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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



Primary processing and pack house handling of fruits and vegetables

The primary processing and pack house handling of fruits and vegetables involves various steps designed to maintain their quality, extend shelf life, and prepare them for distribution to consumers. The process can be divided into several key stages:

1. Harvesting

- **Timing and Maturity:** The first step in processing begins with harvesting, which is usually done when the produce reaches its optimal ripeness. This ensures that fruits and vegetables have the best taste, texture, and nutritional value.
- **Handling During Harvest:** Careful handling is crucial during harvesting to prevent bruising, cutting, or damage to the produce. This can be done manually or using machines, depending on the type of crop.

2. Transportation to the Pack House

- After harvesting, the fruits and vegetables are transported to the pack house. They need to be handled delicately during transportation to prevent physical damage, as the fruits and vegetables can be highly susceptible to bruising and spoilage.
- **Cooling During Transport:** If the produce is highly perishable, such as leafy greens or berries, it may be transported with a cooling system to slow down ripening or spoilage.



3.Sorting



- Visual Inspection:** The first step upon arrival at the pack house is a thorough visual inspection to remove any damaged, overripe, or underripe produce. Imperfect items are separated for processing, juicing, or other secondary uses.
- Sorting by Size and Weight:** Produce is often sorted by size, weight, and quality. Automated sorting machines can be used for items like apples, potatoes, and tomatoes. In some cases, manual sorting is still used, especially for delicate items.

4. Washing and Cleaning

- Pre-washing:** The produce is washed to remove dirt, pesticides, and any contaminants. Some fruits and vegetables, like lettuce or spinach, undergo a rinse in chlorinated water to reduce the risk of bacterial contamination.
- Peeling (if necessary):** Certain fruits or vegetables, like potatoes or carrots, may be peeled to remove skin or outer layers. This can be done manually or mechanically, depending on the volume and type of produce.
- Drying:** After washing, produce may be dried using air blowers or centrifugal drying methods to remove excess moisture.



5. Grading and Packing

• **Grading by Quality:** Produce is graded based on its appearance, size, ripeness, and other quality parameters. High-quality produce is packed for direct sale, while lower-grade produce may be used for juice, puree, or other secondary products.

• **Packaging:** The produce is then placed in packaging that protects it during transport and makes it visually appealing for the market. Packaging materials can include boxes, clamshells, plastic bags, or cartons, depending on the type of product.

- **For Fruits:** Typically, fruits like apples, oranges, and grapes are packed in sturdy boxes or trays with padding to prevent bruising.
- **For Vegetables:** Vegetables like carrots, celery, and onions are often packed in mesh bags or crates, ensuring ventilation to reduce moisture buildup.

• **Labeling:** Packaged produce is labeled with information about the product, such as the variety, weight, origin, and any certification (organic, fair trade, etc.). Labeling is essential for traceability, especially in case of product recalls.



6. Cold Storage and Temperature Control

- **Temperature Regulation:** Many fruits and vegetables require cold storage to prolong freshness. For example, items like berries, grapes, and leafy greens are stored at low temperatures to prevent spoilage. Controlled Atmosphere (CA) or Modified Atmosphere Packaging (MAP) technologies can also be used to slow down respiration and ripening rates of fruits like apples or bananas.
- **Storage Rooms:** Specialized storage rooms with temperature and humidity control help maintain the freshness of produce. Different fruits and vegetables require different conditions (e.g., citrus fruits may be stored at different temperatures than leafy greens).

7. Quality Control and Testing

- **Microbial Testing:** A critical part of the process is ensuring that the produce is free of harmful microorganisms, like E. coli or Salmonella. This may include microbiological testing of water, surfaces, and the final product.
- **Chemical Residue Testing:** Some pack houses test for pesticide residues or other chemical contaminants to meet food safety standards.



8. Distribution

- Once the fruits and vegetables have been sorted, packaged, and checked for quality, they are ready for distribution to wholesalers, retailers, or directly to consumers.
- **Transport to Market:** Like the transportation to the pack house, produce must be transported carefully to avoid damage. This may involve refrigerated trucks to ensure that the produce maintains the correct temperature and remains fresh during transit.

9. Post-Packaging Handling

- **Handling After Packing:** After packing, special care is taken during the handling of the packed produce to avoid damage. This includes proper stacking of pallets, minimizing exposure to direct sunlight, and keeping the produce in appropriate temperature-controlled environments during transportation.



Thank You