What's New and Beneficial About Cabbage

- Did you know that cabbage was one of two vegetable types (the other type was root vegetables) found to be a mainstay for prevention of type 2 diabetes in a recent study of over 57,000 adults in the country of Denmark? In this very large-scale study, adults who closely followed the Healthy Nordik Food Index were found to have the lowest incidence of type 2 diabetes. Importantly, this key health benefit was linked to six food intake categories: (1) fish, (2) rye bread, (3) oatmeal, (4) apples and pears, (5) root vegetables, and (6) cabbage!
- Researchers have now identified nearly 20 different flavonoids and 15 different phenols in cabbage, all of which have demonstrated antioxidant activity. This impressive list of antioxidant phytonutrients in cabbage is one key reason why an increasing number of studies link cabbage intake to decreased risk of several cardiovascular diseases. You can read more about these individual antioxidants in our Health Benefits section.
- In terms of price per edible cup, a report by the Economic Research Service at the U.S. Department of Agriculture (USDA) has shown cabbage to be the second most economical cooked vegetable in terms of price per edible cup. Only potatoes came out slightly less expensive. The relatively low economic cost of cabbage in comparison with most other vegetables makes this cruciferous vegetable a nutritional bargain, especially considering the 3 excellent, 6 very good, and 11 good rankings that it achieves in our WHFoods rating system.
- There are literally hundreds of varieties of cabbage grown worldwide. But of special interest in recent research studies have been cabbage varieties that fall into the red-purple category. It is the anthocyanin antioxidants (and in particular, a subcategory of anthocyanins called cyanidins) that have been the focus of these research studies. Impressively, the anthocyanins in red cabbage are a major factor in the ability of this cruciferous vegetable to provide cardiovascular protection, including protection of red blood cells. Blood levels of beta-carotene, lutein, and total blood antioxidant capacity have been found to improve along with red cabbage intake, while oxidized LDL has been found to decrease. (This reduction in oxidized LDL is a good thing, since LDL—an abbreviation which stands for low-density lipoprotein—becomes a risk factor for blood vessel problems if excessively present in its oxidized form.
- Cabbage turns out to be an especially good source of sinigrin. Sinigrin is one of cabbage's sulfur-containing glucosinolates that has received special attention in cancer prevention research. The sinigrin in cabbage can be also converted into allyl-isothiocyanate, or AITC. This isothiocyanate compound has shown unique cancer preventive properties with respect to bladder cancer, colon cancer, and prostate cancer. It's also worth noting here that a second glucosinolate found in cabbage—glucobrassicin—can be converted into two cancer-protective compounds. These two compounds are indole-3-carbinol (or I3C, an isothiocyanate) and diindolylmethane (or DIM). DIM is an interesting sulfur-containing compound that can be produced in the stomach from I3C if the stomach juices are sufficiently acidic. Like AITC and I3C, DIM has been shown to have cancer-preventive properties for the specific cancer types listed above.

WHFoods Recommendations

You'll want to include cabbage as one of the cruciferous vegetables you eat on a regular basis if you want to receive the fantastic health benefits provided by the cruciferous vegetable family. At a minimum, we recommend 3/4 cup of cruciferous vegetables on a daily basis. This amount is equivalent to approximately 5 cups per week. A more optimal intake amount would be 1-1/2 cups per day, or about 10 cups per week. You can use our <u>Veggie Advisor</u> for help in figuring out your best cruciferous vegetable options.

Traditional methods of steaming or boiling make cabbage watery. Traditional methods of steaming or boiling make cabbage watery. To avoid this result and promote optimal flavor, we recommend Healthy Sautéeing cabbage. Slice cabbage into 1/8-inch slices and let sit for 5 minutes to enhance its health-promoting benefits before cooking. For more details see the Nutrient-Rich Way of Cooking cabbage below.

Our <u>Chinese Chicken Cabbage Salad</u> recipe is a great example of how to enjoy the delicate flavor of napa cabbage in your favorite salad. It is a milder tasting variety of cabbage that boasts the highest concentration of folate.

Enjoy the mild flavor of bok choy by using our Healthy Sauté method of cooking. Our <u>4-Minute Healthy Sautéed Bok Choy</u> recipe will give you great tasting bok choy in a matter of minutes!

Red Cabbage

While green cabbage is the most commonly eaten variety of cabbage, we highly recommend trying red cabbage because of its added nutritional benefits and its robust hearty flavor. We don't think you will be disappointed. The rich red color of red cabbage reflects its concentration of anthocyanin polyphenols, which bring along with them unique antioxidant and anti-inflammatory properties.

