MERCOLA
Take Control of Your Health

Why Beets Are Good for the Heart

Analysis by Dr. Joseph Mercola Fact Checked | June 27, 2022

STORY AT-A-GLANCE

- Research presented to the British Cardiovascular Society showed how nitrates in beetroot juice could reduce harmful inflammation in people with coronary heart disease
- Nitrate is a substrate in the body's production of nitric oxide, long known to be a potent vasodilator that promotes healthy blood flow for efficient oxygenation of your tissues and organs
- Nitrates improve brain neuroplasticity by participating in the expression of brain-derived neurotrophic factor (BDNF), required for activation of BDNF receptors and improve muscle function, athletic performance and lung function
- Other foods with cardioprotective properties include cruciferous vegetables that may promote thinner (healthier) carotid walls, high-fiber, probiotic-rich sauerkraut that reduces inflammation and blood pressure, and high magnesium, dark green leafy vegetables

Research funded by the British Heart Foundation and presented to the British Cardiovascular Society showed how beets may reduce harmful inflammation in people who have coronary heart disease.[1]

There's a lot to be said for this humble red root. Archaeological evidence shows that beets were a part of the diet dating back to the Third Dynasty and Greek records show beets were cultivated around 300 BC.[2] Originally, it was the beet greens that were prized as food and not the fibrous roots.[3]

Ancient Romans, Greeks and Italians believed that beats were an aphrodisiac.[4] The roots were occasionally used for medicine but not consumed regularly until 1542. The plant is easy to grow and whether it's juiced, cooked, pickled or fermented, beets have a wide range of health benefits.

Although packed with nutrients, up to 8% of each beetroot is simple sugar,[5] so people who struggle with insulin resistance should partake carefully. In 1747, a chemist discovered how to extract the sucrose from beets, leading to the development of the beet sugar industry, which uses fewer resources than sugarcane.[6]

Beetroot Juice May Protect Heart Health

Research presented at the British Cardiovascular Society conference in Manchester showed just one glass of beetroot juice each day could help reduce the harmful inflammation found in people who have coronary heart disease.[7]

According to the CDC,[8] heart disease remains the leading cause of death in the U.S. and coronary heart disease is the most common type, killing 360,900 people in 2019. Nearly 20% of deaths from coronary artery disease occur in adults who are younger than 65 years.

The team engaged 114 healthy participants to test the theory that beetroot juice could help reduce inflammation in the endothelium and speed healing.[9] They split the group in two. One group of 78 participants received a typhoid vaccine. This temporarily increased blood vessel inflammation. The researchers triggered a localized inflammatory response on the skin in the last 36 participants.

Half of each group drank 140 milliliters (approximately 5 ounces) of beetroot juice each morning that was high in nitrate while the other half drank the same amount of beetroot juice without nitrates. The researchers tested blood, urine and saliva for biomarkers of nitric oxide and found those who drank the nitrate-rich beetroot juice had higher levels.

In the group that received the typhoid vaccine, the researchers noted the endothelium function was restored, which is lost in the inflammatory response. They also found that

those with blisters healed more quickly than those who drank beet juice without nitrates. The Guardian reported:[10]

> *"The researchers believe the increased levels of nitric oxide helped to speed up how quickly the volunteers were able to recover from inflammation by switching key immune cells from a state that promotes inflammation to a more anti-inflammatory state."*

Researchers from the Queen Mary University of London led the study. Dr. Asad Shabbir, clinical research fellow at the University, spoke with a reporter from The Guardian about the results.[11]

> *"Inflammation is vital to protect the body from injury and infection. However, in people with coronary heart disease persistent inflammation can exacerbate the furring of the arteries, making their condition worse and increasing their risk of a heart attack. Our research suggests that a daily glass of beetroot juice could be one way to get inorganic nitrate into our diet to help to interrupt harmful inflammation."*

Watermelon is another summer delicacy that can raise nitric oxide production. However, watermelon is also high in net carbs and regularly consuming large amounts can likely worsen insulin resistance and increase your risk of heart disease.

One study[12] followed men in their mid-40s to mid-50s for more than 12 years and found the carotenoid antioxidant that gives watermelon[13,14] its pink color — lycopene — reduced the risk of stroke in the group Watermelon has a varied concentration of l-citrulline,[15] which is a precursor of L-arginine and a substrate for a nitric oxide synthase in the production of nitric oxide.[16]

Another study[17] showed that taking 2 grams of fresh garlic could increase plasma concentrations of nitric oxide. Nitric oxide has long been known as a potent vasodilator[18,19,20] that promotes healthy blood flow for efficient oxygenation of your tissues and organs. It also helps remove waste products and carbon dioxide.

