

What are the Benefits of Seabuckthorn?

Medicinal Properties	Health Benefits
Omega 3,6,7 & 9	<ul style="list-style-type: none"> • Supports healthy cardio vascular function • Sustains proper brain and nervous system function • Promotes healthy skin and hair • Supports healthy digestive system function • Promotes healthy urogenital lining
Vitamins A, C & E – Antioxidant B Vitamins – General wellness D, K – Necessary vitamins	<ul style="list-style-type: none"> • Benefits prostate and colon health • Contributes to proper brain & nervous system functioning • Enhances eye health for better vision • Relieves sore joints
Anti-oxidant network	<ul style="list-style-type: none"> • Fights cell-damaging free radicals • Provides anti-aging benefits • Supports healthy cell reproduction • Healthy immune system functioning & cellular rejuvenation • Healthy skin and hair
Flavonoids	<ul style="list-style-type: none"> • Helps fight cell-damaging free radicals • Assists in the process of healthy cellular rejuvenation • Promotes healthy immune system function
Carotenoids	<ul style="list-style-type: none"> • Beta carotene – assists in slowing the aging process • Lycopene – maintains prostate and colon cell health • Zeaxanthin – supports eye health
Minerals	<ul style="list-style-type: none"> • Helps the body produce energy • Helps the body support growth • Supports cell reproduction and rejuvenation
Energy	<ul style="list-style-type: none"> • Enhances mental clarity and promotes stamina • Sustained natural energy (no stimulants)
Anti-inflammatory	<ul style="list-style-type: none"> • Assists in healthy inflammatory response • Supports healthy cardio-vascular system • Relieves sore joints

Biochemical Characteristics

Fruit of seabuckthorn is very rich in variety of vitamins and other bioactive compounds with nutritional and medicinal properties.

Fruit

Weight of 100 fruits may vary from 15 to 70g, although in some cases, it may be as low as 8 g or as high as 110g. The fruit may contain 60-85 percent juice and it may yield about 65 percent juice by centrifugal method (Heilscher and Lorber, 1996). Each fruit contains a seed, weighing on average 15-20 mg, containing 41 percent moisture and 8-18 percent oil.

Dry Matter

In the ripe seabuckthorn fruits, dry matter is represented by fat and non-lipid fractions. Generally dry matter constitutes about 15 percent of the total weight of the fruit. It is known that small-fruited seabuckthorn contains more dry substances than large-fruited one.

Soluble Solids

Soluble solids represent an important fraction of the seabuckthorn juice, because of the high concentration of organic acids typical of its berry. Chinese seabuckthorn berries possess the highest content, varying from a minimum of 5.6 to a maximum of 22.7°Brix.

Proteins and Amino Acids

Total protein level in fresh fruits of seabuckthorn is in the range of 2.1-3.4 percent. In seeds, it may be between 18-33 percent. Protein content in the pulp varies from 0.79-1.64 percent, that is why pulp or juice seems cloudy or opalescent product, which provides a stable turbidity to the juice. The majority of seabuckthorn proteins are well-ingested albumins and globulins. As studied in Russian forms, globulins (53.7-56.0 percent) and albumins (33.1-38.4 percent) are important proteins, which contain a large number of free amino acids, among them aspartic acid is quantitatively most important.

Pectin

Pectin content of the seabuckthorn fruits is low. Pectin value was estimated in Siberian seabuckthorn (Var. Katun) ranging from 0.2 to 1.2 percent.

Sugars

Although, seabuckthorn berries are not considered rich in sugars, however, sugar is an important ingredient of seabuckthorn fruit, as it plays a useful role in determining the sweetness of its juice and in fact the sugar : acid ratio has been reported to constitute the major promoter of taste of seabuckthorn fruit juice. The average content of sugar in fruits is 2.00-3.26 percent and in the sweetest Russian forms, it can go up to 7.0 percent. The sugar is composed of glucose (1.3-1.8 percent), fructose (0.7-2.3 percent), and saccharose (0.07-0.30 percent). There are minor amounts of xylose, mannitol, sorbitol and xylitol.

