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Coimbatore-35
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DEPARTMENT OF FOOD TECHNOLOGY

19FTT305-FRUIT AND VEGETABLE TECHNOLOGY

UNIT 2- POSTHARVEST PROCESSING AND STORAGE



chemicals, wax coating, pre-packaging, cleaning and grading

The processes of chemicals, wax coating, pre-packaging, cleaning, and grading are essential steps in the post-harvest handling of fruits and vegetables to maintain their quality, prolong shelf life, and ensure they reach consumers in optimal condition. Here's an overview of each of these processes:

1. Chemicals in Fruit and Vegetable Processing:

Chemicals are often used in the post-harvest handling of fruits and vegetables to:

- **Preserve freshness:** Chemical treatments can reduce spoilage, slow down ripening, and inhibit the growth of bacteria and mold. For example, **fungicides** and **antioxidants** can help maintain the quality of produce.
- **Control ripening:** Ethylene inhibitors or gases like **controlled atmosphere storage** are used to control the ripening process, especially for fruits like bananas or avocados.
- **Pesticide residue management:** Cleaning methods can help remove any pesticide residues from fruits and vegetables to ensure they meet safety standards.
- Common chemicals used include **sulfur dioxide**, **calcium chloride**, and **wax-based coatings**.



2. Wax Coating:

- Purpose:** Wax coating is applied to fruits and vegetables to improve appearance and preserve moisture. It also serves as a barrier to oxygen and moisture loss, which helps prolong shelf life and reduce water loss during transport.
- Types of Wax:** Commonly used waxes include **carnauba wax**, **beeswax**, and synthetic waxes. These waxes can help maintain a glossy appearance and protect the produce from dehydration.
- Application:** The wax is applied as a thin film, either by dipping, spraying, or rubbing. Some fruits, like apples, citrus, and cucumbers, are frequently waxed.

3. Pre-Packaging:

- Purpose:** Pre-packaging involves packaging the fruits and vegetables before they reach the retail shelf, often in protective materials designed to prevent bruising, spoilage, or contamination.
- Types of Packaging:** Packaging can include plastic clamshells, bags, boxes, or trays. The material used depends on the type of produce and how long it needs to be stored. Packaging may also incorporate modified atmosphere (e.g., controlled oxygen levels) to further preserve freshness.
- Benefits:** Pre-packaging makes transportation easier, prevents physical damage, and often includes labeling with product information, which is useful for traceability and safety.



4.Cleaning:

•**Purpose:** Cleaning is crucial for removing dirt, debris, pesticide residues, and microorganisms from the surface of fruits and vegetables. It also enhances the visual appeal of the produce.

•**Methods:**

- **Water washing:** Most fruits and vegetables are washed with clean, potable water.
- **Sanitizing:** In addition to water washing, a sanitizer may be used to remove bacteria and pathogens, especially for leafy vegetables or products that are more prone to contamination.
- **Drying:** After washing, produce is dried to remove excess moisture, reducing the risk of mold or bacterial growth.

•**Challenges:** Care must be taken to ensure that the cleaning process does not damage the produce or remove important nutrients (like vitamins) from the skin or flesh.



5.Grading:

•**Purpose:** Grading ensures that fruits and vegetables are sorted based on size, color, ripeness, and quality. This process helps ensure consistency in the produce that reaches the consumer.

•**Criteria for Grading:**

- **Size:** Uniformity in size is important for packaging and display.
- **Color:** The ideal color often indicates ripeness and freshness.
- **Shape:** Deformed or damaged produce may be discarded or sold at a lower price.
- **Ripeness/Condition:** Produce that is overripe or damaged is typically excluded from higher-grade categories.

•**Automated Systems:** Modern grading systems use sensors, cameras, and machine learning to grade produce based on color, size, and surface defects.



Thank You