



November 3-9

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**What's New:** Among the World's Healthiest Foods fish, grass-fed and pasture-raised meats, whole grains, and nuts and seeds are either good, very good or excellent sources of **Selenium**.

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# Onions



## What's New and Beneficial About Onions

- The flavonoids in onion tend to be more concentrated in the outer layers of the flesh. To maximize your health benefits, peel off as little of the fleshy, edible portion as possible when removing the onion's outermost paper layer. Even a small amount of "overpeeling" can result in unwanted loss of flavonoids. For example, a red onion can lose about 20% of its quercetin and almost 75% of its anthocyanins if it is "overpeeled."
- The total polyphenol content of onions is much higher than many people expect. (Polyphenols are one of the largest categories of phytonutrients in food. This category includes all flavonoids as well as tannins.) The total polyphenol content of onion is not only higher than its fellow allium vegetables, garlic and leeks, but also higher than tomatoes, carrots, and red bell pepper. In the French diet, only six vegetables (artichoke heart, parsley, Brussels sprouts, shallot, broccoli, and celery) have a higher polyphenol content than onion. Since the French diet has been of special interest to researchers in terms of disease prevention, onion's strong polyphenol contribution will very likely lead to follow-up studies that pay closer attention to this unique allium vegetable.
- Within the polyphenol category, onions are also surprisingly high in flavonoids. For example, on an ounce-for-ounce basis, onions rank in the top 10 of commonly eaten vegetables in their quercetin content. The flavonoid content of onions can vary widely, depending on the exact variety and growing conditions. Although the

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average onion is likely to contain less than 100 milligrams of quercetin per 3-1/2 ounces, some onions do provide this amount. And while 100 milligrams may not sound like a lot, in the United States, moderate vegetable eaters average only twice this amount for *all* flavonoids (not just quercetin) from *all* vegetables per day.

- When onions are simmered to make soup, their quercetin does not get degraded. It simply gets transferred into the water part of the soup. By using a low-heat method for preparing onion soup, you can preserve the health benefits of onion that are associated with this key flavonoid.
- When we get quercetin by eating an onion—rather than consuming the quercetin in purified, supplement form—we may end up getting better protection from oxidative stress. That's exactly what happened in an animal study where some animals had yellow onion added to their diet in a way that would provide the same amount of quercetin provided to other animals in the form of purified quercetin extracts. The best protection came from the onion version of this flavonoid, rather than the supplement form.
- Several servings of onion each week are sufficient to statistically lower your risk of some types of cancer. For colorectal, laryngeal, and ovarian cancer, between 1-7 servings of onion has been shown to provide risk reduction. But for decreased risk of oral and esophageal cancer, you'll need to consume one onion serving per day (approximately 1/2 cup).

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## WHFoods Recommendations

With their unique combination of flavonoids and sulfur-containing nutrients, the allium vegetables—such as onions—belong in your diet on a regular basis. There's research evidence for including at least one serving of an allium vegetable—such as onions—in your meal plan every day.

When onion is your allium vegetable of choice, try to consume at least one-half of a medium onion on that day, and use this guideline to adjust your recipes accordingly. For example, if you are following a recipe that yields 4 servings, include at least 2 medium onions in the recipe so that each of your 4 servings will contain at least one half medium onion.

To bring out the sweet flavor of onions we recommend using our Healthy Saute method of cooking onions for just 7 minutes. Cut onions into slices of equal 1/4-inch thickness to help them cook more evenly. The thinner you slice the onions the

more quickly they will cook. Let them sit for at least 5 minutes to enhance their health-promoting properties. For more details see the Healthiest Way of Cooking Onions in the How to Enjoy section below.

