

Honeydew Melon

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Scientific Name and Introduction

Cucumis melo L. (Inodorus Group), called winter melons even though they are mainly grown in the spring in Texas and summer elsewhere, include honeydew, casaba, crenshaw, and canary melons (Bailey 1976). This melon group is an annual, tender, running herb of the Cucurbitaceae (gourd) family that is grown for its sweet, flavorful fruits with light-green, white, or pink flesh. Honeydew melons are the dominantly grown and shipped melon of this group and are primarily produced in Arizona, California, and Texas.

Quality Characteristics and Criteria

Minimum quality standards for honeydew melons are good internal quality of 8% soluble solids content (SSC) (10% in California); firm; well-formed; mature; and free of aphid stain, rust spot, bruises, broken skin, solar injury (sunscald and sunburn), hail damage, moisture loss, insect damage, or growth cracks (AMS 1981). Nonhybrid honeydew melons are ready for harvest (cutting) when the rind is slightly waxy and the color is mostly whitish with a light-green tinge. These fruit should be well filled out and covered by a fine fuzz of hairs. Superior honeydew melon quality at harvest is associated with a whitish peel, high SSC, and round fruit shape (Lester and Shellie 1992). Hybrid honeydew melons will abscise (slip) when mature and are mostly creamy white, slightly waxy, and may have very sparse netting. Full-slip hybrid honeydew melons, versus honeydew melons cut at harvest, are perceived by consumers to have superior flavor, texture, and sweetness.

Horticultural Maturity Indices

Honeydew melons, hybrids and nonhybrids, are ready to eat when the peel turns pale green to cream colored and the surface feels waxy. The blossom end gives when pressed with the thumb, and the melon has a pleasant aroma. Less ripe and cold melons have little aroma. The majority of honeydew melons have green flesh, but specialty fruit can have gold, orange, or pink flesh.

Casaba melons are ready to eat when the very furrowed or wrinkled peel is yellow and the blossom end is springy. The flesh should be soft, almost white, with a slight salmon cast around the seed cavity and subtly sweet. No aroma is produced except for a hint of cucumber.

Crenshaw melons are a cross between casaba and persian (see “Netted Melons”). Crenshaw melons are ready to eat when half the dark-green peel turns yellow, the blossom end is springy, and a pleasant spicy aroma is emitted at room temperature. The very sweet and juicy flesh should be salmon color and soft. Entirely yellow and soft fruit are overripe and unpleasant to eat.

Canary melons are ready to eat when the peel, generally smooth but sometimes furrowed, is bright canary yellow (the brighter the peel, the riper the melon) and the oval-shaped fruit is springy at the blossom end. The flesh should be crisp, flavorful, and white, with a hint of pink around the seed cavity. A fragrant aroma is emitted at room temperature.

Grades, Sizes, and Packaging

Grades include U.S. No. 1, U.S. Commercial, and U.S. No. 2, based primarily on percentage of honeydew fruit that meet decay, damage, and disease tolerance guidelines (AMS 1981). Honeydew fruit have no Federal marketing standard for SSC except for May 1 through June 20, when all honeydew melons regardless of grade must be at 8% SSC minimum (AMS 1981). Size classification is the number of fruit (based on a uniform fruit diameter and fruit weight) per box to achieve a standard weight of 13.6 kg (30 lb). The distinct size classes are 4s, 5s, 6s, 8s, and 9s.

Precooling Conditions

Honeydew melons harvested cut from the vine need not be precooled. Full-slip melons should be precooled to 10 to 15 °C (50 to 60 °F) soon after harvest to reduce the rate of ripening and sugar loss. Hydrocooling and forced-air cooling are acceptable methods of precooling. Hydrocooling is the most efficient and can reduce a 35 °C (95 °F) melon to at least 15 °C at the center of the flesh within 20 min. The larger fruit sizes take longer.

Optimum Storage Conditions

Prolonged holding (3 weeks) of fruit harvested cut from the vine, as well as casaba, crenshaw, and canary melons, should be stored at 10 °C (50 °F) with 90 to 95% RH. Honeydew melons cut from the vine that have been induced to ripen with ethylene, as well as full-slip honeydew melons, should be stored at 7 °C with 95% RH; they can be held for 7 to 10 days.

Controlled Atmosphere (CA) Considerations

CA storage of honeydew melons harvested cut from the vine has limited commercial use. CA conditions for full-slip melons are not known.

