

Health Benefits of Blueberries

Research shows that blueberries do help vision and eye health but they can also slow aging, help cognitive decline, lower cholesterol, fight cancer and help inhibit urinary tract infections. Why can the blueberry help with all these varied health conditions? Primarily it's due to anthocyanins, the phytochemicals responsible for their deep blue color.

The Power of Anthocyanins

The positive effect of anthocyanins on health is due to their anti-inflammatory properties. Anthocyanins can protect both large and small blood vessels from oxidative damage. "In the course of inflammation, enzymes damage connective tissue in capillaries, causing blood to leak into surrounding tissues. Oxidants are released and further damage blood-vessel walls. Anthocyanins protect in several ways. First, they neutralize enzymes that destroy connective tissue. Second, their antioxidant capacity prevents oxidants from damaging connective tissue. Finally, they repair damaged proteins in the blood-vessel walls. Animal experiments have shown that supplementation with anthocyanins effectively prevents inflammation and subsequent blood-vessel damage."¹ Blood vessel damage presents a great problem for those with diabetes; affecting many areas from eyesight, heart vessel disease to diabetic neuropathy. Consuming either anthocyanin-rich blueberries or blueberry concentrate each day may help mitigate the damage and promote healing.

Source: [U.S. Highbush Blueberry Council, Health Section](#)

From research labs all across the country and the world, there is growing evidence that blueberries could be powerful little disease fighters. Here is what we have learned so far...

Antioxidants - Researchers at the USDA Human Nutrition Center (HNRCA) have found that blueberries rank #1 in antioxidant activity when compared to 40 other fresh fruits and vegetables. Antioxidants help neutralize harmful by-products of metabolism called "free radicals" that can lead to cancer and other age related diseases.

Anthocyanin -- the pigment that makes the blueberries blue -- is thought to be responsible for this major health benefit.

Anti-Aging - In another USDA Human Nutrition Center (HNRCA) lab, neuroscientists discovered that feeding blueberries to laboratory rats slowed age-related loss in their mental capacity, a finding that has important implications for humans. Again, the high antioxidant activity of blueberries probably played a role.

Disease Prevention - Blueberries may reduce the build up of so called "bad" cholesterol that contributes to cardiovascular disease and stroke, according to scientists at the University of California at Davis. Antioxidants are believed to be the active component.

Prevention of Urinary Tract Infections - Researchers at Rutgers University in New Jersey have identified a compound in blueberries that promotes urinary tract health and reduces the risk of infection. It appears to work by preventing bacteria from adhering to the cells that line the walls of the urinary tract.

Blueberries and Eyesight - A number of studies in Europe have documented the relationship between bilberries, the European cousin of blueberries and improved eyesight. This is thought to occur because of the anthocyanin in the blue pigment which is also available in the blueberry. One study in Japan documented that blueberries helped ease eye fatigue.

New Research

Cholesterol Reducing Blueberries - At the recent American Chemical Society meeting it was reported that a compound found in blueberries called *pterostilbene* has "the potential to be developed into a nutraceutical for lowering cholesterol, particularly for those who do not respond well to conventional drugs," reports foodnavigator.com (8/24/04). Study authors from the USDA's Agricultural Research Service (ARS) indicate that the compound found in *Vaccinium* berries could be a "potent weapon in the battle against obesity and heart disease through its cholesterol-reducing potential." Head researcher, Agnes M. Rimando and her associates "earlier showed that this compound may help fight cancer." An abstract of the study is found on the Agricultural Research Service website which also studied the presence of *resveratrol* and *piceatannol*. According to the technical abstract, "These naturally occurring stilbenes, known to be strong antioxidants and to have cancer chemopreventive activity, will add to purported health benefits derived from consumption of these small fruits."

Ethnobotany and Blueberries: Blueberries have been associated with positive physiological and cosmetic benefits for centuries. Here we list non scientific information which although not endorsed by the USHBC, may be of interest to researchers as a direction for further research.