<b>Onions, chopped, cooked</b>		<b>Calories: 92</b>
<b>1.00 cup</b>		<b>GI: <a href="#">low</a></b>
<b>(210.00 grams)</b>		
<b>Nutrient</b>		<b>DRI/DV</b>
<a href="#">biotin</a>	27%	
<a href="#">manganese</a>	16%	
<a href="#">copper</a>	16%	
<a href="#">vitamin B6</a>	16%	
<a href="#">vitamin C</a>	15%	
<a href="#">fiber</a>	12%	
phosphorus	11%	
<a href="#">potassium</a>	10%	
<a href="#">vitamin B1</a>	8%	
<a href="#">folate</a>	8%	

This chart graphically details the %DV that a serving of Onions provides for each of the nutrients of which it is a good, very good, or excellent source according to our Food Rating System. Additional information about the amount of these nutrients provided by Onions can be found in the [Food Rating System Chart](#). A link that takes you to the In-Depth Nutritional Profile for Onions, featuring information over 80 nutrients, can be found under the Food Rating System Chart.

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## Health Benefits

Onions, like garlic, are members of the Allium family, and both are rich in sulfur-containing compounds that are responsible for their pungent odors and for many of their health-promoting effects. A wide variety of allyl sulfides are found in onion, including the four major diallyl sulfides: DMS (diallyl monosulfide), DDS (diallyl disulfide), DTS (diallyl trisulfide), and DTTS (diallyl tetrasulfide). Also present are a wide variety of sulfoxides, including (+) S-methyl-L-cysteine sulfoxide (MCSO), (+)-S-(1-propenyl)-L-cysteine sulfoxide (PRENCSO), S-methyl-L-cysteine sulfoxide, S-propyl-L-cysteine sulfoxide,

and S-propenyl-L-cysteine sulfoxide. Onions are an outstanding source of polyphenols, including the flavonoid polyphenols. Within this flavonoid category, onions are a standout source of quercetin.

## Cardiovascular Benefits

Unlike the research on garlic and its cardiovascular benefits, research specifically focused on onion has mostly been conducted on animals rather than humans. In animal studies, there is evidence that onion's sulfur compounds may work in an anti-clotting capacity and help prevent the unwanted clumping together of blood platelet cells. There is also evidence showing that sulfur compounds in onion can lower blood levels of cholesterol and triglycerides, and also improve cell membrane function in red blood cells.

In human studies, most of the cardiovascular benefits have been demonstrated in the form of overall diet. Multiple studies show onion to be a food that provides protection for the heart and blood vessels when consumed in a diet that is rich in other vegetables and fruits—especially flavonoid-containing vegetables and fruits. The benefits of onion in this overall dietary context extend to prevention of heart attack. In virtually all of these diet-based studies, participants with the greatest intake of vegetables (including onions) gain the most protection. The outstanding flavonoid content of onions supports these research findings. It's also interesting to note that onion is most commonly consumed in relatively small amounts along with other foods rather than by itself. For this reason, it can be more difficult to study in large-scale dietary research studies that involve thousands of participants and rely on diet diaries to determine onion consumption.

## Support for Bone and Connective Tissue

Human studies have shown that onion can help increase our bone density and may be of special benefit to women of menopausal age who are experiencing loss of bone density. In addition, there is evidence that women who have passed the age of menopause may be able to lower their risk of hip fracture through frequent consumption of onions. "Frequent" in this context means onion consumption on a daily basis! In this research on bone density in older women, very sporadic eating of onion (once a month or less) did not provide much benefit. That finding, of course, was very expected. But less

expected was the finding that it took daily consumption of onion to show robust benefits for bone density. Just as in the cancer-related onion research, the take-away message here is clear: you don't want to skimp on onions when you are incorporating them into your meal plan.

In and of itself, the high sulfur content of onions may provide direct benefits to our connective tissue. Many of our connective tissue components require sulfur for their formation. For example, with the exception of hyaluronic acid, all glycosaminoglycans (GAGS) are sulfated. (GAGS are the premiere family of molecules found in the ground substance of our connective tissue.)

