



# HEALTH

## Health Benefits and Safe Handling of Salad Greens no. 9.373

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### Quick Facts...

Lettuce, spinach and other salad greens are an important part of a healthful diet.

Salad greens are year-round sources of vitamin A, vitamin C, and other nutrients.

Red and dark green leafy vegetables are generally higher in nutrients than light-colored greens.

Safe handling of leafy greens helps to reduce the risk of foodborne illness.

### Benefits of Leafy Salad Greens

Green leaves are nutrient rich because they contain the light-catching, energy-converting machinery of plants. Salad greens contain Vitamin A, Vitamin C, beta-carotene, calcium, folate, fiber, and phytonutrients (see Table 1). Leafy vegetables are a good choice for a healthful diet because they do not contain cholesterol and are naturally low in calories and sodium. Many of the health benefits that leafy greens provide come from phytonutrients, unique compounds that provide protection for plants. These compounds are becoming recognized as part of a nutritious diet that promotes long-term health. Phytonutrients can act as antioxidants, which help to prevent chronic diseases like cancer and heart disease. Figure 1 shows the antioxidant content of different kinds of lettuce.

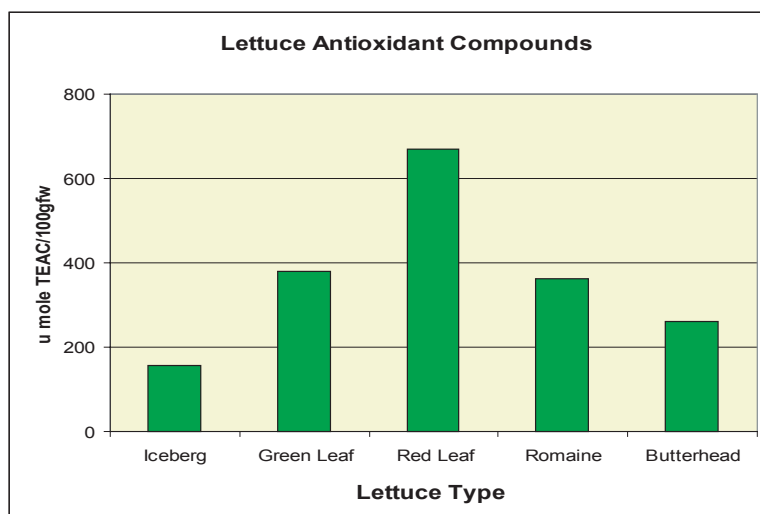


Figure1. Antioxidant content of some types of lettuce.

Lettuce, the most commonly consumed leafy vegetable, provides about seven calories per 1 cup serving. When it comes to satisfying your appetite, it helps to eat foods high in volume but low in calories like lettuce. Lettuce is not typically a stand alone vegetable. It is usually served with an array of other vegetables and fruits or used to add a crunch to sandwiches, hold a variety of fillings as a wrap, or provide color as a garnish.

Lettuce and other leafy greens are generally cool season crops with short growing periods. This means gardeners can get several crops of salad greens in the time it takes other vegetables to reach final maturity. Because leafy greens can grow in a variety of locations, they are often available at local farmers' markets. Home-gardeners can enjoy lettuce and other types of leafy vegetables planted in traditional rows, containers, or even as accents in flower gardens.

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Table 1. Nutrients in various lettuce types.						
Nutrient*	Units	Lettuce Type				
		<i>Iceberg</i>	<i>Green Leaf</i>	<i>Red Leaf</i>	<i>Romaine</i>	<i>Butterhead</i>
Vitamin A	IU	502	7405	7492	5807	3312
Vitamin B <sub>6</sub>	mg	.042	.09	.100	.074	.082
Vitamin C	mg	2.8	1.8	3.7	24	3.7
Vitamin K	mg	24	174	140	103	102
Folic Acid	mcg	29	38	36	136	73
Niacin	mg	.123	.375	.321	.313	.357
Riboflavin	mg	.025	.080	.077	.067	.062
Iron	mg	.41	.86	1.2	.97	1.24
Potassium	mg	141	194	187	247	238
β-carotene	mcg	229	4443	4495	3484	1987
Lutein + Zeaxanthin	mcg	277	1730	1724	2312	1223
*100g fresh weight/USDA National Nutrient Database for Standard Reference, Release 18 (August, 2005) Shaded cells indicate highest values.						

## Types of Lettuce

Many types of lettuce are available in the grocery store and may be purchased by the head or as prepackaged salad greens. Different types have slightly different flavors.

Some have a mild flavor and crisp texture; others have a slightly bitter or tangy flavor that adds a nice bite to mixed salads. Salad greens are popular world-wide so many of the different types have become known by a variety of names. Information about different types of lettuce and salad greens is listed in Table 2.