- Blueberry Health and Nutrition traditions in China. (under construction)
- Native American and First Nations of Canada blueberry health and medicinal traditions. (under construction)
- Blueberry health and nutrition in Russia and Central European Traditions. (under construction)

Nutrition Summary - *The following summarizes some of the published research in the area of nutraceuticals and health.*

The belief that food products have medicinal properties has been celebrated in folk medicine for centuries. Today food properties are being explored by the medical and scientific fields. Some cultures have long valued many naturally occurring substances believed to have preventative and therapeutic value. In the United States, nutraceuticals are part of a rapidly expanding area of biomedical research, generating considerable interest among consumers, manufacturers, and regulators alike. This is a progressive area; the field is continually conducting studies and discovering possible benefits.

Though blueberries themselves are not a cure-all, they contain a number of substances which are thought to have health benefits. These substances include, but are not limited to fructose, fiber, vitamins and antioxidants. Antioxidants thus far, seem to have the most conclusive role in the prevention/ delaying of such diseases as cancer, heart disease and the aging process

however, a limited number of studies, especially long term and on human beings, are not available at this time.

Red Raspberry health benefits

Health Benefits

Red Raspberries contain strong antioxidants such as Vitamin C, quercetin and gallic acid that fight against cancer, heart and circulatory disease and age-related decline. They are high in ellagic acid, a known chemopreventative, and have been shown to have anti-inflammatory properties. Red raspberry ketones are currently being used in Japan as a weight loss supplement. Red raspberry seed oil is creating market interest in the cosmeceutical industry because it is rich in Vitamin E, omega-3 fatty acid and has a sun protection factor (SPF) of 24-50.

- High in polyphenolic compounds known for their anti-cancer properties.
- Contain strong antioxidants such as Vitamin C, quercetin and gallic acid.
- Have a high ORAC level – ORAC is a measure of the antioxidant capacity of a substance. Red raspberries with an ORAC of 24 $\mu\text{mole/TE/g}$ are similar to blueberries, well known for their antioxidant values.
- Raspberries have been shown to inhibit the production of COX-I and COX-II enzymes. Anti inflammatory products like ibuprofen and aspirin, inhibit COX-I and COX-II resulting in the reduction of pain associated with arthritis, gout and other inflammatory conditions.
- Eating whole berries has been shown in scientific studies to be more beneficial than taking the individual phytochemicals in the form of dietary supplements.
- Red raspberry oil is creating interest in the cosmeceutical market (skin care products which provide health benefits). The oil from raspberry seeds is rich in Vitamin E, Omega-3 fatty acids and has a sun protection factor (SPF) of 25-50.
- Red raspberry ketones are currently being used in Japan as a weight loss supplement in a pill form and as an external patch.
- Source: [Oregon Raspberry & Blackberry Commission](#)

Black Raspberry health benefits:

Health Benefits

Black Raspberries contain an extremely dark pigment which allows them to be used as a colorant and gives black raspberries one of the highest antioxidant ratings in common fruits and berries. Rich in ellagic acid, anthocyanins and antioxidants, black raspberries have been called the “king of berries” for their superior health benefits.

Studies at Ohio State University have found significant decreases in colon tumors in rats and esophageal tumors in mice fed a diet with black raspberries. In vitro studies have shown that extracts of raspberries and blackberries may slow the growth of breast cervical, colon and esophageal cancers. Human clinical trials are underway to assess the effects of black raspberries on colon and esophageal cancers in humans.

- The king of berries in terms of health benefits. Has an extremely high overall level of phenolic compounds compared to other berries.
- Phenolic compounds such as ellagic acid, gallic acid and rutin contribute to the health benefits of black raspberries.
- Contains high levels of anthocyanins, which give them their rich, dark color. Anthocyanins work as antioxidants that help fight free radical damage in the body. The anthocyanin level of black raspberries is 214-589 mg/100g.
- Antioxidant levels of food is sometimes measured as ORAC (Oxygen Radical Absorption Capacity). The ORAC level of black raspberries is 77 μ moles /TE/g, about three times higher than blueberries, a very powerful antioxidant.
- Black raspberries are rich in ellagic acid. Ellagic acid is a phenolic compound known to be a potent anticarcinogen, anti-viral and anti-bacterial. The ellagic acid level of black raspberries is 5.37 mg/g of dry weight.
- University studies are underway to determine black raspberries' ability to slow the growth of certain cancers. In vitro studies show that extracts of raspberries and blackberries may slow or reverse the growth of breast, cervical, colon, oral and esophageal cancers.
- Studies at Ohio State University showed a 60–80 % reduction in colon tumors in rats fed a diet with black raspberries added.
- Studies at Ohio State University showed an 80% reduction in esophageal cancers in mice fed a 5-10% diet of black raspberries.
- Scientists from Ohio State University are now conducting human clinical trials into the effects of black raspberries on colon and esophageal cancer in humans.
- Black raspberries continue to generate a high level of interest from research scientists due to their potent antioxidant and anti-cancer properties.
- Source: [Oregon Raspberry & Blackberry Commission](#)

