

Anthocyanin (flavonoids) briefly explained

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"An important group of health-promoting phytochemicals are the flavonoids. These compounds are particularly abundant in fruits, but also occur in vegetables. One notable group of flavonoids are the anthocyanins. The anthocyanins are pigments - they impart the red, blue, purple color to the peel of fruits such as Saskatoon berries, blueberries, strawberries, cranberries, etc. A good indicator of anthocyanin content of fruit, is the color intensity of its juice. For example, a blueberry juice would be much more deeply colored than say a strawberry juice, due to its higher anthocyanin content.

One important property of the flavonoids is that they are antioxidants. This means that antioxidant compounds like flavonoids, may provide some protection to human against the deleterious effect of oxidative stress. Oxidative stress has been strongly implicated in the development of cardiovascular disease, many types and cancers, and certain neurodegenerative diseases."

Flavonoids have other health benefits. For example flavonoids have a "blood-thinning" effect; they inhibit the aggregation of blood platelets which otherwise contributes to the formation of blood clots, and the deposition of atherosclerotic deposits in blood vessels. As antioxidants, flavonoids inhibit the oxidation of LDL (low density lipoprotein), and together these effects contribute to the general protective properties of these compounds.

The "French Paradox", which is the unexpectedly low incidence of cardiovascular disease in high risk groups (smokers with high fat diets) has been explained by the high consumption of flavonoid-rich red wines in these populations.

Fruits contain many **anti-oxidants** like *poly-phenolic flavonoids, vitamin-C, and anthocyanins*. These compounds, firstly, help human body protected from oxidant stress, diseases, and cancers, and secondly; help the body develop capacity to fight against these ailments by boosting our immunity level. Many fruits, when compared to vegetables and cereals, have very high anti-oxidant value, which is something measured by their "**Oxygen Radical Absorbent Capacity" or (ORAC)**.

1. Anthocyanins are flavonoid category of poly-phenolic compounds found in some "**blue-fruits**" like blue-black grapes, mulberries, acai berry, chokeberry, blueberries, blackberries, and in many vegetables featuring blue or deep purple color. Eating fruits rich in blue pigments offers many health benefits. These compounds have potent anti-oxidant properties, remove free radicals from the body, and thus offer protection against

cancers, aging, infections, etc. These pigments tend to concentrate just underneath the skin.

Health benefits of black currants

- Black currants have significantly high amounts of phenolic flavonoid phytochemicals called *anthocyanins*. Scientific studies have shown that consumption of blackcurrants have potential health effects against cancer, aging, inflammation, and neurological diseases.
- Black currants have anti-oxidant value (Oxygen radical absorbance capacity- ORAC) of **7950 Trolox Equivalents per 100g**, which is one of the highest value for fruits after [chokeberries](#), elderberry, and [cranberries](#). Red currants, however, possess comparatively less ORAC value at 3387 TE than the black variety.
- These berries are an excellent source of antioxidant vitamin, **vitamin-C**. 100 g of fresh currants provide more than 300% of daily-recommended intake values of vitamin C. Research studies have shown that consumption of fruits rich in vitamin C helps the body develop immunity against infectious agents and also help scavenge harmful oxygen-free radicals from the body.
- Black currants are very good in **vitamin A**, and flavonoid anti-oxidants such as *beta-carotene*, *zea-xanthin* and *cryptoxanthin* levels. 100 g fresh berries provide 230 IU of vitamin A. These compounds are known to have antioxidant properties. Vitamin A is also required for maintaining integrity of mucus membranes and skin, and essential for healthy eye-sight. Furthermore, consumption of natural fruits rich in flavonoid anti-oxidants helps to protect from lung and oral cavity cancers.
- Fresh blackcurrants are also rich in many essential vitamins such as pantothenic acid (vitamin B5), pyridoxine (vitamin B-6) and thiamin (vitamin B-1). These vitamins are essential in the sense that body requires them from external sources to replenish and required for metabolism.
- They also contain good amounts of mineral **iron**. 100 g currant berries provide about 20% of daily recommended levels. Iron is an important co-factor for cytochrome oxidase guided cellular metabolism. It is also required for red blood cell (RBC) production in the bone marrow.
- Additionally, the berries are also a very good source of other important minerals like copper, calcium, phosphorus, manganese, magnesium, and potassium, which are very essential for body metabolism.
- **Quotes on Black Currant from Dr. Richard St. Pierre** Native Fruit Specialist
University of Saskatchewan
“Historically, black currant fruit, roots and leaves have had many medicinal uses. Black currant fruit are very rich in vitamin C. Black currant juice, tea and extracts have been used to treat sore throats (quinsy). Consequently, the name “squincy berry” was adopted in Great Britain.
- The leaves and buds of European black currants have been used as an anti-inflammatory drug. Various North American native tribes used the roots of the native black currant to treat many conditions including intestinal worms, kidney problems and uterine

disorders. The fruit of one species was used as a mild laxative, while early settlers used root infusions to treat dysentery in cattle and fevers in people.

