

Tomatillo

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Scientific Name and Introduction: The tomatillo or husk tomato (*Physalis ixocarpa* Brot. Ex Hornem) is a warm season vegetable of the Solanaceae family. The fruit are small, spherical and green or green-purple.

They are surrounded by an enlarged calyx or “husk.” As the fruit matures, it fills the husk and can split it open by time of harvest. They are the key ingredients in fresh and cooked green salsas and other Latin American dishes. Tomatillos are available year-round, produced in the U.S. mainly on small acreages in California, with large volumes imported from Mexico (Smith et al., 1999).

Quality Characteristics and Criteria: The freshness and greenness of the calyx (husk) is a quality criteria. Fruit should be firm and bright green, since the color and acidic flavor are the main culinary contributions of tomatillos (Bock et al., 1995; Moriconi et al., 1990).

Horticultural Maturity Indices: Tomatillos can be harvested at various stages of development. For commercial marketing, they should be harvested when fruit are well formed and have substantially filled the husk, but are still bright-green. Over-mature fruit that are light-green or yellowing should be avoided, since they are sweeter and undesirable for most uses.

Grades, Sizes and Packaging: There are no U.S. Grades. Fruit are not usually sized before packing. They are packed in 18 kg (40 lb) crates (Mexican fruit) or in 4.5 kg (10 lb) cartons (U.S. fruit).

Pre-Cooling: Forced-air or room-cool to retain fresh appearance of the husk.

Optimum Storage Conditions: Tomatillos can be stored under a wide range of conditions. At ambient temperatures, the husks will dry, but the fruit will remain in good condition for about 1 week. The freshness of fruit and husk can be extended by storage at 5 to 10 °C (41 to 50 °F) with 80 to 90% RH. Chilling injury can occur after 3 weeks at 5 °C (41 °F).

Controlled Atmosphere (CA) Considerations: No information is available.

Retail Outlet Display Considerations: Keep tomatillos cool to reduce water loss and minimize superficial decay. Do not mist.

Chilling Sensitivity: Tomatillos can be stored for 1 mo at 10 °C (50 °F) without developing chilling injury symptoms. Fruit begin to show symptoms (surface pitting and decay) after 3 weeks at 5 °C (41 °F); symptoms become more pronounced at 2.5 °C (36.5 °F).

Ethylene Production and Sensitivity: Immature tomatillos produce low amounts of ethylene at 0.5 to 2.0 $\mu\text{L kg}^{-1} \text{h}^{-1}$ at 10 to 20 °C (50 to 68 °F), while more mature fruit produce greater amounts of 1 to 10 $\mu\text{L kg}^{-1} \text{h}^{-1}$. Ethylene production can be high, 20 to 40 $\mu\text{L kg}^{-1} \text{h}^{-1}$ at 20 °C (68 °F), in over-mature fruit, ie., fruit showing color changes due to ripening. Exposure of mature fruit to ethylene causes undesirable color changes (Cantwell et al., 1992).

Respiration Rates:

Temperature	mg CO ₂ kg ⁻¹ h ⁻¹
5 °C	12 to 14
10 °C	13 to 19
20 °C	27 to 36

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. Respiration data are for mature-green fruit (Cantwell et al., 1992).

Respiration rates remain relatively constant during storage at 5 and 10 °C (41 to 50 °F); rates decrease during storage at 20 °C (68 °F). Respiration rates of developing fruit are about 25% higher than those of mature fruit.

Physiological Disorders: See section on “Chilling Sensitivity.”

Postharvest Pathology: Chilling injury can encourage the development of black mold on the fruit due to *Alternaria alternata*, the same organism often found on chill-injured red tomatoes. Superficial molds occur on the husk during storage under high RH, but they have not been identified. Washing in chlorinated water reduces superficial mold growth, but may be difficult to implement commercially since it is difficult to remove all moisture inside the husk.

Quarantine Issues: None.

Suitability as Fresh-cut Product: No fresh-cut product is currently available.

Special Considerations: None

References:

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- Moriconi, D.N., M.C. Rush and H. Flores. 1990. Tomatillo: a potential vegetable crop for Louisiana. In: J. Janick and J.E. Simon (eds) *Advances in New Crops: Research, Development, Economics*, Timber Press, Portland OR, pp. 407-413.
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