Organic Acids

Organic acids and sugars are the major portion of the soluble solid fraction of the fruit pulp of seabuckthorn fruit. Fruit juice of seabuckthorn is quite rich in organic acid, pH of juice being near to 2.7. Chinese showed the highest content of organic acid (4.1 to 9.1 percent) and 2.1-3.2 percent in some Russian forms. About 90 percent of the total acidity is represented by malic and quinic acids in Chinese, Russian and Finnish berries, malic acid being a major constituent. Presence of vitamin C organic acid and tannic acid in the fruit of seabuckthorn make it an ideal sources for the production of several beverages particularly health protection juices.

Vitamin C

Seabuckthorn is famous for very high content of vitamin C (100-2750 mg/100g), which are 4-100 times higher than any vegetable and fruit. Generally, Chinese seabuckthorn (ssp. *Sinensis*) 360-2500mg and *H.salicifolia* (2750 mg) in Indian Seabuckthorn are richest in vitamin C, whereas Russian and European forms are low to medium. It is anti-oxidant, scavenger of free radicals, inhibits the formation of potentially carcinogenic N-nitroso compounds and thus offers protection against stomach cancer. Ascorbic acid also plays a critical role in wound repair and healing/regeneration process.

Oil

Oil of seabuckthorn berries is the most valuable product of this plant, as it possesses anti-oxidant, wound healing, anti-ulcer, anti-tumor and curing cardiovascular etc. properties. Generally, the oil content of seabuckthorn fruit is low (about 4 percent), whereas as ssp. *Turkestanica* in western Pamirs, Tajikistan is quite rich in oil of fresh fruits (6.8-13.7 percent). Russian and central Asian forms are known to be rich in oil, where the oil

content on the average does not fall below 6.0-6.6 percent. Indian Seabuckthorn, total oil in fresh fruits varied from 2.9-4.6 percent in *H. rhamnoides* ssp. *turkestanica* and much lower of 2 percent in *H. salicifolia*. The total oil content varies from 2-4 percent in pulp to 8-16 percent in seed.

Fatty Acids

Unsaturated fatty acids make about 85 percent of total oil. The human body absolutely requires the polyunsaturated EFAs α -linoleic acid (omega-6 fats) and alpha-linolenic acid (omega-3 fats). Both fatty acids repair the cell membrane after oxidation due to attack of free radicals. Seabuckthorn seed oil is very high in two essential fatty acids, Linoleic acid (30-40 percent) and α -linoleic acid (20-35 percent). The dominating fatty acids in the soft parts of the fruit are palmitoleic acid (16-54 percent). Generally less than 14 percent of Linoleic acid and less than 3 percent of α -linoleic acid are usually found in pulp oil. Palmitoleic acid has attracted an increasing interest due to its possible effects on many physiological processes including cholesterol and triglyceride lowering and stroke reducing effects. Palmitoleic acid is a principal constituent of skin fat and the extract is recommended for skin softening and anti-wrinkle products.

Vitamin E

Important antioxidant function of vitamin E, also known as tocopherols, appears to be the inhibition of lipid peroxidation, scavenging free radicals. Low intakes of vitamin E and other anti-oxidants results into certain types of cancer and atherosclerosis. Both pulp and seed oils of seabuckthorn are rich in vitamin E, much higher than other nutrient oils. Chinese experts have found the highest vitamin E content in seed oil of *H. rhamnoides* subsp. *turkestanica* (159 mg/100g) and lowest in pulp oil was found in *H. rhamnoides* subsp. *sinensis* (248mg/100g oil).

Vitamin K

Vitamin K promotes normal coagulation of blood during the injuries of blood vessels, and its content varies from 0.65-1.3mg/100gm of fresh fruit, 59-64mg/100g in pulp oil to 110-230mg/100g in seed oil, which is more than many horticulture crops.

Carotenoids

Various colours of ripe berries of seabuckthorn, ranging from yellow to bright red are related to occurrence of carotenoids. Carotenoids are linked with a decreased risk of heart disease, cancer, and degenerative eye diseases like macular degeneration and cataracts. Beta-caratene, the most dominant carotenoid in seabuckthorn, intake is associated with reduced risk of breast, stomach, esophageal, and pancreatic cancers. Total carotenoid content in seabuckthorn fresh fruit varies generally from 1mg to 120mg/100g, whereas

content of β -carotene varies from 0.2 to 17mg/100g. Red and orange-red fruits are richer in carotenoids as compared with the less intensely coloured fruits like yellow and orange-yellow. Different growth conditions influence the carotenoid content in the soft parts of the berries. Carotenoid content has been found increasing with the maturation of fruit. Soft part (pulp) oil of ssp. *sinensis* growing in Shanxi province of China had a maximum carotenoid level of 2140mg/100g and a minimum value of 2.1mg/100g in north Caucasus. It is established that carotenoides of seabuckthorn fruits consist of α -carotene, β -carotene, lycopene and zeaxantin. Many studies have found β -carotene to be a major carotenoid, making 15-55 percent of total carotenoides, depending on the place.

