Plums

Revised 2018

Thermal Properties

	English	Metric
Moisture, %	85.20	--
Protein, %	0.79	--
Fat, %	0.62	--
Carbohydrate, %	13.01	--
Fiber, %	1.50	--
Ash, %	0.39	--
Specific Heat Above Freezing	0.91 Btu/lb*°F	3.83 kJ/(kg*K)
Specific Heat Below Freezing	0.45 Btu/lb*°F	1.90 kJ/(kg*K)
Latent Heat of Fusion	123 Btu/lb	285 kJ/kg

Storage Conditions

Temperature	31 to 32°F (-0.6 to 0°C)
Relative Humidity	90 to 95%
Storage Period	3 to 6 weeks
Freezing Point	30°F (-1.1°C)

Plums are primarily a fresh market commodity and are not dried and rarely frozen. Prunes are varieties of European plums (a different species) that are usually dried whole and sometimes eaten fresh. Plums for fresh market should be cooled within a few hours of harvest. Internal breakdown (i.e., chilling injury) is aggravated by delays at high temperatures before initial cooling. Fruit should be cooled to 41 to 50°F (5 to 10°C) for next day packing but should be cooled to near 32°F (0°C) if longer delays are expected. Many varieties of plums exhibit internal breakdown symptoms if kept at 36 to 48°F (2.2 to 8.9°C) for longer than 1 to 3 weeks, depending on variety and maturity at harvest (less mature fruit are more susceptible).

Research has shown that some late-season plums, such as Casselman and Angelino, benefit from 30°F (-1.1°C) storage temperatures, thereby rendering 3- or even 4-month storage periods commercially possible. However, for this option to be feasible, the fruit should be of high maturity with a soluble solids content of at least 13%. It is important to note that fruit with lower soluble solids may freeze at 30°F (-1.1°C).

The storage period for plums differs with the variety, as follows:

Variety	Minimum Color Requirements	Storage Life at 32°F (0°C)	Remarks
Angelino	Full, dark purple or 3/4 of surface dark purple, remainder light, greenish yellow	5 to 6 weeks	Ripens in early to mid August in California; can be stored for up to 4 months in a controlled atmosphere of 1 to 2% O_2 plus 5% CO_2
Black Amber	Full red color with 'spring' (firmness)	3 to 5 weeks	Harvested mid to late June
Casselman	3/4 of surface distinct red or full light yellow	5 to 6 weeks	Ripens in late July; a slow-ripening variety
El Dorado	Full dark red surface color or part red and rest of surface yellow color ('D' color standard); shoulders smooth with good 'spring' (firmness)	3 to 5 weeks	Ripens in late June and early July in California; may be stored 4 to 6 weeks in an atmosphere of 7% O_2 plus 7% CO_2
Friar	Full red with good 'spring' (firmness)	3 to 4 weeks	Ripens near end of July; flesh softens slowly
Kelsey	Full light green color or trace of red; smooth surface and good 'spring' (firmness)	2 weeks	Ripens in late July in California; susceptible to internal breakdown
Laroda	Full dark red color or dark red at blossom end and remainder full light greenish yellow	3 to 4 weeks	Ripens near end of July
Late Santa Rosa	3/4 of surface distinct red or full light-yellow color	3 weeks	Ripens early to mid July; sometimes tends to split
Nubiana	Full dark purplish blue or 3/4 of surface dark to purplish blue; remainder light amber color characteristic of variety; good 'spring' (firmness)	2 weeks	Ripens in late July in California
President	3/4 of surface reddish purple and under color light yellowish green or full light greenish yellow	3 weeks	Ripens in late July and early August
Queen Ann	Full dark purple or 80% surface dark purple color with remainder light greenish yellow; good 'spring' (firmness)	3 to 4 weeks	Ripens mid-August
Red Beaut	3/4 of surface distinct red or full light greenish color	1 to 2 weeks	Ripens in late May; highly susceptible to internal breakdown

