

# ASTAXANTHIN

Natural Astaxanthin: King of the Carotenoids

by Bob Capelli with Dr. Gerald Cysewski

Ironman triathlete, Max Burdick, competed for years, but was never able to finish a triathlon. Then he began supplementing his diet with BioAstin®, a brand of Natural Astaxanthin, and at 75 years old he was able to finish. He still competes at age 78.

Natural Astaxanthin is responsible for the amazing strength, endurance and color of Salmon. For over 10 years, health scientists have been studying this wonderful ingredient. In his Introduction to the book, co-author Bob Capelli wrote:

“We are just beginning to understand the wonderful health benefits that Natural Astaxanthin (pronounced asta-ZAN-thin) can bring to humans, as well as animals. While many studies have already been done, there is still potential for a great deal more to be discovered. I foresee a time not too long from now when Astaxanthin (although difficult to pronounce) becomes a household word. For twenty years I have been involved with natural supplements and herbs, and I have to say that I have never been as excited about any other natural product as I am about Natural Astaxanthin. Scientists have not found any substance that has stronger antioxidant effects for free radical elimination or singlet oxygen quenching, and as the impressive anti-inflammatory properties of Astaxanthin become more widely researched and recognized, a whole new channel for the use of Astaxanthin in human nutrition is opening. Medical researchers are finding links between inflammation and a myriad of life threatening and debilitating diseases. The necessity of combating this ‘silent inflammation’ is becoming more apparent each year. At the same time, scientists continue to prove that supplementing with antioxidants is essential to lengthening and improving the quality of our lives.”

#### Did a Friend Send You this Summary?

If so, please be sure to visit our website to register so you can gain access to all our past and future summaries. We keep your email private and will send you updates when we've summarized a new book. Click here or visit [www.HealthBookSummaries.com](http://www.HealthBookSummaries.com) to register now!

#### Want to Sponsor a Summary?

If you have a business in the health industry and want to reach your target audience, then please visit our website to access our affordable advertising packages. We work hard to make sure our sponsors get the best value and service. Click here or visit [www.HealthBookSummaries.com](http://www.HealthBookSummaries.com) to view our downloadable ad kit.

#### Reader Services

If you have a question for us, please visit our site and take a look at the Frequently Asked Questions page for a quick answer or send your questions or comments to us via email at [Readers@HealthBookSummaries.com](mailto:Readers@HealthBookSummaries.com)

#### Summary Information

From the book *ASTAXANTHIN Natural Astaxanthin: King of the Carotenoids* by Bob Capelli with Dr. Gerald Cysewski. Copyright © 2007. Reprinted by arrangement with Cyanotech Corporation (<http://www.nutrex-hawaii.com>). All rights reserved.

This book summary may not be copied or distributed in any form without the permission from [HealthBookSummaries.com](http://HealthBookSummaries.com). [HealthBookSummaries.com](http://HealthBookSummaries.com) assumes no responsibility for the use or misuse of this material. Always work with a qualified health professional before making any changes to your diet, prescription drug use, lifestyle or exercise activities.

The advertisements contained in this summary do not necessarily reflect the views, opinions or policies of the book publisher, book author or Health Book Summaries, LLC.

CAT 215111

## What is Natural Astaxanthin?

Astaxanthin is a member of the carotenoids, which are the pigments that give beautiful colors to many of the foods we eat. Carotenoids are divided into two groups: Carotenes and Xanthophylls of which Astaxanthin is a member. The difference between the two groups is that the Xanthophylls have hydroxyl groups at the end of the molecule. Astaxanthin has more hydroxyl groups than other xanthophylls, which allow it to do more in the human body.

“Some of the many things that Natural Astaxanthin can do that beta carotene (and many other carotenoids) cannot:

1. Cross the blood-brain barrier and bring antioxidant and anti-inflammatory protection to the brain and central nervous system
2. Cross the blood-retinal barrier and bring antioxidant and anti-inflammatory protection to the eyes
3. Travel throughout the body effectively to bring antioxidant and anti-inflammatory protection at a high activity level to all the organs and the skin
4. Span the cell membranes



BioAstin Natural Astaxanthin

## The new supplement that the "Health Ranger" Mike Adams is raving about

Amazing new supplement supports joint health, skin health, eye health, and a healthy immune system. Click [here](#) to see for yourself what the Health Ranger says about BioAstin® Natural Astaxanthin.