- Oils extracted from leaf and flower buds of black currants have been used in cosmetic creams, lotions and perfumes. Black currant seed is considered to be a potential source of omega-3 and omega-6 fatty acids for the treatment of asthma, premenstrual syndrome, skin conditions, and arthritis.
- Black currant has exceptional nutritional value. Seeds are rich in both omega-3 and omega-6 fatty acids. Fresh fruit have an abundance of vi

Health benefits of blackberries

- As in other kinds of bush berries, blackberries too are packed with numerous plant nutrients such as vitamins, minerals, anti-oxidants, and dietary fibers that are essential for optimum health.
- The berries are very low in calories. 100 g provide just 43 calories. Nonetheless, they are rich in soluble and insoluble fiber (100 g whole berries consist of 5.3 g or 14% RDA of fiber). **Xylitol**, a low-calorie sugar substitute in the fruit fiber, absorbs more slowly than glucose inside the gut, and thus does not cause rapid fluctuations in blood sugar levels.
- Blackberries compose significantly high amounts of phenolic flavonoid phytochemicals such as *anthocyanins*, *ellagic acid*, *tannin*, *quercetin*, *gallic acid*, *cyanidins*, *pelargonidins*, *catechins*, *kaempferol* and *salicylic acid*. Scientific studies show that these antioxidant compounds may have potential health benefits against cancer, aging, inflammation, and neurological diseases.
- Fresh berries are an excellent source of **vitamin-C** (100 g of berries contain 23 mg or 35% of RDA), which is a powerful natural antioxidant. Consumption of fruits rich in vitamin C helps develop resistance against infectious agents, counter inflammation, and scavenge harmful free radicals from the human body.
- They contain adequate levels of vitamin A, vitamin E, and vitamin K (16% of RDA/100 g) and in addition; they are rich in much other health promoting flavonoid poly-phenolic antioxidants such as *lutein*, *zeaxanthin*, and *β-carotene* in small amounts. Altogether, these compounds help act as protective scavengers against oxygen-derived free radicals and reactive oxygen species (ROS) that play a role in aging and various disease processes.
- Blackberries have an ORAC value (oxygen radical absorbance capacity, a measure of anti-oxidant strength) of about 5347 μmol TE per 100 grams.
- Further, blackberries contain a good amount of minerals like potassium, manganese, **copper**, and magnesium. Copper is required in the bone metabolism as well as in production of white and red blood cells.
- They contain moderate levels of B-complex group of vitamins. It contains very good amounts of pyridoxine, niacin, pantothenic acid, riboflavin, and folic acid. These vitamins are acting as cofactors help the body metabolize carbohydrates, proteins, and fats.

Aronia: At least *two* species of chokeberries are cultivated widely, **black and red**. The plant bears numerous small, about 1 cm size fruits with relatively thick, pigmented skin. Red berries are sweeter in taste than black varieties; the latter are slightly bitter in taste; however, black and blue color berries are rather rich sources *anthocyanin* class of anti-oxidants.

Aronia: The North American super berry with cancer-fighting properties

By Chris Kilham

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While elderberry from Austria, acai from the Amazon, maqui from Patagonia and sea-buckthorn berry from Northern Asia have all made headlines as super berries packed with nutrition, a lesser known North American berry is gaining ground, poised to hit the nutritional spotlight as a world class super berry: Aronia.

Commonly found wild in woodlands and swamps, aronia is also known as chokeberry, due to its astringent flavor. The berries come naturally in three colors – red, purple and black-purple. Aronia melanocarpa, the black-purple species, has a much deeper purple color than blueberries, which are also North American natives. The berry is now cultivated, and that cultivation is expanding in anticipation of the berry's impending popularity.

The deep purple color of Aronia melanocarpa has attracted a lot of scientific attention. Purple fruits by virtue of their color are rich in the category of antioxidants known as anthocyanins. These pigments demonstrate potent cell-protective properties, and are also anti-inflammatory, helping to reduce systemic inflammation – a key factor in the development of chronic diseases.

But this is just the start of the benefits offered by aronia. Digging more into the compounds found in this native berry, scientists have found a number of more specific agents, including caffeic acid, cyanidin-3-galactoside, delphinidin, epicatechin, malvidin, and many more. You'll likely never have to remember these names, but to health researchers, the presence of these compounds in aronia is big news.

