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Coimbatore-35
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DEPARTMENT OF FOOD TECHNOLOGY

19FTT305-FRUIT AND VEGETABLE TECHNOLOGY

UNIT 3 - MINIMAL PROCESSING AND CANNING



DEFECTS IN CANNED PRODUCTS

Defects in canned fruits and vegetables can occur at various stages of the canning process, from harvest to storage. These defects may affect the product's appearance, taste, texture, safety, and shelf life. Common defects include:

1. Physical Defects

- **Denting:** Can damage the integrity of the can, leading to leakage or spoilage. Dents can also create a potential for microbial growth.
- **Swelling or Bulging:** Indicates gas buildup, often from bacterial growth (such as *Clostridium botulinum*), which can be dangerous.
- **Leaking Cans:** Can occur during sealing or due to improper handling. Leaking cans can lead to spoilage and loss of product.
- **Broken or Damaged Pieces:** Happens during the processing or canning stages, leading to smaller or mashed fruit/vegetables that are unappealing to consumers.



2. Chemical Defects

- **Excessive Acidity:** Caused by an imbalance during the canning process, resulting in off-tastes or potential corrosion of the can itself. Can cause discoloration and negatively impact flavor.
- **Color Change:** Oxidation or the breakdown of pigments in fruits and vegetables can lead to browning or fading of color.
- **Overcooking:** Overheating during the canning process can lead to loss of texture, flavor, and nutritional value.
- **Metallic Taste:** Caused by the interaction between the food and the metal of the can, especially when acidic foods like tomatoes or fruits are involved.

3. Microbiological Defects

- **Spoilage:** Caused by improper sealing or insufficient heat treatment, leading to microbial growth and the potential for spoilage. This can result in foul odors, sliminess, and discoloration.
- **Botulism (Botulinum toxin):** A serious defect that can result from improper processing. The bacteria *Clostridium botulinum* can grow in low-acid foods in sealed cans, producing a potent neurotoxin. Symptoms can include dizziness, difficulty swallowing, and even death.



4. Texture Defects

- **Softening:** Fruits and vegetables may become mushy or overly soft, often due to overcooking, improper handling, or prolonged storage. Texture loss is a common issue with fruits like peaches, pears, and tomatoes.
- **Loss of Crispness:** Vegetables like peas, carrots, and beans may lose their natural crispness if overcooked or improperly stored.

5. Flavor Defects

- **Flat or Off Flavors:** Caused by improper handling, storage, or canning techniques. Can occur when fruits or vegetables are harvested too early or late, leading to off-tastes.
- **Fermentation:** Can happen if there's inadequate sealing or the product has been exposed to air. This can result in sour or yeasty flavors.

6. Nutritional Defects

- **Vitamin Loss:** Some vitamins, such as vitamin C and some B-vitamins, are sensitive to heat, light, and oxygen. These can be reduced during the canning process, especially if high heat is used or the storage conditions are not optimal.



7. Packaging Defects

- **Improper Lining or Coating:** Some cans are coated with a lining to prevent the food from reacting with the metal. If the lining is damaged or defective, the food might come into contact with the metal, affecting both taste and safety.
- **Non-airtight Seal:** If the canning process fails to create a vacuum seal, air can enter the can, leading to spoilage, mold, or bacterial growth.



8. Environmental Defects

- **Contamination During Harvest:** Pesticide residues, dirt, or foreign objects can get into the product if proper hygiene and handling standards aren't followed.
- **Storage Conditions:** Improper storage, such as exposure to extreme temperatures, humidity, or light, can cause the product to degrade in quality.



9. Foreign Objects

- **Contamination with Foreign Materials:** Canned products can occasionally contain foreign materials such as plastic, glass shards, or metal fragments, often due to faulty manufacturing equipment.

Prevention & Control Measures

To minimize these defects:

- **Quality Control During Harvest:** Ensure that fruits and vegetables are picked at their peak ripeness and handled carefully to avoid bruising or damage.
- **Proper Canning Process:** Use correct temperatures, timings, and pressure to eliminate bacteria and enzymes that cause spoilage.
- **Cleanliness:** Both the environment and equipment used in canning should be regularly cleaned to avoid contamination.
- **Storage Conditions:** Store cans in cool, dry places to maintain the integrity of the product and prevent spoilage



Thank You