Please go to our website today at [www.nutrex-hawaii.com](http://www.nutrex-hawaii.com) to order. Enter "NaturalNews" as the coupon code and we'll give you 25% off and free shipping on orders of \$75 or more!



*2% of profits donated to protect  
the natural environment of Hawaii*

Nutrex Hawaii, Inc., Kailua-Kona, Hawaii, USA  
800-453-1187  
[www.nutrex-hawaii.com](http://www.nutrex-hawaii.com)

5. Bond with muscle tissue
6. Work as a super-powerful antioxidant and quickly eliminate free radicals and neutralize singlet oxygen.
  - ▶ There are over 700 different carotenoids. They are produced in nature by plankton, algae and plants as well as a small number of bacteria and fungi. In plants and algae, carotenoids are actually part of the process of photosynthesis along with chlorophyll. Some animals can actually eat a certain carotenoid and then convert it in their body into a different carotenoid, but all animals must originally obtain carotenoids from their diet." (Quoted from the original text)

Astaxanthin can be found in plants and animals. It is most prevalent in algae and phytoplankton. Any sea animals with a red or pinkish color, such as salmon, trout, lobster, shrimp and crab will also have Astaxanthin. These animals eat krill and other organisms that ingest Astaxanthin-containing algae and plankton.

### World's Strongest Antioxidant

Natural Astaxanthin has proven to be the world's strongest antioxidant. Here are a few of the test results:

- ▶ Astaxanthin antioxidant strength was 550 times stronger than vitamin E in singlet oxygen quenching.
- ▶ Astaxanthin was 11 times stronger than beta-carotene in singlet oxygen quenching.
- ▶ Astaxanthin was 3 times stronger than Lutein as an antioxidant targeting singlet oxygen.
- ▶ Natural Astaxanthin was 14.3 times stronger than vitamin E as a free radical scavenger.
- ▶ BioAstin® was 17 times stronger than Pycnogenol®.
- ▶ 20.9 times stronger than Synthetic Astaxanthin
- ▶ 53.7 times stronger than beta-carotene.
- ▶ 64.9 times stronger than Vitamin C.

### Free Radicals and Singlet Oxygen

Free radicals are formed when weak chemical bonds split. Free radicals are very unstable and react quickly with other compounds, trying to capture the needed electron to gain stability. Generally, free radicals attack the nearest stable molecule, "stealing" its electron. When the "attacked" molecule loses its electron, it becomes a

free radical itself, beginning a chain reaction. Once the process is started, it can cascade, finally resulting in the disruption of a living cell. Internally, free radicals damage tissue and can adversely affect the body's immune system. They weaken and can destroy cells and the DNA in the cells.

Oxygen is an element and a vitally important substance for life on Earth, and especially for human life. Living organisms need oxygen for most, if not all, of their cellular functions. On the other hand, oxygen can produce metabolites that are toxic and potentially lethal to the same cells. Being reactive and chemically unstable, reactive oxygen species (ROS) are the most important metabolites that initiate reduction and oxidation (redox) reactions under physiological conditions. Oxygen in its excited singlet state ( $^1O_2$ ) is probably the most important intermediate in such reactions.

Singlet oxygen is linked to oxidation of LDL cholesterol and resultant cardiovascular effects. Polyphenol antioxidants can scavenge and reduce concentrations of reactive oxygen species and may prevent such deleterious oxidative effects. ([http://en.wikipedia.org/wiki/Singlet\\_oxygen](http://en.wikipedia.org/wiki/Singlet_oxygen))

### Antioxidants: A Daily Regimen

There are many different types of antioxidants available in fruits and vegetables. Antioxidants are best taken with a variety of other antioxidants, as there is a synergistic benefit. In order to ensure proper antioxidant protection, we should:

- ▶ Eat a good diet each day with lots of fresh fruits and vegetables, preferably up to nine servings.
- ▶ Take a high quality multivitamin.
- ▶ Take a green food supplement like Spirulina.
- ▶ Take a powerful antioxidant like Natural Astaxanthin.