Blackberry health benefits:

Health Benefits

Marionberries, Boysenberries, Loganberries and other blackberries are high in gallic acid, rutin and ellagic acid, a known chemopreventative, with anti-viral and anti-bacterial properties. With their dark blue color, blackberries have one of the highest antioxidant levels of fruits regularly tested. Blackberries are also rich in Vitamin C and fiber, which have been shown to help reduce the risks of certain cancers. Blackberries are low in calories, carbohydrates and have no fat, which makes them popular in low carb and low calorie diets.

- High in Vitamin C and fiber both of which have been shown to help reduce the risks of certain cancers.
- Contains high levels of anthocyanins (83-326 mg/ 100g) which work as antioxidants to help fight free radical damage in the body and give berries their deep dark color.
- The antioxidant level of foods can be measured as ORAC (Oxygen Radical Absorption Capacity). The ORAC value of Evergreen blackberries is 28 μ moles/TE/g, slightly higher than blueberries.

- Evergreen blackberries contain ellagic acid, a phenolic compound shown to have anti-carcinogen, anti-viral and anti-bacterial properties. The ellagic acid levels of Evergreen blackberries is 3.69 mg/g of dry weight.
- Source: [Oregon Raspberry & Blackberry Commission](#)

Pomegranate health benefits:

The juice of the pomegranate contains vitamin C, folic acid, and polyphenols (antioxidants), which are the basis of the health claims for the fruit.

Polyphenols work by removing free radicals from cells, which helps to maintain the human cell function, and they also aid in wound repair, in strengthening the immune system, and by having an anti-inflammatory effect. Perhaps the most famous benefit is that these polyphenols can help to slow skin wrinkling, and so pomegranates are a popular ingredient in anti-aging remedies, both traditional and modern.

Researchers report that they are rich in antioxidants that can keep bad LDL cholesterol from oxidizing (American Journal of Clinical Nutrition, May 2000). This degradation of LDL seems to be an initial step in the development of atherosclerosis. In addition, pomegranate juice, like aspirin, can help keep blood platelets from clumping together to form unwanted clots.

Several recent studies have shown significant potential health benefits from drinking pomegranate juice. Here are eleven:

Fights Breast Cancer

Studies in Israel show that pomegranate juice destroys breast cancer cells while leaving healthy cells alone. It may also prevent breast cancer cells from forming.

Lung Cancer Prevention

Studies in mice show that pomegranate juice may inhibit the development of lung cancer.

Slows Prostate Cancer

It slowed the growth of prostate cancer in mice.

Keeps PSA Levels Stable

In a study of 50 men who had undergone treatment for prostate cancer, 8 ounces of pomegranate juice per day kept PSA levels stable, reducing the need for further treatment such as chemotherapy or hormone therapy.

Protects the Neonatal Brain

Studies show that maternal consumption of pomegranate juice may protect the neonatal brain from damage after injury.

Prevention of Osteoarthritis

Several studies indicate that pomegranate juice may prevent cartilage deterioration.

Protects the Arteries

It prevents plaque from building up in the arteries and may reverse previous plaque buildup.

Alzheimer's Disease Prevention

It may prevent and slow Alzheimer's disease. In one study, mice bred to develop Alzheimer's disease were given pomegranate juice. They accumulated significantly less amyloid plaque than control mice and they performed mental tasks better.

Lowers Cholesterol

It lowers LDL (bad cholesterol) and raises HDL (good cholesterol).