## Anti-Inflammatory Benefits

While onion is not as well researched as garlic in terms of specific inflammatory health problems like rheumatoid arthritis or allergic airway inflammation, this allium vegetable has nevertheless been shown to provide important anti-inflammatory benefits. Onionin A—a unique sulfur molecule in onion that is found in the bulb portion of the plant—has been shown to inhibit the activity of macrophages, specialized white blood cells that play a key role in our body's immune defense system, and one of their defense activities involves the triggering of large-scale inflammatory responses. While macrophage activity is typically a good thing, inhibition of their activity can sometimes be critical in getting chronic unwanted inflammation under control.

Onion's antioxidants—including its hallmark flavonoid antioxidant, quercetin—also provide us with anti-inflammatory benefits. These antioxidants help prevent the oxidation of fatty acids in our body. When we have lower levels of oxidized fatty acids, our body produces fewer pro-inflammatory messaging molecules, and our level of inflammation is kept in check.

## Cancer Protection

Onion has repeatedly been shown to lower our risk of several cancers, even when we consume it in only moderate amounts. "Moderate" generally means 1-2 times per week, even though in some studies it has been used to mean up to 5-6 times per week. Colorectal cancer, laryngeal cancer, and ovarian cancer are the cancer types for which risk is reduced along with moderate amounts of dietary onion. For other cancer types, however, moderate intake of onion has not been enough to show significant risk reduction. For these cancer types—including

esophageal cancer and cancers of the mouth—daily intake of onion is required before research results show significant risk reduction.

Many factors may play a role in these different research findings for different cancer types. However, the overall take-away from this research seems clear: you do not want to err on the side of small onion servings or infrequent onion intake if you want to obtain the full cancer-related benefits of onion. A few slivers of sliced onion on a tossed salad are a good thing—but probably not enough to provide you with the cancer-related onion benefits that you are seeking. In recipes that already call for onion, try to include at least 1 whole onion (medium size) in the recipe. In recipes that do not already call for onion, consider the addition of 1 medium size onion (if you think onion might fit into the recipe and still provide a tasty outcome). In terms of individual portion sizes when you sit down to eat a meal, try to consume the equivalent of 1/2 onion.

## Other Health Benefits

In animal studies, onions have shown potential for improvement of blood sugar balance, even though it is not yet clear about the carry over of these benefits for humans who are seeking better blood sugar balance from their diet. Most of the animal studies have been conducted on rats, and most have used onion juice or onion extract as the form of onion tested. Future research is needed to clarify onion's potential for helping lower blood sugar and improving blood sugar control, especially in persons with blood sugar problems.

While not as well researched as garlic in terms of antibacterial benefits, onion has nevertheless been shown to help prevent bacterial infection. Along with its sulfur-containing compounds, the flavonoid quercetin contained in onion helps provide these antibacterial benefits. We've seen studies showing antibacterial activity of onion in relationship to the bacteria *Streptococcus mutans* and *Streptococcus sobrinus*. (These bacteria are commonly involved in the production of tooth cavities). Antibacterial benefits have also been shown in the area of gum (periodontal) disease bacteria, including *Porphyromonas gingivalis* and *Prevotella intermedia*. Interestingly, in one study, fresh, chopped, uncooked onion had antibacterial effects on these potentially unwanted gum bacteria, but non-fresh, uncooked onion (raw onion that was chopped and then left to sit for 2 days at room temperature) did not demonstrate these same antibacterial properties nor did fresh onion that was grated and then steamed for 10 minutes. While it is not possible to draw broad

conclusions from a single lab study, these findings suggest that length of storage (for onion that has been chopped but not cooked) and duration of heat exposure (in this case involving exposure to steam for 10 full minutes) can affect some of onion's health benefits. For these reasons, special care may be needed in the storage, handling, and cooking of this allium vegetable.

## Description

What would a kitchen be without the distinctively pungent smell and taste of onions filling out the flavors of almost every type of cuisine imaginable? Fortunately, yellow storage onions are available throughout the year although sweet varieties have a much more limited growing season and are available only a few months out of the year.