Combined, these specific agents in aronia are anti-bacterial, anti-viral, and anti-diabetic. They fight the formation of arterial plaque and lower serum cholesterol, and they protect the liver against a host of insults and toxins. In our ever-increasingly diabetic society, aronia's compounds help to lower blood sugar and improve the body's own natural production of insulin.

Several of the compounds in aronia are natural cancer fighters, and protect against the development of tumors of the bladder, breasts, colon, lungs, ovaries and skin. In addition, these compounds fight Crohn's disease, inhibit HIV, reduce uncomfortable symptoms of PMS and fight herpes. Preliminary studies have also shown that aronia may prove helpful in slowing the growth of glioblastoma – a form of fatal brain cancer.

Since the 1940s, aronia has been commercially cultivated in Russia, and since the 1950s, it has been a commercial crop in Europe. In 2009 the Midwest Aronia Association formed in Iowa to provide information and resources to farmers who wanted to get involved with commercial farming of this super berry. According to the association, members are now found in California, Illinois, Iowa, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New York, North Dakota, South Dakota, Wisconsin and Ontario, Canada.

In the world of berries, antioxidant activity is a major factor in the endless jockeying for position as top berry. Aronia has greater antioxidant activity than cranberry, blueberry, strawberry, cherry, pomegranate, goji and mangosteen. You can think of aronia as the King Kong of antioxidant berries. This awesome antioxidant power gives growers of the berry confidence that super-stardom for aronia is close at hand.

Aronia berry products are already in the market, and some have received coveted USDA Organic certification – the highest standard of agriculture purity in effect today. Unlike strawberries and many other fruits, aronia is naturally pest-resistant and does not require the use of agricultural toxins. This spells good news for those who do not want unhealthy chemicals in their fruits.

In the contest for ever healthier foods, aronia is surely a winner in the making. With science demonstrating significant benefits to health, farmers planting large acreage and the media increasingly boosting its fortunes, it's only a short matter of time before aronia, the North American super berry, leaps to prominence in juices, jams, jellies and many other products.

Health benefits of chokeberry

- Chokeberries are low in calories and fats. 100 g of fresh berries contain 47 calories. Nonetheless, they are one of the nature's richest sources of flavonoid anthocyanin antioxidants. In addition, the berries contain handsome levels of minerals, and vitamins, and dietary fiber obtained through their peel.
- The **oxygen radical absorbency capacity** or ORAC (measurement of antioxidant strength of food items) demonstrates chokeberry with one of the highest values yet recorded among berries-**16,062 micro-moles of Trolox Equivalents (TE)** per 100 g.
- Black color berries consist of significantly high amounts of phenolic flavonoid phytochemicals called **anthocyanins**. Total anthocyanin content is 1480 mg per 100 g of fresh berries, and proanthocyanidin concentration is 664 mg per 100 g (Wu et al. 2004, 2006). Scientific studies have shown that consumption of berries on a regular basis offers potential health benefits against cancer, aging and neurological diseases, inflammation, diabetes, and bacterial infections. (- By Dr. Paul Gross, 2007-07-09).
- Laboratory analyses of **anthocyanins** in chokeberries have identified the following individual chemicals: *cyanidin-3-galactoside*, *quercetin*, *peonidin*, *delphinidin*, *petunidin*, *epicatechin*, *caffeic acid*, *pelargonidin* and *malvidin*. These flavonoid poly-phenolic

antioxidants have proven health benefits through scavenging dangerous oxygen-free radicals from the body.

- Cancer research on anthocyanins where in black chokeberry preparations were first used to inhibit chemically induced cancer in the rat esophagus was found to reduce the disease severity by 30-60% and that of the colon cancer by up to 80%. Effective at both the initiation and promotion/progression stages of tumor development, these berries are a practical research tool and hold a promising therapeutic source, since they contain the highest amount of anthocyanins among native North American berries [J. Agric. Food Chem. 50 (12): 3495–500].
- They are also rich in flavonoid anti-oxidants such as *carotenes*, *luteins* and *zeaxanthins*. **Zea-xanthin** has photo-filtering effects on UV rays and thus protects eyes from age-related macular disease in the elderly (ARMD).
- Further, they are also a good source of many antioxidant vitamins like **vitamin-C**, vitamin A, vitamin E, beta-carotene and folate and minerals like potassium, iron and manganese. 100 g of fresh berries provide about 35% of daily-recommended levels of vitamin C.

