Figs

Revised 2008

Thermal Properties

	Fresh		Dried	
	English	**Metric**	**English**	**Metric**
Moisture, %	79.11	--	28.43	--
Protein, %	0.75	--	3.05	--
Fat, %	0.30	--	1.17	--
Carbohydrate, %	19.18	--	65.35	--
Fiber, %	3.30	--	9.30	--
Ash, %	0.66	--	2.01	--
Specific Heat Above Freezing	0.88 Btu/lb*°F	3.70 kJ/(kg*K)	0.60 Btu/lb*°F	2.51 kJ/(kg*K)
Specific Heat Below Freezing	0.54 Btu/lb*°F	2.25 kJ/(kg*K)	0.98 Btu/lb*°F	4.13 kJ/(kg*K)
Latent Heat of Fusion	113 Btu/lb	264 kJ/kg	41 Btu/lb	95 kJ/kg

Storage Conditions

	Fresh	**Frozen**	**Canned**	**Dried**
Temperature	30 to 32°F (-1 to 0°C)	0 to -10°F (-18 to -23°C)	50°F (10°C)	32-50°F (0 to 10°C)
Relative Humidity	90-95%	Air-tight, heat sealed containers		50-70%
Storage Period	7 days or less	1 year +	1 year +	1 year
Freezing Point	27°F (-3°C)			

Commercial production of figs in the US is largely limited to California and has declined steadily from about 100,000 tons (fresh basis) per year in the early 1950s to about 37,000 tons in 1990, but increased to about 50,000 tons in 2000. Production varies with seasonal factors, but increasing production costs and imports are the major reasons for this decline. The bulk (90%) of the production, as well as the imports, are marketed as dried figs (about l/3 of fresh weight) and the rest (10%) as fresh or canned product.

Although only a small portion of the crop is sold fresh, substantial quantities may be offered for cold storage for a few days prior to processing. Even at an optimum temperature of 32°F (0°C) and 90-95% RH, fresh figs will not keep well for much more than 1 week, by which time they should be marketed or processed. The storage period can be extended to 3 weeks if the fresh figs were kept in 15% CO2-enriched air at 32°F (0°C). Recent research has shown that controlled or modified atmospheres of 5-10% oxygen and 15-20% carbon dioxide are effective in decay control, firmness retention, and reduction of respiration and ethylene production rates. Postharvest-life of fresh Black Mission and Calimyrna figs

ranges from 3 to 4 weeks under these conditions (vs. 1 to 2 weeks in air), but flavor quality declines with time in storage.

Diseases and Injuries

Alternaria Spot	At first, small brown to black spots appear on the surface; later grayish-white tufts of mold turning olive-green, grayish-white tufts of mold turning olive-green, superficial or shallow, largely on fully ripe fruit. Especially prevalent in the Kadota and Calimyrna cultivars. **Control:** Prompt cooling to 32°F (0°C).
Black Mold Rot	Chiefly affects light-colored cultivars, such as Calimyrna and Adriatic; dirty white to slightly pink skin and pulp color, with the pulp finally becoming cheesy; severely diseased fruits appearing translucent and dark. Within the fig, there is a growth of white mold, eventually with black spore masses which puff out in a black cloud when the fig is pressed. Disease is difficult to recognize in its early stages. **Control:** Disease starts in the orchard; more frequent picking and careful culling to discard infected fruit would help reduce storage losses. Prompt refrigeration slows decay development and spread.
Blue Mold Rot	Blue-green spore masses on white mold growth. **Control:** Prompt refrigeration.
Endosepsis (Soft Rot)	Water-soaked areas in skin, pink or purple in color. Flesh is yellowish-brown, soft, watery and has a sour, offensive yeast-like odor. Found primarily on caprified figs. **Control:** Sanitary practices in the orchard and in caprifying techniques are only known control measures.
Gray Mold Rot	Chiefly on overripe fruit--affected tissue has water-soaked appearance at first, later turns tan and becomes covered with a gray, fluffy, or velvety growth of mold. Tissues eventually soften and may leak juice in late stages of decay. **Control:** Prompt cooling to 32°F (0°C).
Rhizopus Rot	Affected tissue is soft and leaky, turning brown, and later covered with coarse, gray mold with black spores. Soft, overripe fruit particularly susceptible to disease. Mold spreads rapidly from infected to sound fruit at warm temperatures. **Control:** *Rhizopus* will not grow below 45°F (7°C). Prompt cooling below this temperature controls disease.
Splitting	Calimyrna and Kadota are especially susceptible. Apparently due to damp weather conditions, but may be intensified by package pressure and careless handling. **Control:** No warehouse control.
Sunburn	Tan or dark leathery brown bands encircling eye, or blotches and spots on side of fruit, due to exposure to sun.

	Control: No warehouse control.

Freezing

The small quantities of figs that are frozen are packed as whole fruit in heavy syrup or as sliced or crushed fruit, usually 4 parts of fruit to 1 part of water. The heavy syrup prevents discoloration and other serious quality changes when stored at 0°F (-18°C) or lower for 1 year. The low temperature also prevents appreciable changes in the substantial nutrients present.

Drying

Figs are usually dried on trays in hot-air drying tunnels where their moisture content is reduced from 75-80% to 20-25%. Thus dried figs are not really completely dried, and are not too different from semi-moist foods whose water activity (Aw) is not sufficient to support bacterial growth but can and does support mold growth. Thus to prevent mold growth and insect infestation and to stabilize color and moisture content for as long as 1 year, dried figs should be stored at 32-50°F (0-10°C), and 50-70% RH. At lower temperatures, the relative humidity can be permitted to rise, especially if the dried figs are packaged in moisture-barrier films. In general, the best conditions for dried fig storage are 40°F (4.4°C) and 65% RH.

Since dried figs contain only about 1/3 of their original water content, solids, including nutrients, are present at levels that are about 3 times higher than in the fresh, canned, or frozen fruit. Thus a 4-oz (113 g) portion of dried figs should provide 20% or more of the recommended dietary allowance of calcium, iron, and vitamin B1, 10% of vitamin B2 and niacin, and about 5% of the protein requirements. Low temperature storage will help preserve these nutrients.

WFLO is indebted to Dr. Adel Kader, Department of Plant Sciences, University of California, Davis, for the review and revision of this topic.