

# Longkong

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## Scientific Name and Introduction

There are at least two major types, with a number of intermediate types, of *Lansium domesticum* Jack.: langsat (Malay, Thailand), longkong (Thailand, intermediate type), and duku (Malay, Thailand). Other names include lanson (Philippines), and intermediate types are referred to as duku-langsat in Malaysia (Nakasone and Paull 1998). There is considerable inconsistency in the naming of the different types (Yaacob and Bamroongruga 1992). Peninsular Thailand to Borneo is the major area of cultivation. Besides the Philippines, *L. domesticum* is also cultivated in Vietnam, Burma, India, Sri Lanka, Australia, Surinam, and Puerto Rico.

## Quality Characteristics and Criteria

Langsat fruit are more ovoid, roughly 30 to 60 mm (1.2 to 2.4 in) in diameter, while duku are rounder and 40 to 50 mm (1.6 to 2 in) in diameter; longkong is intermediate, nearly seedless, has a brittle skin, and is the same size as langsat. There are 15 to 25 fruit per longkong raceme and 4 to 12 in duku. The skin of young fruit is pale green and turns yellow when ripe, frequently with brown blemishes. The langsat has a thin skin that contains a milky white sticky sap. Duku has a thicker—up to 6 mm (0.25 in)—skin and no latex. Longkong has a slightly thicker skin than langsat and less sap that is not sticky. The green seed is covered by a white translucent flesh that is slightly sour in langsat. Langsat tends to vary from sweet to sour; duku is sweet. Both fruit have five separate segments with one to five seeds in langsat and one or two in duku. During ripening, astringency in the flesh declines while sugars increase six-fold (Paull et al. 1987). The skin bruises very easily, leading to brown discoloration.

## Horticultural Maturity Indices

Fruit are harvested at the full ripe stage indicated by the skin color change from light to dark yellow, dryness of the sepals, and the peduncle (stem) losing most of its green color. The flesh is transparent when ripe. Fruit on the bunch generally ripen together over a very short period. Four to five harvests per tree are necessary. It is essential to harvest as soon as possible before over-ripe fruit abscise from the peduncle. Fruit to be shipped long distances are harvested when 70 to 80% ripe to avoid excessive fruit drop. Fruit should be picked when dry, as they can become moldy if packed wet.

## Grades, Sizes, and Packaging

There are no U.S. or international standards. Fruit are generally graded by size and color and normally sold in single-layer fiberboard cartons holding 2.25 kg (5 lb) of fruit, with padding, or sometimes in trays with liners.

## Precooling Conditions

Room cooling is used because forced-air cooling causes moisture loss.

### **Optimum Storage Conditions**

The most recent recommendation for storage is 18 °C (46 °F) with 90% RH (Piyasaengthong et al. 1997), giving about 21 days of storage life. Previously, 11 to 14.4 °C (34 to 58 °F) with 85 to 90% RH for 2 weeks was recommended, which gave 24.3% weight loss (Pantastico 1975). Others have recommended 11 to 13 °C (52 to 55 °F) with 85 to 90% RH for 14 days (Srivastava and Mathur 1955).

### **Controlled Atmosphere (CA) Considerations**

Fruit stored at 14 °C (58 °F) in 3% O<sub>2</sub> and 0% CO<sub>2</sub> had 16 days of postharvest life, compared to 9 days for fruit held in air (Pantastico et al. 1975). High CO<sub>2</sub> aggravated postharvest skin browning, especially at 10% O<sub>2</sub>; browning can also occur in fruit held in polyethylene film bags. Holding in plastic bags (0.08 mm thickness) reduces weight loss but increases surface browning (Brown and Lizada 1984). Preliminary recommendations are 5% O<sub>2</sub> and 0% CO<sub>2</sub> (Yahia 1998).

### **Retail Outlet Display Considerations**

Fruit are commonly displayed in overwrapped trays or closed styrene clam shell containers with no holes at 15 °C (59 °F). They should not be misted.

### **Chilling Sensitivity**

Chilling leads to skin browning; at 15 °C symptoms develop after 21 days (Piyasaengthong et al. 1997).

### **Ethylene Production and Sensitivity**

Fruit produce low amounts of ethylene, with internal concentrations of 2 to 6 µL kg<sup>-1</sup>. There are no reported responses to ethylene treatment; it may lead to premature senescence.

### **Respiration Rates**

Respiration rates decline after harvest, and small fruit have a higher rate than large fruit (Srivastana and Mathur 1955, Pantastico et al. 1968).

Temperature	mg CO <sub>2</sub> kg <sup>-1</sup> h <sup>-1</sup>
9 °C	40 to 50
20 °C	50 to 90

To get mL CO<sub>2</sub> kg<sup>-1</sup> h<sup>-1</sup>, divide the mg kg<sup>-1</sup> h<sup>-1</sup> rate by 2.0 at 0 °C (32 °F), 1.9 at 10 °C (50 °F), and 1.8 at 20 °C (68 °F). To calculate heat production, multiply mg kg<sup>-1</sup> h<sup>-1</sup> by 220 to get BTU ton<sup>-1</sup> day<sup>-1</sup> or by 61 to get kcal tonne<sup>-1</sup> day<sup>-1</sup>.

## **Physiological Disorders**

Abrasion and impact injury, water loss, and chilling injury are the three major disorders. Mechanical injury (abrasion, impact, and compression) leads to skin darkening and browning. Chilling injury symptoms are pitting and brown scalding of the skin.

## **Postharvest Pathology**

Anthraxnose, aspergillus, and rhizopus surface rots on the skin have been reported. Packing dry fruit and using fungicides can minimize losses.

## **Quarantine Issues**

Longkong is a fruit fly host; irradiation at 300 grays has potential for disinfestation.

## **Suitability as Fresh-Cut Product**

No current potential.

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