Flavonoids

Seabuckthorn fruit and leaves are very rich source of flavonoids. Flavonoids are found in all parts of seabuckthorn, i.e. leaves (3.8-4.0 percent), fruits, juice and seeds. Russians have estimated 420-552mg/100g flavonoids fresh fruits of various seabuckthorn populations. Seabuckthorn growing in west Pamirs had flavonoids 310-1238mg/100g dry wt in leaves and 168-859mg/100g in crude fruits. Studies found that the juice and dried fruit residue contained flavonoid of 0.2 percent and 0.55 percent, respectively in seabuckthorn from western Sichuan, China. The main flavonoids identified in seabuckthorn are leucocyanidin, catechin, flavonol and trace flavanone. From flavonol, the isorhamnetin, quassin and camellin could be isolated. They have been found to possess very strong anti-oxidant activity. It has found that flavonoids improve the immunity of the body, lower the osmosis of the capillary wall and prevent oxidation of vitamin C. Flavonoids have been found in controlling arteriosclerosis, reducing cholesterol level, turning hyperthyroidism into euthyroidism and eliminating inflammation. They have also been found effective against tumor and radiation damage.

Sterols

Sterols constitute the main portion of unsaponifiable matters. All sterols in seabuckthorn oil belongs the following 4 series, i.e., ergosterols, stigmasterol, lanosterols and amyrins. Due to their structural similarity to cholesterol, plant sterols are well studied for their cholesterol absorption inhibition properties. In addition to their cholesterol lowering property, plant sterols may possess anti-cancer, anti-atherosclerosis, anti-inflammation and anti-oxidation activities. The amount of sterols, in the fruit pulp of studies forms ranged between 0.16 and 0.76 percent, but in the seeds, it ranged from 0.19 to 0.96 percent. It was found that content of sterol in seabuckthorn oil is about 10 times higher than other oils. Total sterol content in the pulp oil (soft part) of seabuckthorn fruit ranged from 1 percent to 3 percent. Juice oil, processed by centrifugation of pressed juice of subsp. *sinensis*, had 720 mg/100g sterols.

Folate

Folate is a water-soluble vitamin B known to have several benefits to human health, such as prevention of neural tube defect in babies, an action against cardiovascular diseases caused by elevated plasma homocysteine and certain forms of cancer. Seabuckthorn fruits have been found to be a rich source of folate (29µg/100g fresh weight).

Betain

Seabuckthorn accumulates betain an anti-ulcer compound in high amount. It varied from 19.9 to 190 mg/100g in seabuckthorn cultivars growing at Urals Curative Plants Garden, Russian. Betain quantity in seabuckthorn fruits varied from 512 to 897 mg percent in Altay cultivars and from 728 to 1389 mg percent in East Sayan forms.

5-hydroxytryptamine (5-HT)

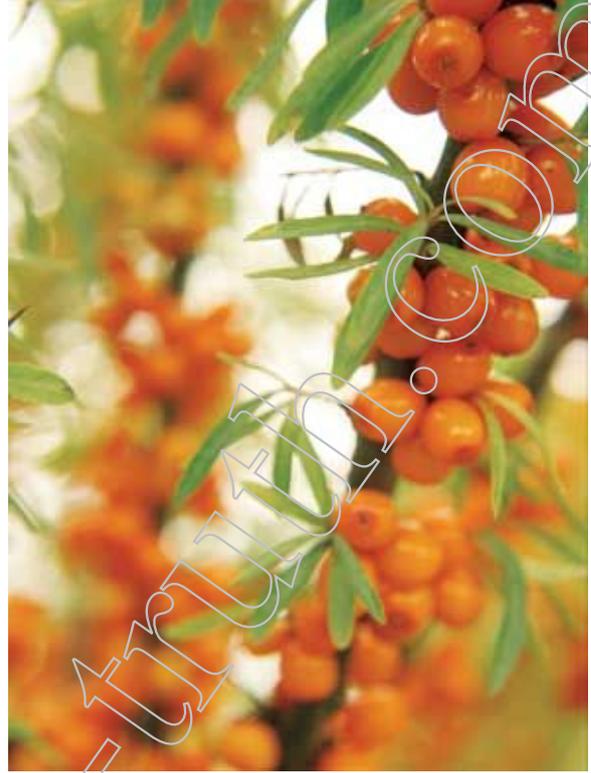
Of the chemical neurotransmitter substances, serotonin is perhaps the implicated in the etiology or treatment of various disorders, particularly those of the central nervous system, including anxiety, depression, obsessive-compulsive disorder, schizophrenia, stroke, obesity, pain, hypertension, vascular disorders, migraine and nausea. The peel of stem and fruit of seabuckthorn contains serotonin. In Russian forms, experts estimated 1.1-2.6 mg/100g serotonin in seabuckthorn fruit. 5-hydroxytryptamine (5-HT) isolated from seabuckthorn bark inhibited tumor growth.