Chokecherry

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Chokecherry is a fruit that belongs to the cherry and berry family of the bird-cherry species. This is one of the suckering shrubs. The fruit is also known as Virginia bird cherry and bitter-berry.

Chokecherry Scientific Name

Chokecherry is scientifically known as *Prunus virginiana*.

Chokecherry Description

Color : This fruit has a rich Canada red color complete global. Sometimes when the fruit over ripens it turns dark purplish red.

Shape : The fruit is evenly round.

Size : Each fruit of chokecherry is exactly of the size of a glass marble.

Taste : The fruit has a sweet and acidic taste of its own.



Picture 1 - Chokecherry

Chokecherry Varieties

Chokecherry is found in two varieties, Eastern chokecherry and Western chokecherry.

Chokecherry Distribution

This strange fruit is found all over U.S.A., Canada and France.

Chokecherry Cultivation

Sowing :

- Chose low alkaline and well drained soil to sow the chokecherry seeds.
- They seeds should be sown in winters as they require cold for germination.
- Plant the seeds at three inches apart from each other.

Sunlight : These shrubs need open space and full sun to grow.

Water : Water the area of plantation thoroughly and make sure the water is drained out completely.

Chokecherry Health Benefits

Chokecherry is quite beneficial for health. It nourishes the body from deep within. Find out all about its health benefits below.



Picture 2 - Chokecherry Image

- It contains flavonoids that are phytonutrients. This property nourishes the various organs of human body and boost up their functioning.
- Vitamin C content in chokecherry improves immunity of human body.
- It has high level of anti-oxidant contents. This protects our body cells from free radical damages.
- Its manganese content is extremely beneficial for maintained functioning of thyroid hormones.
- The same manganese is also beneficial for healthy functioning of nerves and well maintenance of bones.

Chokecherry Side Effects

The fruit has many side effects as well if over eaten.

- The mildest side effect results in headache.
- Over eating of this fruit can cause constipation.
- Sometimes it even results in ushering ulcers.
- Leaves and seeds of this fruit have been studied to be toxic.
- Consumption of wild chokecherries' leaves and seeds has also proven to be fatal.

Chokecherry Edibility

Chokecherry is eaten raw as a fruit like berries and cherries. It is also processed and used in deserts.

Chokecherry Uses

Chokecherry has various uses since ages back. Find out the edible, medicinal and other commercial uses of this fruit.

Edible Uses

- It is used make deserts like pies.
- Jelly is made from the extracts of this fruit.

- It is also stewed sometimes.
- Liqueurs and spirits are flavored with extracts of this fruit.

Medicinal Uses

- Extracts of this fruit is used to treat chronic cough, dry cough and whooping cough.
- It treats nervous dyspepsia.
- Helps in improving digestion.
- It helps in curing gastritis.
- The fruit treats diarrhea.
- It cures convalescent debility.
- It has anti-bacterial and anti-viral properties.

Other Uses

Extracts from the bark of chokecherry tree is used in flavoring many canned edible things and liqueurs.

Chokecherry Interesting Facts

Find some of the strange and extremely interesting facts about chokecherry listed below.

- Chokecherry is has properties that are extremely beneficial for human health.
- Though the fruit is nutritious and beneficial for health but the seed and leaves of the same fruit are extremely toxic. Consumption of these seeds and leaves can even prove fatal.
- This fruit's extracts has more medicinal uses than culinary ones.
- Though it is a fruit but it cannot be eaten raw as it is. It has an acidic taste. Though is used to flavor a lot of deserts and liqueurs.
- This fruit looks quite similar to berries from a distance.

- **Nutraceutical Properties of Cherries**

- **'Listen to Rick Sawatsky research technician U. of S. and see what all the excitement is about!'**

- Quote " Researchers in Michigan have found that tart cherries, one of the parental species of dwarf cherries, contain compounds with antioxidant and anti-inflammatory properties. Cherries have been linked to beneficial health effects in that cherry growers, who eat six times the amount of cherries as the average American, have a lower incidence of cancer and heart conditions. The most active antioxidant compounds in the cherry fruit are superior to vitamins E and C and some synthetic antioxidants. The same researchers have speculated that the natural antioxidants in cherry fruit could be extracted for use in food processing. It is interesting to note that these superior antioxidants in tart cherries are anthocyanins that are associated with the bright red color. Our dwarf cherries have a more intense red color than Montmerency, the most commonly grown tart cherry in Michigan. Our dwarf cherry fruit has not been tested for antioxidant concentration, but it is reasonable to expect high levels.
- These scientists also found that compounds from tart cherry fruit have anti-inflammatory properties which supports anecdotal information that tart cherries may relieve the pain of

gout and arthritis. A family member reports relief from gout after eating our dwarf cherry fruit.

