

Are Baby Carrots as Good for You as Full Size?

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STORY AT-A-GLANCE

- › Carrots are a popular snack food in the U.S. as they are easy, sweet and go well with a number of different dipping sauces, such as humus
- › While baby carrots are nutrient-dense, they also are bathed in chlorine before sale, increasing the risk of exposure to disinfection byproducts, some of the most dangerous chemicals to your health
- › Cooking and cutting whole unprocessed carrots may release more beneficial and powerful antioxidants in the vegetable

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Carrots, and especially baby carrots, are a popular snack in the U.S., for adults and children alike. Parents use the bite-sized, sweet treats in children's lunches to boost the nutrient value of their mid-day meal. They are easy to dip, snack on and require little to no preparation.

Baby carrots today are a breed apart from the original product, which were peeled and reshaped from broken or misshapen larger carrots. California carrot farmer Mike Yurosek was the entrepreneur in the 1980s who reshaped the way you think about carrots.¹

As Yurosek's method of peeling and reshaping has evolved over the years, the popularity of the product has grown. Today, farmers produce hybrid carrots designed to meet the

needs of the consumer who wants a fresh out-of-the-bag snack without the hassle of peeling and cleaning. But, does all that convenience come at a price?

Do Small Size Carrots Have Full-Size Nutrients?

Baby carrots appeal to many, as they both taste good and deliver an additional nutritional punch to a diet potentially high in processed foods. Carrots are a root vegetable that are commonly orange in color. Purple, black, red, white and yellow varieties have also been developed, although not as baby carrots.

The current 2-inch carrots are cut from a special variety of plant that grows slim and remains tender.² The ends of the carrots, or broken pieces, are now used for juicing or are processed into cattle feed.

The carrots used for baby carrots are grown in close proximity, to encourage the root to grow deep and slender, as well as being harvested approximately 40 to 60 days earlier than full grown variety.³

Baby carrots are also not peeled as they once were. Instead, the carrots are shaped from small, slender carrots that don't have the characteristic lighter colored core, and then are buffed and polished in a tumble drum.⁴

According to a comparison between baby carrots⁵ and full-sized carrots⁶ in the U.S. Department of Agriculture National Nutrient Database for Standard Reference Release, baby carrots have slightly more water and slightly fewer calories.

They each have approximately the same amount of sugar, but baby carrots have less iron, phosphorus and magnesium. Comparing 100 grams of each type of carrot, baby carrots also carry less vitamin A and vitamin C, but significantly more folate than the larger variety.

Although the nutrient value between the two types of carrots is not equal, this may be offset if you are more tempted to eat a greater number of baby carrots than you are the larger, thicker variety.

Benefits of Carrots and Beta-Carotene

In this short video, I briefly go over the role and importance of antioxidants to your health. Carrots are a potent source of antioxidants in your diet, including lycopene, beta-carotene and vitamin A. Half a cup of chopped carrots, whether the larger or smaller baby carrot, contains over 200% of the average daily recommended amount of vitamin A.

The high vitamin A content comes from beta-carotene, which is converted into vitamin A in your liver. Beta-carotene is also a strong antioxidant, effective against free radicals and reducing oxidative stress. By developing a habit of including carrots in your daily diet, you will enjoy some important health benefits.

Cancer — Antioxidants in carrots may play a role in cancer prevention. Research has demonstrated smokers who eat carrots more than once a week have a lower risk of lung cancer,⁷ while a beta-carotene-rich diet may also protect against prostate cancer.^{8,9}

Further research demonstrates the association between beta-carotene and a lower risk of colon cancer,¹⁰ a positive effect against leukemia¹¹ and reduced risk of gastric cancer.¹² A natural toxin carrots use against fungal disease, falcarinol, may stimulate cancer-fighting mechanisms in your body, and has demonstrated the ability to reduce the risk of tumors in rats.¹³

Vision — Vitamin A deficiency may cause your eye's photoreceptors to deteriorate, leading to vision problems. Eating foods rich in beta-carotene may restore vision,¹⁴ lending truth to the old adage that carrots are good for your eyes.

