



Grape Research Overview

Concord and Niagara grapes provide an important mix of plant nutrients – polyphenols – that can help fuel healthy, vibrant lives. For more than a decade, researchers have been exploring the polyphenols found in Concord grapes and the effects they have on the body, including possible benefits in supporting cardiovascular health. In addition, emerging research is being conducted to determine whether Concord grapes play a role in supporting a healthy mind and immune system.

Please note that the following research summaries are only intended as brief overviews. Please refer to actual publications in each section for full details and to determine if this information may relate to you.

POLYPHENOL POWER – Polyphenols, which give Concord grapes their vibrant color, are plant nutrients that naturally function as antioxidants and help promote overall health.¹⁻⁴

Polyphenols' health benefits are often attributed to their antioxidant function. Polyphenols are concentrated in the seeds and skin of both Concord and Niagara grapes and they act as antioxidants to help neutralize damaging free radicals, which are unstable molecules that can harm healthy cells.^{1,2} The polyphenols found in Concord grapes contribute to the antioxidant power of 100% grape juice, as measured by *in vitro* ORAC lab tests.⁵

- Research published in the *American Journal of Clinical Nutrition* by O'Byrne et al. in 2002 on antioxidant consumption in healthy adults found that those who consumed α -tocopherol (vitamin E), as well as those who drank Concord grape juice, experienced increases in serum antioxidant capacity and decreases in oxidation of LDL cholesterol rate after drinking Concord grape juice every day for two weeks.¹
- In a study by Albers et al. in 2004 on adults with coronary artery disease (CAD), drinking Concord grape juice daily for two weeks decreased free radical production and markers of inflammation.⁶ Similar research published in *Circulation* in 2001 on healthy adults found that daily Concord grape juice consumption for two weeks decreased the production of free radicals.⁷



*Polyphenols in
Concord grapes
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overall health.*

CARDIOVASCULAR HEALTH – In addition to a produce-rich diet and active lifestyle, Concord grapes may be one important ingredient for maintaining a healthy cardiovascular system. Research suggests that polyphenols, like those found in Concord grapes, can contribute to heart health in certain populations by promoting healthy arteries.⁷⁻¹³

A literature review outlining nearly 20 years of research shows that grapes and grape products promote heart health. The findings from this review highlight strong evidence for the heart-health benefits of grapes in low-density (LDL) oxidation, oxidative stress, and vascular function.¹⁴

Concord grapes may help support flexible arteries to promote healthy blood flow.⁷⁻¹¹

When the lining of arterial walls is not functioning properly, this can be an early sign of atherosclerosis (hardening of the arteries).¹⁸ Studies report that drinking Concord grape juice appears to help relax and dilate arteries in people with coronary artery disease.^{9,11} Relaxed and dilated arteries may support healthier blood flow throughout the body.

- Concord grape juice consumption appears to help widen arteries when necessary, specifically in individuals with CAD. In 1999, Stein et al. studied 15 participants with CAD who consumed Concord grape juice for two weeks and saw significant increases in flow mediated dilation of the brachial artery.¹¹ Chou and colleagues performed a similar study over a longer time period. These researchers found that in two groups of 11 adults with CAD, given different levels of Concord grape juice, there were equivalent and significant increases in brachial artery dilation after 28 days.⁹
- A study completed and presented by Dorsey et al. suggests that drinking moderate amounts of Concord grape juice regularly supports healthy circulation in healthy overweight, older adults. This randomized, cross over, double blind, placebo-controlled study monitored 51 overweight men and women that were 50 years or older. Each group consumed 12 ounces (1 ½ cups) of Concord grape juice or a grape-flavored, sugar-sweetened drink daily during two continuous four week periods. Researchers found that drinking Concord grape juice daily significantly improved flow mediated dilation versus placebo, demonstrating a benefit to vascular function and blood vessel health.¹⁵
- In a study with young adult smokers who were otherwise considered healthy, Siasos et al. found that consumption of Concord grape juice increased flow mediated dilation (FMD) versus placebo. The 26 participants, average age 26 ± 5 years, consumed 7 mL/kg/d of Concord grape juice for two weeks and a placebo for two weeks with a four week washout period in-between. The researchers also found that chronic consumption of Concord grape juice prevented an immediate smoking-induced decrease in FMD.¹⁶
- When compared to nearly 50 other fruit juices, Welch's 100% Grape Juice grape juice made with Concord grapes made with Concord grapes, alongside blackcurrant juice and a



red juice blend, had the most potent positive effect on blood vessel health. This laboratory research suggests that not only is it the polyphenol concentration, but also the type of polyphenols present in the grape juice, that supports blood vessel relaxation and healthy circulation.¹⁷