Lowers Blood Pressure

One study showed that drinking 1.7 ounces of pomegranate juice per day lowered systolic blood pressure by as much as 5 percent.

Dental Protection

Research suggests that drinking pomegranate juice may be a natural way to prevent dental plaque.

Cranberry health benefits:

Cranberries have long been valued for their ability to help prevent and treat urinary tract infections. Now, recent studies suggest that this native American berry may also promote gastrointestinal and oral health, prevent the formation of kidney stones, lower LDL and raise HDL (good) cholesterol, aid in recovery from stroke, and even help prevent cancer.

Urinary Health

1. Many people are familiar with using cranberry juice for urinary tract infections. Cranberry juice produces hippuric acid, which makes the urine more acidic, making the kidneys and bladder inhospitable to bacteria.

Antioxidants

2. Cranberries are a great source of polyphenol antioxidants, which may benefit the heart and circulatory system. Antioxidants effects on the immune system and cancer are currently being researched.

Dental Health

3. Cranberry tannins have been shown to reduce the amount of [dental](#) plaque that can stick to the teeth.

Heart Health

4. There has been some evidence that cranberries and cranberry juice could raise HDL cholesterol, which is the good cholesterol that fights LDL cholesterol. LDL cholesterol is the artery-blocking substance that is responsible for constriction of the arteries and heart disease.

A few Science Studies supporting berry health benefits:

Berry extracts may ease age-related mental decline: Study

By Stephen Daniells, 12-Dec-2008

Old lab rats fed a diet supplemented with a compound from berries and grapes called pterostilbene performed better in mental challenges than their un-supplemented counterparts, says a new study.

The results indicated that in aging rats, [pterostilbene](#) was effective in reversing the decline in cognitive function that occurs with naturally with age, and that precedes diseases such as Alzheimer's.

The improvements in the working memory of the animals was associated with pterostilbene levels in the hippocampus region of the brain, said the researchers from the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University in Boston, and the ARS Natural Products Utilization Research Laboratory in Oxford, Miss..

The study, published in the *Journal of Agricultural and Food Chemistry*, adds to the growing body of science supporting intakes of [berries](#) and grapes to potential health benefits that has filtered through to consumers and boosted sales of berries and foods formulated with them.

Study details

The researchers, led by Barbara Shukitt-Hale, performed two studies. The first involved screening seven different stilbene compounds in cell cultures. This led to identification of pterostilbene as the most effective at preventing oxidative stress.

The second study involved dividing aged rats into three groups, and feeding one a control diet or the control diet adjusted to include high or low concentrations of pterostilbene. Shukitt-Hale and her co-workers report that, in ageing rats, the compound was associated with a reverse in cognitive decline and an improvement in the working memory of the animals.

Spaced out berries

Source: *Journal of Agricultural and Food Chemistry*

The same researchers reported previously that extracts from blueberries and strawberries could protect against the oxidative stress behind aging, and could even protect astronauts from dangerous galactic radiation.

The study, partly funded by NASA and published in the journal *Neurobiology and Aging* (doi: 10.1016/j.neurobiolaging.2006.05.031), reported that rats fed a diet supplemented with either strawberry or blueberry extracts for eight weeks before exposure to the radiation were protected from some of the reductions in brain function.

And interestingly, the high-energy and charge particles found in the radiation are also found outside the Earth's magnetic field, suggesting, said the researchers, that astronauts on a manned-mission to Mars may also benefit from daily berry supplements.

They reported that the compounds in blueberries and strawberries appeared to act in different ways. *"Perhaps, the polyphenolic compounds in blueberries are working mainly in the striatum, while those in strawberries are primarily affecting the hippocampus. While these results are interesting, more testing needs to be done to confirm this suggestion,"* they said.

Source: *Journal of Agricultural and Food Chemistry*

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"Berry Fruit Supplementation and the Aging Brain"

Authors: B. Shukitt-Hale, F.C. Lau, J.A. Joseph

Blueberries and Aging

USDA Human Nutrition Research Center (HNRC),

In a USDA Human Nutrition Research Center laboratory, neuroscientists discovered that feeding blueberries to laboratory rats slowed age-related loss in their mental capacity, a finding that has important implications for humans.