### Natural Astaxanthin vs. synthetic Astaxanthin

BioAstin® from Cyanotech Corp is extracted from *Haematococcus Pluvialis* microalgae which also produces small quantities of other supporting Carotenoids. The resulting breakdown is as follows:

1. Esterified Astaxanthin 80 percent
2. Beta-carotene 6 percent
3. Free Astaxanthin 5 percent
4. Canthaxanthin CoA about 5 percent
5. Lutein 4 percent

Synthetic Astaxanthin is produced in the laboratory from petrochemicals. It therefore lacks the above listed additional supporting carotenoids, which work in synergy to make Natural Astaxanthin a more effective antioxidant than Astaxanthin.

## Safe Natural Anti-inflammatory

Many anti-inflammatories, such as aspirin Tylenol®, Vioxx® and Celebrex® have undesirable side effects. The American journal of Medicine reported that non-steroidal anti-inflammatory drugs (NSAID's) contribute to roughly 16,500 deaths and more than 100,000 hospitalizations each year! (Singh, G, 1998)

A word of warning here: Astaxanthin may not work as strongly nor as quickly as Vioxx, however it is a safe, natural alternative.

- ▶ People may not see benefits in pain relief or increased strength and mobility for two to four weeks after taking Astaxanthin.
- ▶ As many as 25 percent of people may have reduced results.
- ▶ Natural remedies are not as concentrated as prescription medications, so they won't work overnight.
- ▶ Due to the different metabolisms and the different types of bodies people have, they may not work perfectly for everyone.

In different clinical studies on inflammatory conditions, Natural Astaxanthin has been shown to be very effective for the majority of people, although there are some who don't get the desired results. This is also true with prescription drugs such as Vioxx and Celebrex, and over-the-counter products such as aspirin and Tylenol, where there are also people who don't get results. With these products there may be dangerous side effects.

Natural Astaxanthin has never been shown to have any negative side effect nor contraindication other than a slight orange color in the palms and soles of the feet due to doses far above the recommended 4 - 12 mg per day. This is due to the pigment in Astaxanthin depositing in the skin, which is a good thing since it is what allows Astaxanthin to work as an internal sunscreen.

## Clinical Trials

Inflammation	Measurement	Investigator/ Location	Number of subjects and treatment	Results
Heart disease risk	CRP blood test	Gene Spillar California, 2006	Double blind, 25 humans, 16 given Natural Astaxanthin	20.7% reduction in blood CRP levels in 8 weeks
High risk for Heart disease humans	CRP blood test	Mara Pharma- ceuticals, 2006	Double blind with Natural Astaxanthin,	Half the group had normal CRP after 3 months
Tennis Elbow (Tendonitis)	Grip strength	Gene Spillar California, 2006	Double blind, 21 with BioAstin®, 12 with a placebo	93% improvement when compared to the placebo group after 8 weeks
Carpal Tunnel Syndrome	Daytime pain rate and duration	Gene Spillar, 2002	Double blind, 13 with Natural Astaxanthin, 7 with placebo	41% reduction in pain rate and 36% reduction in pain duration after 8 weeks
Rheumatoid Arthritis	Pain scores and self-rated satisfaction scores	Dr.'s Nir and Spillar, 2002	Double blind, 14 with Natural Astaxanthin, 7 with a placebo	35% reduction in pain scores and 40% improvement in satisfaction after 8 weeks
Joint Soreness after Exercise	After strenuous knee exercise on a resistance- training apparatus the subjects were surveyed immediately after the workout and at intervals of 10, 24, and 48 hours afterward	Professor Andrew Frye, PhD, Tennessee, 2001	20 young men, 2 groups, some with Natural Astaxanthin, some with a placebo. The trial lasted 3 weeks	The treatment group experienced no pain while the placebo group did experience pain
Eye strain	Eye soreness, tiredness, and blurred vision	Shiratori, et al, 2005 and Nagaki, et al, 2006	6 mg per day of Natural Astaxanthin	Symptoms reduced after 4 weeks of treatment
Eye fatigue	Eye fatigue	Nakamura, et al, 2004	4 mg per day and 12 mg per day of Natural Astaxanthin	Researchers found positive results at 4 mg per day but even better results at 12 mg per day
Retinal capillary blood Flow	Retinal capillary blood Flow	Yasunori, N, 2005	Double blind, 18 with 6 mg per day of Natural Astaxanthin, 18 with a placebo	The treatment group had better retina capillary blood Flow after 4 weeks
Eye fatigue	Eye fatigue and visual accommodation	Nitta, et al, 2005	Double blind, 20 with 6 mg per day of Natural Astaxanthin, 20 with a placebo	3 separate visual parameters were found to have statistically significant benefits after 4 weeks in the treatment group
Oxidative damage in the eyes of rats	Nitric oxide, tumor necrosis factor alpha, and prostaglandin E-2	Suzuki, et al, 2006	Inflammation in the uvea was induced and one group also had Astaxanthin injections	Treated rats had lower levels of all 3 inflammatory markers