- In a study published in *Cardiovascular Research* in 2007, researchers found that Concord grape juice was shown to stimulate the production of nitric oxide in cells that line the arteries, promoting arterial relaxation.⁸ Additional research has also illustrated that Concord grape juice produces this relaxation effect by stimulating the same reactions in the arteries that are activated by red wine. This research complements previous work by Freedman and colleagues, which showed increased production of nitric oxide from blood platelets in healthy adults drinking Concord grape juice,⁶ and may explain why coronary artery disease patients drinking Concord grape juice have shown improved arterial flexibility in some studies.^{9,11}

***Concord grapes may help promote healthy, clear arteries.*^{1,11,19-21}**

Concord grape juice helps manage the effects of LDL or “bad” cholesterol to help keep arteries free and clear of excess plaque build-up in certain populations.^{1,11,19-21} If LDL cholesterol is oxidized while in the artery wall, it can initiate a cascade of events that can eventually lead to arterial blockage.²²

- A study conducted by O’Byrne and colleagues of healthy adults who either consumed Concord grape juice or a vitamin E supplement for two weeks found that the Concord grape juice drinkers experienced a similar increase in antioxidant capacity and decrease in LDL oxidation rate as those who were given the vitamin E supplement.¹ Positive results on LDL-oxidation were also seen in Stein et al.’s study on adults with CAD.¹¹ It’s important to note that while these findings are promising, Chou and colleagues found that consuming Concord grape juice had no beneficial effect on LDL oxidation rate in CAD patients studied over a 28-day period.⁹

***Concord grapes have been shown to have an anti-clotting effect^{7,19,23} similar to red wine.*²⁴**

- Red wine has been shown to have an anti-clotting effect through its ability to inhibit platelet aggregation,²⁴ and in two studies on humans, drinking Concord grape juice daily resulted in anti-clotting effects^{7,23} similar to red wine.
- Platelet aggregation makes blood “sticky” and can lead to clots within the artery. A crossover study by Keevil et al. compared the effects of consuming either purple grape juice, orange juice or grapefruit juice in healthy adults.²³ Only grape juice showed an ability to inhibit platelet aggregation. Freedman et al. published similar benefits of Concord grape juice in a study of 20 healthy adults.⁷ Both authors attribute the anti-clotting effects to the proanthocyanins and other flavonoid polyphenols found in high concentrations in Concord grape juice. Note that these outcomes were not replicated by Albers and colleagues in their study on Concord grape juice and platelet aggregation in individuals on aspirin therapy.⁶
- An animal study by Shanmuganayagam et al. published in *Atherosclerosis* in 2007 found that, after feeding all subjects a high-cholesterol diet, the group who received Concord grape juice for 48 days experienced a reduction in clotting and cholesterol levels versus the group receiving a placebo-matched drink of sugar water.¹⁹

In certain populations, Concord grapes may play a role in healthy blood pressure.²⁵⁻²⁷
By promoting arterial relaxation, Concord grape juice may contribute to a healthy blood pressure for people with hypertension.^{25,26}



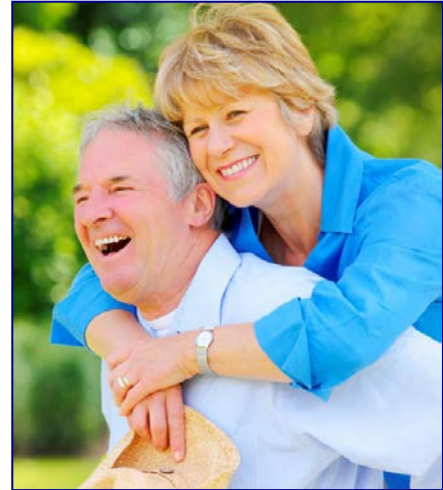
- Two studies on adult males with hypertension found those who consumed Concord grape juice daily for eight weeks²⁵ or 12 weeks²⁶ experienced decreases in both systolic and diastolic blood pressure.
- It's healthy and normal for blood pressure to drop at night, giving the heart a rest. People who don't experience these nighttime dips may, over time, be at increased risk for heart-related health issues.^{28,29} One study conducted by Dohadwala, Vita, and colleagues supports the role of Concord grape juice to benefit blood pressure, specifically nocturnal blood pressure. In this study, participants drank 100% Concord grape juice and a placebo-matched drink for eight weeks each, with a four-week rest period in between. Nocturnal blood pressure and blood glucose levels appeared to dip when subjects consumed Concord grape juice; however, it's important to note that ambulatory blood pressure remained unchanged.²⁷

