



TOPIC: NATURAL ASTAXANTHIN

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look good
feel good
be well

nutrition NEWS

Can You Say Asta-ZAN-thin?

Amazing Natural Astaxanthin!

- Most powerful antioxidant known
- Highly effective anti-inflammatory
- Protects the eyes and brain
- Improves skin appearance
- Increases energy and endurance

Look inside and optimize your health....

asta•ZAN•thin

Astaxanthin – as•ta•ZAN•thin – within the next few years, this word will be as familiar to you as *antioxidant*. And, Natural Astaxanthin is a powerful antioxidant.¹

Besides its healing potential as an antioxidant, Natural Astaxanthin has additional benefits. One of these is its action as an anti-inflammatory. Other benefits include its capacity to protect the eyes and brain, bring improved performance to athletes, to condition the skin, and to help couples to become pregnant.

Our Colorful World

We live in a colorful world. All the colors around us – feathers, flowers, fruits, and fish – come from pigments, just as paint does. Astaxanthin is a red pigment. But it isn't the red pigment of tomatoes. (That's lycopene.) Astaxanthin gives the shades of red we see in marine life like shrimp, lobster, and particularly salmon. In the food chain, Natural Astaxanthin is delivered through microalgae.

In addition to their coloring property, natural pigments are involved in various biological functions. At commercial fish and crustacean farms, astaxanthin is added to feeds not only to give the animals their characteristic pinkish colors but also to deliver a supplement essential to the animals' growth and survival.

Astaxanthin is a *carotenoid*. Carotenoids are fat-soluble pigments found mainly in plants and algae. Currently, some 600 different carotenoids have been identified. The best known of these is *beta-carotene*. In the human body, one biological function of beta-carotene is as the precursor to vitamin A. Carrots are famously rich in this substance. (This is the reason that eating carrots improves night vision.) However, it is the small difference between the molecules of beta-carotene and astaxanthin that gives astaxanthin its impressive array of healing properties.

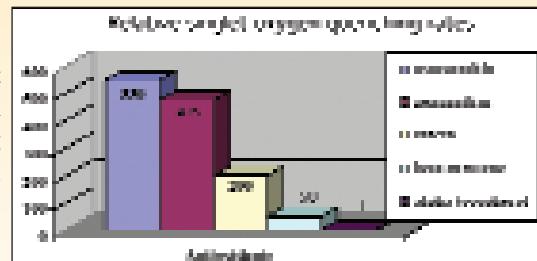


Amazing Astaxanthin

Natural Astaxanthin may be the best choice we can make when selecting an antioxidant supplement. Derived from microalgae, Natural Astaxanthin has dual antioxidant power. It can quench two notorious oxidizing agents: the well-known *free radical* (which launches chain reactions, damaging cells and producing more free radicals), and a highly reactive form of oxygen called *singlet oxygen*. This amazing power is demonstrated by two comparison studies. One measures Natural Astaxanthin's singlet oxygen quenching power, and the second, it's ability to eliminate free radicals.

In the first study, the singlet oxygen quenching potential of four carotenoids was pitted against the alpha-tocopherol form of vitamin E. Natural Astaxanthin was by far the strongest, registering 550 times the antioxidant strength of vitamin E! (N. Shimuzu, et al, 1996)

The second study compared the free radical scavenging capacity of Natural Astaxanthin with beta-carotene, pine bark



Antioxidants, Disease, & You

In our bodies, oxidation is a normal chemical process that includes energy production (metabolism). However, oxidative stress occurs when the body is overwhelmed by more oxidation than it can neutralize with its own internally produced antioxidants.² Oxidation can damage our tissues, cells, and even our DNA. This damage can occur from air pollution, exposure to chemicals, exposure to UV light, and poor nutrition. (Poor nutrition includes junk food, alcohol, sub-standard fats, etc.)