Inflammation	Measurement	Investigator/ Location	Number of subjects and treatment	Results
<b>Human skin quality</b>	Fine wrinkles, Moisture levels, Skin tone, Elasticity, Smoothness, Swelling, Spots and freckles	Yamashita, E., 2002	Double blind, treated group received 2mg per day Natural Astaxanthin with tocotrienols, and a placebo group	<p>After 2 weeks, improvements were noted in the treated group.</p> <p>After 4 weeks the treated group showed significant improvement in all areas while the placebo group showed no improvement or actually worsened.</p>
<b>Strength</b>	Maximum number of knee bends on a Smith machine	Malmsten, 1998	Double blind, 40 men aged 17-19, 20 with a 4 mg capsule of Natural Astaxanthin, 20 with a placebo	The treatment group improved their strength and endurance after 6 months by 62 %, while the placebo group strength improved 22% which is normal for this age group
<b>Exercise</b>	Lactic acid in muscles before and 2 minutes after running 1200 meters	Sawaki, et al, 2002	Double blind with 20-year-old men. The treatment group were given 6 mg per day of Natural Astaxanthin, and the second group, a placebo for 4 weeks	The treatment group averaged 28.6% lower serum lactic acid after running 1200 meters compared to the placebo group.
<b>Exercise</b>	Survey	Guerin, et al, 2002	247 people aged 20-87 were surveyed and 146 reported joint and muscle soreness after heavy exercise.	88% of all participants reported improvement in muscle and joint soreness when taking Astaxanthin.
<b>Exercise</b>	Swimming endurance and blood lactose levels in mice.	Ikeuchi, et al, 2006	The mice were divided into two groups and their endurance was tested by seeing how long they could swim before exhaustion	The mice fed Astaxanthin showed a significant increase in swimming time before exhaustion than the control group. Blood lactose levels of the treatment group were significantly lower than the control group.
<b>Immune System support</b>	Various	Chew, et al, 2003	Double blind placebo controlled human clinical trials	<p>Astaxanthin:</p> <p>Stimulates lymphocyte proliferation</p> <p>Increases the total number of antibody producing B-cells</p> <p>Produces increased number of T-cells</p> <p>Amplifies natural killer cell cytotoxic activity</p> <p>Significantly increases delayed-type hypersensitivity response</p> <p>Dramatically decreases DNA damage</p>
<b>Cardiovascular benefits</b>	LDL oxidation lag time	Iwamoto, et al, Japan, 2000	In-Vitro tests and Clinical trials with humans. The Astaxanthin doses were as low as 1.8 mg per day and as high as 21.6 mg per day for fourteen days.	<p>The in-vitro tests showed that Astaxanthin dose-dependently prolonged the oxidation lag time of LDL.</p> <p>All four doses positively affected LDL oxidation lag time. The optimum dose was significantly lower than 21.6 mg per day.</p>

## Pre-clinical Animal Trials

### Decrease in blood pressure

- ▶ Supplementation with natural Astaxanthin for 14 days significantly reduced blood pressure in hypertensive rats, Hussein, et al, 2005 a.
- ▶ Supplementation with natural Astaxanthin for five weeks significantly reduced blood pressure in hypertensive rats and delayed incidence of stroke, Hussein, et al, 2005 a.
- ▶ It was found that the mechanism for reducing blood pressure might be its modulating effect on nitrous oxide (Hussein, et al, 2005 b).

### Lowering Cholesterol

Hypertensive rats that were fed Astaxanthin increased their HDL, decreased their triglycerides, lowered their blood pressure and showed positive effects on key indicators of diabetes (Hussein, et al, 2006).

### Decreased heart damage from exercise and heart attacks

- ▶ Mice that were fed Astaxanthin then ran on a treadmill until exhaustion showed less heart damage than those that were not fed Astaxanthin (Aoi, et al, 2003).
- ▶ Astaxanthin fed to mice prior to heart attacks significantly reduced the area of infarction and the damage caused to the heart by the heart attack (Gross and Lockwood, 2004).