In one study, Jim Joseph, director of the neuroscience laboratory in the USDA Human Nutrition Research Center (HNRC), fed blueberry extractions—the equivalent of a human eating one cup of blueberries a day—to mice and then ran them through a series of motor skills tests.

He found that the blueberry-fed mice performed better than their control group counterparts in motor behavioral learning and memory, and he noticed an increase in exploratory behavior. When he examined their brains, he found a marked decrease in oxidative stress in two regions of the brain and better retention of signal-transmitting neurons compared with the control mice.

The compound that appears responsible for this neuron protection, anthocyanin, also gives blueberries their color and might be the key component of the blueberry's antioxidant and anti-inflammatory properties. Blueberries, along with other colorful fruits and vegetables, test high in their ability to subdue free radicals. These free radicals, which can damage cell membranes and DNA through a process known as oxidative stress, are blamed for many of the dysfunctions and diseases associated with aging.

These findings could become increasingly important as the U.S. population ages. It is projected that by 2050, more than 30% of Americans will be over 65 and will have the decreased cognitive and motor function that accompanies advanced age. Joseph is currently testing the effects of blueberries on humans. Preliminary results show that people who ate a cup of blueberries a day have performed 5–6% better on motor skills tests than the control group.

Pomegranate Research Update Western Reserve University School of Medicine study published in the September 2005 issue of the Journal of Nutrition

Pomegranate fruit extracts can block enzymes that contribute to osteoarthritis according to a Case Western Reserve University School of Medicine study published in the September 2005 issue of the Journal of Nutrition. The study looked at the ability of an extract of pomegranate fruit against Interleukin-1b (IL-1b), a pro-inflammatory protein molecule that plays a key role in cartilage degradation in osteoarthritis. Plant-based flavonoids found in fruits, leaves and vegetables have attracted a lot of attention for their beneficial health effects in various diseases. Pomegranate, in particular, has been found to possess antioxidant and anti-inflammatory properties that have potential therapeutic benefits in a variety of diseases. The Case study demonstrated for the first time the ability of pomegranate fruit extracts to slow the deterioration of human cartilage.

Researchers at the Washington University School of Medicine in St. Louis:

Drinking pomegranate juice during pregnancy may help reduce the risk of brain injuries in babies.

Decreased blood flow and oxygen to an infant's developing brain during pregnancy, birth and early development is linked to premature birth and can lead to brain tissue loss, seizures and mobility impairments such as cerebral palsy. The phenomenon, called hypoxia ischemia, causes brain injury in approximately two of every 1,000 full-term human births and in a very high percentage of babies born before 34 weeks of gestation. Researchers at the Washington University School of Medicine in St. Louis found that newborn mice whose mothers drank water mixed with pomegranate concentrate lost 60 percent less brain tissue than mice whose mothers drank sugar water or other fluids. Pomegranates contain very high concentrations of polyphenols, a substance also found in berries and grapes, which has been shown to potentially have anti-aging and neuroprotective effects.

(American Journal of Clinical Nutrition, May 2000):

Researchers report that they are rich in antioxidants that can keep bad LDL cholesterol from oxidizing (American Journal of Clinical Nutrition, May 2000). This degradation of LDL seems to be an initial step in the development of atherosclerosis. In addition, pomegranate juice, like aspirin, can help keep blood platelets from clumping together to form unwanted clots.

(American Journal of the College of Cardiology, Sept. 2005):

More recent research has found that eight ounces of pomegranate juice daily for three months improved the amount of oxygen getting to the heart muscle of patients with coronary heart disease (American Journal of the College of Cardiology, Sept. 2005).

(Journal of Urology, July 2005):

Other researchers report that long-term consumption of pomegranate juice may help combat erectile dysfunction (Journal of Urology, July 2005).

(Proceedings of the National Academy of Sciences, Sept. 26, 2005):

Investigators are also excited about the possibility that pomegranate compounds might prevent prostate cancer or slow its growth. In mice, treatment with pomegranate extract delayed the development of tumors and improved survival (Proceedings of the National Academy of Sciences, Sept. 26, 2005). Other research reports suggest that pomegranate juice might help reduce the risk of breast cancer.