



# Factors That Influence Post-Harvest Quality Management of Fresh Fruits and Vegetables

There are several factors that influence the Post-Harvest Quality Management of fresh fruits and vegetables. Apart from the pre-harvest factors such as pre-planting and in-field production practices, harvesting is an important key point that dictates the ultimate post-harvest quality management. Other factors include physical, pathological, physiological, and mechanical parameters. Proper harvesting and after harvest handling can minimize post-harvest deterioration of fresh produce.

## Harvesting And After Harvest Handling Practices

**Harvesting date** of a fruit or vegetable is greatly influenced by the characteristics and rates of its respiration and its end use.

**Climacteric fruits and vegetables** (Durian, mango, banana, chico, papaya, muskmelon, soursop, passion fruit, guava, breadfruit, jackfruit, tomato and chilli) may be harvested when its commercial maturity is reached.

**Non climacteric fruits and vegetables** (mandarin orange, pineapple, rambutan, lanzones, pummelo and mangosteen) should be harvested only when the fruit is ripe (physiologically mature). **Leafy, shoots and most fruit vegetables** (brassicas, ferns, bamboo, cucumber, okra, young cob corns and gourds) should be harvested immature.

**Harvest Maturity** of fruits and vegetables can be determined through computation of age, or through measurement of firmness, size, sugar and acid contents or through assessment of distinctive sensory characteristics changes such colour, surface texture, smell, appearance, shape, ability to ripen and attain acceptable eating quality.

**Harvesting and after-harvest handling** should be done properly in order to avoid contacts with pathogenic contaminants, physical and mechanical damaging conditions.

## Physical, Physiological, Pathological and Mechanical Factors

**Heat** from external (sunlight and heat generating objects) and internal sources (respiring produce kept in enclosed conditions, heavy and compact package) encourage transpiration, respiration, improper ripening and microbial spoilage leading to faster deterioration. On the other hand, **chilling**

**conditions** can cause internal browning and failure to ripen normally.

**High humidity** encourages pathogenic and spoilage microorganisms to develop, leading to rots and decay. While **low humidity** enhances dehydration leading to loss of weight, wilting and shrinkage.

**Gaseous compositions** (carbon dioxide, oxygen and ethylene) and extraneous acetylene in the surrounding can affect respiration, ripening and other physio-chemical activities in the produce. **High carbon dioxide and low oxygen concentrations** can develop anaerobic respiration and inhibit ripening. **Ethylene or acetylene concentrations above threshold levels** can trigger ripening and promote senescence.

**Vermis** such as rats, birds and insects can damage and infest stored fresh produce. **Pathogenic and spoilage micro-organisms** (bacteria and fungi) from soil, air, immediate surfaces and surrounding during handling, storage and transportation, under favourable conditions, can cause post-harvest diseases (rots and decays).

**Physiological activities** (respiration, transpiration, ripening, senescence and other biochemical), naturally cannot be stop but can be enhanced or retarded.

**Mechanical damages** caused by improper handling (exposure to compaction, compression, sharp and

hard objects or rough surfaces) during harvesting and post-harvest handling can bruise, puncture, cut, break or squash fresh fruits and vegetables.

## General Post-Harvest Management

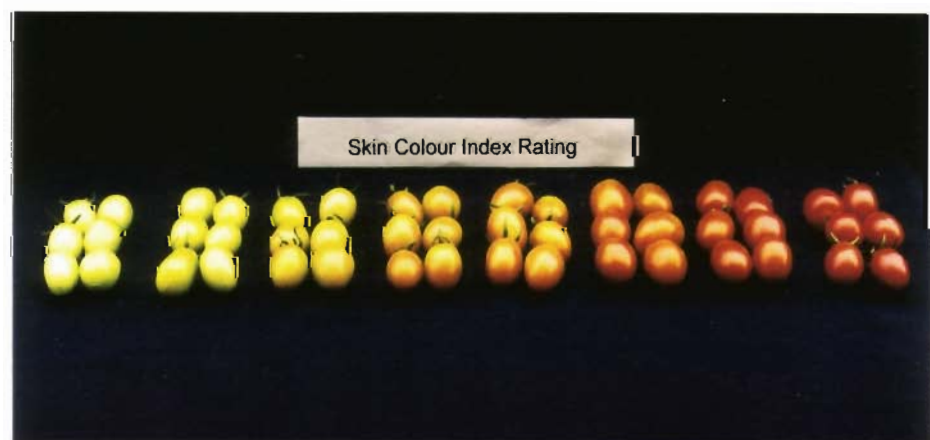
In general, the post-harvest quality of fruits and vegetables can be maintained through proper control of temperature, humidity and environmental conditions (Refer to Table 1). Their storage life can be extended through proper cleaning, sanitation and chemical treatments.

Table 1. Control ranges for temperature, humidity and environmental conditions.

Produce Group	Temp (°C)	% RH	% O <sub>2</sub>	% CO <sub>2</sub>
Climacteric	13.5-23	80-95	>10	<2
Non-Climacteric	5-10	80-95	>10	<2
Leaf And Shoots	5-10	90-97	>10	<2

## Colour Index of Cherry Tomato

The use of suitable maturity index is very important in deciding which post-harvest management to be employed in order to achieve a required shelf life.



## Colour Index of Cherry Tomato.

The above picture showed different stages of maturity of cherry tomato. For this variety, the suitable index for harvesting is at yellowish red stage at which there is no significant difference in eating quality to full ripe stage.