### Ulcers, Gastric Injury, Stomach Cancer

- ▶ Mice infected with *Helicobacter pylori* (*H. pylori*), a very destructive bacteria found in the stomachs of half of the world's population, that were fed Natural Astaxanthin had reduced bacterial load and gastric inflammation (Bennedsen, et al, 1999).
- ▶ Mice infected with *H. pylori* that were fed *Haematococcus* algae meal showed lower bacteria levels and lower inflammation scores than the untreated mice when tested one day after and ten days after the cessation of the treatment (Wang, et al, 2000).
- ▶ Rats that were given naprocin, which is known to cause ulcerative lesions in the stomach, were fed Astaxanthin in three different dosage levels. All realized significant protection against naproxen's deleterious effects on the stomach lining (Kim, et al, 2005).
- ▶ Rats that were fed ethyl alcohol, the active ingredient in whiskey, rum, vodka, etc., which can cause ulcerative gastric lesions in humans when consumed in excess showed similar results. The effects of Astaxanthin on ethyl alcohol showed

significant protection against ulcers, and pretreatment increased the free radical scavenging activities of super oxide dismutase (SOD), catalase and glutathione peroxidase (Kim, et al, 2005b).

- ▶ "Three different forms of Astaxanthin - Natural Astaxanthin from Haematococcus microalgae, Astaxanthin from the mutated yeast Phaffia Rhodiza, and Astaxanthin synthesized from petrochemicals - along with Vitamin C and beta carotene, on their ulcer preventative abilities in stressed rats. Rats were subjected to two different types of stress that cause ulcers. The rats fed all forms of Astaxanthin as well as beta-carotene were appreciably protected from the formation of gastric ulcerations. However, an extremely significant result of this research was that 'Ulcer indexes in particular were smaller with the rat group fed Astaxanthin extracted from Haematococcus than the other groups.' The research further showed that by combining Astaxanthin and Vitamin C 'protected against the evolution of gastric ulcerations in relation to control rats. The effects were more intense, especially in rats simultaneously supplied Astaxanthin and Vitamin C. The simultaneous supplementation of food substances with Astaxanthin and Vitamin C would supply enough antioxidants to offset stress-related injuries' (Nishikawa, et al, 2005)."

## Detoxification

The liver and kidneys help to detoxify the body by removing harmful substances. One of the key functions of the liver is the oxidation of fats to produce energy. The liver also destroys pathogenic bacteria and viruses, and eliminates dead red blood cells. These functions can release volumes of free radicals. It is very important to have the protection of neutralizing antioxidants in the liver to combat this oxidative process

- ▶ In one study, it was found that Astaxanthin was a much more effective antioxidant for rat liver cells than vitamin E. (Kurashige, et al, 1990).
- ▶ Astaxanthin also causes the liver to produce certain enzymes that may help prevent the formation of liver cancer (Gradelet, et al, 1998).
- ▶ Liver benefits were also observed in rats in 2001, where the antioxidant properties of Astaxanthin appeared to protect the rats from liver damage. An increase in superoxide dismutase (SOD) and glutathione was found in the rats' livers (Kang, et al, 2001).

## Cancer Prevention and Tumor Reduction

Because beta-carotene has been shown to reduce levels of cancers in people, it seems logical that the possibility exists that beta-carotene's cousin, Natural Astaxanthin, could produce similar results. Animal studies have shown positive results:

- ▶ Mouse tumor cells put into a solution supplemented with Astaxanthin and into the same solution without Astaxanthin. After one and two days, it was found that the tumor cells in the Astaxanthin solution had lower cell numbers and a lower DNA synthesis rate (Sun, et al, 1998).

