



## “PHYTONUTRIENT ANTIOXIDANT”

# ASTAXANTHIN

■ Potent Natural Antioxidant

■ More Powerful Than Vitamin E And Other Carotenoids

■ Supports Healthy Immune and Cardiovascular Function

■ Well-Researched With Documented Results

■ High Quality BioAstin® Astaxanthin

Carotenoids are a class of lipid-soluble natural pigments found in plants, as well as in phytoplankton and certain fungi and bacteria. The red, orange and yellow colors seen in fruits and vegetables are from carotenoids. When various aquatic animals such as salmon and shrimp eat plants containing some of the over 700 compounds that make up the carotenoid class, those animals are also decorated with the same brilliant colors. However, carotenoids do more than provide color - they're powerful phytonutrient antioxidants. Beta carotene, lutein, and lycopene are some of the more well-known carotenoids, but the most powerful found to date is astaxanthin.

Astaxanthin is a fat-soluble carotenoid with a unique molecular structure that makes it an extremely effective antioxidant. The PDR® Medical Dictionary 2<sup>nd</sup> Edition defines an antioxidant as, “An agent that inhibits oxidation; any of numerous chemical substances, including certain natural body products and nutrients, that can neutralize the oxidant effect of free radicals and other substances.” Not only is astaxanthin a potent free radical scavenger, but it also can protect against oxidation, which limits the number of free radicals produced. Additionally, it's very effective at quenching a molecule called singlet oxygen, a harmful reactive oxygen species formed through normal biological processes. Singlet oxygen possesses a high amount of excess energy that must be released to keep it from damaging other cells. Astaxanthin absorbs this energy and dissipates it as heat, and in the process returns the singlet oxygen to a grounded state.

A growing body of research is showing that astaxanthin is the *creme de la creme* of phytonutrient antioxidants. Studies comparing astaxanthin to other carotenoids have shown it to possess antioxidant activity up to 10 times stronger than that of beta carotene, canthaxanthin, lutein and zeaxanthin.<sup>4</sup> A study published in 1990 conducted by Kurashige and associates compared the effectiveness of vitamin E and astaxanthin for the prevention of lipid peroxidation. The results showed that astaxanthin is 100-500 times more effective in preventing lipid peroxidation *in vivo* than vitamin E.<sup>5</sup>

Astaxanthin in algae provides protection against the effects of ultraviolet (UV) light exposure, and studies are showing that this protective effect is also imparted with dietary astaxanthin. Scientists believe that astaxanthin effectively scavenges the oxygen radicals produced through photo-oxidation caused by UV exposure. A 1995 study by Savoure and associates studied the protective effects of astaxanthin, beta carotene and retinol against UV-induced photo-oxidative stress. The results showed that astaxanthin is extremely effective in preventing increases of certain polyamines created through photo-oxidation, which damages skin. A particular polyamine was found to increase only 1.5-fold in subjects fed astaxanthin, whereas subjects in the control group experienced a significant 4.1-fold increase. It was concluded that astaxanthin works through a particular enzyme, increasing this enzyme's consumption of polyamines in response to irradiation.

Research has shown that astaxanthin also offers cardioprotective effects through its ability to decrease oxidation of HDL (“good” cholesterol), which is a cholesterol transporter in the blood. It's well established that high levels of HDL and low levels of LDL (“bad” cholesterol) are desirable for healthy cardiovascular function, so protecting HDL from oxidation means there's more circulating in the bloodstream. In a 1992 study by Murillo, subjects were fed dietary astaxanthin for 30 days. HDL cholesterol increased 57mg/dL, compared to the control diet (42.4 mg/dL). LDL cholesterol decreased from 12.5 mg/dL to 9.6 mg/dL. Clearly, astaxanthin exhibited an influence on the ratio of these two lipoproteins.

We can thank the lobster for the discovery of astaxanthin. Researchers working with an extract of the lobster *Homarus astacus* first characterized astaxanthin in 1938. It was soon discovered that astaxanthin is abundant in nature, although mostly in very low concentrations. The greatest source found is in green algae called *Haematococcus pluvialis*, which also contains other carotenoids such as beta carotene and lutein.

NOW® Foods Astaxanthin supplies 4mg of this effective phytonutrient antioxidant and is an excellent source of this outstanding member of the carotenoid family. The astaxanthin used for our product is BioAstin® supplied by the Cyanotech Corporation, one of the premier suppliers of high-quality astaxanthin taken from *Haematococcus pluvialis*, the richest natural source discovered. In addition to Astaxanthin, NOW® offers other carotenoids, including Lutein, Beta Carotene and Lycopene. Research continues to support the inclusion of carotenoids in the diet to support overall health. This is even truer for those with less than perfect diets and for those who smoke or spend any time with someone who does.

#### References

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\* This statement has not been evaluated by the FDA. This product is not intended to diagnose, treat, cure or prevent any disease.



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