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Simple Ways to Reduce Post-Harvest Losses in Fruits and Vegetables

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INTRODUCTION

Fruits and vegetables are among the most important components of the human diet because they provide essential vitamins, minerals, dietary fibre, and antioxidants. However, they are highly perishable in nature due to their high moisture content and active metabolic processes. Even after harvesting, fruits and vegetables remain living tissues and continue to respire, transpire, and undergo biochemical changes. These processes lead to loss of freshness, wilting, softening, ripening, and eventual spoilage.

Post-harvest losses refer to the reduction in the quantity and quality of agricultural produce from the time of harvest until it reaches the consumer. These losses occur during harvesting, handling, grading, packaging, transportation, storage, and marketing. In many developing countries, including India, post-harvest losses in fruits and vegetables are estimated to range between **20 and 40 percent**, resulting in substantial economic losses to farmers and reduced availability of nutritious food to consumers. The major causes of post-harvest losses include improper harvesting methods, mechanical injuries, microbial infections, inadequate storage facilities, poor packaging, and inefficient transportation systems. Such losses not only reduce farmers' income but also lead to wastage of valuable resources such as land, water, labour, fertilizers, and energy used in crop production.

Adoption of simple and scientific post-harvest management practices can significantly reduce these losses. Proper harvesting at the right maturity stage, careful handling, sorting and grading, use of suitable packaging materials, maintenance of

hygiene, appropriate storage conditions, and efficient transportation can help preserve the quality and extend the shelf life of fruits and vegetables. Therefore, reducing post-harvest losses is essential for improving food security, increasing farmers' profitability, and promoting sustainable agricultural development.

1. Harvest at the Right Stage of Maturity

Harvesting produce at the correct maturity stage is essential for obtaining good quality and longer shelf life. Immature produce lacks flavor and nutritional value, while overripe produce deteriorates rapidly.

2. Harvest During Cool Hours

Harvesting during the early morning or late evening helps reduce field heat and moisture loss. Cooler temperatures slow down respiration and delay spoilage.

3. Handle Produce Carefully

Mechanical injuries such as bruising, cuts, and compression increase respiration and provide entry points for microorganisms. Gentle handling preserves appearance and quality.

4. Use Clean and Sharp Harvesting Tools

Sharp and sanitized harvesting tools produce clean cuts and minimize tissue damage. Clean equipment also reduces the spread of diseases and contamination.

5. Remove Damaged and Diseased Produce

Damaged, diseased, or overripe fruits and vegetables can accelerate spoilage of healthy produce by spreading pathogens and increasing ethylene production. Immediate removal reduces storage losses.

6. Grade and Sort Produce Properly

Sorting and grading based on size, shape, color, and quality improve market acceptability and ensure uniform packaging and storage conditions.

7. Use Appropriate Packaging Materials

Proper packaging protects produce from physical damage during handling and transportation. Ventilated plastic crates and corrugated fiberboard boxes provide better protection than traditional sacks or baskets.

8. Maintain Good Hygiene and Sanitation

Clean storage rooms, containers, and equipment prevent contamination by insects, fungi, and bacteria. Good sanitation significantly reduces post-harvest diseases.

9. Store at Suitable Temperature and Humidity

Temperature and relative humidity greatly influence the shelf life of fruits and vegetables. Proper storage conditions slow respiration, reduce moisture loss, and delay ripening and senescence.

10. Use Proper Transportation Practices

Transportation should be quick and careful. Produce should be protected from excessive heat, vibration, and compression. Covered and well-ventilated vehicles help maintain quality during transit.

Benefits of Reducing Post-Harvest Losses

- Maintains freshness, appearance, and nutritional quality.
- Extends shelf life and marketability.
- Reduces economic losses for farmers and traders.
- Increases availability of fruits and vegetables for consumers.
- Enhances food security and promotes sustainable agriculture.

CONCLUSION

Post-harvest losses in fruits and vegetables can be substantially reduced through simple and scientific management practices. Harvesting at proper maturity, careful handling, proper packaging, suitable storage, and efficient transportation help preserve quality and reduce wastage. Adoption of these practices not only increases farmers' income but also ensures a more efficient and sustainable food supply system.

“Every fruit and vegetable saved after harvest is food preserved, income protected, and resources conserved.”