Longan

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Scientific Name and Introduction: This small fruit *(Dimocarpus longan* (Lour.) Steud.), a relative of 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 non-edible 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; culled while sorting for size.

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

Pre-cooling Conditions: Room or forced-air cooling. Longan in plastic baskets can be hydro-cooled, although hydro-cooled longan should not be treated with SO_2. SO_2 fumigation damages hydro-cooled fruit skin by producing brown spots on both the inner and outer skin surface. It also results in greater SO_2 residues remaining on the fruit (Suwanagul, 1992). SO_2 treatment of fruit to be sold as fresh is not approved in the U.S.

Optimum Storage Conditions: The recommendation is 4 to 7 °C (41 to 46 °F) at 90 to 95% RH (Paull and Chen, 1987). Fruit can be held for 2 to 3 weeks, although the skin loses it yellowish coloration and becomes brown. At lower temperatures, there is a 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 is as follows (Suwanagul, 1997):

Temperature	Storage-life (days)	SO_2-treated (days)
0 ºC	14 to 28	21 to 42
4 ºC	14	14 to 28
10 ºC	7 to 14	14
20 ºC	3 to 5	7
30 ºC	1 to 2	3 to 5

Controlled Atmospheres (CA) Considerations: No controlled atmosphere studies have been reported, though MAP in 0.03 mm (1/1000 in) polyethylene bags has been tested for 7 days at room temperature, followed by 35 days at 4 °C (39 °F). A MA of 1 to 3% O_2 delays browning and maintains SSC and vitamin C content (Zhang and Quantick, 1997). A 1% O_2 treatment results in a slight off-flavor.

Retail Outlet Display Considerations: Should display refrigerated; do not mist 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 color of longan stored at 0 °C (32 °F) turns dark brown, while SO_2-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 at < 1 nL kg^{-1} h^{-1}. There are no reports on ethylene sensitivity.

Respiration Rates:

Temperature	mg CO_2 kg^{-1} h^{-1}
5 °C	3.5 to 11.3
10 °C	16.0 to 25.0
20 °C	30.0 to 53.0

To get mL kg^{-1} h^{-1}, divide the mg kg^{-1} h^{-1} 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^{-1} h^{-1} by 220 to get BTU per ton per day or by 61 to get kcal per metric ton per day. Data are from Liao et al. (1983).

Physiological Disorders: Desiccation is a major problem that leads to a rapid loss of bright yellowish skin, which turns to a dull brown color.

Postharvest Pathology: Similar postharvest diseases as 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.,1992).

Quarantine Issues: Longan is a fruit fly host. Suitable treatments include hot air, vapour heat treatment, or irradiation.

Suitability as Fresh-cut Product: Peeled, de-seeded fruit aril can be used as a fresh-cut product.

Special Considerations: Longan are fumigated with SO_2 in Thailand and other countries to prevent skin browning and to control postharvest disease (Tongdee, 1994). Although very effective, it is not approved for use in the U.S. 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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