Unfortunately, oxidation results in the formation of more oxidizing agents. Many diseases and degenerative processes are associated with oxidation. These include multiple and single organ conditions. (Cross, et al. 1987)

Multiple organ conditions include:

- cancer
- aging (including premature aging disorders)
- radiation injury
- alcohol damage
- inflammatory-immune injuries
- reactions to drugs and toxins
- iron overload

In the following list, we give just one example of many conditions associated with each organ:

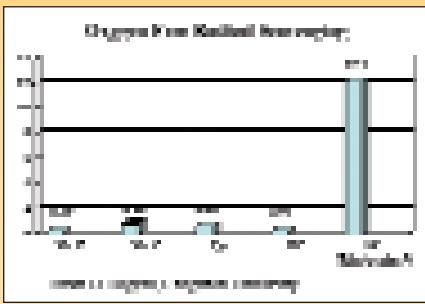
- brain – senile dementia
- red blood cells – lead poisoning
- lungs – cigarette smoke effects
- cardiovascular system (heart) – clogged arteries
- kidney – heavy metal toxicity
- joints – rheumatoid arthritis
- GI tract – lesions from NSAIDS³
- skin – sunburn
- eyes – cataract

Scientifically, it has become quite clear that our health depends in large part on controlling oxidative stress. This is where the power of antioxidant supplementation enters the picture. Such supplements reinforce the body and support its efforts to combat oxidative stress.

¹ The words Natural Astaxanthin are capitalized to differentiate microalgal-derived astaxanthin from synthetic astaxanthin and astaxanthin grown on yeast, both of which are inferior food forms for humans.

² These internal antioxidants include superoxide dismutase (SOD), catalase, and glutathione peroxidase.

³ NSAIDS is the acronym for non-steroidal anti-inflammatory drugs, such as aspirin and ibuprofen.



extract (as Pycnogenol[®]), vitamins E and C, and several others, including synthetic astaxanthin. In this experiment, conducted at Creighton University, **Natural Astaxanthin (as BioAstin[®]) from Cyanotech Corporation** ranged from 14 times to over 60 times stronger than any of the other antioxidants. (Bagchi 2001)

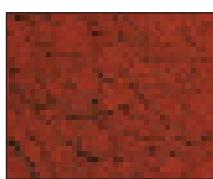
Incidentally, the measurement of antioxidant activity is highly dependent on the system used. A case in point is ORAC (Oxygen Radical Absorbance Capacity). This is a test tube analysis that measures the total antioxidant power of foods and other chemical substances. ORAC is growing in popularity, so why isn't an ORAC analysis given for Natural Astaxanthin? According to the company who owns ORAC (Brunswick Labs), ORAC does not accurately measure carotenoid antioxidant activity.

Keep Your Eye on This!

Tragedically, there are nearly 50 million cases of blindness worldwide while far more people become visually impaired. (Jacques 1999). Two of the leading causes of blindness and visual impairment are age-related cataracts and age-related macular degeneration (AMD). It appears that both of these conditions are the result of oxidative stress, originating from a lifetime of light-induced oxidation.

Briefly, a **cataract** is caused when the proteins in the lens of the eye clump together, resulting in cloudiness, and potentially leading to blindness. Oxidative stress causes the protein damage. Likewise, oxidation damages the enzymes which would normally remove the damaged proteins. Cataract is most commonly related to aging.

Regarding **AMD**, the retina is the "screen" of the eye where signals are sent to the brain. The *macula* is in the center of the retina. This area contains a high density of photoreceptor cells, giving the eye its highest visual acuity. AMD refers to the slow degradation of the macula, destroying the photoreceptors, and ultimately resulting in blindness. Free radical damage to fatty acids in the retina is thought to be the cause of this condition. (Gerster 1991) There is no treatment at this time.



There is abundant evidence that certain carotenoids can help protect both the lens and retina from oxidative damage. (Snodderly 1995) Population studies have shown that a diet high in carotenoids, specifically lutein and zeaxanthin (spinach, kale, and other leafy greens), is related to a reduced risk for both cataract and AMD. (Seddon, et al., 1994; Lyle, et al., 1999)

Although astaxanthin is not normally found in the eye, research indicates that **Natural Astaxanthin may provide the absolute best supplemental protection available for the eyes**. Mark Tso, PhD, has shown that astaxanthin can cross the blood-brain barrier. When he fed it to rats, he found it in their eyes. He then demonstrated that it **protects the eyes from**

light-induced damage, photoreceptor cell damage, damage to nerve bundles (called *ganglia*), nerve damage, and inflammatory damage. (Tso, et al., US Patent No. 5,527533, 1996) Tso showed that astaxanthin is also **effective in ameliorating retinal damage.** (Tso & Lam, 1996)



