

Endive and Escarole

Revised 2018

Thermal Properties

	English	Metric
Moisture, %	93.79	--
Protein, %	1.25	--
Fat, %	0.20	--
Carbohydrate, %	3.35	--
Fiber, %	3.10	--
Ash, %	1.41	--
Specific Heat Above Freezing	0.97 Btu/lb*°F	4.07 kJ/(kg*K)
Specific Heat Below Freezing	0.40 Btu/lb*°F	1.69 kJ/(kg*K)
Latent Heat of Fusion	135 Btu/lb	313 kJ/kg

Storage Conditions

Temperature	32°F (0°C)
Relative Humidity	95 to 100%
Storage Period	2 to 3 weeks
Freezing Point	31.8°F (-0.1°C)

Endive and escarole are not well adapted for long-term cold storage and cannot usually be held for more than 2 to 3 weeks even under optimum storage conditions of 32°F (0°C) and 95 to 100% relative humidity (RH). Storage life at 41°F (5°C) is only about half this long. These products are very sensitive to water loss, which is why storage RH should be maintained at 95 to 100%. One benefit of storage is that a certain amount of blanching takes place.

Vacuum cooling, hydrovac cooling or hydrocooling can help maintain fresh appearance. It is recommended that potable water chlorinated at 50 ppm and adjusted to pH 7 be used in order to avoid transfer of decay and pathogenic organisms to the products. The storage requirements for endive and escarole closely resemble those for Lettuce. Exposure to ethylene will cause brown spots on the midribs as in lettuce.

Storage conditions for Belgium endive or witloof chicory are similar except that they should not be exposed to light. The cream-yellow color of the dark-green heads will quickly turn green and bitter when exposed to light.

Diseases and Injuries

Bacterial Soft Rot	<p>Water-soaked appearance, softening, and breakdown of tissues, sometimes with a putrid odor.</p> <p>Control: Careful handling and prompt cooling to 32°F (0°C).</p>
Marginal Browning	<p>For endive, brownish discoloration of edges and tips of blanched heart leaves and very small reddish-brown spots or streaks in the fleshy midrib. For escarole, browning, drying, and partial blackening occur on the tips of outer leaves, but center leaves are rarely, if ever, affected.</p> <p>Control: Marginal browning is a sign of senescence, or aging. Prompt cooling and storage near 32°F (0°C) will slow its development.</p>
Watery Soft Rot	<p>Soft, watery, leaky decay, usually first on stem and lower leaves; light or pinkish-brown without characteristic odor. White fungus growth with scattered bluish-black bodies called sclerotia.</p> <p>Control: Field control essential, followed by prompt cooling to 32°F (0°C). The fungus grows slowly at temperatures below 50°F (10°C).</p>
Ethylene injury	<p>Exposure to ethylene will result in leaf yellowing as well as russet spotting (tiny, reddish-brown spots on the midribs).</p> <p>Control: Don't store or transport endive and escarole in the vicinity of ethylene-producing fruits such as apples, pears and peaches, or other ethylene sources such as exhaust from internal combustion engines.</p>

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