Cabbage, red, cooked 1.00 cup (150.00 grams) Calories: 44 GI: <u>very low</u>		
NutrientDRI/DV		
vitamin K 79%		
vitamin C69%		
vitamin B6 <mark>20%</mark>		
manganese 14%		



This chart graphically details the %DV that a serving of Cabbage 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 Cabbage can be found in the Food Rating System Chart. A link that takes you to the In-Depth Nutritional Profile for Cabbage, featuring information over 80 nutrients, can be found under the Food Rating System Chart.

- Health Benefits
- Description
- History
- How to Select and Store
- Tips for Preparing and Cooking
- How to Enjoy
- Individual Concerns
- Nutritional Profile
- References

Health Benefits

While cardiovascular protection and decreased risk of type 2 diabetes have been areas of increased research interest with respect to cabbage intake, it is the area of cancer prevention that still offers the largest number of health-related studies for this cruciferous vegetable. To date, more than 475 studies have examined the role of this cruciferous vegetable in cancer prevention (and in some cases, cancer treatment). The uniqueness of cabbage in cancer prevention is due to the three different types of nutrient richness found in this widely enjoyed food. The three types are (1) antioxidant richness, (2) anti-inflammatory richness, and (3) richness in glucosinolates.

Antioxidant-Related Health Benefits of Cabbage

Cabbage ranked in our WHFoods rating system as an excellent source of vitamin C and a very good source of manganese. But in terms of antioxidants in the newer, phytonutrient category, cabbage is impressive, even among cruciferous vegetables. Polyphenols rank at the top of the list for phytonutrient antioxidants in cabbage. In fact, one group of researchers has described polyphenols as the primary factor in cabbage's overall antioxidant capacity. Even white cabbage (a very lightly-colored form of green cabbage and the most commonly eaten variety of cabbage in the U.S.) provides about 50 milligrams of polyphenols in a half-cup serving. Red cabbage makes its own unique contribution in this area by providing about 30 milligrams of the red pigment polyphenols called anthocyanins in each half cup. (These anthocyanins qualify not only as antioxidant nutrients, but as anti-inflammatory nutrients as well.) The antioxidant richness of cabbage is partly responsible for its cancer prevention benefits. Without sufficient intake of antioxidants, our oxygen metabolism can become compromised, and we can experience a metabolic problem called oxidative stress. Chronic oxidative stress, in and of itself, can be a risk factor for development of cancer.

More than a dozen cabbage phenols have been shown to contribute to its antioxidant capacity. These phenols are now known to include: benzoic acid, caffeic acid, cinnamic acid, coumaric acid, dimethylbenzoic acid, gallic acid, hydroxybenzoic acid, hydroxycinnamic acid, phenylacetic acid, rosmarinic acid, syringic acid, trimethylbenzoic acid, and vanillic acid.

Anti-Inflammatory Benefits of Cabbage

Without sufficient intake of anti-inflammatory nutrients, regulation of our inflammatory system can become compromised, and we can experience the problem of chronic inflammation.

Especially when combined together with oxidative stress, chronic inflammation is a risk factor for development of cancer.

The anthocyanins found in red cabbage are well-documented anti-inflammatory compounds and make red cabbage a standout anti-inflammatory food for this reason. However, all types of cabbage contain significant amounts of polyphenols that provide anti-inflammatory benefits. Anthocyanins are also compounds that fall into the general category of polyphenols known as flavonoids, and they are definitely not the only important flavonoids provided by cabbage. Included in the list of cabbage flavonoids are the following anti-inflammatory compounds: artemetin, betanidin, butein, equol, hydroxyflavone, kaempferol, luteolin, malvidin, naringenin, pelargonodin, purpurogalin, quercitol, and tetrahydrochalcone.

Glucosinolates and Cancer Prevention from Cabbage

Given the roles of oxidative stress and chronic inflammation as risk factors for cancer, the antioxidant and anti-inflammatory richness of cabbage would provide anti-cancer health benefits without the addition of cabbage's glucosinolates. But glucosinolates are cabbage's trump card with regard to "anti-cancer" benefits. The glucosinolates found in cabbage can be converted into isothiocyanate compounds that are cancer preventive for a variety of different cancers, including bladder cancer, breast cancer, colon cancer, and prostate cancer. Some of the key glucosinolates present in cabbage and their corresponding isothiocyanates are listed in the chart below.