By relaxing and dilating your blood vessels, nitric oxide improves blood flow and lowers blood pressure. In conventional medicine, nitrates are used to treat angina and congestive heart failure.[21] Research shows a daily glass of beetroot juice could lower blood pressure.[22,23]

Additionally, it improves your brain neuroplasticity by participating in the expression of brain-derived neurotrophic factor (BDNF) and is required to activate BDNF receptors.[24] Beet juice increased tissue oxygenation, blood flow and brain neuroplasticity in a study[25] published in The Journals of Gerontology in a group of 26 middle-aged men and women diagnosed with high blood pressure.

Beets Improve Lung Efficiency and Athletic Performance

In this short video,[26] Dr. Michael Greger discusses the top 10 widely available natural sources of nitrates. He compares the number of milligrams (mg) of nitrates per 100 grams (g) of food and found beets barely made the top 10 having 110 mg per 100 g of beets. However, concentrated raw beet juice has 279 mg of nitrates. This puts it in the No. 3 position behind rhubarb with 281 and arugula with a whopping 480 milligrams of nitrates.

Past studies[27] have shown that nitrates can help improve muscle function, potentially by optimizing the way the muscle uses calcium. One animal study[28] split mice into two groups. The mice were 24 months old, which is equivalent to roughly 70 years in humans.

One group was given drinking water with sodium nitrate for 14 days and the other group was given plain water. At the end of 14 days, the researchers measured the isometric force and peak power of the diaphragm muscles and found that both measures were significantly increased in the mice that drank nitrates. This increase in force and power translates to improved contraction of the diaphragm muscle, which can improve lung function and breathing.

This may help the elderly clear their lungs more effectively, which in turn could reduce the risk of developing infections. Nitrates have also shown to help improve oxygen uptake by dilating the blood vessels. This improves the delivery of oxygen to muscles and other cells.

Improved oxygen delivery may be one factor in how nitrates can improve athletic performance. One literature review[29] looked at the effects that beetroot juice supplementation has on cardiorespiratory endurance in athletes. They selected 23 studies for analysis and found the results suggested beetroot juice improved cardiorespiratory endurance by increasing efficiency, and time to exhaustion at a submaximal intensity and may improve performance at the anaerobic threshold.

The researchers hypothesize that beet juice could moderate the exercise impairment "of hypoxia on cardiorespiratory endurance in athletes" and "it is possible that the effects of supplementation with beetroot juice can be undermined by interaction with other supplements such as caffeine."[30]

Beetroot Packs a Powerful Nutrition Punch

In addition to nitrates, 100 g of beets has a mere 43 calories. According to the U.S. Department of Agriculture,[31] other nutrient values found in beets include:

Fiber 2.8 grams	Calcium 16 mg
Magnesium 23 mg	Potassium 325 mg
Folate 109 µg	Choline 6 mg
Vitamin A 33 IU	

Beats also contain a phytonutrient called betalains. This compound gives them the reddish-purple cuddle color and helps reduce inflammation and fight cell damage in the

body. According to one study,[32] the antioxidant capacity of red beetroot is correlated with the betalain content.

Betalains[33] also have anti-inflammatory, anticancer and antihepatitis properties, and have demonstrated the ability to improve cognitive impairment. The phytonutrient has exhibited antimalarial and antimicrobial effects and studies have confirmed the phytonutrient can reduce glycemia without weight loss or liver impairment.

The phytonutrient responsible for the beet's color can also add a red tinge to your bowel movements and urine.[34] Holistic nutritionist Joy McCarthy[35] suggests using it as a simple way to get a sense of how long it takes food to pass through your gastrointestinal system since the beets add a red hue to your bowel movements.

Beets are also high in oxalic acid. An overconsumption of foods high in oxalic acid can lead to the development of calcium oxalate kidney stones.[36] If you are predisposed to kidney stones or have calcium oxalate stones already, your doctor may recommend avoiding foods rich in oxalates.

These include dark green vegetables (especially spinach and Swiss chard), bran, rhubarb, beets and beet greens, chocolate, nuts (especially almonds, cashews and peanuts) and nut butters.[37,38] Increasing calcium in your diet may seem counterintuitive, seeing how calcium is the largest component of these stones.