Tannins

Seabuckthorn leaves have been found to contain high content of polyphenols, including tannins (10-12 percent). Therefore, seabuckthorn plant leaves have been proposed as the prospective source of dyeing and tanning substances. Fruits, pulp and juice were found to be poor in tannins (0.02, 0.02 and 0.004 percent, correspondingly). Seabuckthorn tannins are important source of anti-viral drugs.

Metallothionein

Metallothionein acts as detoxifying agency for heavy metals and as free radical scavenger for most toxic radical, hydroxyl radical (HO). Metallothionein inhibits the erythrocyte hemolysis, and stress induced ulcer and diabetes. In view of the high anti-oxidant activity, which is 7-8 times higher than human serum, it can be commercially utilized in sufficient quantity from seabuckthorn.



Consider seabuckthorn's nutritional profile: Seabuckthorn contains more than 190 biologically active compounds. Included in these 190 nutrients, are the following:

- Vitamins A, B1, B2, C, D, K, and P
- Omega 3, 6, 7 & 9 (Essential Fatty Acids or EFAs)
- 42 Lipids
- Organic Acids
- Amino Acids
- Folic Acid
- Tocopherols
- Flavonoids
- Phenols
- Terpenes
- Tannins
- 20 Mineral Elements

Seabuckthorn's many documented health benefits include:

- Strong antioxidant network
- Reduces inflammation
- Cellular Rejuvenation
- Improves cardiovascular health
- Improves brain and nervous system function
- Natural energy booster
- Helps repair scald and wound burns
- Improves nervous system health
- Improves skin complexion, anti-acne

Consider a more in depth look at the powerful nutritional properties of seabuckthorn –

Over 120 specific studies on seabuckthorn and countless studies on the biological properties found in seabuckthorn have shown that this little berry promotes health. From seabuckthorn's rare abundance of some of the most powerful antioxidants to being the only plant in the world known to contain essential fatty acids 3, 6, 7, and 9 - seabuckthorn has earned its title of superfruit.

Note: There are over 190 identified bioactive substances found in seabuckthorn and 60 unidentified that we hope to learn more about. We have selected only a handful of these substances that make seabuckthorn truly unique when compared to other fruits and vegetables.

Seabuckthorn and Antioxidants

Oxygen is essential for survival, just stop breathing and you'll know what we are talking about, but in the late sixties scientist began to theorize that oxygen was also toxic. That's not to say that breathing will kill you, but oxygen molecules that are unstable, meaning they are missing an electron, have been linked to many common health issues. These unstable oxygen molecules, referred to as Free Radicals, are unavoidable because we have to breathe, but they also increase when we exercise and when we are subjected to radiation, pollution, some heavy metals, pesticides, and cigarette smoke. A simple example is getting a sunburn, that's basic radiation damage to our bodies and our free radical production increases. But science has also shown that we can defend against Free Radicals with Antioxidants.