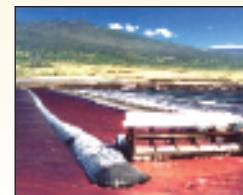
Since Dr. Tso's groundbreaking work, other scientists have found that Natural Astaxanthin has further benefits for the eyes. Nagaki, et al. (2002) found that Natural Astaxanthin (as Asta Real[®] from Fuji Chemical Industry) **helps ward off eye fatigue** in people using computer screens for extended periods. (Seven different studies have been completed in this area.)

Sawaki, et al. (2002) showed that people taking Natural Astaxanthin (as Asta Real[®]) had **improved visual acuity** when playing handball. Several visual parameters were measured. The largest improvement was seen in depth perception which improved by an astounding 46 percent!

Put Out the Fire!

In today's aging population, the reality of systemic inflammation is widespread. It has been called both "Silent Inflammation" and "inflamaging". Research indicates that this systemic inflammation is at the root of a myriad of life threatening diseases, including heart disease, stroke, cancer, diabetes, and Alzheimer's. One excellent marker for the presence of inflammation is C-reactive protein (CRP) levels in the blood.⁴

In a recent double blind, placebo-controlled clinical study, Dr. Gene Spiller found that subjects given Natural Astaxanthin (as BioAstin[®]) **showed CRP levels reduced by over 20 percent** at the end of eight weeks. The placebo group's levels actually increased. (Spiller, et al. 2006)



Natural Astaxanthin is a safe, natural anti-inflammatory, unique among its competitors. In the first place, it is not a drug but a natural substance. Secondly, most NSAIDS work through a single pathway in an intense manner that often leads to unwanted side effects. Natural Astaxanthin uses multiple pathways to combat inflammation throughout the entire body. It does not work as quickly as prescription medications. Reports show 2-4 weeks before the effects take place. On the other hand, Natural Astaxanthin has no reported side effects and it has benefits that ordinary anti-inflammatory products simply do not have.

Cyanotech Corporation, a major producer of Natural Astaxanthin (as BioAstin[®]), has funded several studies focusing on inflammation. These studies were conducted through independent laboratories under strict placebo-controlled, double blind conditions. **Natural Astaxanthin was found to reduce pain and increase mobility in people suffering from rheumatoid arthritis and carpal tunnel syndrome.** It has also been shown to reduce joint and muscle pain after exercise. In one interesting study, people with tennis elbow (tendonitis) were given Natural Astaxanthin. With this condition, grip strength can be severely compromised. After only 8 weeks of daily supplementation, the treatment group's grip strength improved by 93 percent!

⁴ In 2003, a panel of experts convened by the American Heart Association and the Centers for Disease Control and Prevention recommended use of the inexpensive CRP (C-reactive protein) blood test for assessing heart disease risk.

Athletics, Beauty & Conception... What Do They Have in Common?

If you guessed Natural Astaxanthin as the answer to this A, B, C, you guessed correctly!

Natural Astaxanthin is a secret weapon for athletes. In a six month double-blind study in Sweden, healthy young men taking 4 mg daily of Natural Astaxanthin (as AstaCarox® by AstaCarotene) demonstrated significant improvement in strength and endurance compared with controls. **After three months, the Natural Astaxanthin group increased the number of deep knee bends they could complete by 62 percent!** (The control group increased by only 22 percent.)

The huskies who run the Alaskan Iditerod are another group

 whose performance is enhanced by Natural Astaxanthin. Dr. Arleigh Reynolds, sled dog nutritionist and racer, says, "Natural Astaxanthin is 50 - 100 times better as an antioxidant for dogs than Vitamin E. It shows measurable improvement in blood parameters and visibly improves the dogs' performance."

Man's best friend and man himself owe this breakthrough to some of the world's finest athletes: salmon. This famous fish swims up raging rivers for as long as seven days. Scientists believe it is the very high amount of astaxanthin in salmon muscle that gives it such extraordinary endurance.

