Peaches

Revised 2018

Thermal Properties

	Fresh		Dried	
	English	Metric	English	Metric
Moisture, %	87.66	--	31.80	--
Protein, %	0.70	--	3.61	--
Fat, %	0.90	--	0.76	--
Carbohydrate, %	11.10	--	61.33	--
Fiber, %	2.00	--	8.20	--
Ash, %	0.46	--	2.50	--
Specific Heat Above Freezing	0.93 Btu/lb*°F	3.91 kJ/(kg*K)	0.61 Btu/lb*°F	2.57 kJ/(kg*K)
Specific Heat Below Freezing	0.45 Btu/lb*°F	1.90 kJ/(kg*K)	0.83 Btu/lb*°F	3.49 kJ/(kg*K)
Latent Heat of Fusion	126 Btu/lb	293 kJ/kg	46 Btu/lb	106 kJ/kg

Storage Conditions

	Temperature		Storage Period	Relative Humidity or Packaging
	°F	°C		
Fresh Air Storage	32	0	2 to 6 weeks*	90 to 95%
Fresh CA Storage**	32	0	4 to 8 weeks*	90 to 95%
Freezing Point	30	-1.1		
Frozen	0	-17.8	Up to 1 year	Vapor-proof packaging
	-10	-23.3	12 to 16 months	Vapor-proof packaging
Canned	65	18.3	9 to 12 months	
	40	4.4	Up to 2 years	

* Depending on variety (cultivar) and maturity at harvest.

** Controlled atmospheres (CA) containing 1 to 2% oxygen plus 3 to 5% carbon dioxide (balance nitrogen) delay ripening and softening of peaches. A CA of 4 to 6% oxygen plus 15 to 17% carbon dioxide (balance nitrogen) may be used to reduce incidence and severity of internal breakdown (chilling injury) during long-distance transport.

Storing Fresh Peaches

If the grower/packer intends to ship fresh market peaches to distant distribution centers, the peaches are harvested at the 'well-mature' stage when ground color changes from green to yellowish-green. This allows the peaches to withstand harvesting and packing with less bruising and be ripened under controlled temperatures prior to retail marketing or processing. Peaches are harvested partially-ripe (yellow ground color) for local markets and for processing.

Rapid cooling of harvested peaches to temperatures near 32°F (0°C) is important to retard ripening and decay. Failure to cool fruit to a low enough temperature to protect it from decay and ripening is a common fault. Clingstone peaches and some varieties of freestone peaches can be held up to 4 to 6 weeks at 32°F (0°C) to lengthen the canning or freezing season. Ripening after storage may be needed to attain more uniform firmness of the processed product and can be achieved by warming the peaches to 68°F (20°C) and keeping them at that temperature for 1 to 2 days.

Peaches are very perishable and do not lend themselves to prolonged cold storage. Sound, well-mature peaches can be stored for 2 to 6 weeks at 31-32°F (-0.6 to 0°C) depending in part upon the variety and growing season. Peaches will freeze at temperatures below 30°F (-1.1°C). Therefore, to assure that peaches in cold storage do not freeze due to cold spots or improper air circulation, the storage air temperature should not fall below 31°F (-0.6°C). Peaches can be held longer at 32°F (0°C) than at 36 to 50°F (2.2 to 10°C) without losing capacity to ripen normally when exposed to ripening temperatures.

Some peaches, depending on variety and harvest maturity, that are held longer than 1 to 4 weeks at 36 to 48°F (2.2 to 8.9°C) often fail to ripen satisfactorily on removal to higher temperatures. Instead, they develop internal breakdown or chilling injury (CI), a disorder in which the flesh becomes dry or mealy, sometimes mushy, often badly discolored, and with a watery translucent area around the stone. Flavor deterioration is also very evident, and the appearance is dull rather than bright. Shifting fruit from 32 to 41°F (0 to 5°C) after 1 to 2 weeks' storage will result in very severe CI. This frequently occurs during marketing. No internal breakdown develops at or above 50°F (10°C), but these temperatures are unsatisfactory because of rapid flesh softening and decay incidence. Sensitivity to CI declines as peaches ripen. Pre-ripening (conditioning) freshly harvested peaches at 70 to 75°F (21.1 to 23.9°C) for 1 to 3 days before placing them in 32°F (0°C) storage is one method to alleviate or delay CI.