Carrots may reduce your risk of age-related macular degeneration¹⁵ and the incidence of cataracts.¹⁶ Additionally, research shows women may reduce their risk of glaucoma by 64% by consuming more than two servings of carrots per week.¹⁷

Heart health — Fruits and vegetables that are deep orange in color are associated with a lower risk of coronary heart disease (CHD). Carrots are associated with a 32%

lower risk of CHD¹⁸ and have been associated with a lower risk of heart attacks in women.¹⁹

Metabolic syndrome – Beta-carotene and lycopene, two carotenoids found in carrots, have been associated with a lower incidence of metabolic syndrome in middle aged men.²⁰ Metabolic syndrome is associated with heart disease, stroke and type 2 diabetes.

Skin – Orange-red vegetables, rich in beta-carotene, may help prevent cell damage and premature skin aging.

People who suffer from leukoplakia, white lesions found in the mouth and tongue of people exposed to years of smoking or alcohol consumption, and who took a beta-carotene supplement experienced fewer symptoms.²¹

Researchers have also found people who suffer from scleroderma, a connective tissue disorder causing hardening of the skin, had low levels of beta-carotene.²²

Oral health – Carrots may help reduce the number of cavities you get and help keep your teeth clean. Saliva is an alkaline substance, helping to reduce bacteria and plaque production on your teeth. Eating carrots helps to increase your production of saliva and stimulates your gums.²³

Brain health – Carrot extract has demonstrated a positive effect on the management of cognitive dysfunction.²⁴ Eating a high number of root vegetables, such as carrots, reduce cognitive decline in middle-aged men and women.²⁵

Liver function – Carrot extract may also help protect your liver from environmental toxins.²⁶ The hepatoprotective benefits of carrots are experienced with both the vegetable and the extract.²⁷

Antiaging effects – Antioxidants help to ward off the damage caused by free radicals, and are a strong antiaging force. Carrots are a valuable source of these antioxidants.²⁸

Anti-inflammatory – The anti-inflammatory properties in carrots are significant even when compared to anti-inflammatory drugs like aspirin, ibuprofen and naproxen.²⁹

Cutting Carrots May Enhance the Nutrient Value

Since baby carrots are buffed, removing the outer protective layer, they require refrigeration to extend their shelf life. Even in the refrigerator, they may start to spoil within 30 days of picking and processing. Many of the health benefits of carrots come from their strong antioxidant activity, which may be enhanced through cooking or cutting the vegetable.

Plants have a rudimentary form of communication and a means of protection. In one study, researchers discovered when a tobacco plant was attacked by a specific insect, the plant released a compound that attracted the insect's predator, thus protecting itself.³⁰ This same process of chemical change may increase the antioxidant concentration in a carrot after it has been cut.

Both humans and plants use antioxidants to limit the damaging effects of oxidative reactions and stress in cells. Oxidative stress may predispose you to diseases, such as heart disease and cancer. Plant-based phenolic antioxidants may reduce the risk of developing these conditions.³¹ Some of the phenolic antioxidants produced by plants appear in blood plasma and tissue, which may improve the function of these antioxidants in your body.

Studies suggest that wounding a carrot by cutting or shredding will increase the production of antioxidants in the plant. Author of one study, Luis Cisneros-Zevallos, Ph.D., director of the Plant Bioactives & Bioprocessing Research Lab at Texas A&M University, commented:³²

"Wounding fresh produce sends a signal to the cells, which perceive that as if they were under attack or facing adverse conditions. As a result, oxidative

stress increases in the cell and they start synthesizing antioxidant molecules to protect the cell from that stress."

Researchers found the more the plant was wounded or stressed, the greater the antioxidant production at the cellular level.³³ The higher the intensity of the damage, the longer the plant produced antioxidants, measured over four days during the study, making carrots rich sources of phenolic antioxidant compounds.

