Garlic

Revised 2018

Thermal Properties

	English	Metric
Moisture, %	58.58	--
Protein, %	6.36	--
Fat, %	0.50	--
Carbohydrate, %	33.07	--
Fiber, %	2.10	--
Ash, %	1.50	--
Specific Heat Above Freezing	0.76 Btu/lb*°F	3.17 kJ/(kg*K)
Specific Heat Below Freezing	0.52 Btu/lb*°F	2.19 kJ/(kg*K)
Latent Heat of Fusion	84 Btu/lb	196 kJ/kg

Storage Conditions

Temperature	32°F (0°C)
Relative Humidity	60-70% with ventilation
Storage Period	6-7 months, if properly cured
Highest Freezing Point	30.5°F (-0.8°C)

The conditions of storage for garlic closely resemble those recommended for dry onions. Storage is in loose mesh bags or in bulk bins that provide adequate aeration and ventilation. Generally about 1 cfm of air per cu. ft. of garlic is adequate. Garlic cloves sprout rapidly at temperatures of 40-64°F (4.4-l8°C), so prolonged storage at this temperature range should be avoided.

Thorough curing of garlic before storage is highly important for satisfactory quality retention. If field conditions for curing are unsatisfactory, garlic can be artificially cured by blowing heated air at 110-115°F (43-46°C) through them for 8-12 hours. Incomplete curing results in excessive decay, particularly when bulbs are held above 32°F (0°C). Proper relative humidity maintenance (60-70%) is highly important to retain quality and prevent molding and growth of roots. Garlic stored at humidity higher than 70%, at any temperature, will probably mold, sprout, and start to grow roots. In California, where considerable garlic is grown, it is also placed in common storage, where it may be held 3-4 months or longer if the building is kept cool, dry, and well ventilated. Early harvested garlic often receives less curing and is not stored as

long as more mature garlic. Garlic treated with maleic hydrazide before harvest for sprouting control has been for stored 1 year at 32°F (0°C) with only about 10% weight loss. Postharvest treatment with very low doses (0.05-0.15 KGy) of gamma irradiation has provided similar sprout control when storage is at 32°F (0°C). Garlic may also be stored at slightly lower than 32°F (0°C), near its freezing point (30.5°F). Controlled atmospheres (< 0.5% O_2 alone or in combination with 5-10% CO_2) will retard sprout development and extend shelf life. Controlled Atmosphere (CA) storage may also retard development of waxy breakdown.

To maintain the highest quality, longest term storage, dried, flaked, or powdered garlic should be held between 22 to 32°F (-5 to 0°C); however, for practical purposes, it can be held at 32°F (0°C). Since dehydrated garlic is handled in sealed containers, relative humidity is not an issue.

Garlic should not be stored with other products that tend to absorb odors. It may be stored with onions.

Diseases and Disorders

Garlic is subject to about the same storage diseases that affect the onion, but the two mentioned below are most often encountered.

Blue Mold Rot	Garlic bulbs affected with this disease may sometimes show little external evidence of it. Early evidence is light yellow spots on the fleshy scales, followed by white mold and later blue spores. Affected bulbs will be light in weight and the individual cloves will be soft and spongy or powdery-dry. When in advanced stage of decay, the cloves break down completely into a dry bluish green or gray powdery mass. **Control:** None except careful inspection prior to storage. If excessive mechanical injury, freezing, or sunscald is noted, then blue mold rot may be serious, especially if there is insufficient aeration or ventilation, and warehouse personnel should be on their guard.
Waxy Breakdown	Early symptoms of this physiological disorder are small, slightly sunken, light yellow areas in the flesh of the clove, the color deepening later to yellow or amber. The clove is then somewhat translucent sticky, and waxy, but the outer scales are not affected. No external evidence of disease may be noted until it is well advanced. **Control:** Nothing except careful inspection before storage to avoid storing lots with this disorder.

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