Celery

Apium graveolens var. *dulce*

Best practice

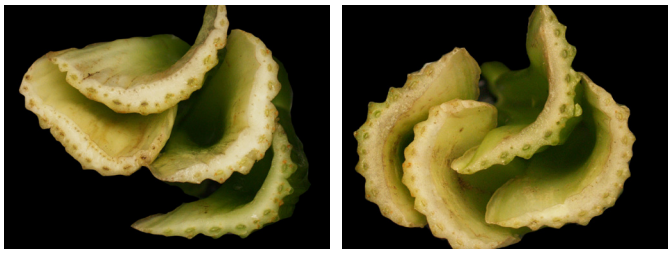
Celery is harvested once the crop reaches a marketable size. If left in the field too long the internal tissues of the outer petioles start to become spongy and dry or 'pithy'. Stress due to cold, uneven watering or root infections can also increase pithiness.

Celery consists of petioles, which clasp around a central growing heart. The inner petioles can continue to develop after harvest, especially if storage temperature is over 4°C. Good quality petioles should be thick, pale green in colour, straight and tender.

As celery is around 95% water, rapid cooling after harvest is essential to keep it well hydrated and crisp. Vacuum cooling is the most efficient way to cool celery. Hydrocooling is also effective.

The best storage life is at close to 0°C. At this temperature storage life may be 5-7 weeks. However, celery is very susceptible to freezing damage. Storage at 2°C can provide a margin of safety without compromising quality. At 5°C storage life may be reduced by half.

Celery is increasingly trimmed into various sizes before packaging for retail sale. Trimming blades need to be as sharp as possible: blunt knives cause additional damage to the cut cells, increasing phenolic browning.



Celery cut with a sharp (left) or blunt knife

Key messages

- **Celery should be harvested once it reaches a marketable size but before the outer tissues start to be come dry or 'pithy'.**
- **The inner petioles can continue to grow after harvest if storage temperature is over 4°C.**
- **Celery is around 95% water, so keeping it cool and well hydrated is essential to quality.**
- **Optimum storage life is at 0°C, but celery is very sensitive to freezing so storage at 2°C is preferable.**
- **Knives used to trim celery must be kept as sharp as possible to avoid discolouration of the cut surface.**

Weight loss

- Celery can lose up to 8% weight while still remaining acceptable.
- If weight loss is slight, celery can re-absorb moisture and recover turgidity.

Average percent weight loss per day for unprotected celery 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%	1.2 ±0.3	1.4 ±0.3	1.7 ±0.3	2.2 ±0.6	4.2 ±1.8
60%	0.8 ±0.3	1.0 ±0.3	1.2 ±0.3	1.5 ±0.5	2.8 ±1.2
80%	0.5 ±0.3	0.6 ±0.3	0.7 ±0.3	0.8 ±0.3	1.5 ±0.7
90%	0.3 ±0.3	0.4 ±0.3	0.4 ±0.3	0.5 ±0.2	0.8 ±0.4
100%	0	0	0.1	0.2	0.3

Summary

Storage conditions	Optimum temperature	0–2°C
	Optimum RH	95–100%
	Storage life (best)	6 weeks
	Storage life at 5°C	2–4 weeks
Cooling	Cooling method	Vacuum cooling is best, forced air and hydrocooling can also be suitable
	Freezing point	-0.5°C
	Susceptibility to freezing	High
	Chilling sensitive?	No
Physiology	Respiration rate	Low
	Ethylene production	Low
	Ethylene sensitivity	Low
Packing	Cleaning	Two-stage rinse and wash, including a sanitiser in the final wash.
	Rate of water loss	Moderate, good benefits from POS packaging.
	Display	Can be displayed on ice.

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Horticulture Innovation Australia

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WESTERN SYDNEY UNIVERSITY

Celery

Diseases

Bacterial soft rot – *Erwinia* spp. *Pectobacterium* spp.

Bacterial soft rots are the major postharvest disease affecting celery. Water soaked lesions on the petioles enlarge and collapse, often with an unpleasant smell.

Septoria spot - *Septoria apicola*

Pre-harvest infections of septoria spot can continue to develop postharvest. Small, yellowish spots on the leaves enlarge and turn brown and sunken. Greyish spots and lesions can also develop on the petioles.

White mould - *Sclerotinia* spp.

Soft, water-soaked lesions develop, covered with white cottony growth. In the later stages hard black resting bodies (sclerotia) form within the decayed tissue.

Photo: ST Koike, UCDavis

Disorders

Blackheart

Blackheart is a form of tip burn caused by calcium deficiency during rapid growth. The inner, hearting leaves brown on the growing tips and eventually die.

Photo: ST Koike, UCDavis

Freezing damage

Celery is very susceptible to freezing damage due to its high water content. Frozen tissue becomes water-soaked and translucent.

Pith breakdown

The tissue inside the petioles develops cavities, becoming spongy and dry. Pith breakdown can be induced by various forms of stress such as heat, cold, uneven irrigation or root infections. Pithiness is also associated with overmaturity, especially if the plant is starting bolt i.e. develop a flowering stem.

Normal (left) and pithy celery stems