

# Longan

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## Scientific Name and Introduction

This small fruit (*Dimocarpus longan* [Lour.] Steud.), a relative of the litchi, is 2.5 to 3 cm (1 to 1.2 in) in diameter with a smooth, thin, yellowish-brown shell and a sweet translucent flesh (aril) surrounding a large hard nonedible seed (Nakasone and Paull 1998). The pulp comes away cleanly from the shell and seed.

## Quality Characteristics and Criteria

Shell color, size, and shape; seed size; and sweetness are criteria. Fruit should be free of insect damage and skin blemishes; defective fruit are culled while being sorted for size. See Jiang et al. (2002) for further information.

## Horticultural Maturity Indices

Maturity is judged by shape, skin color, and flavor of each cultivar. Most fruit can be picked from a tree with one harvest, unless multiple flowerings have occurred. No definite harvest index exists for longan, but growers usually note changes in skin appearance—mature fruit develop a smooth and relatively darker skin (Wong and Ketsa 1991).

## Grades, Sizes, and Packaging

One-piece fiberboard crates are used, holding either 4.5 kg (10 lbs) or 2.25 kg (5 lbs), with plastic liners if fruit are not already packed in polystyrene containers. Fruit are clipped from the stem, as hand removal often leads to some inadvertent skin removal.

## Precooling Conditions

Room or forced-air cooling is used for precooling. Longan in plastic baskets can be hydrocooled, though hydrocooled longan should not be treated with SO<sub>2</sub>. SO<sub>2</sub> fumigation damages hydrocooled fruit skin by producing brown spots on both the inner and outer skin surfaces. It also results in greater SO<sub>2</sub> residue remaining on the fruit (Suwanagul 1992). SO<sub>2</sub> treatment of fruit to be sold as fresh is not approved in the United States.

## Optimum Storage Conditions

The recommendation storage conditions are 4 to 7 °C (41 to 46 °F) with 90 to 95% RH (Paull and Chen 1987). Fruit can be held for 2 to 3 weeks, though the skin loses its yellowish coloration, becoming brown. At lower temperatures, there is rapid loss of eating quality, and above 10 °C (50 °F), postharvest diseases are a concern. The expected storage life of longan held at high RH

(Suwanagul 1997) is—

Temperature	Storage life	
	Untreated	SO <sub>2</sub> -treated
	-----days-----	
0 °C	14 to 28	21 to 42
4 °C	14	14 to 28
10 °C	7 to 14	14
20 °C	3 to 5	7
30 °C	1 to 2	3 to 5

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

No controlled atmosphere studies have been reported, though modified atmosphere packaging in 0.03 mm (1/1000 in) polyethylene bags was tested for 7 days at room temperature, followed by 35 days at 4 °C (39 °F). A modified atmosphere of 1 to 3% O<sub>2</sub> delays browning and maintains SSC and vitamin C content (Zhang and Quantick 1997). Treatment with 1% O<sub>2</sub> results in a slight off flavor.

### **Retail Outlet Display Considerations**

Longan should be displayed refrigerated. Misting is not recommended so as to avoid microbial growth.

### **Chilling Sensitivity**

At storage temperatures, <5 °C (41 °F), a slight off flavor can develop after about 1 week. The peel of longan stored at 0 °C (32 °F) turns dark brown, while SO<sub>2</sub>-fumigated longan remain yellowish-brown. The dark brown peel of longan that develops at very low temperatures is regarded as chilling injury (La-Ongsri et al. 1993).

### **Ethylene Production and Sensitivity**

Longan fruit have a low rate of ethylene production: <1 nL kg<sup>-1</sup> h<sup>-1</sup>. There are no reports on ethylene sensitivity.

### **Respiration Rates**

Temperature	mg CO <sub>2</sub> kg <sup>-1</sup> h <sup>-1</sup>
5 °C	3.5 to 11.3
10 °C	16.0 to 25.0
20 °C	30.0 to 53.0

Data from Liao et al. (1983).

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**

Desiccation is a major problem that leads to a rapid loss of bright yellowish color of the skin, which turns to a dull brown (Jiang et al. 2002).

## **Postharvest Pathology**

Longan suffers similar postharvest diseases to litchi. Fungi associated with skin browning and darkening of the skin along with mycelium include *Lasiodiplodia theobromae*, *Pestalotiopsis* sp., *Cladosporium* sp., *Fusarium* sp., and *Aspergillus niger* (Sardsud et al. 1994).

## **Quarantine Issues**

Longan is a fruit fly host. Suitable treatments include hot air, vapor heat treatment, and irradiation.

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

Peeled, deseeded fruit aril can be used as a fresh-cut product.

## **Special Considerations**

Longan are fumigated with SO<sub>2</sub> in Thailand and other countries to prevent skin browning and to control postharvest disease (Tongdee 1994). Though very effective, SO<sub>2</sub> fumigation is not approved for use in the United States for fruit to be sold as fresh. Asian consumers prefer longan in bunches. They assume that single fruit have fallen from the bunch because it has been dropped or that fruit are not fresh. Individual fruit may also have a higher rate of weight loss.

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