Roysum	3/4 surface distinct red or full light yellow ('F' color standard)	3 to 4 weeks	Ripens slowly but evenly; some surface cracks that heal over; harvested mid to late September
Santa Rosa	2/5 of surface red color or full light greenish yellow ('C' color standard)	3 to 5 weeks	Ripens early to mid-June in California; develops scald when picked early, flesh becomes hard and discolored; well-colored plums subject to flesh discoloration
Simka	Full dark red or dark red and full light-yellow color	3 weeks	Ripens last half of July in California
Wickson	Full yellowish green or trace of red ('A' color standard)	4 weeks	Ripens in late June in California; flesh becomes tough and often discolored; imperfect ripening

Diseases

The most common postharvest diseases of plums are blue mold rot, brown rot, *Cladosporium* rot, gray mold rot, and *Rhizopus* rot. Fruit maturing late in the season are particularly subject to brown and gray mold rot, and fruit that have become cracked during growth or during harvesting and handling are especially susceptible to blue mold and *Cladosporium* rot. *Rhizopus* mold grows only at temperatures above 45°F (7.2°C), and consequently develops only in plums that are not properly pre-cooled or refrigerated in storage or transit.

Control of plum diseases involves using protective fungicides in the orchard, postharvest fungicide-wax applications in the packinghouse, careful handling to prevent bruising or cracking, and good temperature management.

Blue Mold Rot	Round spots of mushy decay that can be scooped out cleanly. White tufts turning to bluish-green develop on surface. Musty odor and flavor. **Control:** Apply recommended fungicides. Market promptly. Cool promptly to 31 to 32°F (-0.6 to 0°C).
Brown Rot	Extensive firm brown, unsunken decay, turning dark in center. May be covered with dusty spores in yellowish-gray masses. Should be controlled in orchard. **Control:** Cool promptly to 31 to 32°F (-0.6 to 0°C). Apply recommended fungicides.
Gray Mold Rot (Botrytis)	Light brown, fairly firm, watery decay covered with delicate dirty-white mold. On completely decayed plums grayish-brown velvety sporulation may occur. Associated with wet weather.

	Control: Avoid inflicting harvesting and handling wounds to avoid infection. Cool promptly to 31 to 32°F (-0.6 to 0°C).
Green Mold Rot (Alternaria and Cladosporium Rots)	Mold growth on area is dark green below and white above. Light brown, dry, firm decay lining skin breaks. Can be removed easily from surrounding healthy tissue. **Control:** Cull out plums with cracks and other skin breaks.
Rhizopus Rot	Extensive soft leaking decay with little change of color. Coarse mold growth and black spores prominent under moist conditions. **Control:** Prompt cooling to 31 to 32°F (-0.6 to 0°C). Growth of Rhizopus is effectively inhibited by temperatures below 41°F 5°C).

Disorders

Common disorders, not caused by pathogens, include hail injury, heat injury, russeting, split pits, ammonia injury, internal breakdown (chilling injury), shriveling, freezing injury, and bruising.

Internal Breakdown or Chilling Injury	Flesh browning, 'bleeding' (red color that appears to 'bleed' from the pit into the flesh), and loss of flavor. **Control:** Avoid exposure to temperatures between 36 and 48°F (2.2 and 8.9°C) throughout postharvest handling. Do not exceed storage potential of the variety.
Plum Curculio	In eastern half of the US, this insect causes skin punctures that often are followed by brown rot. **Control:** Field control by spraying and other practices.
Russeting	Found on practically all varieties of plums and prunes in all producing sections, but most common on Tragedy plums and Italian prunes grown on the West Coast. Irregular, rough russeted spots on surface caused by insects, weather conditions, or mechanical damage on tree. **Control:** No warehouse control.

The diseases and disorders listed above are discussed in detail in "Market Diseases of Stone Fruits: Cherries, Peaches, Nectarines, Apricots, and Plums," US Department of Agriculture, Handbook No. 414.

Freezing

Some freezing of purple plums and prunes is done for the institutional market and for further processing. When fruit are prepared for freezing, they are halved and pitted and then packed in

syrup, usually in barrels. In some European countries, plums and prunes are pitted with equipment similar to, but larger than, that used for cherries. For use in further processing, frozen plums and prunes may be held for 1 year or longer at 0°F (-17.8°C) or lower.

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