- ▶ In a study of mouse breast tumor cells, researchers found that Astaxanthin reduced the proliferation of the tumor cells by 40 percent depending on dosage (Kim, et al, 2001).
- ▶ A very interesting study compared Astaxanthin against eight other carotenoids to see which was most effective at inhibiting liver tumor cells in culture. It was found that Astaxanthin surpassed all eight carotenoids (Kozuki, 2000).
- ▶ Astaxanthin in vitro has been found to also inhibit the proliferation of human cancer cell lines. Human colon cancer cell lines were placed in a culture containing Astaxanthin versus one that was Astaxanthin free. After four days, the cell lines in the culture containing Astaxanthin were significantly less viable (Onogi, et al, 1998).
- ▶ A similar study was done to see at what stage the Astaxanthin would have its positive effects. It was found that when Astaxanthin supplementation was started, both at one week and also at three weeks prior to the tumor inoculation, growth was inhibited. However, when the supplementation with Astaxanthin began at the same time as the tumor inoculation, the benefit was not found. The conclusion of this study was that Astaxanthin may work better in the early stages of tumor development, but not in the later stages. The researcher was very enthused with the potential of Astaxanthin in cancer prevention, pointing out that the anti-tumor activity came at blood concentration levels that are achievable. This study also pointed out that, unlike chemotherapy drugs, the ability of Astaxanthin to reduce tumors cannot be due to toxicity. Even dietary concentrations as high as 2 percent did not induce toxicity in rats, mice or ferrets. The theory espoused by these researchers from the University of Minnesota's School of Medicine is that the anti-tumor activity of Astaxanthin is related to its enhancement of the immune response (Jyonouchi, et al, 2000).

The three primary mechanisms of action that enables Astaxanthin to prevent cancer and shrink tumors can be any or all of these (Rousseau, et al, 1992):

- ▶ Its potent biological antioxidant action
- ▶ Its abilities as an immune system enhancer
- ▶ Its action as a gene expression regulator

## Help for Diabetics

The research in the area of diabetes has not yet been tested in humans. Logically, since silent inflammation can cause diabetes, and since Astaxanthin can help reduce silent inflammation, the use of Astaxanthin should have some benefit in preventing diabetes and helping people with diabetes. Human clinical trials are needed to prove this, but in the meantime there has been some very encouraging work in rodent models.

Four studies took place in Japan at the Kyoto University of Medicine and at the Institute of Natural Medicine. The first study examined a special type of mice that are diabetic and obese, a generally accepted model for type 2 diabetic humans. Results demonstrated that Astaxanthin significantly reduced the blood glucose level of these mice. It further showed that the Astaxanthin-treated groups maintained their ability to secrete insulin, and concluded: “These results indicate that Astaxanthin can exert beneficial effects in diabetes, with preservation of beta-cell function” (Uchiyama, et al, 2002).

Diabetes adversely affects many different organs of the body. In particular, diabetes can cause the kidneys to malfunction, causing a condition called “nephropathy.” This second study used the same diabetic and obese mice to examine how Astaxanthin could benefit the kidneys. The results: “After 12 weeks of treatment, the Astaxanthin-treated group showed lower blood glucose compared with the non-treated group...treatment with Astaxanthin ameliorated the progression and acceleration of diabetic nephropathy in the rodent model of type 2 diabetes. The results suggested that the antioxidant activity of Astaxanthin reduced the oxidative stress on the kidneys and prevented renal cell damage. In conclusion, administration of Astaxanthin might be a novel approach for the prevention of diabetic nephropathy” (Naito, et al, 2004).

The third study in rats that touched on diabetes showed that after 22 weeks, Astaxanthin reduced blood pressure and improved cholesterol and triglyceride profiles, but it also showed a reduction in blood glucose levels. A significant reduction in fasting blood glucose levels as well as insulin resistance was noted, along with improvement in insulin sensitivity. A fascinating notation was made that Astaxanthin actually decreased the size of fat cells. “These results suggest that Astaxanthin ameliorates insulin resistance by mechanisms involving the increase of glucose uptake and by modulating the level of circulating lipid metabolites and adiponectin” (Hussein, et al, 2006).

A recent study in diabetic mice showed that Astaxanthin decreased expression levels of genes extracted from the kidneys. This research may lead to a “better understanding of the genes and pathways involved in the anti-diabetic mechanism of Astaxanthin” (Naito, et al, 2006).

### **Trying to Have a Baby? Give your Husband Natural Astaxanthin!**

Another benefit of Natural Astaxanthin is its ability to help couples conceive.

In the 1990s, a company in Sweden called AstaCarotene sponsored studies of the ability of Natural Astaxanthin to improve conception in pigs and horses. The logical conclusion was that Natural Astaxanthin somehow worked to make the males’ sperm more potent (Lignell and Inboor, 2000).