- A food scientist in Michigan reports that adding tart cherry fruit to ground meat resulted in 50% greater reduction in the formation of mutagenic compounds during cooking. This was compared to ground meat to which other antioxidant compounds had been added. Dr. Alden Booren, professor of Food Science and Human Nutrition at Michigan State University, says, "We found that tart cherries reduced the formation of mutagenic compounds by 90% - a 50% greater reduction than with the other compounds. They are the most significant source that we have found for preventing mutagen formation in ground beef. Our trained taste testers found the cherry-beef mixtures to be very desirable and had equal to or better flavor than those from lean ground beef. We also found that reheated ground beef with cherries was essentially devoid of oxidized or rancid flavors." He and other scientists believe that the antioxidant properties of tart cherries are responsible for these effects. For complete information, see the Cherry Marketing Institute" end of quote.
- **So what is a Nutraceutical you ask?** A nutraceutical is a food or food component considered to provide medical or health benefits. These foods assist in the prevention or treatment of disease. This is a new area of study but scientists are now just proving that mom was right. She always said to eat your fruits and vegetables. Live long and healthy - Eat your berries!

The great health benefits of elderberry

by Dr. David Jockers

(NaturalNews) Elderberries have been used for their medicinal benefits for thousands of years throughout North America, Europe, Western Asia and North Africa. In the Middle Ages, it was considered a Holy Tree due to its ability to improve health and longevity. Elderberries are full of powerful nutrition and have incredible health benefits.

Elderberries are a dark blue, purplish berry that is both rich in color and nutrition. These berries contain very high amounts of the polyphenol anthocyanin, which give them their dark color. Anthocyanin's antioxidant ability allows the berries to survive periods of intense UV light radiation from the sun. These antioxidants are passed on to those who consume the berry and provide anti-carcinogenic benefits.

Elderberry has a very high ORAC, or oxygen radical absorbance capacity, score: over twice as much as blueberry and cranberry. Elderberry also contains trace minerals and has more vitamin C than oranges. Studies have shown that elderberry supports brain health, improves immune coordination, protects blood vessels and reduces cancer cell growth patterns in the body.

Elderberry has potent antiviral effects:

German studies have linked anthocyanins with greatly increased immune coordination. Anthocyanins have been shown to boost the production of immune cytokines. The cytokines are key messengers in the immune system to help regulate the immune response. This allows the body to defend against disease. These studies have shown the antioxidant balance of [elderberry](#) to be greater than equal doses of vitamin E and vitamin C.

Studies have also looked at the effect of anthocyanins on the mucous membranes and the sinuses. They have found that these antioxidants protect the mucous membranes and reduce inflammation-associated swelling. A study published in 2004 demonstrated elderberry's ability to improve flu-like symptoms. This study examined 60 people with the flu. The group that received elderberry extract for five days had their symptoms subside four days earlier than the placebo group.

Viruses multiply by invading our cells through their hemagglutinin spikes. These spikes allow them to penetrate the cell membrane and move in and take control the cell. Elderberry contains a potent antiviral agent called "antivirin" which helps neutralize the activity of the hemagglutinin spikes. When these spikes are deactivated, the viruses are no longer able to get inside of the cell and replicate.

Elderberry protects and promotes good circulation:

A 2000 study published in Free Radical Biology and Medicine showed that elderberry anthocyanins protect the inner layer of blood vessels from oxidative stress. The inner membrane of the blood vessels are called the endothelium. This study and others have shown that the epithelial cells absorb anthocyanins into their membrane, which gives them a strong protection from inflammatory stressors. This effect improves circulation and reduces the risk of heart disease and stroke.

Elderberry Benefits

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Used for its antioxidant activity, to lower cholesterol, improve vision, boost the immune system, improve heart health and for coughs, colds, flu, bacterial and viral infections and tonsilitis. Elderberry juice was used to treat a flu epidemic in Panama in 1995.

Elderberries (*Sambucus*) have been a folk remedy for centuries in North America, Europe, Western Asia, and North Africa, hence the medicinal benefits of elderberries are being investigated and rediscovered. Elderberry is used for its antioxidant activity, to lower cholesterol, to improve vision, to boost the immune system, to improve heart health and for coughs, colds, flu, bacterial and viral infections and tonsilitis. Bioflavonoids and other proteins in the juice destroy the ability of cold and flu viruses to infect a cell. People with the flu who took elderberry juice reported less severe symptoms and felt better much faster than those who did not.

