Cabbage

Brassica oleracea var. *capitata*

Best practice

Cabbages are harvested when the heads are firm and heavy and the size is appropriate ot the market.

Cabbage leaves often have a waxy bloom, which is particularly obvious in coloured varieties. This, combined with their dense, overlapping leaf structure, helps protects them from water loss. The squeakiness of the leaves when rubbed together can be considered a sign of freshness.

Cabbages have a long storage life, especially if cooled close to 0°C soon after harvest. However, their dense internal structure makes them relatively slow to cool. Vacuum cooling is less efficient for cabbage than most other leafy vegetables.

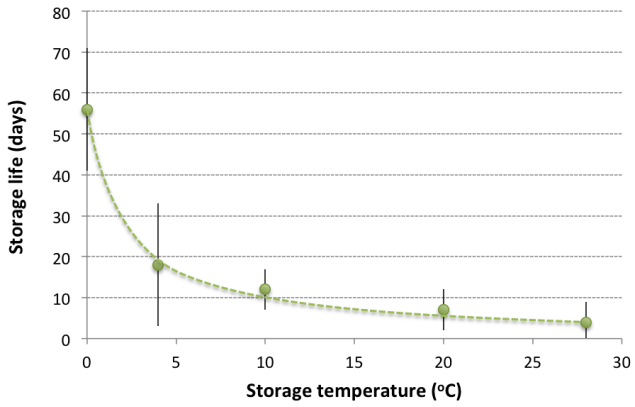
While not chilling-sensitive, cabbage is susceptible to freezing injury. Freezing can become an issue when cabbages are stored at 0°C, particularly for heads placed close to the delivery air.

The outer leaves are usually trimmed so that they do not interfere with air circulation between the heads, but continue to provide some protection against physical damage and water loss. Exposure to ethylene will increase the rate of leaf yellowing.

Storage life

Storage life of cabbage is maximised at 0°C combined with high relative humidity. Under these conditions cabbages can remain in good condition for 2 to 4 months, depending on the cultivar as well as seasonal conditions.

Although storage life is reduced to 3–6 weeks at 2–4°C, this reduces costs and is usually long enough for normal transport and retail.



Storage life of cabbage at different temperatures. Bars indicate the likely range around each mean value.

Weight loss

- Cabbage loses weight very slowly during normal storage. Weight loss can be further reduced by using packaging and keeping the storage temperature constant.
- Cabbage can lose up to 5% weight and still remain remain marketable.
- Cabbage that have lost 7% weight or more will be wilted and unacceptable.

Average percent weight loss per day for unprotected cabbages in open containers stored at different temperatures and humidities, ± values represent 95% of the predicted range.

Relative Humidity	Temperature				
	0°C	2°C	5°C	10°C	20°C
40%	0.3 ±0.2	0.4 ±0.2	0.5 ±0.2	0.6 ±0.3	1.1 ±0.5
60%	0.3 ±0.1	0.3 ±0.1	0.3 ±0.2	0.4 ±0.2	0.7 ±0.3
80%	0.2 ±0.1	0.2 ±0.1	0.2 ±0.1	0.3 ±0.1	0.4 ±0.2
90%	0.1	0.1 ±0.1	0.1 ±0.1	0.2 ±0.1	0.2 ±0.1
100%	0.0	0.0	0.1	0.1	0.2

Key messages

- **Cabbages are harvested when firm, heavy and of market-suitable size.**
- **The waxy bloom on cabbage leaves, combined with their tightly overlapping structure, helps protect the head from water loss.**
- **Some outer leaves may be trimmed before storage to aid air circulation; however, leaving a few leaves intact helps protect the head from physical damage and water loss.**
- **Cabbages can remain acceptable for up to 4 months depending on variety, growing conditions and storage environment.**
- **Cabbages produce almost no ethylene in storage. Exposure to ethylene accelerates leaf yellowing.**
- **Cabbage is susceptible to a number of postharvest diseases including white mould and bacterial soft rots.**

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Horticulture Innovation Australia

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WESTERN SYDNEY UNIVERSITY

Cabbage

Summary

Storage conditions	Optimum temperature	0°C
	Optimum RH	95–100%
	Storage life (best)	2–4 months
	Storage life at 5°C	2–4 weeks
Cooling	Cooling method	Forced air, room cooling can also be suitable
	Freezing point	-0.9°C
	Susceptibility to freezing	Low
	Chilling sensitive?	No
Physiology	Respiration rate	Low
	Ethylene production	Low
	Ethylene sensitivity	High – results in leaf yellowing
Packing	Cleaning	Harvest clean, trim outer leaves and pack dry without washing.
	Rate of water loss	Low
	Display	Commonly sold cut and wrapped. Can be displayed on ice, preferably refrigerated.

Disorders

Ethylene damage

While leaf yellowing is an inevitable symptom of senescence, it can also be triggered prematurely by exposure to ethylene. Ethylene production is increased by development of disease.

Physical injury

Damage to the outer leaves such as cuts, tears and crushing damage is often most noticeable on the leaf edge. Can be reduced by leaving a few outer leaves intact.

Diseases

White mould – *Sclerotinia sclerotiorum.*

White mould first appears as a watery, light brown rot that spreads rapidly. In humid environments, white cottony mould develops and is followed by hard black fruiting bodies (sclerotia). Mainly a problem in coastal areas and where cool, moist conditions occur.

Alternaria rot – *Alternaria brassiciola*

Dark grey to black spots spread over the leaves. These have a sunken centre with distinct margins, often surrounded by a yellow halo. Favoured by warm, wet weather, with spores spread in wind and water.

Photo: NSW DPI

Bacterial soft rot – *Pectobacterium carotovorum*

A wet slimy rot, often starting in the cut base. Tissue becomes water-soaked and disintegrates, often with an unpleasant smell. Symptoms can develop soon after harvest.

Black rot – *Xanthomonas campestris*

Yellow to brown V-shaped areas appear on the outer edges of leaves and gradually progress inwards. Most often a problem for cabbages grown in warm, humid climates.

Early black rot symptoms

Late black rot symptoms