Glucosinolates in Cabbage and Their Anti-Cancer Thiocyanates

Glucosinolate	Derived Isothiocyanate	Isothiocyanate Abbreviation
glucoraphanin	sulforaphane	SFN
glucobrassicin	indole-3-carbinol*	I3C
sinigrin	allyl-isothiocyanate	AITC
glucotropaeolin	benzyl-isothiocyanate	BITC

* Indole-3-carbinol (I3C) is not an isothiocyanate. It's a benzopyrrole, and it is only formed when isothiocyanates made from glucobrassicin are further broken down into non-sulfur containing compounds.

The isothiocyanates (ITCs) made from cabbage's glucosinolates act to protect us against cancer through a variety of different mechanisms. In some cases, they help regulate inflammation by altering the activity of messaging molecules within our body's inflammatory system. In other cases, they improve our body's detoxification system and leave our cells with a smaller toxic load. But the bottom line is decreased risk of cancer from consumption of cabbage and its glucosinolates. We've seen one study, from Poland, showing impressive reduction of breast cancer risk in women consuming large amounts of cabbage. (In this particular study, this reduction in risk was associated with consumption of at least 4 cabbage servings per week, in comparison with the once-per-week serving consumed by women with higher breast cancer risk.)

In this context of glucosinolates, isothiocyanates, and cancer prevention, it is worth noting that one of the I3C (the isothiocyanate made from glucobrassicin) can be further converted in the stomach under healthy acidic conditions to diindolylmethane (DIM), which has also been shown to be a valuable cancer-preventive compound.

Digestive Tract Support of Cabbage

Long-established in health research is the role of cabbage juice in helping heal stomach ulcers (called peptic ulcers), but more recent studies on cabbage have looked at the overall health benefits of this food for the stomach and digestive tract as a whole. Present-day studies make it clear that cabbage contains a variety of nutrients of potential benefit to our stomach and intestinal linings. These nutrients include glucosinolates (and the anti-inflammatory isothiocyanates or ITCs made from them), antioxidant polyphenols, and the amino acid-like substance called glutamine. In the case of ITCs, digestive tract benefits include proper regulation of bacterial populations of Helicobacter pylori inside the stomach. These bacteria are normal stomach inhabitants, but their populations can become too large and they can latch onto the stomach lining in an undesirable way. The ITCs made from cabbage's glucosinolates can lower the risk of these unwanted stomach events.

It would also be wrong to move on from this issue of digestive support without mentioning the very good fiber support provided by cabbage. At nearly 4 grams per cup and only 44 calories, cabbage provides nearly 1 gram of fiber for every 10 calories! This "fiber density" of cabbage actually ranks it above some our WHFoods legumes, including our beans, lentils, and dried peas. This very low "calorie cost" of cabbage fiber makes it easy to add fiber to your diet without adding calories. And this added fiber can be very helpful in improving digestion of food.

Cardiovascular Support from Cabbage

Recent studies on cabbage intake—especially studies on intake of red cabbage—have looked carefully at the potential for cardiovascular support from this vegetable. The results have been encouraging. Blood levels of beta-carotene, lutein, and total blood antioxidant capacity have been found to increase along with increasing intake of red cabbage intake. At the same time, total cholesterol<, total LDL >cholesterol, and total oxidized LDL have been found to decrease. Reductions in oxidized LDL are a particularly noteworthy finding since oxidized LDL is a known risk factor for development of atherosclerosis. One of the ways in which cabbage intake can lower your total and LDL cholesterol is through the process of binding with bile acids. Your liver uses cholesterol as a basic building block to produce bile acids. Bile acids are specialized molecules that aid in the digestion and absorption of fat, and when they are present in your digestive tract, fiber-related nutrients in cabbage can bind together with them for eventual excretion. Whenever this process takes place, your liver needs to replace the excreted bile acids by drawing upon your existing supply of cholesterol, and as a result, your cholesterol level drops down.

Description

Cabbage has a round shape and is composed of superimposed leaf layers. It is a member of the food family traditionally known as cruciferous vegetables and is very closely related to kale, broccoli, collards and Brussels sprouts. All cruciferous vegetables provide integrated nourishment across a wide variety of nutritional categories and provide broad support across a wide variety of body systems as well. For more on cruciferous vegetables see:

- Eating Healthy with Cruciferous Vegetables
- Feeling Great with Cruciferous Vegetables

The word "brassica" translates in Latin as "cabbage." However, this connection between cabbage and "brassica" vegetables can sometimes be confusing.