Beneficial components in Elderberries

Elderberries contain organic pigments, tannin, amino acids, carotenoids, flavonoids, sugar, rutin, viburnic acid, vitamin A and B and a large amount of vitamin C. They are also mildly laxative, a diuretic, and diaphoretic. Flavonoids, including quercetin, are believed to account for the therapeutic actions of the elderberry flowers and berries. According to test tube studies² these flavonoids include anthocyanins that are powerful antioxidants and protect cells against damage.

Health Benefits of Elderberries

Elderberries were listed in the CRC Handbook of Medicinal Herbs as early as 1985, and are listed in the 2000 Mosby's Nursing Drug reference for colds, flu, yeast infections, nasal and chest congestion, and hay fever. In Israel, Hasassah's Oncology Lab has determined that elderberry stimulates the body's immune system and they are treating cancer and AIDS patients with it. The wide range of medical benefits (from flu and colds to debilitating asthma, diabetes, and weight loss) is probably due to the enhancement of each individual's immune system.

At the Bundesforschungsanstalt research center for food in Karlsruhe, Germany, scientists conducting studies on Elderberry showed that elderberry anthocyanins enhance immune function by boosting the production of cytokines. These unique proteins act as messengers in the immune system to help regulate immune response, thus helping to defend the body against disease. Further research indicated that anthocyanins found in elderberries possess appreciably more antioxidant capacity than either vitamin E or vitamin C.

Studies at Austria's University of Graz found that elderberry extract reduces oxidation of low-density lipoprotein (LDL) cholesterol. Oxidation of LDL cholesterol is implicated in atherogenesis, thus contributing to cardiovascular disease.

[Elderflowers](#) are also used for their health benefits.

Are Elderberries poisonous?

Most species of Sambucus berries are edible when picked ripe and then cooked. Both the skin and pulp can be eaten. However, it is important to note that **most uncooked berries and other parts of plants from this genus are poisonous**. Sambucus nigra is the variety of Elderberry that is most often used for health benefits as it is the only variety considered to be non-toxic even when not cooked, but it is still recommended to cook the berries at least a little to enhance their taste and digestibility.

1. J Alt Compl Mod 1995: 1:361-69 2. Youdim KA, Martin A, Joseph JA. Incorporation of the elderberry anthocyanins by endothelial cells increases protection against oxidative stress. Free Radical Biol Med 2000: 29:51 60

Nutraceutical, Nutrition & Health

Saskatoon Berries are a "Super Fruit". The word "Super Fruit" refers to antioxidant rich fruits. Saskatoon Berries naturally rich dark royal purple color comes from anthocyanins. Saskatoon Berries rank high in berries rich in anthocyanins with 562.4 mg / 100 g dry basis.

Antioxidant

There have been numerous studies and research on the nutritional values of high antioxidant content fruits that help to fight cancers and heart diseases. Consumers are looking for more natural and healthy fruits to add into their diet. One of the studies done by C.Hu, B.H.L. Kwok, and D.D Kitts shows Saskatoon Berries are good source of anthocyanins (Phytochemical Antioxidant)¹. Recent research indicates that Saskatoon berries have higher levels of **antioxidants** compared to other more common berries such as wild blueberries, strawberries and raspberries.

Antioxidants rich fruits may also have health contribution in heart diseases. Research showed anthocyanins from fruits "inhibits in vitro oxidation of human low-density lipoprotein"^{2,3}, and serving fruits rich in flavonoids compounds "has shown to be inversely related to coronary heart disease mortality"^{4,5}. Other studies and research have shown that anthocyanins rich fruits could help in reducing oxidative stress associated with aging^{6,7}.

Nutrition and Health

From a nutritional perspective Saskatoon berries contain a very high source of fibre. A 3/4 cup (100gram) serving of frozen Saskatoon berries contain 6 grams of fibre or 24% of the daily requirement.

Unfortunately, not everyone understands how good the fibre helps our bodies to defend against certain diseases. Fibre contributes to reducing the risks of heart diseases, diverticular disease⁸, and evidence now shows a possibility of defence against diabetes. "Studies found that high total dietary fiber intake was linked to 40 percent lower risk of coronary heart disease, compared to a low fiber intake. Soluble fibre breaks down as it passes through the digestive tract, forming a gel that traps some substances related to high cholesterol. There is some evidence that soluble fibre may lessen heart disease risks by reducing the absorption of cholesterol into the bloodstream."⁹ Benefit for those with diabetes. "Soluble fibre may help control blood sugar by delaying gastric (stomach) emptying, retarding the entry of glucose into the bloodstream and lessening the postprandial (post-meal) rise in blood sugar. It may lessen insulin requirements in those with type 1 diabetes. Because fibre slows the digestion of foods, it can help blunt the sudden spikes in blood glucose that may occur after a low-fibre meal.

