# Swiss Chard

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## Scientific Name and Introduction

Swiss chard *(Beta vulgaris* L. var. *cycla)* is a biennial plant belonging to Chenopodiacae family. The edible parts are the elongated, oval, smooth or wrinkled leaves, which can reach 50 cm (20 in) in length including the petiole. The prominent petiole is white or dark-red. It is a good source of folacin (Gami and Chen 1985), vitamin C, and flavonoids (Gil et al. 1998).

## Quality Characteristics and Criteria

Leaves must be turgid and dark green, with the midrib and petiole completely white or red depending on the variety. Leaves must not show any symptoms of yellowing or browning or have soil residue. Harvested leaves with petioles can be 20 to 50 cm (7.5 to 20 in) long.

## Horticultural Maturity Indices

Leaves are periodically hand-harvested beginning about 60 days after seeding. The harvest season can last 2 to 3 mo in spring and 4 to 6 mo in fall and winter. Sometimes the whole plant is harvested.

## Grades, Sizes, and Packaging

There are no U.S. grade standards for Swiss chard. Leaves of similar size and quality are banded together and packed loose in waxed cardboard, wooden, or plastic boxes. Using plastic film to cover packaging reduces water loss.

## Precooling Conditions

Room-cooling is often used, but hydrocooling and vacuum-cooling result in faster cooling.

## Optimum Storage Conditions

Can be stored for 1 to 2 weeks at 0 °C (32 °F) with 95 to 98% RH.

## Controlled Atmosphere (CA) Considerations

Storage can be increased to 1 mo using 2 to 3% $CO_2$ and 10% $O_2$ at -0.5 °C (31 °F) (Tesi 1990).

## Retail Outlet Display Considerations

Leaves are very delicate and lose water easily if not in plastic liners. Misting with water and refrigerated storage are recommended.

## Chilling Sensitivity

Swiss chard is not chilling sensitive and should be stored as cold as possible without freezing.

## Ethylene Production and Sensitivity

Ethylene production is very low: 0.13 to 0.14 µL $kg^{-1}$ $h^{-1}$ at 20 ºC (68 ºF). Sensitivity, however, is very high. Exposure results in yellowing and senescence.

## Respiration Rates

| Temperature | mg $CO_2$ $kg^{-1}$ $h^{-1}$ |
|---|---|
| 2 °C | 18 to 20 |
| 20 ºC | 29 |

To get mL $CO_2$ $kg^{-1}$ $h^{-1}$, divide the mg $kg^{-1}$ $h^{-1}$ rate by 2.0 at 0 °C (32 °F), 1.9 at 10 °C (50 °F), and 1.8 at 20 ºC (68 °F). To calculate heat production, multiply mg $kg^{-1}$ $h^{-1}$ by 220 to get BTU per ton per day or by 61 to get kcal per tonne per day.

## Physiological Disorders

Freezing is a risk during refrigerated storage, as are yellowing and browning of leaf margins caused by ethylene exposure.

## Postharvest Pathology

The most frequent field pathogens are *Peronospora schachtii* Fuckel and *Cercospora beticola* Sacc.

## Quarantine Issues

There are no known quarantine issues.

## Suitability as Fresh-Cut Product

No current potential exists.

## References

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Tesi, R. 1990. Bietola da costa. *In* V. Bianco and F. Pimpini, eds., Orticoltura, pp. 323-328. Patron Press, Bologna, Italy.

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