Cabbage and all of its fellow cruciferous vegetables all belong to the family of plants called the *Brassicaceae*. Despite the literal translation of "brasssica" as "cabbage," however, this family of plants is seldom referred to as the "cabbage family." Far more often, it is referred to as the "mustard plant family." (Mustard, including mustard greens, belongs to this plant family as well.) When people talk about the "brassica" family of plants, they are talking about the plant family that includes both cabbage and mustard. Historically, this family of plants was most commonly referred to as the *Crucifereae*. For all practical purposes, Crucifereae and Brassicaceae are interchangeable names for this plant family. The name *Crucifereae*, of course, is where the term "cruciferous vegetables" originates. All cruciferous vegetables are members of the *Brassicaceae/Crucifereae* family.

Even more confusing is the very close relationship between several members of this plant family. The genus/species combination of *Brassica oleraceae* is identical for all of the following cruciferous vegetables: broccoli, Brussels sprouts, cabbage, cauliflower, kale, and kohlrabi. These six vegetables are simply different subspecies and varieties of *Brassica oleraceae*.

Because cabbage's inner leaves are protected from the sunlight by the surrounding leaves, they are oftentimes lighter in color. However, the outer color of cabbage leaves is still the most common way of dividing cabbage into types. For cabbage, the two basic color types are green and red. Green cabbages can range from very dark to very light in color. (In fact, some of the lighter-colored green cabbage varieties are actually referred to as "white" cabbages.) The subgroup "alba" (meaning "white" in Latin) is often used to refer to the green cabbage subgroup as a whole. Red cabbage can also range widely in color, with some appearing deep purple in color. The subgroup "rubra" is often used to refer to the red cabbage subgroup as a whole. You'll also sometimes hear the darkest shades of purple cabbage being referred to as "black" cabbage.

Savoy cabbage refers to cabbage that has more crinkled or "ruffly" leaves. The leaves may also be less densely packed together. Savoy cabbage also typically has a more delicate texture than ordinary green or red varieties. However, there are light green, dark green, red, and purple varieties of savoy cabbage, just like there are similar colors of non-savoy varieties. Most of the savoy cabbage varieties commonly available in U.S. grocery stores, however, have leaves that are lighter green or green-yellow in color. The subgroup name "sabauda" is often used to refer to the savoy subgroup as a whole.

Once you move past these basic cabbage types, however, some of the terms that you will hear to describe cabbage can become confusing. For example, you will sometimes hear the term "Chinese cabbage" being used to refer to cabbage types. However, cabbage types referred to as "Chinese" seldom belong to the *Brassica oleracea* genus/species of plant, but rather, to the *Brassica rapa* genus/species. *Brassica rapa* is the genus/species to which boy choy and turnips also belong.

Due to these close plant relationships, you may find the terms "choy" and "cabbage" overlapping fairly extensively in common vegetable names. For example, you may find bok choy being referred to as "white cabbage" or "Chinese cabbage" even though bok choy does not belong to the *Brassica oleracea* genus species that serves as the home for broccoli, Brussels sprouts, cabbage, cauliflower, kale, and kohlrabi. As mentioned earlier in this Description section, the *Brassicaceae* family of plants has some very closely related groups and this closeness is witnessed by the common naming of cabbage and choy plants.

Most "Chinese cabbage" sold in U.S. groceries belongs to the group *Brassica rapa* subspecies *pekinensis*. The term "napa cabbage" is sometimes used in a way that is synonymous with "Chinese cabbage," and this usage makes sense to us because the most common plant group for "napa cabbage" is also group *Brassica rapa* subspecies pekinensis. When the terms "Chinese cabbage" and "napa cabbage" are used in this synonymous way, you can treat these varieties of cabbage as being readily identifiable by their fairly large, barrel-shaped heads and their somewhat crinkly leaves. In the case of "napa cabbage," it is also worth noting that the designation "napa" comes from the Japanese word "nappa" rather than the region of California known as the "Napa Valley."

Yet another *Brassicaceae* family vegetable that you may hear being referred to as cabbage is "Tuscan cabbage." At this point in time, the term "Tuscan cabbage" does not have a very reliable food counterpart in the grocery store. "Cavolo nero"—which literally means "black cabbage" in Italian—is most often a variety of *Brassica oleracea* most closely resembling kale. In fact, "Tuscan kale" is a more common name for the seeds of this plant than either "Tuscan cabbage" or "black cabbage." But once again, you can see the amazing closeness in the food naming and food relationships in this *Brassicacea* family of plants.