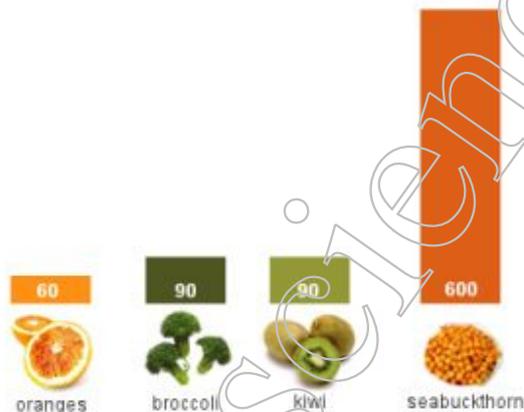
Antioxidants are free radical scavengers, in that they react with free radicals to make them more stable and less likely to cause damage to our lipids, proteins, and nucleic acids. When these vital molecules are damaged it can change the structure or even kill our cells - uh that's bad. Thus antioxidants are good, really good. Many vitamins and minerals act as antioxidants in our bodies, but there are some antioxidants that are better than others and it's not just about taking a single antioxidant either. Research has shown that consuming a single antioxidant has mixed results, from helping or not helping to actually causing more damage. This means that taking say a Vitamin E pill or potion (a powerful antioxidant!) doesn't always do the trick and could possibly have a negative effect.** Researches conclude that whole foods are likely the answer because they contain antioxidants along with other compounds that work together to protect the body by decreasing the risks of many common health issues.** It's no wonder why everyone from your Mom to the government suggests that we consume more fruits and vegetables that are abundantly rich in antioxidants.

Seabuckthorn and Vitamin C

Did you know that animals and plants can make their own vitamin C except for mankind and a few other animals? Yet vitamin C is essential for life!

Vitamin C is well-known for its superior antioxidant and immune support, and for promoting the health of joints.** It is also involved in collagen formation, which is important for healthy nails, skin and hair.**

Seabuckthorn ranks 3rd on the list of fruits and vegetables when comparing their vitamin C content, and ranked 7th when you take its average. The top two are Billy Goat Plum and Camu Camu. Yeah, we'd never heard of them either. Here's how seabuckthorn compares to fruits and vegetables you have heard of:



Note: The amounts shown are approximations and show the relative abundance of vitamin C in different raw plant sources. The amounts given are in mg per 100 grams of fruit or vegetable. Seabuckthorn contains an average of 600mg/100g of fruit and a high of 2750mg/100g of fruit.

Seabuckthorn and Superoxide Dismutase (SOD)

Eat More SOD. No, not grass! Superoxide Dismutase (SOD) is considered the most important enzyme in the body for protecting the body's cells and tissues from free radical damage. Seabuckthorn is an excellent source of SOD. SOD has been shown to support healthy joints, help with the side effects of cancer treatments, and support a healthy prostate.**



Note: The amounts shown are approximations and show the relative abundance of SOD in different raw plant sources. The amounts given are in mg per 100 grams of edible plant.

Seabuckthorn and Vitamin E

Second only to Wheat Germ, Seabuckthorn is an excellent source of vitamin E. Increasing amounts of scientific backing confirms the widely held belief that vitamin E has the ability to maintain cardiovascular health and immune function. It also supports prostate health.**



Note: The amounts shown are approximations and show the relative abundance of vitamin E in different raw plant sources. The amounts given are in mg per 100 grams of edible plant.

Seabuckthorn and Carotenoids

Lutein, zeaxanthin, alpha-carotene, beta-carotene, and lycopene are all carotenoids, but that's only a handful of the 600 carotenoids identified by man, of which 50 are present in our diets. Scientists have identified 39 of the 50 in seabuckthorn! This mix of carotenoids is incredibly high for such a small little berry and important because no individual carotenoid shows a high level of anti-oxidant activity, however, as a whole group the carotenoids become one of the most effective and powerful anti-oxidants out there.**

Seabuckthorn and Vitamin A

The most abundant carotenoid in seabuckthorn is beta-carotene which our bodies turn into Vitamin A. We know that Vitamin A protects dark green, yellow, and orange fruits and vegetables from the sun and helps maintain the health of eyes, skin, bones, teeth, and immune system.**Because seabuckthorn is one of the richest sources of beta-carotene it is also one of the richest sources of Vitamin A.



Note: The amounts shown are approximations and show the relative abundance of vitamin A in different raw plant sources. The amounts given are in mg per 100 grams of edible plant.

