



UNIT 4

PRESERVATION TECHNIQUES



MAJOR CAUSES OF FOOD DETERIORATION

Food deterioration refers to the processes by which food quality degrades, making it unsuitable for consumption. The major causes of food deterioration include:

1. Microbial Growth

- **Bacteria:** Pathogenic bacteria can cause foodborne illnesses, while spoilage bacteria cause food to become inedible.
- **Yeasts and Molds:** These can grow on food, especially in humid environments, leading to spoilage and sometimes producing toxins (e.g., mycotoxins).

2. Enzymatic Activity

- **Enzymes in Food:** Naturally present enzymes can cause undesirable changes in color, flavor, and texture. For example, enzymes can cause fruits to brown and vegetables to lose their crispness.
- **Microbial Enzymes:** Enzymes produced by microorganisms can further degrade food quality.

3. Chemical Reactions

- **Oxidation:** Exposure to oxygen can lead to rancidity in fats and oils, off-flavors, and loss of nutrients.
- **Maillard Reaction:** While beneficial for flavor in some cases (e.g., roasting coffee), it can lead to undesirable browning in others.
- **Hydrolysis:** Breakdown of food components by water, such as the hydrolysis of triglycerides into free fatty acids and glycerol, can affect flavor and texture.

4. Physical Damage

- **Bruising:** Mechanical damage during harvesting, processing, or transport can accelerate spoilage by making food more susceptible to microbial invasion.
- **Freezing and Thawing:** Improper freezing and thawing can cause textural changes and moisture loss.

5. Environmental Factors

- **Temperature:** High temperatures can accelerate microbial growth and chemical reactions. Freezing temperatures can cause freezer burn.
- **Humidity:** High humidity promotes microbial growth and enzymatic activity, while low humidity can lead to dehydration and texture changes.
- **Light:** Exposure to light can cause photodegradation, leading to the loss of vitamins (e.g., vitamin A and C) and the development of off-flavors.

6. Pests

- **Insects and Rodents:** Can physically damage food, introduce contaminants, and spread microorganisms.

7. Time

- **Shelf Life:** Over time, all foods naturally degrade, even under optimal storage conditions. This is due to the cumulative effects of the above factors.

Preventive Measures

- **Proper Storage:** Use appropriate temperature and humidity conditions to slow down deterioration.
- **Preservation Methods:** Utilize methods like canning, drying, freezing, and use of preservatives.
- **Hygiene:** Maintain cleanliness during handling and processing to minimize contamination.
- **Packaging:** Use suitable packaging to protect food from environmental factors and physical damage.