Another bonus for outdoor athletes is **sunburn protection**. An amazing two week study showed that Natural Astaxanthin (as BioAstin®, 4 mg/d) can protect the skin from UV radiation by increasing the amount of exposure time before the skin burns. (Independent Consumer Research Company, 2001) Taking Natural Astaxanthin protects skin and eyes from the damaging effects of the sun while bringing all its healthful benefits.

Natural Astaxanthin is a systemic antioxidant. The same antioxidant property that makes it an internal sunscreen also makes it an **internal beauty supplement**. By now, most women know that sun damage and even internal free radical damage can affect skin quality, leading to an aged appearance of the skin. In two separate studies, Natural Astaxanthin

demonstrated its ability to improve skin from the inside.

In the first study, participants took a combination of Natural Astaxanthin and tocotrienols (a vitamin E derivative). **Measurable differences began to appear within two weeks.** By the fourth week, individuals with dry skin had increased moisture levels and a reduction of fine wrinkles and pimples. Overall, improved elasticity, reduced swelling under the eyes, and better skin texture were reported. None of this happened in the placebo group. (Yamashita 2002)



In the second study, researchers combined Natural Astaxanthin with omega-3 fatty acids (fish oils) and marine glycosaminoglycans.⁵ In this Canadian study, **significant improvements were measured in skin hydration and elasticity. Improvements of the skin's appearance, including tone, reduction of fine lines and sallowness, were also noted.** Although some ingredients differed in the two studies, Natural Astaxanthin was the common denominator. Results were so convincing that leading companies worldwide are now using Natural Astaxanthin in their antioxidant skin care formulas.

Lastly, studies show **successful conception due to Natural Astaxanthin.** In Sweden during the 1990s, a number of studies demonstrated that farm animals fed Natural Astaxanthin had higher conception rates and healthier birth statistics than animals that were not supplemented. The next logical step was to test the supplement in human couples.

The Swedish company supplied Natural Astaxanthin (as AstaCarox®) to ten couples who could not conceive (poor sperm quality). After three months of 16 mg of Natural Astaxanthin per day, five of the ten couples had succeeded in conceiving. (Comhaire, et al. 2003; Similarly by Garem, et al. in 2002.) Taking Natural Astaxanthin is certainly the first technique to try for couples having the same difficulty. Imagine the stress and expense that could be saved by simply trying this easy solution first.

⁵ Glycosaminoglycans (GAGs) are the building blocks of cartilage and joint fluid.

Furthermore, Cyanotech is one of the few companies in the world with the technology to accurately measure Natural Astaxanthin levels. Cyanotech's methods have been accepted by the United States, Canadian, and Japanese governments. **In 1999, BioAstin® was the first source of astaxanthin for human nutrition to be reviewed by the U.S. Food and Drug Administration (FDA).** In fact, it passed review by the FDA and is now allowed to be sold in the US as a human dietary supplement.

Dosage recommendations are based on a reasonable portion of the world's highest grade salmon. A quarter pound of sockeye contains about 4.5 mg of astaxanthin. **One capsule of BioAstin® daily provides 4 mg at far less cost, much less trouble, and all the astaxanthin benefits.** BioAstin® is marketed by many leading vitamin and supplement companies around the world.

Take the Best Natural Astaxanthin

We recommend clinically proven and patented BioAstin® from Cyanotech Corporation.

As the word spreads about astaxanthin, commercial production is growing. Our recommendation, BioAstin® Natural Astaxanthin, is from microalgae grown on the pristine Kona Coast of Hawaii. Cyanotech has been producing microalgae since 1983.

Astaxanthin is such a strong antioxidant and so volatile that it can degrade rapidly when exposed to heat, light, and oxygen. It is imperative to ensure that it is properly handled both during production and when making the finished capsules or tablets. Cyanotech's patented Ocean Chill Drying™ method allows the algae to dry in a chamber containing less than 1 percent oxygen in less than 7 seconds. This preserves the integrity of the antioxidant content.

Siri Khalsa, Editor in Chief • Lisa Wade Devine, Associate Editor

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