However, the answer to this paradox is that high dietary calcium actually blocks a chemical action that causes the formation of the stones. Cleveland Clinic explains:[39]

> *"Low amounts of calcium in your diet will increase your chances of forming calcium oxalate kidney stones ... [C]alcium binds oxalate in the intestines. A diet rich in calcium helps reduce the amount of oxalate being absorbed by your body, so stones are less likely to form."*

More Foods With Cardioprotective Properties

Cruciferous vegetables also influence your heart health. These vegetables are widely recognized for their anticancer benefits, such as broccoli, cabbage, cauliflower and Brussel sprouts. One study[40] examined the effects vegetable intake has on carotid artery measures, which are indicative of arterial health.

They found those who consumed the most cruciferous vegetables had healthier carotid arteries than those who consumed the fewest. Narrow hard arteries restrict blood flow and can lead to a heart attack and stroke. The researchers found that on average, those who had at least three servings of cruciferous vegetables each day had thinner (healthier) carotid arterial walls than those who ate two servings or less each day.

The fiber[41] and healthy bacteria found in traditionally fermented and cultured foods can also benefit your heart. Probiotic-rich sauerkraut has been shown[42] to reduce inflammation, promote good health, improve high blood pressure, reduce triglyceride levels and maintain healthy cholesterol levels. Each of these factors benefits your cardiovascular and heart health.

Magnesium is also profoundly important for heart health and many people are deficient. More than 300 enzymes rely on the magnesium for proper function, and it is needed for a host of biochemical processes.[43] The best way to get a healthy amount of magnesium is to ensure you're eating plenty of dark green leafy vegetables. Foods that are highest in magnesium include:[44]

Spinach	Swiss Chard
Lima Beans	Acorn Squash
Artichokes	Kale
Green Peas	Okra

Finally, consider including onions in your nutrition plan. They are packed with quercetin[45] that helps combat inflammation and boost immune function.[46] One 2016 meta-

analysis[47] found quercetin effectively lowered blood pressure at a dose of roughly 500 mg per day. Other studies have shown it helps reduce your risk of atherosclerosis.[48]

The best way to maximize your health benefits is to eat a wide variety of vegetables daily. Make sure to include nitrate-rich leafy greens, cruciferous vegetables, onions and some homemade sauerkraut.

Sources and References

- [1, 7, 9, 10, 11] The Guardian, June 9, 2022
- [2] Vegetable Facts, History of Beetroot
- [3, 4] The History Kitchen, October 8, 2014
- [5] MyFoodData, April 24, 2022
- [6] The History Kitchen, October 8, 2014 para 4
- [8] Center for Disease Control and Prevention, February 7, 2022
- [12] Neurology, 2012; 79(15); 1540
- [13] Journal of Nutrition, 2003;133(4)
- [14] USDA Watermelon Packs a Powerful Lycopene Punch
- [15] American Society for Horticultural Science, 2011;46(12)
- [16] Cardiovascular Drug Review 2006 Fall-Winter;24(3-4):275
- [17] Journal of Interferons and Cytokine Research, 2007;27(5)
- [18] Circulation, 1996;93
- [19] Cardiology, 2012;122
- [20] International Journal of Molecular Sciences, 2018;19(9)
- [21] Cardiac Failure Review, 2016;2(1)
- [22] Queen Mary University, April 13, 2016
- [23] Queen Mary University, January 19, 2015
- [24] Journal of Neuroscience, 2011;31(19) Discussion bottom of the article para 1
- [25] The Journals of Gerontology, 2017;72(9)
- [26] YouTube, February 17, 2012, Min 1;25
- [27] Journal of Cachexia, Sarcopenia, and Muscle, 2019;10(3)
- [28] The Journal of Physiology, 2020; doi.org/10.1113/JP280227
- [29, 30] Nutrients, 2017;9(1)
- [31] Food Data Central, Raw Beets
- [32] Journal of Functional Foods, 2016; 27
- [33] Plants, 2020;9(9)
- [34] Global News, February 25, 2014
- [35] Global News, February 25, 2014, para 2-4
- [36] NYU Langone Health, Types of Kidney Stones

- [37] World's Healthiest Foods, Oxalates
- [38, 39] The Cleveland Clinic, Oxalate-Controlled Diet
- [40] Journal of the American Heart Association April 4, 2018; 7: e008391 Abstract/Results
- [41] Harvard Health Publishing, July 12, 2020
- [42] BBC Good Food, Top Five Benefits of Sauerkraut
- [43] Clinical Kidney Journal, 2012;5(1) Para 1 under figure 3
- [44] My Food Data, April 24, 2022
- [45] Journal of the American Society for Horticultural Science, 1995;120(6)
- [46] Molecules, 2016;21(5)
- [47] Journal of the American Heart Association 2016; 5:e002713
- [48] Food Science and Nutrition, 2021;9(7)