CA storage in 2% O_2 plus 5% CO_2 at 32°F (0°C) or 6% O_2 plus 17% CO_2 has been reported to reduce internal breakdown and flavor loss and allow longer storage, sometimes up to 6 weeks. Cultivars differ in their response to CA, so each cultivar should be tested under CA conditions to determine its suitability for CA storage. Commercial use of CA is still limited to holding small quantities awaiting processing and during marine transport of fresh market peaches.

Peaches ripen satisfactorily at temperatures between 65 and 77°F (18.3 and 25°C). However, ripening at 65°F (18.3°C) may result in less decay than ripening at higher temperatures. For peaches stored for short periods, better quality and less decay occur when peaches are ripened after storage than when they are ripened before storage. But the longer peaches are stored, the greater the amount of decay likely to develop during ripening and marketing afterwards.

Research has shown that storage for 10 to 14 days at 31 to 32°F (-0.6 to 0°C) will measurably reduce Rhizopus decay during subsequent ripening but will have little effect on brown rot. Also, dipping peaches for 2 to 2.5 minutes in 125°F (51.7°C) water will reduce postharvest decay. The heat treatment kills decay-producing organisms on the surface and under the skin. Good sanitation practices must then be followed during subsequent handling to prevent recontamination. Combination of fungicides with hot water may serve as a method of controlling this contamination. With the addition of fungicides, the water temperature can be lowered to 115°F (46.1°C) and chemical concentrations reduced to 1/10th the effective concentration in room temperature water and still obtain decay control.

Diseases and Disorders

Anthracnose	Potentially serious as a field disease in Southeastern, Eastern, and Mid-western states. Rarely causes serious marketing losses but may cause storage losses. In early stages, small brown spots may be slightly moist but normally are firm and dry. As spots enlarge tissue beneath collapses and leaves a dry depression 1/8 to 1/4 inch (3 to 6 mm) deep, surrounded by a firm circular margin. At late stages, a grayish fungal growth and circular pinkish spore masses are in the center of the depression. **Control:** Hot water treatment and prompt cooling to 32°F (0°C).
Bacterial Spot	Field disease found in peach growing areas east of the Rocky Mountains. At first faint brown spots often with light green halo occurring on any area of fruit. Later, spots coalesce and become dark brown to black and deep cracks may form in the infected areas. Spots normally do not enlarge as their numbers increase during storage. **Control:** No warehouse control.
Brown Rot	Occurs in most of the commercial peach growing areas. At first greenish-tan, then tan circular spots occurring in any area of the fruit. As spots enlarge, infected area becomes brown to black and may contain yellowish-gray spore masses. The infected skin is tough or leathery in all stages. Orchard infections are usually worse in warm, wet weather. Decay present at harvest will develop during storage even at 32°F (0°C), although very slowly. **Control:** Combination of blossom and preharvest sprays of approved fungicides greatly reduce brown rot in the field and while the fruit are ripening after harvest. Dips of 2 to 2.5 minutes in 125°F (51.7°C) water will kill the decay-producing organism on and under the skin of the fruit. Fungicides give better decay control when added to 115 to 125°F (46.1 to 51.7°C) water than when they are added to 70°F (21.1°C) water. Temperatures below 41°F (5°C) slow decay development and decrease "nesting" of decaying fruits.

Gray Mold Rot	Usually occurs on freshly harvested peaches depending on environmental conditions, but may be severe when peaches are stored too long, especially at improper temperatures. Spots at first are a light tan with a lighter tan wrinkled margin. Infected skin slips readily with slight pressure, and the tissue beneath the skin is brown, soft to mushy, and watery. Later, a white-gray fungal growth appears, which turns gray within 2 to 3 days. The organism causing gray mold (*Botrytis cinerea*) can grow and infest peaches even at 32°F (0°C) and cause nesting of fruit during long storage periods. **Control:** Avoid prolonged storage. Careful handling and sanitation are important.
Rhizopus Rot	Second to brown rot, the most important market disease of peaches. Light brown to tan lesions that are somewhat moist, and infected skin slips easily with slight pressure. Flesh discolored light tan to brown. Later stages at first white then grayish fungal growth with many black spores. Severe nesting occurs when infected fruit are held at moderate temperatures. **Control:** Careful packinghouse handling to avoid any bruising damage and good sanitation, particularly in hydrocooling water. Transit temperatures below 40°F (4.4°C). Two- to 3-minute dips in 125°F (51.7°C) water or in 115 to 125°F (46.1 to 51.7°C) suspensions of fungicides will kill organisms in and on the fruit.
Mucor Rot	Similar in appearance to Rhizopus rot, although it differs in early stage as the tan skin is firm and does not slip easily when pressure is applied. Later, gray-white fruiting bodies very similar to those of Rhizopus develop. Mucor can rot peaches stored at 32°F (0°C) fairly rapidly, whereas Rhizopus will not rot fruit stored below 45°F (7.2°C). **Control:** Careful handling and effective sanitary procedures. No chemical postharvest treatment known.
Penicillium Rot (Blue Mold)	Small tan spots that, when scooped out, leave a small saucer-like cavity with entire circular edges. Later, white growth and finally a blue spore mass surrounded by white border appear. Disease appears usually on peaches with prolonged storage or chilling damage. **Control:** Packinghouse and storage sanitation. Careful handling to avoid skin breaks. Avoid prolonged house storage. Growth of this fungus rarely occurs at 32°F (0°C).
Diplodia	Soft brown spots with skin tougher than with Rhizopus rot, but softer than brown rot. Infected flesh is tan to brown, somewhat watery, and sometimes has sour odor. Later, infected skin is covered with white, cottony growth that becomes gray with black fruiting bodies. This disease occurs after peaches are harvested. It originates mostly because of packinghouse or storage contamination. **Control:** Sanitary procedures and recommended refrigeration.