While onions may bring a tear to your eye and a pungency to your breath they will also certainly bring delight to your taste buds. The onion, known scientifically as *Allium cepa*, is, on the surface, a humble brown, white or red, paper-thin skinned bulb; yet, despite its plain looks, it has an intense flavor and is a beloved part of the cuisine of almost every region of the world.

The word onion comes from the Latin word *unio*, which means "single," or "one"—reflecting of the onion plant producing a single bulb, unlike its cousin, the garlic, that produces many small bulbs. The name also describes the onion bulb when cut down the middle; it is a union (also from *unio*) of many separate, concentrically arranged layers.

Onions range in size, color, and taste depending upon their variety. There are generally two types of large, globe-shaped onions, classified as spring/summer or storage onions. The former class includes those that are grown in warm weather climates and have characteristic mild or sweet tastes. Included in this group are the Maui Sweet Onion (in season April through June), Vidalia (in season May through June) and Walla Walla (in season July and August). Storage onions are grown in colder weather climates and, after harvesting, are dried out for a period of several months, which allows them to attain dry, crisp skins. They generally have a more pungent flavor and are usually named by their color: white, yellow or red. Spanish onions fall into this classification. In addition to these large onions, there are also smaller varieties such as the green onion, or scallion, and the pearl onion.

Onions are a major source of polyphenols in general,

and also of flavonoids (a very important subdivision of polyphenols). They can also vary greatly in their polyphenol and flavonoid content. In general, red onions are higher in total flavonoids than white onions, (with yellow onions falling somewhere in between).

## History

Onions are native to Asia and the Middle East and have been cultivated for over five thousand years. Onions were highly regarded by the Egyptians. Not only did they use them as currency to pay the workers who built the pyramids, but they also placed them in the tombs of kings, such as Tutankhamen, so that they could carry these gifts bestowed with spiritual significance with them to the afterlife.

Onions have been revered throughout time not only for their culinary use, but also for their therapeutic properties. As early as the 6th century, onions were used as a medicine in India. While they were popular with the ancient Greeks and Romans, they were oftentimes dressed with extra seasonings since many people did not find them spicy enough. Yet, it was their pungency that made onions popular among poor people throughout the world who could freely use this inexpensive vegetable to spark up their meals. Onions were an indispensable vegetable in the cuisines of many European countries during the Middle Ages and later even served as a classic healthy breakfast food. Christopher Columbus brought onions to the West Indies; their cultivation spread from there throughout the Western Hemisphere. Today China, India, the United States, Russian, and Spain are among the leading producers of onions.

## How to Select and Store

Choose onions that are clean, well shaped, have no opening at the neck, and feature crisp, dry outer skins. Avoid those that are sprouting or have signs of mold. In addition, onions of inferior quality often have soft spots, moisture at their neck, and dark patches, which may all be indications of decay. As conventionally grown onions are often irradiated to prevent them from sprouting, purchase organically grown varieties whenever possible to avoid onions that have undergone this process. When purchasing scallions, look for those that have green, fresh-looking tops that appear crisp yet tender. The base should be whitish in color for two or three inches. Avoid those that have wilted or yellowed tops.

Onions should be stored in a well ventilated space at room temperature, away from heat and bright light. With the exception of green onions, do not refrigerate onions. Place them in a wire hanging basket or a perforated bowl with a raised base so that air can circulate underneath. The length of storage varies with the type of onion. Those that are more pungent in flavor, such as yellow onions, should keep for about a month if stored properly. They will keep longer than those with a sweeter taste, such as white onions, since the compounds that confer their sharp taste help to preserve them. Scallions should be stored in a plastic bag in the refrigerator where they will keep for about one week. All onions should be stored away from potatoes, as they will absorb their moisture and ethylene gas, causing them to spoil more readily.