Cooking Your Carrots May Release More Carotenoids

Cooking carrots may also increase the level of beta-carotene and phenolic acids produced by the carrot. Since raw carrots have a tough cell wall, less than 25% of the beta-carotene in carrots is able to be converted into vitamin A.³⁴ During cooking the cellulose walls are dissolved, freeing up nutrients. An increase in total carotenoids available after steam blanching have been demonstrated. When dehydrated, the carotenoids are protected but do not increase.

Another study evaluating the effects of boiling, steaming and frying on carotenoids in vegetables, found steamed vegetables kept the best texture quality, but all three means of cooking demonstrated an overall increase in values.³⁵ Just resist the urge to cut your carrots before cooking to make more antioxidants available for absorption.

Baby Carrots Take a Chlorine Bath

Part of the process baby carrots undergo before reaching the grocery store is a chlorine bath. The largest carrot farm, Grimmway Farms, reports that chlorine is used on all their baby carrots to prevent food poisoning.³⁶ After their chlorine wash they are rinsed, packaged and shipped.

Chlorine is also used to extend the shelf life of the baby carrots.³⁷ As baby carrots begin to age they develop a white appearance on the outer layer. This doesn't affect the nutrient value of the carrots, but does impact how appetizing they appear. Buffing and

processing baby carrots increase the rate at which the carrots begin deteriorating and develop a white blush on the exterior caused from drying out.³⁸

The rate at which this white coating appears will depend upon the condition of the carrots before processing, the amount of abrasiveness of the processing and the humidity levels during storage. Chlorine, used to clean and preserve the carrots, is a common chemical found in your water supply, pesticides, paper and plastics. In the last 30 years, a growing body of evidence has suggested that chlorine and by-products trigger significant negative health conditions.

Although the amount of chlorine in baby carrots is minute, it is added to your overall toxic burden from other sources. It isn't the chlorine that causes the problems, but rather the disinfection byproducts (DBPs) produced when chlorine interacts with organic matter. These byproducts are far more toxic than the chlorine, including trihalomethanes and haloacetic acids. In this instance, the term organic is used to mean a compound that is carbon-based.

This means these byproducts are produced in all carrots, whether toxic pesticides were used in the growing process or not. Long-term risks of exposure to DBPs include excessive free radical formation, which accelerates aging and vulnerability to gene mutation and cancer. More than 600 DBPs have been discovered, some of which are linked to liver malfunction, arteriosclerotic damage and neurodegenerative changes.³⁹

Scientists are only beginning to understand the long- and short-term impact of chlorine-based chemicals. The healthiest option is to buy whole, unprocessed carrots – ideally organic – then wash, peel and cut them yourself.

Create a Super Trio

Here are three excerpts from studies showing how ginger, turmeric and carrots – three superfoods – were effective in both treatment and prevention of several cancers:

- **Ginger** – "Although the medicinal properties of ginger have been known for thousands of years, a significant number of in vitro, in vivo, and epidemiological

studies further provide substantial evidence that ginger and its active compounds are effective against wide variety of human diseases including GI [gastrointestinal] cancer.

Ginger has been found to be effective against various GI cancers such as gastric cancer, pancreatic cancer, liver cancer, colorectal cancer and cholangiocarcinoma."⁴⁰

- **Turmeric** – "Curcumin is among the more successful chemopreventive compounds investigated in recent years, and is currently in human trials to prevent cancer. The mechanism of action of curcumin is complex and likely multifactorial. We have made the unexpected observation that curcumin strikingly modulates proteins of iron metabolism in cells and in tissues, suggesting that curcumin has properties of an iron chelator."⁴¹
- **Carrots** – This study has shown that extracts from carrots can induce apoptosis and cause cell cycle arrest in leukemia cell lines.⁴²

Get all three of these powerful antioxidants in one delicious dish: Steam a few cups of carrots in a few tablespoons of water, just until tender-crisp. Add a few teaspoons of butter, sea salt to taste and a half-teaspoon each of grated turmeric and ginger (or half that amount of the ground variety). To serve, mash lightly or serve whole for a wildly healthy, delicious side dish.

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