History

As you might imagine from the complicated set of descriptions above, it has been equally complicated for plant researchers to trace the exact history of cabbage and its development. Because of the linguistic overlap between "choy" and "cabbage" and because of the cultivation of *Brassicacea* plants in Europe, Asia, and Africa, there are some conflicting analyses of cabbage and its exact origins. Most histories, however, point to the presence of wild cabbage in Europe as the most direct, distant ancestor of the cabbages we currently purchase in the grocery store. However, if we lived in Europe during the first years of wild cabbage growth over 2,000 years ago, we would be unlikely to recognize any of those wild cabbage plants as cabbages. That's because the original European forms of this plant were non-head-forming and much more closely resembled cruciferous vegetables like kale or collards.

In 2014, U.S. adult intake of cabbage averaged about seven pounds per year. This volume of intake placed cabbage in 10th place in 2014 as the most commonly consumed vegetable. In terms of food production and the U.S. food supply chain, nearly half (45%) of all cabbage produced for the retail marketplace is ultimately processed into coleslaw. Production of sauerkraut accounts for another 12% of all cabbage production, and most of the remaining cabbage is sold as produce in the form of head cabbage. The states of California, Florida, Georgia, New York, and Texas jointly produce about 75% of the cabbage grown in the U.S., even though cabbage is widely grown across most of the country. About 2.2 billion pounds of cabbage are grown in the U.S. each year, with about 100 million pounds being exported and at least that amount or greater being imported from other countries each year. Mexico—followed by Canada—account for the majority of cabbage imports into the U.S.

How to Select and Store

Choose cabbage heads that are firm and dense with shiny, crisp, colorful leaves free of cracks, bruises, and blemishes. Severe damage to the outer leaves is suggestive of worm damage or decay that may reside in the inner core as well.

There should be only a few outer loose leaves attached to the stem. If not, it may be an indication of undesirable texture and taste. Avoid buying precut cabbage, either halved or shredded, since once cabbage is cut, it often begins to lose its valuable vitamin C content.

At WHFoods, we encourage the purchase of certified organically grown foods, and cabbage is no exception. Repeated research studies on organic foods as a group show that your likelihood of exposure to contaminants such as pesticides and heavy metals can be greatly reduced through the purchased of certified organic foods, including cabbage. In many cases, you may be able to find a local organic grower who sells cabbage but has not applied for formal organic certification either through the U.S. Department of Agriculture (USDA) or through a state agency. (Examples of states offering state-certified organic foods include California, New York, Oregon, Vermont, and Washington.) However, if you are shopping in a large supermarket, your most reliable source of organically grown cabbage is very likely to be cabbage that displays the USDA organic logo.

Put the whole head in a plastic bag in the crisper of your refrigerator. Red and green cabbage will keep if stored this way for about 2 weeks while Savoy cabbage will keep for about 1 week.

If you need to store a partial head of cabbage, cover it tightly with plastic wrap and refrigerate. Since the vitamin C content of cabbage can more quickly degrade once it has been cut, you should use the remainder within a couple of days.

Here is some background on why we recommend refrigerating cabbage. Whenever food is stored, four basic factors affect its nutrient composition:exposure to air, exposure to light, exposure to heat, and length of time in storage. Vitamin C, vitamin B6, and carotenoids are good examples of nutrients highly susceptible to heat, and for this reason, their loss from food is very likely to be slowed down through refrigeration.

Tips for Preparing and Cooking

Tips for Preparing Cabbage

Even though the inside of cabbage is usually clean since the outer leaves protect it, you still may want to clean it. Wash whole cabbage head under running water or remove the thick fibrous outer leaves and cut the cabbage into pieces and then wash under running water.

We recommend washing cabbage just prior to eating or cooking in order to help decrease the rate of deterioration. To cut cabbage into smaller pieces, first quarter it and remove the core. Cabbage can be cut into slices of varying thickness, grated by hand or shredded in a food processor.

The Nutrient-Rich Way of Cooking Cabbage

From all of the cooking methods we tried when cooking cabbage, our favorite is Healthy Sauté. We think that it provides the greatest flavor. Healthy Sauté—similar to Quick Boiling and Quick Steaming, our other recommended cooking methods—follows three basic cooking guidelines that are generally associated in food science research with improved nutrient retention. These three guidelines are: (1) minimal necessary heat exposure; (2) minimal necessary cooking duration; (3) minimal necessary food surface contact with cooking liquid.