Store cut onions by placing in a sealed container; use them within a day or two since they tend to oxidize and lose their nutrient content rather quickly. Cooked onions will best maintain their taste in an airtight container where they can be kept for a few days; they should never be placed in a metal storage container as this may cause them to discolor. Although peeled and chopped onions can be frozen (without first being blanched), this process will cause them to lose some of their flavor.

## Tips for Preparing and Cooking

### Tips for Preparing Onions

Cut onions into 1/4-inch slices to cook them evenly and quickly. Let them sit for at least 5 minutes to help enhance their health-promoting benefits.

While many people love to eat onions, most dread cutting them since this process usually brings a tear or two to the eyes. The substance that causes the eyes to burn is a special gas that has been named lachrymatory factor (LF). (The full chemical name for this gas is propanthial S-oxide, and it is made from a naturally occurring compound in onion called 1-propenyl-L-cysteine sulphoxide.) Recent research has shown that LF gas is not produced through activity of onion's alliinase enzyme, but rather through the activity of a special enzyme named lachrymatory-factor synthase. Interestingly, even though lachrymatory-factor synthase is the enzyme responsible for production of LF gas, the alliinase enzyme must still be present in order for LF gas production to occur.

Of course, no sooner had this new tear-producing enzyme been discovered than researchers began looking for ways to switch off the gene that served as the blueprint for this enzyme. However, "silencing" the gene without compromising the health benefits of the onion turned out to be a difficult task. Even though researchers in Japan succeeded in shutting down the gene and preventing production of lachrymatory-factor enzyme (thereby paving the way for a genetically engineered onion that would not produce LF gas and cause tearing), they also determined that the shutdown of the gene caused significant (and mostly unwanted) changes in the overall mixture of sulfur-containing molecules in onion.

If cutting onions irritates your eyes, there are a few tricks that you can employ. Use a very sharp knife and always cut the onions while standing; that way your eyes will be as far away as possible. Consider cutting onions by an open window. If cutting onions really makes you cry, consider wearing glasses or goggles. Chill the onions for an hour or so before cutting; this practice can slow down the onion's metabolism and thereby lessen the rate of LF gas production. Cutting onions under cold, running water is a method that is often used to cut back on eye irritation, but it's a method we view as a second-best choice since some of the nutrients found in onion can be lost into the flow of water.

## The Healthiest Way of Cooking Onions

Although onions are most often used as a seasoning, we want to share with you how to enjoy them as a healthy side dish. For great flavor and nutrition we recommend Healthy Sautéing sliced onions. Heat 2 TBS vegetable or chicken broth over medium heat in a stainless steel skillet. When broth begins to steam, add onions and cover for 3 minutes. The onions will release a small amount of liquid. Uncover, add another 2 TBS broth, and continue to stir for 4 minutes, leaving the lid off. Toss with our Mediterranean Dressing and top with your favorite optional ingredients. For details see, [7-Minute Healthy Sautéed Onions](#)

## How to Enjoy

### A Few Quick Serving Ideas

- Combine chopped onions, tomatoes, avocado, and jalapeno for an all-in-one guacamole salsa

- dip.
- To perk up plain rice, top with green onions (scallions) and sesame seeds.
- Healthy Sauteed chopped onions can enhance the flavor or almost any vegetable dish.
- Enjoy a classic Italian salad—sliced onions, tomatoes, and mozzarella cheese drizzled with olive oil.

## WHFoods Recipes that Feature Onions

- [5 Spice Onion Soup](#)
- [7-Minute Healthy Sautéed Onions](#)

## Individual Concerns

Onions are not a commonly allergenic food, are not known to contain measurable amounts of oxalates or purines and are also not included in the Environmental Working Group's 2010 report "Shopper's Guide to Pesticides" as one of the 12 foods most frequently containing pesticide residues.