Scab	Widespread, except in Oregon and Washington. Distinct, olive-green to black, circular spots often on side of peach uppermost as fruit hangs on tree. Later may cause large, dark, sooty areas, misshapen fruit, and, after cracking, opening way to other decay. Does not spread in transport or storage. **Control:** No warehouse control.
Internal Breakdown or Chilling Injury	Dryness or mealiness of flesh, loss of flavor. Breakdown starting around pit is grayish-brown, water-soaked, mealy flesh. **Control:** Avoid exposure to temperatures between 36 and 48°F (2.2 and 8.9°C) throughout postharvest handling. Store in CA or precondition (limited control). Do not exceed the storage potential of each variety.
Bruising	Sometimes mistaken for rot. To distinguish, remember bruised peaches have mottled white and brown appearance in flesh, and skin is not brown, whereas in decay both skin and flesh are brown. **Control:** Careful harvest, avoid picking over-mature, not packing too tight, and avoidance of rough handling in transit.
Hail Injury	Irregular, somewhat sunken, often reddish or greenish brown spots, and on one side of fruit, usually not gummy. **Control:** Covering the trees in the orchard with screen to protect against hail, but this is very expensive.

Freezing

The major problem with frozen peaches is their tendency to brown readily. To delay this, ascorbic acid should be added. Shelf life of frozen peaches at 0°F (-17.8°C) can be doubled from less than 1 year to nearly 2 years if ascorbic acid is added. Other methods of delaying browning are by increasing syrup concentration or reducing storage temperature. During storage at -40°F (-40°C), there is little loss of ascorbic acid (vitamin C).

Frozen peaches are mostly a western (California) product. A 60% sugar syrup is usually used, with about 1 part of syrup to 5 parts of peaches. Darkening is inhibited on thawing if 250 to 300 ppm of ascorbic acid by weight of the peaches is added to the syrup.

For the food service, baking, and ice cream trades, packs to 32 lbs (14.5 kg) net in plastic containers with plastic covers are used. Packs of 40 lbs (18.2 kg) net weight are often made in a barrier foil-lined bags, which are subjected to vacuum of 12 to 15 inches (300 to 375 mm), heat-sealed, and secured in a corrugated container. This too is usually a 1 part 60% sugar syrup to 5 parts of fruit pack. Peach puree may be used in place of the syrup. A substantial amount of Freestone peaches is frozen in barrels, and IQF frozen slices are available in plastic 1.5-lb (680-g) packages.

Storing Canned Peaches

Clingstone peach halves and slices predominate for the canned peach market because of their greater firmness retention and tissue integrity compared to freestone peaches, which tend to disintegrate during the retort heat process that follows canning. The freestone varieties are considered more flavorful and are usually frozen rather than canned. In recent years clingstone peaches have constituted well over 80% of the total pack of canned peaches.

Storage temperature of 65°F (18.3°C) is adequate to retain 90% of vitamins A and C content up to 1 year. If canned peaches are to remain in the channels of trade for longer than 1 year, they should be stored in refrigerated warehouses at 40°F (4.4°C). As with other canned products, care should be taken in storage to avoid large temperature fluctuations, and the canned goods should be tempered before transfer to higher temperatures to avoid peeling and other damage to labels and rusting of cans.

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