## Tips for Safe Handling and Storage of Salad Greens

- When shopping, pack fresh salad greens in plastic bags so they are kept separate from other groceries, especially raw meats and poultry.
- Refrigerate salad greens at 35 to 40 degrees F within two hours of purchasing. Store in a plastic bag or lettuce keeper.
- Always wash hands before preparing salads and make sure you are working with a clean cutting board.
- Wash lettuce just before using by running cold water over leaves. Leaves can be difficult to clean so immersing the leaves in a bowl of cold water for a few minutes helps loosen sand and dirt. Presoaking lettuce for 10 minutes in dilute vinegar-water (1/2 cup distilled white vinegar per 1 cup water), followed by a clean water rinse, has been shown to reduce bacterial contamination but may affect texture and taste. After washing, blot dry with paper towels or use a salad spinner to remove excess moisture.
- Because lettuce and other salad greens are very perishable, they should be used within one week after purchase.
- Bagged salads can be convenient but added processing steps like cutting and mixing can increase the likelihood of contamination with microorganisms. To reduce the risk of foodborne illness with bagged salads keep them refrigerated at 35 to 40 degrees F, observe “Use By” dates marked on the package, and rinse well before eating, removing any damaged or spoiled leaves.

**See the following Extension fact sheets for additional information on produce safety:**

- 9.369, Preventing E. coli From Garden to Plate
- 9.310, Food Storage for Safety and Quality

**Table 2. Commonly available salad greens.**

	Name	Characteristics
<b>Commonly available types of lettuce</b>		
	<b>Green Leaf</b> (loose leaf or salad bowl)	Green leaf lettuce forms a loose bunch and is known for its mild flavor.
	<b>Red Leaf</b> (lollo rosso)	Red leaf lettuce makes a colorful addition to salads and sandwiches. Studies have shown red lettuce to be high in antioxidants (Figure 1). Red leaf lettuce is more perishable than head types and has a shorter shelf life.
	<b>Romaine</b> (cos)	Romaine lettuce, a Caesar salad favorite, has elongated, sturdy leaves. Romaine stores well and its coarse texture holds up well in salads.
	<b>Butterhead</b> (bibb or Boston)	This lettuce has tender, rounded leaves with a mild, buttery flavor that form into a soft head. It is often sold in a clam shell to protect its tender leaves.
	<b>Iceberg</b> (head or crisphead)	Iceberg is prized for its crispness and sweet flavor. It can be stored longer than leaf types of lettuce.
	<b>Batavia</b> (French Batavia)	Batavia lettuce is a subtype of crisphead lettuce and is similar to iceberg except it is smaller, less dense and more flavorful. Batavia lettuce is popular in Europe and may be found at farmers' markets or grown in home gardens.
<b>Salad greens that may be part of a salad mix or sold separately</b>		
	<b>Arugula</b> (rocket)	Arugula belongs to the mustard family and has a distinctive peppery flavor. The young fresh leaves are pungent but pleasant and often available in grocery stores.
	<b>Baby Bok Choy</b>	These tender young leaves have a crunchy, celery-like texture and a mild, refreshing flavor.
	<b>Belgian Endive</b> (witloof chicory)	Belgian endive has a dense, cigar-shaped head of crunchy leaves that are pale yellow because it is grown under cover. It is often used in hors d'œuvres, but can be added to salads.

### Tips for Healthier Salads

- For added color and variety, try a different type of salad green to mix with your usual choice.
- Baby greens tend to be more tender, nutritious, and milder in flavor than mature greens.
- Use less dressing to enjoy the flavor of the salad greens.










## Resources & References

Bunning, M. 2007. *Evaluation of Antioxidant and Sensory Properties of Multiple Cultivars of Colorado-grown Lettuce (Lactuca sativa L.)*. PhD Dissertation. Department of Food Science & Human Nutrition, Colorado State University, Fort Collins, CO.

Produce Safety, U. S. Food and Drug Administration, Center for Applied Food Safety & Applied Nutrition. Available online at: [www.cfsan.fda.gov](http://www.cfsan.fda.gov).

USDA National Nutrient Database for Standard Reference, Release 18 (August, 2005). Available online at: [www.nal.usda.gov/fnic/foodcomp/search/](http://www.nal.usda.gov/fnic/foodcomp/search/).

Vijayakumar, C., and Wolf-Hall, C. E. 2002. *Evaluation of household sanitizers for reducing levels of Escherichia coli on iceberg lettuce*. Journal of Food Protection 65: 1646-1650.

	<b>Curly Endive</b> (frisée)	These attractive, yellowish-green, frilly leaves have a strong, pleasantly bitter taste.
	<b>Dandelion greens</b>	These relatives of lettuce are available in some grocery stores. If you collect them yourself, choose young plants that have not been exposed to pesticides.
	<b>Escarole</b>	The taste of this broad-leafed endive varies from mild in the lighter-colored portions to bitter in the darker green leaves.
	<b>Mache</b> (corn salad, lamb's lettuce)	Mache has an unusual but pleasant, nutty flavor. Because its leaves are very delicate, it's usually sold separately rather than included in salad mixes.
	<b>Mesclun</b>	Mesclun is French for a mixture of tender young lettuces (baby greens) and other salad greens. The traditional mesclun mix includes chervil, arugula, lettuce and endive.
	<b>Mizuna</b> (oriental greens)	Mizuna has deeply cut, fringed leaves with a tangy flavor.
	<b>Radicchio</b> (red chicory)	Radicchio is a type of chicory that has dark red leaves with white veins that form into a small, loosely wrapped, cabbage-like head. Radicchio is known for its bittersweet taste.
	<b>Spinach</b>	Young spinach leaves are nutritious and flavorful, alone or mixed with other salad greens. Savoy types of spinach have more wrinkled and curly leaves than smooth types.
	<b>Watercress</b>	These spicy, robust leaves are a pleasing addition to salads and they are also good on sandwiches.

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