Researchers have recently taken the next logical step and tested Natural Astaxanthin (as AstaCarox® by AstaCarotene) in human couples that wanted babies but couldn’t conceive. They took twenty couples that were trying to conceive for a minimum of at least twelve months. After three months of daily supplementation of a high dose of 16 mg per day of Natural Astaxanthin, five out of ten couples conceived. Tests of the men’s semen showed that sperm motility, velocity and morphology improved for the men taking Astaxanthin (Comhaire and Mahmoud, 2003, and Comhaire, et al, 2005).

Another study showed similar results. In this study the researchers concluded that supplementation with Natural Astaxanthin improved the quality of the spermatozoa, which is suggested to be the plausible explanation for the increased frequency of conception (Garem et al, 2002).

It is wonderful to think that many infertile couples' dreams of having children may be realized by taking a few Natural Astaxanthin capsules each day, rather than going through expensive therapies and may still not yield the desired result. .

## Additional Research

Additional work has/is being done in the following areas:

- ▶ Prostate problems
- ▶ Oxidative damage to DNA
- ▶ Prevention of enlargement of the lymph nodes
- ▶ Reduction of excess protein in the urine
- ▶ Feeding Natural Astaxanthin to house pets and sled dogs
- ▶ Uses of Astaxanthin in Aquaculture
- ▶ Use of Natural Astaxanthin in livestock to increase fertility
- ▶ Curing life-threatening muscle disease in race horses

## Recommended dosages

The recommended daily dosage is fairly standardized at a 4 mg per day level for the average person who has no serious concerns (such as low fertility or severe joint or tendon problems). Following is a table of recommended dosages that is provided as a rough guideline for consumers.

Dosage	Use
2-4 mg	Antioxidant, Immune System Enhancer, Cardiovascular Health
4-8 mg	Internal Beauty and Skin Improvement, Strength and endurance, Brain and Central Nervous System Health, Eye Health
4-12 mg	Arthritis, Tendonitis or Carpal Tunnel Syndrome, Silent inflammation, (C-reactive protein), Internal Sunscreen
20-100 parts per million	Topical Use
Higher doses	There is no toxicity level so taking more won't hurt you

If you like this summary,  
you'll definitely want to order  
the complete book *ASTAXANTHIN*  
*Natural Astaxanthin: King of the*  
*Carotenoids*

## Testimonials

Astaxanthin users report many benefits including increases in stamina and energy. They feel greater strength and recover faster from exercise. They say their skin has better resistance to the sun and improved appearance. They report better immunity and increased resistance to colds and flu. Medical doctors and chiropractors swear by it; professional athletes and weekend warriors extol its benefits. Here are a few benefits highlighted in the many letters that were received at the offices of Cyanotech in Hawaii, producers of BioAstin® Natural Astaxanthin. While these are not scientific studies, they do show how people feel a difference in their health when using Natural Astaxanthin.

- ▶ Medical doctor says Natural Astaxanthin changed his life
- ▶ Professional triathlete gets relief from overuse injuries
- ▶ America's top free diver: Immunity/recovery/less Fatigue
- ▶ 70-year-old: Joint Pain/stamina/macular degeneration
- ▶ College athlete: Sore hands relieved
- ▶ Hawaii's top marathon runner has increased energy and quicker recovery from intense workouts
- ▶ Competitive swimmer: Severe tendonitis
- ▶ Skin improvement/wrinkles/energy
- ▶ Sun allergy/aches and pains
- ▶ Chiropractor: Athletic performance/lymphatic drainage
- ▶ Joint pain/sunscreen
- ▶ Arthritis/repetitive stress injury
- ▶ Gum disease/gingivitis
- ▶ Carpal tunnel syndrome/pain from playing guitar
- ▶ Eyesight/clarity of vision
- ▶ Sunscreen/soreness after exercise
- ▶ Stomach problems/aching knees and joints
- ▶ Tennis elbow and sunburn

This book is sponsored by Hawaiian Cyanotech Corp., producer of BioAstin®, and is dedicated to those scientists, nutritionists and consumers who believe in Natural Astaxanthin.

BioAstin® and AstaZan® are registered trademarks of Cyanotech Corp.

If you like this summary,  
you'll definitely want to order  
the complete book *ASTAXANTHIN*  
*Natural Astaxanthin: King of the*  
*Carotenoids*

