

Factors Affecting Post Harvest Losses in Fruits

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INTRODUCTION

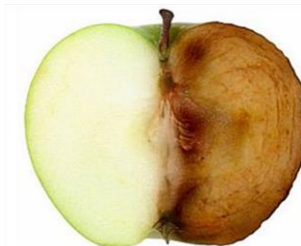
Fruits are highly perishable since they contain very high amount of water and exhibit relatively high metabolic activity. Post-harvest losses of fresh fruits in India are quite high and reduction of these losses is quite necessary. The different causes of postharvest food losses may be broadly grouped as primary and secondary causes.

Primary causes

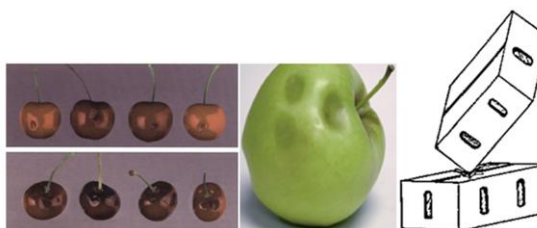
1. **Biological and microbiological:** Consumption or damage by insects, pests, animals and micro-organisms (fungi and bacteria).



2. **Chemical and biochemical:** Undesirable reactions between chemical compounds present in the food such as browning, rancidity, enzymatic changes etc.



3. **Mechanical:** Spillages, damages caused by abrasion, bruising, crushing, puncturing etc.



4. **Physical:** Improper environmental and storage conditions (temperature, relative humidity, air speed etc.)



5. **Physiological:** Sprouting, senescence, other respiratory and transpiratory changes.



6. **Psychological:** Human aversion or refusal due to personal or religious reasons.

Secondary Causes

- Usually the result of inadequate or non-existent input.
- May lead to conditions favourable for primary causes.

The various causes of post harvest spoilage can be grouped based on the nature of biological and environmental factors

Biological factors:

- **Respiration:** It results in loss of organic matter and addition of heat load. The higher the respiration rate of produce, the shorter is its shelf life.
- **Ethylene production:** It can trigger the physiological activity even in trace amounts. Most living commodities produce ethylene as a natural product of respiration
- **Compositional changes:** Many changes occur during storage, some desirable and some undesirable. Eg.- loss of green colour is desirable

mango but not in sweet orange. There will be changes in carbohydrates, proteins and all other food components

- **Growth and development:** In most produce, there is continuous growth and development even after harvest
- **Transpiration:** It refers to water loss resulting in shriveling and wilting due to dehydration. It is undesirable due to loss of appearance, salable weight, texture and quality
- **Physiological breakdown:** It includes freezing injury or frost damage in commodities subjected to temperature below their freezing point which can occur in field or during transportation/storage. Chilling injury is mainly associated with tropical and sub-tropical commodities held for prolonged period at temperatures between 5 °C and 15 °C. Heat injury can result in commodities exposed to

direct sunlight or excessively high heat for prolonged intervals

- **Other factors:** These include physical/mechanical damage to the produce occurring during harvesting, handling, storage and transportation,

as well as spoilage due to pathological attack (bacteria and fungi)

Environmental factors:

- **Temperature:** Higher temperature will result in increased respiratory activity and hence lowered shelf life.



- **Relative humidity:** Very high relative humidity conditions may lead to mould growth on produce surface while lower relative humidity can result in desiccation
- **Atmospheric composition:** Lowering of oxygen and increasing of carbon

dioxide levels in storage atmospheres promote micro-respiration in produce and thus, extend the shelf life

- **Light:** Sun scald
- **Other factors** (fungicides, growth regulators, pollutants etc.)