However, in some recent studies on cabbage cooking, different cooking methods have been found to produce differing results. For example, when 5-minute boiling was compared to 5-minute streaming, 5-minute microwaving, and 5-minute steaming, boiling came out better than either steaming or microwaving for preserving the anthocyanins in red cabbage. For retention of vitamin C in this same study, however, steaming came out best.

Fermentation of raw cabbage has also been shown in several recent studies to provide some health benefits that heat-based cooking methods cannot. For example, fermentation of cabbage has been shown to result in increased formation of ascorbigen, a well-documented antioxidant formed by the interaction of vitamin C (ascorbic acid) with indole-3-carbinol (I3C). I3C is the isothiocyanate that can be made from glucobrassicin, one of the glucosinolates present in cabbage. The creation of ascorbigen through cabbage fermentation has further been shown to improve oxidative stress and antioxidant capacity in several animal studies.

Finally, several recent studies have point out that raw cabbage can offer greater amounts of certain nutrients that either cooked or fermented cabbage. In one study, the incorporation of fresh, uncooked, chopped red cabbage was recommended as an optimal way to derive nutritional benefits from this cruciferous vegetable.

Slicing Cabbage very thin before cooking and letting it sit for 5-10 minutes helps bring out their hidden flavors and makes them more enjoyable. You can start to smell the complex rich aroma after you cut it. This is similar to the reactions that occur that causes the pungent smell when onions and garlic are cut, although the smell is not quite as intense For more on how preparation methods may impact the benefit of cruciferous vegetables, see <u>our article on the subject</u>.

To Healthy Sauté cabbage, heat 5 TBS of vegetable broth, chicken broth, or water in a stainless steel skillet. Once bubbles begin to form add shredded cabbage, cover, and Healthy Sauté for 5 minutes. For great Mediterranean flavor, transfer to a bowl and toss with Mediterranean Dressing. (See our <u>5-Minute Healthy Sautéed Red Cabbage</u> recipe for details on how to prepare this dish.) Ginger is a great addition to your Healthy Sautéed cabbage; you can also add rice vinegar and sesame seeds.

How to Enjoy

A Few Quick Serving Ideas

- Braise red cabbage with a chopped apple and red wine. This is a child-friendly dish since the alcohol (but not the flavor or the flavonoids) will evaporate.
- Combine shredded red and green cabbage with fresh lemon juice, olive oil, and seasonings such as turmeric, cumin, coriander, and black pepper to make coleslaw with an Indian twist.

Some WHFoods recipes that feature cabbage:

- Asian Chicken Salad
- Chinese Chicken Cabbage Salad
- Spicy Cabbage Soup
- Poached Fish with Napa Cabbage
- Sesame Braised Chicken & Cabbage
- Sweet N' Sour Cod with Cabbage and Broccoli
- Vegetarian Stir-Fry
- Napa Cabbage Salad
- 5-Minute Healthy Sautéed Red Cabbage
- Gingered Cabbage

If you'd like even more recipes and ways to prepare cabbage the Nutrient-Rich Way, you may want to explore *The World's Healthiest Foods* book.

Individual Concerns

Cabbage and Goitrogens

You may sometimes hear cabbage being described as a food that contains "goitrogens," or as a food that is "goitrogenic." For helpful information in this area—including our WHFoods Recommendations—please see our article What is meant by the term "goitrogen" and what is the connection between goitrogens, food, and health?

Nutritional Profile

Cabbage is an excellent source of vitamin K, vitamin C and vitamin B6. It is also a very good source of manganese, dietary fiber, potassium, vitamin B1, folate and copper. Additionally, cabbage is a good source of choline, phosphorus, vitamin B2, magnesium, calcium, selenium, iron, pantothenic acid, protein and niacin.

As described earlier in this food profile, cabbage is also a unique source of several types of phytonutrients. Its overall antioxidant activity is largely due to its unusual phenol and polyphenol content. With red cabbage, these polyphenols include antioxidant and anti-inflammatory compounds called anthocyanins. Cabbage is also unique for it rich supply of glucosinolates. These phytonutrients can be converted by the body into isothiocyanates that have special detoxification and anti-cancer properties.

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.

