

Leek

Jennifer R. DeEll

DeEll is with the Ontario Ministry of Agriculture and Food, Simcoe, Ontario, Canada.

Scientific Name and Introduction

The leek, *Allium porrum* L. (syn. *Allium ampeloprasum* L. var. *porrum*), is an onionlike plant belonging to the Liliaceae family. The edible portion consists of the elongated bases of the foliage leaves (a false stem) and the lower parts, which are blanched white from being underground. There are three major types of leek: European leek, which develops a short and thick pseudostem; Turkish leek, which develops a relatively long and thin pseudostem; and kurrat, which does not produce a pseudostem. The kurrat type is grown in the Mediterranean and the Middle East for its leaves.

Quality Characteristics and Criteria

High-quality leeks are firm and smooth, free of blemishes, and have characteristic white stems with dark-green leaves. The cut bottoms should be flat, because rounded bottoms may indicate prolonged storage.

Horticultural Maturity Indices

Leeks can grow as tall as 50 to 100 cm (20 to 39 in) in height and are harvested when the base diameter reaches 2.54 cm (1 in).

Grades, Sizes, and Packaging

There are no established USDA quality standards for leeks. Leeks are commonly trimmed so that only a 30.5-cm (12-in) portion of the green top remains. They can, depending on diameter, be bunched in groups of three and placed in polyethylene film bags to prevent moisture loss. They are usually packaged in 4.5-kg (10-lb) cartons or wire-bound crates, holding ten 0.45-kg (1-lb) film bags. Some crates may be packed with 18 to 24 bunches, with a net weight of up to 13.6 kg (30 lb).

Precooling Conditions

Hydrocooling, crushed ice, and vacuum-cooling are the most common methods to promptly cool harvested leeks to 0 °C (32 °F).

Optimum Storage Conditions

Leeks can be stored for 2 to 3 mo at 0 °C (32 °F) with 95 to 100% RH. High RH is essential to prevent wilting. Good refrigeration retards elongation and curvature that develops in leeks at 10 to 21 °C (50 to 70 °F). Leeks held in polyethylene-lined crates remain saleable for 5 to 6 weeks at 0 °C (32 °F) under crushed ice, 4 weeks at 0 °C without ice, more than 2 weeks at 4.4 °C (40 °F), and 13 days at 10 °C (50 °F). Leeks stored in nonlined crates keep for 3 weeks at 0 °C (32

°C), 8 days at 4.4 °C (40 °F), and 1 week at 10 °C (50 °F), with or without crushed ice (Hruschka 1978). Freshly harvested leeks held naked in consumer-unit perforated polyethylene bags or in nonperforated (sealed) polyethylene bags remain attractive and saleable for up to 10 weeks. They can last up to 10 weeks under crushed ice at 0 °C (32 °F); for 10 weeks without ice at 0 °C (32 °F); for 12 days at 10 °C (50 °F); and 6 days at 21 °C (70 °F).

Controlled Atmosphere (CA) Considerations

Storage for 4 to 5 mo at 0 °C (32 °F) is possible with CA, though there will be some loss of quality. Recommended CA conditions are 1 to 3% O₂ in combination with either 2 to 5% CO₂ (Saltveit 1997) or 5 to 10% CO₂ (Kurki 1979). Such CA retards yellowing and decay development. Levels of 15 to 20% CO₂ cause tissue injury.

Retail Outlet Display Considerations

Leeks should be held as close to 0 °C (32 °F) as possible and preferably away from products that produce ethylene.

Chilling Sensitivity

Leeks are not sensitive to chilling and should be stored as cold as possible without freezing.

Ethylene Production and Sensitivity

Leeks produce very low levels of ethylene: <0.1 µL kg⁻¹ h⁻¹. Leeks are moderately sensitive to ethylene. Detrimental effects include softening and increased decay.

Respiration Rates

Temperature	mg CO₂ kg⁻¹ h⁻¹
0 °C	10 to 20
4.4 °C	20 to 29
10 °C	50 to 70
15.6 °C	75 to 117
21 °C	110
26.7 °C	107 to 119

Data from Hruschka (1978).

To get mL CO₂ 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 °C (68 °F). To calculate heat production, multiply mg kg⁻¹ h⁻¹ by 220 to get BTU ton⁻¹ day⁻¹ or by 61 to get kcal tonne⁻¹ day⁻¹.

Physiological Disorders

Slight elongation and geotropic curvature may occur, even at 0 °C (32 °F). Leeks held in polyethylene-lined crates elongate less than 1% per week at 0 °C (32 °F) under crushed ice, 3%

per week at 0 °C (32 °F) without ice, 13% per week at 4.4 °C (40 °F), and 22% per week at 10 °C (50 °F) (Hruschka 1978). No attempt has been made to establish a relation between elongation and curvature, though varying degrees of curvature have been observed in such treatments. Senescent yellowing develops more rapidly at warmer temperatures, and moderate wilting is apparent when leeks lose about 15% of their weight.

Postharvest Pathology

Most diseases that attack onions may also affect leeks.

Quarantine Issues

None are known.

Suitability as Fresh-Cut Product

No current potential exists.

Special Considerations

Cultivar, preharvest and postharvest conditions, degree of trimming, and method of packing will all influence the storage life of leeks.

References

Hruschka, H.W. 1978. Storage and Shelf Life of Packaged Leeks. Marketing Research Report 1084, U.S. Department of Agriculture, Agricultural Marketing Service, Washington, DC.

Kurki, L. 1979. Leek quality changes during CA storage. *Acta Hort.* 93:85-90.

Saltveit, M.E. 1997. A summary of CA and MA requirements and recommendations for harvested vegetables. *In* M.E. Saltveit, ed., 7th International Controlled Atmosphere Research Conference, University of California, Davis, July 13-18, 1997, vol. 4, pp. 98-117. University of California, Davis, CA.

Acknowledgments

Some of the information included was taken from the University of Oregon website, "Commercial Vegetable Production Guides, Leeks," at <http://horticulture.oregonstate.edu/content/vegetable-production-guides>.

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