Other Nutrients

Saskatoon berries just don't quit when it comes to health and nutrition. Saskatoon Berries are a source of 5 essential vitamins and minerals. Exploring the health benefits of Saskatoon berries today, is the one step forward reaching healthy lifestyle.

The Saskatoon berry is a tasty purple berry native to the southern Yukon, Northwest Territories, the Canadian Prairies and the northern plains of the United States. It has long been a feature of jams and pie fillings in Western Canada but has never achieved the proper recognition it deserves given the abundance of health benefits it provides.

Berries of all sorts contain numerous health benefits. They lower blood pressure, increase good cholesterol (HDL), are high in anti-oxidants and are packed with a variety of nutrients.[i] Blueberries get the most praise due to their anti-oxidant content. However, did you know that the less famous Saskatoon Berry contains more nutrients and has a higher anti-oxidant content than many of its berry relatives, including strawberries, raspberries and even blueberries? The Saskatoon berry is a little purple berry with intense health benefits. They have been found to contain higher levels of the anti-oxidants such as phenolics, flavonols and anthocyanins than most other berries.[ii]

Anti-oxidants play an important role in preventing damage to cells within the body caused by an excess of free radicals. Free radicals are highly reactive molecules and occur through normal biochemical processes. Too many free radicals can cause damage to the cells in our body. They

can accumulate as a result of environmental factors such as exposure to radiation, pollution, diet and exposure to chemicals we encounter in our daily life. By increasing anti-oxidants in your diet your body will be better equipped to protect and detoxify itself against free radical damage. This can help reduce the risk of a number of diseases including heart disease, high blood pressure, cancer and diabetes. Saskatoon berries are a delicious, versatile and simple option to increase anti-oxidant intake.

On top of all this Saskatoon berries are also a wonderful source of calcium, carotene, iron and manganese[[iii](#)], which are all vital nutrients to maintaining proper health. So consider making this tasty native northern berry part of your summer diet! The Saskatoon berry can be found in fresh or frozen at the Kingsland Farmers Market at ***Little Purple Apple and Sunrise Berry Farms: The Pie Store***. **Both the *Little Purple Apple and Sunrise Berry Farms: The Pie Store* serve up Saskatoon Berries as fillings in some of their delicious pies. Now your family and guests can enjoy a delicious dessert and increase their anti-oxidant and nutrient levels.**

Best of Health,
Dr. Stephanie Moody
Chiropractor
LifeMark Health- Heritage Hill

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Saskatoon Berries - A Potential Nutraceutical Crop

July in Manitoba signals the start of the native fruit industry in the province. Apples, blueberries, raspberries, saskatoons and strawberries are some of the more common Manitoba fruits. Traditionally the choice of fruit for the consumer has been one of availability, taste preference or home recipes.

Fruits have long been associated with nutrition and health. Recently, the role of the diet in this regard has evolved with a new classification of "functional foods" or "nutraceuticals", foods which have health-enhancing properties in addition to normal nutritional benefits. Fruits play a prominent role in this new classification.



By Arnie Hydamaka,
Department of Food
Science

One fruit in particular which has tremendous appeal and opportunity in the nutraceutical and functional food market is the saskatoon berry. Saskatoon berries were picked in the wild and used as a major food source as well as medicine by the native people and early settlers in the Prairies. Orchard production began in Manitoba only about 20 years ago, with current planted acreage placing the fruit second only to strawberries as a commercial fruit crop. In terms of nutrition, saskatoons are a good source of the recommended daily allowance for iron (22%), manganese (34%), calcium (11%), vitamin C (30%) and carotene (20%) for each 100 gm serving, as well as supplying other nutrients.

Several diseases of aging are believed to result from cumulative damage to cells by free radicals generated in the body through normal metabolism. Free radicals also result from environmental factors such as pollution, radiation, cigarette smoke and chemicals such as pesticides or herbicides. Fruits play a major role in preventing the oxidative damage to cells caused by free radicals. This function is attributed to the antioxidant power contained in the flavonoid composition, including pigments which give color to the fruits.

United States Department of Agriculture studies in 1998 ranked blueberries number one in antioxidant activity compared with 40 other commercially available fruits and vegetables. In comparison, strawberries were slightly more than half as potent as blueberries in antioxidant activity. Basically, the study revealed that the more intense color the fruit, the higher the antioxidant activity.