Cabbage, re	d, cooked
1.00 cup	
150.00 gram	S
Calories: 44	

GI: very low

		DRI/DV	Nutrient	World's Healthiest
Nutrient	Amount	(%)	Density	Foods Rating
<u>vitamin K</u>	71.40 mcg	79	32.8	excellent
vitamin C	51.60 mg	69	28.5	excellent
vitamin B6	0.34 mg	20	8.3	excellent
<u>manganese</u>	0.33 mg	14	5.9	very good
<u>fiber</u>	3.90 g	14	5.8	very good
<u>vitamin B1</u>	0.11 mg	9	3.8	very good

<u>folate</u>	36.00 mcg	9	3.7	very good
copper	0.08 mg	9	3.7	very good
potassium	393.00 mg	8	3.5	very good
<u>choline</u>	32.10 mg	8	3.1	good
<u>phosphorus</u>	49.50 mg	7	2.9	good
vitamin B2	0.09 mg	7	2.9	good
<u>calcium</u>	63.00 mg	6	2.6	good
<u>selenium</u>	3.45 mcg	6	2.6	good
magnesium	25.50 mg	6	2.5	good
<u>iron</u>	0.99 mg	6	2.3	good
pantothenic acid	0.23 mg	5	1.9	good
<u>protein</u>	2.27 g	5	1.9	good
vitamin B3	0.57 mg	4	1.5	good
World's Healthiest				
Foods Rating		Rule		
excellent		DRI/DV>=75% OR Density>=7.6 AND DRI/DV>=10%		

Density>=7.6 AND DRI/DV>=10%
DRI/DV>=50% OR

Density>=3.4 AND DRI/DV>=5%
DRI/DV>=25% OR

Density>=1.5 AND DRI/DV>=2.5% In-Depth Nutritional Profile

very good

good

In addition to the nutrients highlighted in our ratings chart, here is an in-depth nutritional profile for Cabbage. 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.

Cabbage, red, cooked (Note: "" indicates data <u>unavailable</u>)		
1.00 cup (150.00 g)		GI: very low
BASIC MACRONUTRIENTS AND CALORIES		
nutrient	amount	DRI/DV (%)
Protein	2.27 g	5
Carbohydrates	10.41 g	5
Fat - total	0.14 g	0
Dietary Fiber	3.90 g	14
Calories	43.50	2

MACRONUTRIENT AND CALORIE DETAIL		
nutrient	amount	DRI/DV (%)
Carbohydrate:		
Starch	g	
Total Sugars	4.98 g	
Monosaccharides	3.92 g	
Fructose	1.79 g	
Glucose	2.12 g	
Galactose	0.00 g	
Disaccharides	1.06 g	
Lactose	0.00 g	
Maltose	0.00 g	
Sucrose	1.06 g	
Soluble Fiber	g	
Insoluble Fiber	g	
Other Carbohydrates	1.53 g	
Fat:		
Monounsaturated Fat	0.01 g	
Polyunsaturated Fat	0.06 g	
Saturated Fat	0.02 g	
Trans Fat	0.00 g	
Calories from Fat	1.22	
Calories from Saturated Fat	0.15	
Calories from Trans Fat	0.00	
Cholesterol	0.00 mg	
Water	136.26 g	
MICRONUTRIENTS		
nutrient	amount	DRI/DV (%)
Vitamins		
Water-Soluble Vitamins		

B-Complex Vitamins		
Vitamin B1	0.11 mg	9
Vitamin B2	0.09 mg	7
Vitamin B3	0.57 mg	4
Vitamin B3 (Niacin Equivalents)	0.90 mg	
Vitamin B6	0.34 mg	20
Vitamin B12	0.00 mcg	0
Biotin	0.15 mcg	1
Choline	32.10 mg	8
Folate	36.00 mcg	9
Folate (DFE)	36.00 mcg	
Folate (food)	36.00 mcg	
Pantothenic Acid	0.23 mg	5
Vitamin C	51.60 mg	69
Fat-Soluble Vitamins		
Vitamin A (Retinoids and Carotenoids)		
Vitamin A International Units (IU)	49.50 IU	
Vitamin A mcg Retinol Activity Equivalents (RAE)	2.47 mcg (RAE)	0
Vitamin A mcg Retinol Equivalents (RE)	4.95 mcg (RE)	
Retinol mcg Retinol Equivalents (RE)	0.00 mcg (RE)	
Carotenoid mcg Retinol Equivalents (RE)	4.95 mcg (RE)	
Alpha-Carotene	0.00 mcg	
Beta-Carotene	30.00 mcg	
Beta-Carotene Equivalents	30.00 mcg	
Cryptoxanthin	0.00 mcg	
Lutein and Zeaxanthin	30.00 mcg	
Lycopene	0.00 mcg	
Vitamin D		
Vitamin D International Units (IU)	0.00 IU	0
Vitamin D mcg	0.00 mcg	
Vitamin E		
Vitamin E mg Alpha-Tocopherol Equivalents (ATE)	0.18 mg (ATE)	1

