



In the blink of an eye

The eye health benefits
of natural astaxanthin



In the Blink of an Eye

Vision is perhaps the most important one of our senses, providing us with a constant stream of visual information.

Technological advances and changes in the way we work and spend leisure time have increased visual stimuli and our exposure to blue light from personal computers and cell phone screens. This has given rise to an entirely new health threat called *computer vision syndrome* (CVS) ⁽¹⁾.



The Rise of Computer Vision Syndrome

The increasing use of digital displays for work and leisure has led to surging complaints about eye -related health problems at nearly pandemic dimensions.

Two studies in the U.S. reported that 75% of PC workers ^(2,3) were suffering from eye fatigue (asthenopia), characterized by symptoms such as dry, sore eyes, blurred vision, but also headaches and stiff shoulders, after working on computers for 6–9 hours.

Over time these symptoms can intensify, ranging from asthenopia and impaired accommodation (the capability of the eye to adjust to changing focus points) to the early onset of age-related farsightedness, macular degeneration or the development of glaucoma due to chronic overexertion.

A study with 10.000 office workers, conducted by Toho University in Japan, confirmed a linked between the extensive use of visual display terminals (VDTs) and the development of glaucoma, a serious eye condition that affects the optical nerve and can lead to irreversible blindness if left untreated ⁽⁴⁾.

Oxidative Stress at the Core of the Eye Health Problem

There is sufficient evidence and scientists believe that overexertion causes the dysfunction of our natural internal antioxidant system, losing the capacities of our bodies to produce their own antioxidants, such as glutathione peroxidase, superoxide dismutase or catalase.

The resulting excess of free radicals and other aggressive oxygen species leads to oxidative stress and damage.

Increasing concentrations of free radicals and singlet oxygen oxidize the polyunsaturated fatty acids in the cells of the retina severely affect their function and over time cause irreversible damage to the retina.

In recent years research has been focusing on natural antioxidants as remedies, particularly the carotenoid *astaxanthin* because of its exceptional capabilities in neutralizing aggressive oxygen species like free radicals and singlet oxygen ⁽⁵⁾.



Rebalancing the Eye's Antioxidant Status

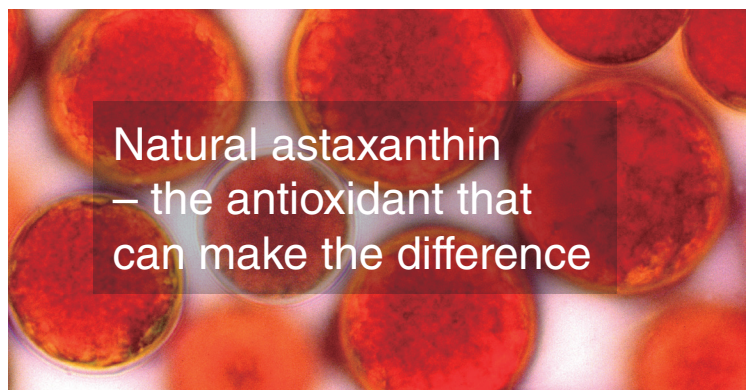
Only antioxidants that can reach the eye by crossing the blood-brain and blood-retinal barrier can unfold their antioxidant powers and protect the eyes ^(6,7).

The carotenoids lutein and zeaxanthin are known to accumulate in the retina where they protect the retina from the harmful effects of blue light and may prevent age-related macular degeneration and the development of cataracts ⁽⁸⁾.

Although normally not found in the retina, astaxanthin was shown to cross the blood-retinal barrier ⁽⁹⁾.

Several clinical studies reported that supplementation with natural astaxanthin from the fresh water alga *Haematococcus pluvialis* can alleviate the symptoms typically associated with CVS.

Supplementation with 6 mg of astaxanthin for 4 weeks significantly improved accommodation, reduced blurred vision, eye fatigue and alleviated symptoms that are typically associated with CVS such as stiff shoulders, headache and dry eyes ^(4,10,11,13,14).