Based on these findings, and that consumer interest in eating foods that prevent disease is at an all time high, the blueberry industry has greatly expanded its markets and popularity in the diet. While variety is still key to a healthy diet and the current recommendation is to eat a minimum of five servings of fruits and vegetables daily, just one half cup of blueberries delivers as much antioxidant power as the recommended five servings of common fruits and vegetables.

Similar opportunities exist for saskatoon berries. The intense purple color of saskatoon berries is due to the presence of pigments called anthocyanins. Anthocyanins (from two Greek words meaning "plant" and "blue") are part of a large and widespread group of plant constituents known as flavonoids. Flavonoid compounds have been attributed to provide health

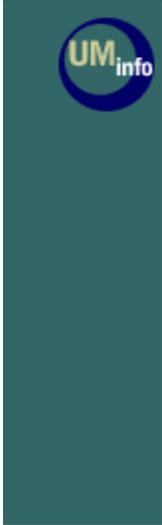
benefits against chronic diseases including cancer, heart disease, and macular degeneration. The deep color of saskatoon berries suggest that this fruit should contain high levels of anthocyanins and antioxidant activity similar to blueberries.

With support funding from the Agri-Food Research and Development Initiative (ARDI), Graham's Groves, a berry farm operation just south of Carmen contracted the Food Science Department at the University of Manitoba to study the nutraceutical potential of saskatoon berry varieties being grown in their orchards over a two-year period.

The current research data indicates that the anthocyanin content and antioxidant activity in saskatoons is comparable to values reported for blueberries. The major varieties grown at Graham's Groves B Honeywood, Smoky, Northline and Thiessen B all scored high in test results. A recent study conducted at the University of British Columbia reported similar findings.

These research results should encourage and assist in further development of the saskatoon berry industry in the province. Although there may be approximately 170 saskatoon growers in Manitoba, there are only about 10 commercialized orchards, and only two that are involved in value-added processing. The Manitoba saskatoon berry industry is largely based on U-pick operations, farm gate sales, and limited retail of processed products such as juice beverages, pies, jam, fruit toppings and jellies. Most growers rely on the short opportunity of few weeks in July to move the berries as fresh product.

As consumers awareness of the health benefits of saskatoons grows, market demand will follow. A major problem is that saskatoons are a Prairie fruit and not well known outside this area. The subtle unique flavour of the berry and its high antioxidant potential could soon change the market development. The nutraceutical and functional food industry is expected to generate annual sales of \$500 billion worldwide in the next decade. Saskatoon growers are in an ideal position to expand market potential and share in this growth industry.



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Honeyberry Health Benefits:

Vitamins

One of its many advantages is the high content of vitamins that are found in the honeyberry varieties. Thus, the amount of ascorbic acid up to 170 mg per 100 g of berries, i.e. more than strawberries, raspberries, gooseberries, approaching black currant. In terms of P-active compounds (catechins, rutin, anthocyanins, leykoantotsiany etc. 2800mg per 100g of berries) Honeysuckle is second only to black chokeberry. Vitamins B1, B2, B9 found in much smaller quantities.

Minerals

Honeyberries contain a rich set of macro-and micronutrients. They accumulate a lot of iron, calcium, and phosphorus. For magnesium, a component of nervous tissue, honeysuckle has no equal. In terms of sodium honeyberry retains leadership among wild berry bushes. It is rich in potassium and contains twice as much as black currants, raspberries, blackberries, and yields in these only lingonberries. Trace elements - catalysts of metabolic processes in living cells - are manganese, copper, aluminium, barium, silica, and iodine. Honeyberries contain a rare trace element Selenium- an element of youth.

Glucose, fructose and organic acids

Honeyberries contain sugars that are dominated by glucose, fructose, and organic acids - malic and citric.

In ancient times honeyberries were considered a priceless gift in the (Taiga region) northern barren lands of the Arctic, and in the treatment of many ailments by using different parts of the plant: flowers, leaves and branches.

Fruits are used in cardiovascular diseases, atherosclerosis, hypertension, gastritis, disorders of the gastrointestinal tract, they are particularly valuable in diseases of the liver and gall bladder, as an antipyretic and a diaphoretic for colds, and they are used for frequent nosebleeds.

Honeyberry juice is used as a health-improving drink for weakened immune systems, anemia, beriberi; it is used to treat ulcers and herpes. Honeyberries are also used to strengthen cell walls, anti-inflammatory, astringent and diuretic.

A mixture of flowers and leaves can be used to treat diseases of the mouth and throat as well as cure skin diseases and burns.

Infusions are used in the edema of different origin, in diseases of the kidneys and bladder.

Broth of branches and bark can be used to treat dropsy.