COGNITIVE HEALTH – Researchers have begun investigating the role of Concord grapes in cognitive health.^{12,30-34}

As we age, the effect of a lifetime of oxidative stress caused by free radicals in the body can have a damaging effect on the brain.^{35, 36} Polyphenols can help neutralize free radicals, which may help to combat the effects of oxidative stress.

While more research is needed, specifically in humans, recent studies indicate that Concord grape juice may help slow the progression of age-related cognitive decline.

- A study from the University of Cincinnati, College of Medicine was one of the first placebo-controlled human studies to investigate whether regular consumption of a polyphenol-rich food or beverage could have beneficial effects against age-related cognitive decline. Of the 12 older adults participating in this pilot study, five who drank the Concord grape juice had significant improvement in list learning and trended toward improved verbal recall and spatial memory compared to controls.³⁰
- Building on this earlier research, Krikorian and colleagues demonstrated that Concord grape juice can increase blood flow to certain regions of the brain, as well as improve memory function compared to those consuming a grape-flavored placebo. In this study, 21 older adults (average age = 77) were given either Concord grape juice or the placebo daily for 16 weeks, and were tested in various areas related to long-term memory. Those who drank Concord grape juice were less susceptible to distraction when asked to remember what they had previously learned. Test scores in other areas like learning and retention did not improve with the juice.³³
- A hallmark of Alzheimer's disease is the accumulation of amyloid-beta peptides and their formation into plaques in the brain. Researchers at Mount Sinai School of Medicine presented by Ho and colleagues at Experimental Biology in 2010 found that select polyphenol extracts from red wine and Concord grape juice may have the ability to inhibit the production and accumulation of amyloid-beta peptides in experimental models of Alzheimer's disease.³²
- In a study conducted by the USDA-ARS Human Nutrition Research Center on Aging at Tufts University, older animals were tested for short-term memory and neuro-motor skills. Scientific lead, Dr. James Joseph, noted improved cognitive performance and enhanced motor function in the Concord grape juice-treated groups compared to those receiving the placebo drink.³¹



Emerging research suggests that Concord grapes may offer certain health benefits for the mind.

IMMUNE HEALTH – Emerging research suggests that micronutrients and polyphenols, like those found in Concord and Niagara grapes, have the potential to play a role in immune system health.³⁷⁻⁴³



Preliminary research suggests that polyphenols may play a role in supporting a healthy immune system.

- To date, most research suggesting that polyphenols may impact immune function has been done in a laboratory setting;^{40-42, 44-46} however, in one study conducted by the University of Florida, healthy adults who drank 100% grape juice made with Concord grapes and added vitamin C showed a significant increase in a type of immune cell – the gamma delta T cell – which signals to the immune system to attack when a pathogen is present.⁴³ Subjects who received a placebo drink experienced no beneficial impact on immunity. Researchers are uncertain if this effect was due to the polyphenols, the micronutrient vitamin C in the beverage, or both; more research on humans is needed before any conclusions can be drawn.
- Based on the animal studies, researchers suggest the polyphenols in grapes may block or neutralize certain viruses, preventing them from entering the cell and replicating.^{39, 42} A great deal more research is needed before it can be determined if grape juice will protect humans against viruses in real-life conditions.
- In a study presented at the 2009 American Society for Microbiology conference in Philadelphia, researchers demonstrated that in a laboratory model, natural compounds found in Concord grape juice protected cells from a rotavirus infection.⁴⁰ Grape juice was shown to have a protective effect when added to the cells either before the virus was introduced or after the cells were infected by the virus, suggesting that consumption of grape juice could have a protective effect in one's digestive system prior to or soon after virus infection. Similar results were seen in a study conducted by Leon and colleagues presented at The American Society for Microbiology in 2010.⁴¹

Please visit grapescience.com for more information about research on the role of grapes in healthy lifestyles.

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Rev. 08/15