Vitamin E International Units (IU)	0.27 IU	
Vitamin E mg	0.18 mg	
Vitamin K	71.40 mcg	79
Minerals		
nutrient	amount	DRI/DV (%)
Boron	160.50 mcg	
Calcium	63.00 mg	6
Chloride	mg	
Chromium	mcg	
Copper	0.08 mg	9
Fluoride	mg	
Iodine	3.00 mcg	2
Iron	0.99 mg	6
Magnesium	25.50 mg	6
Manganese	0.33 mg	14
Molybdenum	mcg	
Phosphorus	49.50 mg	7
Potassium	393.00 mg	8
Selenium	3.45 mcg	6
Sodium	42.00 mg	3
Zinc	0.37 mg	3
INDIVIDUAL FATTY ACIDS		
nutrient	amount	DRI/DV (%)
Omega-3 Fatty Acids	0.04 g	2
Omega-6 Fatty Acids	0.03 g	
Monounsaturated Fats		
14:1 Myristoleic	0.00 g	
15:1 Pentadecenoic	0.00 g	
16:1 Palmitol	0.00 g	
17:1 Heptadecenoic	0.00 g	

Alanine	0.07 g	
nutrient	amount	DRI/DV (%)
INDIVIDUAL AMINO ACIDS		
24:0 Lignoceric	g	
22:0 Behenate	g	
20:0 Arachidic	g	
18:0 Stearic	g	
17:0 Margaric	g	
16:0 Palmitic	0.01 g	
15:0 Pentadecanoic	g	
14:0 Myristic	g	
12:0 Lauric	g	
10:0 Capric	g	
8:0 Caprylic	g	
6:0 Caproic	g	
4:0 Butyric	g	
Saturated Fatty Acids		
22:6 Docosahexaenoic (DHA)	0.00 g	
22:5 Docosapentaenoic (DPA)	0.00 g	
20:5 Eicosapentaenoic (EPA)	0.00 g	
20:4 Arachidonic	0.00 g	
20:3 Eicosatrienoic	0.00 g	
18:4 Stearidonic	0.00 g	
18:3 Linolenic	0.04 g	
18:2 Conjugated Linoleic (CLA)	g	
18:2 Linoleic	0.03 g	
Polyunsaturated Fatty Acids	-1	
24:1 Nervonic	0.00 g	
22:1 Erucic	0.00 g	
20:1 Eicosenoic	0.00 g	
18:1 Oleic	0.01 g	

Arginine	0.13 g	
Aspartic Acid	0.22 g	
Cysteine	0.02 g	
Glutamic Acid	0.52 g	
Glycine	0.05 g	
Histidine	0.04 g	
Isoleucine	0.05 g	
Leucine	0.07 g	
Lysine	0.08 g	
Methionine	0.02 g	
Phenylalanine	0.06 g	
Proline	0.08 g	
Serine	0.09 g	
Threonine	0.06 g	
Tryptophan	0.02 g	
Tyrosine	0.03 g	
Valine	0.07 g	
OTHER COMPONENTS		
nutrient	amount	DRI/DV (%)
Ash	0.93 g	
Organic Acids (Total)	g	
Acetic Acid	g	
Citric Acid	g	
Lactic Acid	g	
Malic Acid	g	
Taurine	g	

-- g

-- g

-- g

-- g

-- g

Sugar Alcohols (Total)

Glycerol

Inositol

Mannitol

Sorbitol

Xylitol	g	
Artificial Sweeteners (Total)	mg	
Aspartame	mg	
Saccharin	mg	
Alcohol	0.00 g	
Caffeine	0.00 mg	

Note:

The nutrient profiles provided in this website are derived from The Food Processor, Version 10.12.0, ESHA Research, Salem, Oregon, USA. Among the 50,000+ food items in the master database and 163 nutritional components per item, specific nutrient values were frequently missing from any particular food item. We chose the designation "--" to represent those nutrients for which no value was included in this version of the database.

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