## Nutritional Profile

The outstanding polyphenol content of onions (including their rich concentration of flavonoid polyphenols) is probably the most overlooked nutrient content of these allium vegetable. Among the flavonoids, onions also provide a particularly large amount of quercetin. A wide variety of allyl sulfides are found in onion, including the four major diallyl sulfides: DMS (diallyl monosulfide), DDS (diallyl disulfide), DTS (diallyl trisulfide), and DTTS (diallyl tetrasulfide). Also present are a wide variety of sulfoxides, including (+) S-methyl-L-cysteine sulfoxide (MCSO), (+)-S-(1-propenyl)-L-cysteine sulfoxide (PRENCSO), S-methyl-l-cysteine sulfoxide, S-propyl-l-cysteine sulfoxide, and S-propenyl-l-cysteine sulfoxide.

Onions are a very good source of biotin. They are also a good source of manganese, vitamin B6, copper, vitamin C, dietary fiber, phosphorus, potassium, folate, and vitamin B1. For an in-depth nutritional profile click here: [Onions](#).

## In-Depth Nutritional Profile

In addition to the nutrients highlighted in our ratings chart, an in-depth nutritional profile for [Onions](#) is also available. This profile includes information on a full array of nutrients, including carbohydrates, sugar, soluble and insoluble fiber, sodium, vitamins, minerals, fatty acids, amino acids and more.

## Introduction to Food Rating System Chart

In order to better help you identify foods that feature a high concentration of nutrients for the calories they contain, we created a Food Rating System. This system allows us to highlight the foods that are especially rich in particular nutrients. The following chart shows the nutrients for which this food is either an excellent, very good, or good source (below the chart you will find a table that explains these qualifications). If a nutrient is not listed in the chart, it does not necessarily mean that the food doesn't contain it. It simply means that the nutrient is not provided in a sufficient amount or concentration to meet our rating criteria. (To view this food's in-depth nutritional profile that includes values for dozens of nutrients - not just the ones rated as excellent, very good, or good - please use the link below the chart.) To read this chart accurately, you'll need to glance up in the top left corner where you will find the name of the food and the serving size we used to calculate the food's nutrient composition. This serving size will tell you how much of the food you need to eat to obtain the amount of nutrients found in the chart. Now, returning to the chart itself, you can look next to the nutrient name in order to find the nutrient amount it offers, the percent Daily Value (DV%) that this amount represents, the nutrient density that we calculated for this food and nutrient, and the rating we established in our rating system. For most of our nutrient ratings, we adopted the government standards for food labeling that are found in the U.S. Food and Drug Administration's "Reference Values for Nutrition Labeling." [Read more background information and details of our rating system.](#)

Onions, chopped, cooked				Calories: 92
1.00 cup				GI: <a href="#">low</a>
210.00 grams				
				World's Healthiest Foods Rating
Nutrient	Amount	DRI/DV (%)	Nutrient Density	
<a href="#">biotin</a>	7.98 mcg	27	5.2	very good

<a href="#">manganese</a>	0.32 mg	16	3.1	good
<a href="#">vitamin B6</a>	0.27 mg	16	3.1	good
<a href="#">copper</a>	0.14 mg	16	3.0	good
<a href="#">vitamin C</a>	10.92 mg	15	2.8	good
<a href="#">fiber</a>	2.94 g	12	2.3	good
phosphorus	73.50 mg	11	2.0	good
<a href="#">potassium</a>	348.60 mg	10	1.9	good
<a href="#">folate</a>	31.50 mcg	8	1.5	good
<a href="#">vitamin B1</a>	0.09 mg	8	1.5	good
<b>World's Healthiest Foods Rating</b>	<b>Rule</b>			
excellent	DRI/DV $\geq$ 75% OR Density $\geq$ 7.6 AND DRI/DV $\geq$ 10%			
very good	DRI/DV $\geq$ 50% OR Density $\geq$ 3.4 AND DRI/DV $\geq$ 5%			
good	DRI/DV $\geq$ 25% OR Density $\geq$ 1.5 AND DRI/DV $\geq$ 2.5%			

In-Depth Nutritional Profile for [Onions](#)

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