Retail Outlet Display Considerations

Honeydew melons are less perishable than netted melons (see “Netted Melons”), while those fully abscised (full-slip) are highly perishable and should therefore be displayed promptly on arrival.

Chilling Sensitivity

Chilling injury can occur at temperatures below 7 °C (45 °F), but the riper the melon the more tolerant to chilling injury. Injury is expressed as pitting and darkened, elongated patchy surface lesions.

Ethylene Production and Sensitivity

Honeydew melons harvested cut from the vine, as well as casabas, crenshaw, and canary melons, produce very low amounts of ethylene. However, they benefit at the time of shipping, soon after harvest, by exposure to 100 $\mu\text{L L}^{-1}$ ethylene at 12.5 to 25 °C (55 to 77 °F) for up to 24 h (Kader 1992). Full-slip honeydew melons should not be gassed with ethylene.

Respiration Rates

Temperature	mg CO ₂ kg ⁻¹ h ⁻¹
5 °C	8
10 °C	14
15 °C	24
20 °C	30
25 °C	33

To get mL CO₂ 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 tonne per day.

Physiological Disorders

Compression, bruising, scuffing, and cutting may occur during harvest and at packing sheds and may lead to desiccation, water-soaking, internal breakdown, and discoloration of the peel.

Honeydew melons should never be dropped more than 60 cm (2 ft), and all harvesting and packing line equipment should be well-padded to reduce bruising, scuffing, and cuts (Ryall and Lipton 1979). To reduce fruit crushing and bruising at harvest, replace the traditional deep 180-cm-bed (6-ft-bed) hauling trucks with stackable, ventilated plastic field boxes measuring 1.2 m × 1.2 m × 0.6 m (48 in × 48 in × 26 in deep), and load them onto a flatbed truck (Kader 1992).

Postharvest Pathology

Honeydew melons produced in the Western United States occasionally develop bacterial brown spot, infested by *Pantoea ananatis* (formerly called *Erwinia ananas*). *Alternaria alternata* and *Cladosporium cucumerinum* rots can be found on honeydew as a result of chilling injury, cuts, punctures, or holding fruit too long in storage (Bruton 1995, Zitter et al. 1996).

Quarantine Issues

Honeydew melons entering the United States must be disinfested of external feeders (noctuid moths, thrips, and *Copitarisa* species) by fumigation with methyl bromide (APHIS 1998). Methyl bromide was identified as causing significant damage to the Earth's protective ozone layer and was scheduled for global phaseout under the Montreal Protocol, an international treaty developed to protect the Earth from the detrimental effects of ozone depletion. Title VII of the U.S. Clean Air Act (Amendments of 1990) requires that production and importation of "Class I"

substances (ozone depletion potential of 0.2 or greater) be phased out in the United States by the year 2005. Use of methyl bromide for preshipment and quarantine purposes has been declared exempt from these restrictions, but the limited supply and increasing cost of methyl bromide may make it undesirable for commercial use in the future.

Suitability as Fresh-Cut Product

Honeydew fruit harvested cut from the vine or hybrid honeydew fruit harvested at half-slip with 11 to 12% SSC have crisp pulp and are appropriate for fresh-cut processing. Cultivar selection is essential as there is considerable variation among cultivars for sugar, firmness, and flesh thickness—that is, piece yield. Fruit should be well washed and sanitized by rinsing in 200 $\mu\text{L L}^{-1}$ of a 5.25% sodium hypochlorite solution at 5 °C (41 °F), pH 6.5 to 7.0, for 5 min, and cut into cubed pieces with very sharp blades. Cubed pieces should be rinsed with 150 $\mu\text{L L}^{-1}$ of 5.25% NaOCl at 5 °C (41 °F) for 30 sec. Shelf-life of honeydew fruit cubes, with good eating quality, can be expected for 6 to 10 days when stored at 5 °C (41 °F). Modified atmospheres of 5% O₂ combined with 5% CO₂ are beneficial in retarding microbial growth and reducing loss in firmness and other quality degradations. Shelf-life of honeydew fruit cubes is not reduced by taking pieces from defective areas such as the ground spot or sunburned regions, but eating quality is reduced due to lower sugar content, green color, and firmness (Wu and Watada 1999).

Special Considerations

Product quality and shelf-life of full-slip, hybrid honeydew can be extended by applying an amino acid-chelated calcium (80 mM) rinse or soak prior to sizing and storage (Lester and Grusak 1999).

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