



Whole, Raw  
A Grade  
**Nutrition Facts**  
Serving Size 1 oz (28 g)  
Per Serving % Daily Value\*  
**Calories 8**  
Calories from Fat 0  
**Total Fat** 0.0g 0%  
**Carbohydrates** 1.7g 1%  
Dietary Fiber 0.6g 2%  
**Protein** 0.0g

## Health Benefits

Carrots are perhaps best known for their rich supply of the antioxidant nutrient that was actually named for them: beta-carotene. However, these delicious root vegetables are the source not only of beta-carotene, but also of a wide variety of antioxidants and other health-supporting nutrients. The areas of antioxidant benefits, cardiovascular benefits, and anti-cancer benefits are the best-researched areas of health research with respect to dietary intake of carrots.

### Antioxidant Benefits

All varieties of carrots contain valuable amounts of antioxidant nutrients. Included here are traditional antioxidants like vitamin C, as well as phytonutrient antioxidants like beta-carotene. The list of carrot phytonutrient antioxidants is by no means limited to beta-carotene, however. This list includes:

- Carotenoids
  - alpha-carotene
  - beta-carotene
  - lutein
- Hydroxycinnamic acids
  - caffeic acid
  - coumaric acid
  - ferulic acid
- Anthocyanindins
  - cyanidins
  - malvidins

Different varieties of carrots contain differing amounts of these antioxidant phytonutrients. Red and purple carrots, for example, are best known for the rich anthocyanin content. Oranges are particularly outstanding in terms of beta-carotene, which accounts for 65% of their total carotenoid content. In yellow carrots, 50% of the total carotenoids come from lutein. You're going to receive outstanding antioxidant benefits from each of these carrot varieties!

### Cardiovascular Benefits

Given their antioxidant richness, it's not surprising to find numerous research studies documenting the cardiovascular benefits of carrots. Our cardiovascular system needs constant protection from antioxidant damage. This is particularly true of our arteries, which are responsible for carrying highly oxygenated blood.

A recent study from the Netherlands, in which participants were followed for a period of 10 years, has given us some fascinating new information about carrots and our risk of cardiovascular disease (CVD). In this study, intake of fruits and vegetables was categorized by color. The researchers focused on four color categories: green, orange/yellow, red/purple, and white. Out of these four categories, orange/yellow (and in particular, foods with deeper shades of orange and yellow) was determined to be the most protective against CVD. Within this dark orange/yellow food group, carrots were determined to be the single most risk-reducing food. Participants who had the least carrot intake had the least amount of CVD risk reduction, even though they still received risk-reducing benefits from their carrot intake. However, participants who ate at least 25 more grams of carrots (with 25 grams being less than one-quarter of a cup) had a significantly lower risk of CVD. And the groups of participants who ate 50- or 75-grams more had an even more greatly reduced risk of CVD! We're not sure how any study could better demonstrate how easy it can be to lower CVD risk by making a food like carrot part of the everyday diet.

Antioxidant nutrients in carrots are believed to explain many of the cardioprotective benefits provided by these root vegetables. The many different kinds of carrot antioxidants are most likely to work together and provide us with cardiovascular benefits that we could not obtain from any of these antioxidants alone if they were split apart and

consumed individually, in isolation from each other. The synergistic effect of carrot antioxidants is a great example of a whole food and its uniqueness as a source of nourishment.

Yet in addition to the diverse mixture of carrot antioxidants, there is yet another category of carrot phytonutrient that is believed to help explain carrot protection against cardiovascular disease. That category is polyacetylenes. Polyacetylenes are unique phytonutrients made from metabolism of particular fatty acids (often involving crepenynic acid, stearolic acid and tariric acid). They are particularly common in the *Apiaceae/Umbelliferae* family of plants (which includes carrot). The two best-researched polyacetylenes in carrot are falcarinol and falcarindiol. Preliminary research on animals and in the lab has shown that carrot polyacetylenes have anti-inflammatory properties and anti-aggregatory properties (that help prevent excessive clumping together of red blood cells). So in addition to the unique mix of antioxidants in carrot, polyacetylenes may play a key role in the cardiovascular protection provided by this amazing food.

### **Vision Health**

While you might expect to find a large number of human research studies documenting the benefits of carrot intake for eye health, there are relatively few studies in this area. Most studies about carotenoids and eye health have focused on carotenoid levels in the bloodstream and the activities of the carotenoids themselves, rather than the food origins of carotenoids (like carrots). Still, we have found some smaller scale human studies that show clear benefits of carrot intake for eye health. For example, researchers at the Jules Stein Institute at the University of California at Los Angeles determined that women who consume carrots at least twice per week - in comparison to women who consume carrots less than once per week - have significantly lower rates of glaucoma (damage to the optic nerve often associated with excessive pressure inside the eye). Intake of geranyl acetate - one of the phytonutrients that is present in carrot seeds (and sometimes extracted from purified carrot seed oil) has also been repeatedly associated with reduced risk of cataracts in animal studies. However, researchers have yet to analyze the amount of geranyl acetate in the root portion of the carrot and the impact of dietary intake on risk of cataracts.

### **Anti-Cancer Benefits**

The anti-cancer benefits of carrot have been best researched in the area of colon cancer. Some of this research has involved actual intake of carrot juice by human participants, and other research has involved the study of human cancer cells types in the lab. While much more research is needed in this area, the study results to date have been encouraging. Lab studies have shown the ability of carrot extracts to inhibit the growth of colon cancer cells, and the polyacetylenes found in carrot (especially falcarinol) have been specifically linked to this inhibitory effect. In studies of carrot juice intake, small but significant effects on colon cell health have been shown for participants who consumed about 1.5 cups of fresh carrot juice per day.

We're confident that future studies in this area will show carrot intake as being protective against risk of colon cancer. Carrots are simply too rich in digestive tract-supporting fiber, antioxidant nutrients, and unique phytonutrients like falcarinol to be neutral when it comes to support of the lower digestive tract and colon cancer protection.