **63°C** for about **30 minutes** and suddenly cooling to destroy the microbes present in the milk.

Canning:

- In this method of food preservation, most vegetables, fruits, meat and dairy products, fruit juices and some ready-to-eat foods are **processed and stored in a clean, steamed air tight containers under pressure and then sealed.**
- It is then **subjected to high temperature and cooled to destroy all microbes.**

Addition of Preservatives

A. Natural preservatives

Addition of salt:

- Addition of salt removes the moisture content in the food by the process of osmosis.
- This prevents the growth of bacteria and reduces the activity of microbial enzymes.
- Meat, fish, gooseberry, lemon and raw mangoes are preserved by salting.

Addition of sugar:

- Sugar/Honey is added as a preservative to increase the shelf life of fruits and fruit products like jams, jellies, squash, etc.
- The hygroscopic nature of sugar/honey helps in **reducing the water content of food and also minimizing the process of oxidation in fruits.**

Addition of oil:

- Addition of oil in pickles prevents the contact of air with food.
- Hence microorganisms cannot grow and spoil the food.

B. Synthetic preservatives

Synthetic food preservatives like

- sodium benzoate,
- citric acid,
- vinegar,
- sodium meta bisulphate
- potassium bisulphate

are added to food products like sauces, jams, jellies, packed foods and ready- to- eat foods.

These preservatives delay the microbial growth and keep the food safe for long duration.

October 16th is World Food Day. It emphasizes on food safety and avoiding food wastage.

Food Adulteration

Adulteration is defined as the **addition or subtraction of any substance to or from food**

Some of the common adulterated foods are milk and milk products, cereals, pulses, coffee powder, tea powder, turmeric powder, saffron, confectionary, non-alcoholic beverages, spices, edible oils, meat, poultry products etc.

The adulterants in food can be classified in **three categories:**

1. Natural adulterants

Natural adulterants are those **chemicals or organic compounds that are naturally present in food.**

e.g.

- toxic substances in certain poisonous mushrooms,
- Prussic acid in seeds of apples and cherry,
- marine toxins,
- fish oil poisoning,
- environmental contaminants

2. Incidental/unintentionally added adulterants

- Pesticide residues
- Droppings of rodents, insects, rodent bites and larva in food during its storage
- Microbial contamination due to the presence of pathogens like Escherichia coli, Salmonella in fruits, vegetables, ready-to-eat meat and poultry products

3. Intentionally added adulterants

These adulterants are **added intentionally for financial gain and have serious impact on the health of the consumers.**

a. Additives and preservatives like **vinegar, citric acid, sodium bicarbonate (baking soda), hydrogen peroxide** in milk, modified food starch, food flavours, synthetic preservatives and artificial sweeteners.

b. Chemicals like **calcium carbide** to ripen bananas and mangoes.

c. Non certified food colours containing chemicals like **metallic lead** are used to give colours to vegetables

d. Edible synthetic wax like **shellac or carnauba wax** is coated on fruits like apple, pear to give a shining appearance.

Food Quality Control

- 1954, Prevention of Food Adulteration Act
- Prevention of Food Adulteration Rules in 1955

Food Quality Control Agencies

ISI, AGMARK, FPO, FCI and other health departments enforce minimum standards for the consumer products.

FCI (Food Corporation of India) was set up in the year 1965



A slogan **From farm to plate, make food safe** was raised on World Health Day (7th April 2015) to promote and improve food safety.

	ISI - (Indian Standards Institution) known as Bureau of Indian Standard (BIS)	Certifies industrial products like electrical appliances like switches, wiring cables, water heater, electric motor, kitchen appliances etc.
	AGMARK - (Agricultural Marking)	Certifies agricultural and livestock products like cereals, essential oils, pulses, honey, butter etc.
	FPO - (Fruit Process Order)	Certifies the fruit products like juice, jams, sauce, canned fruits and vegetables, pickles etc.
	Food Safety and Standards Authority of India	Responsible for protecting and promoting the public health through regulation and supervision of food safety.

Activate Win
First to Settlement

1. Milk: Place a drop of milk on a slanting polished surface. Pure milk flows slowly leaving a trail behind while the milk adulterated with water will flow fast without leaving a trail.
2. Honey: Dip a cotton wick in honey and light it with a match stick. Pure honey burns while adulterated honey with sugar solution gives a cracking sound.
3. Sugar: Dissolve sugar in water. If chalk powder is added as an adulterant, it will settle down.
4. Coffee powder: Sprinkle a few pinches of coffee powder in a glass of water. Coffee powder floats. If it is adulterated with tamarind powder it settles down.
5. Food grains: They have visible adulterants like marble, sand grit, stones, etc. These are removed by sorting, hand picking, washing etc.

Sl. No.	Name of the Diseases	Causative Agents	Impacts/Consequences	Remedial measures
1	Bleeding gums	Vitamin C deficiency	Bleeding of the gums	Eating citrus fruits
2	Tooth decay	Bacteria in plaque	Bacteria produce acids	Brushing and flossing the teeth can prevent decay.
3	Periodontitis	Tobacco chewing	Severe form of gum disease ruin the bones, gums, and other tissues	Chewing type of tobacco should be avoided. Eat a well-balanced diet.

S.No.	Name of the Disease	Causative Agents	Impacts/Consequences	Remedial measures
1.	Night Blindness	a lack of vitamin A , a disorder of the cells in your retina	makes it hard to see well at night or in poor light..	Eat foods rich in anti-oxidant, vitamins and minerals.
2.	Conjunctivitis (Pink eye)	Caused by a virus and bacteria	One or both eyes can be affected. Highly contagious; can be spread by contamination and sneezing.	Antibiotic eye drops or ointments, home remedy
3.	Color blindness	genetic condition	• Difficulty distinguishing between colours • Inability to see shades or tones of the same colour	There is no known cure for colour blindness. Contact lenses and glasses with filters.

Burns

The **tissue damage caused by heat, chemical, electricity, sunlight or nuclear radiation** is known as Burns.

There are **three types of burns**, according to **degree of burning**.

First-degree burns

affect only the **outer layer (called the epidermis)** of the skin

Second-degree burns

damage the **epidermis and the layer beneath it (called the dermis)**

Third-degree burns

involve damage or complete **destruction of the skin to its full depth and damage to underlying tissues** also.

People who experience such burns often require **skin grafting**.