Seabuckthorn and Flavonoids

There are many different types of flavonoids and each appears to have protective health effects. Some of the better known flavonoids include resveratrol, anthocyanins, quercetin, hesperidin, tangeritin, kaempferol, myricetin, and apigenin. Flavonoids are well-known for their antioxidant and immune support, and for promoting the health of the cardiovascular system.**

Seabuckthorn and Fatty Acids

Shouldn't we avoid fat? We used to think so, but research makes it clear that some fats are good and some are bad. Better yet, some fats are really good and some fats are really bad. In fact, some are essential (you need to eat them to live). These essential fatty acids are more commonly called Omega 3 and 6. Omega 6 is abundant in plants while Omega 3 is abundant in fatty cold water fish. Other "good" fatty acids are omega 7 and 9 (the **only known sources for omega 7 in the plant kingdom are seabuckthorn berries and macadamia nuts**). Seabuckthorn is the **only plant in the world known to contain omega 3, 6, 7, and 9**. Increasing amounts of research show that Omega fatty acids are important for cellular, heart, circulatory, and skin health.** Omega 3's have also been shown to promote cognitive functions and bone health.**

Seabuckthorn and Phytosterols

Phytosterol, found in plants, perform the same function that cholesterol performs in mammals. Except in mammals we have "good" and "bad" cholesterol. Plants only have the "good" kind. And the phytosterols found in fruits and vegetables are good for people, they have cholesterol-lowering properties, promote the health of the digestive system, and support the health of cells.

Seabuckthorn and 5-Hydroxytryptamine (5-HTP)

In the central nervous system, 5-HTP is a precursor to serotonin, a neurotransmitter involved in sending messages through the nervous system. It is believed that 5-HTP promotes a healthy nervous system. We're happy to report that serotonin, sometimes called the molecule of happiness, is abundant in seabuckthorn.

Seabuckthorn and Betaine

Betaine is a nutrient that plays an important role in the health of your cardiovascular system and supports digestive health.

Seabuckthorn and Folate

Folate (also known as vitamin B9 or folic acid) is an important nutrient for the production, repair, and functioning of DNA (our genetic map), so it's no wonder that doctors recommend increasing folate intake during pregnancy when rapid cell growth takes place.** But Folate doesn't stop there, it also plays a role in maintaining cardiovascular health, in the formation of new cells, and in producing serotonin and norepinephrine, those happy molecules linked to your central nervous system.**

Seabuckthorn and Amino Acids

All the little processes that happen in our bodies like energy, building cells, muscle building, fat loss, and mood and brain functions are intimately and critically linked to amino acids.** There are 22 known amino acids. Eight are essential (our bodies can't make them) and the other 14 can be produced by our bodies when they are optimally running. Studies have shown that seabuckthorn contains an unusually high amount of amino acids and that 50% of the total amino acids found in the berry are essential.

Seabuckthorn and Malic Acid

As part of the energy-producing biochemical reactions in cells, malic acid plays an important role in the body and supports muscle health.**

The real power of seabuckthorn lies in the lives of those who are taking it today. Seabuckthorn juice, which includes the highest quality seabuckthorn on earth, is helping to balance lives through its incredible nutritional properties.

OMEGAS

- **Contains omegas 3, 6, 7, 9**
- **Supports healthy cardio vascular function**
- **Sustains proper brain and nervous system function**
- **Promotes healthy skin and hair**
- **Enhances integrity of mucous membranes**
- **Supports healthy digestive system function**
- **Promotes healthy urogenital Lining**

VITAMINS

- **A,C,E – Antioxidant network**
- **B vitamins – General wellness**
- **D,K – necessary vitamins**

FLAVONOIDS

- **Helps fight cell-damaging free radicals.**
- **Assists in the process of healthy cellular rejuvenation.**
- **Promotes healthy immune system function.**

CAROTINOIDS

- **Beta carotene – assists in slowing of aging process.**
- **Lycopene – maintains prostate and colon cell health.**
- **Zeaxanthin – supports eye health.**

MINERALS

- **Helps body produce energy.**
- **Helps the body support growth.**
- **Supports cell reproduction and health.**

ANTI-OXIDANT

- **Fights cell damaging free radicals.**
- **Provides anti-aging benefits.**
- **Supports healthy cell reproduction.**

ENERGY

- **Enhances mental clarity.**
- **Sustained natural energy (no stimulants).**
- **Promotes stamina.**

ANTI-INFLAMMATORY

- **Assists in the normal process of healthy inflammatory response.**
- **Supports healthy cardio vascular system.**
- **Relieves sore joints.**

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