All studies concluded that improved visual acuity and accommodative recovery can be attributed to astaxanthin's beneficial effects on the ciliary muscle which adjust the lens to different focus points (zoom-in, zoom-out).

Other clinical studies could show that the supplementation with astaxanthin enhances the capillary blood flow, improving the eye's supply with nutrient and oxygen and the removal of waste products, easing the symptoms of eye fatigue, and leading to an overall rejuvenation of the eyes ^(13,15,16).

Improving one's eye sight can be achieved in a relatively short period of time. Taking 6 mg of astaxanthin for 4 weeks was shown to slow down the progression of age-related farsightedness in elderly men ⁽¹⁷⁾ and increase depth perception during athletic performance ⁽¹⁸⁾.

Natural Astaxanthin is a Scientifically Proven Anti-inflammatory

Numerous studies have clearly demonstrated that astaxanthin's antioxidant capabilities contribute to vision improvement and shed light on the diverse mechanisms through which astaxanthin ameliorates eye fatigue.

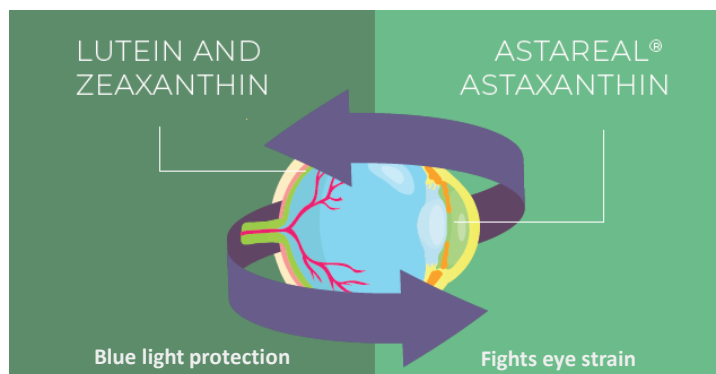
Additionally, astaxanthin, as a potent anti-inflammatory, plays an important role in the prevention of inflammation in the eye. An early Japanese study revealed that astaxanthin inhibited inflammation in the eye by blocking nitric oxide synthase resulting in the suppression of the release of nitric oxide and the inflammation markers prostaglandin E-2 and the tumor necrosis factor alpha ⁽¹⁹⁾.

In a recent study conducted in Japan, researchers demonstrated that astaxanthin can reduce inflammation in the aqueous humor of patients undergoing cataract surgery, thus reducing the risk of post-surgery eye inflammation⁽²⁰⁾.

Back-to-front Protection Through Synergy

The carotenoids astaxanthin, lutein and zeaxanthin are capable of crossing the blood-retinal barrier.

Whereas lutein and zeaxanthin accumulate in the retina, at the back of the eye, astaxanthin prefers the front of the eye where it accumulates in the ciliary (focusing) muscles and aqueous humor ^(21,22).



The synergistic benefits of combining astaxanthin for the front of the eye and lutein and zeaxanthin for the back of the eye *create a superior supplement formulation* for eye health care.

Thank you for reading our white paper.

If you would like to obtain more information about natural astaxanthin, its health benefits, publication references or what it can add to your formulations, please get in touch:

support@astareal.co.jp
www.astareal.se



Sumitomo Fudosan Onarimon Tower 10th Floor, 1-1-1 Shiba Koen,
Minato-ku, Tokyo 105-0011 Japan
TEL: +81-3-3437-2353

AstaReal Co., Ltd is part of the AstaReal Group wholly owned by the Fuji Chemical Group of Japan. AstaReal believes that the information contained in this sheet is accurate, and while it is provided in good faith, it is without warranty of any kind, expressed or implied. AstaReal® is a trademark or registered trademark of Fuji Chemical Group in Japan, United States of America, Europe and/or other countries. This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0) License. <https://creativecommons.org/licenses/by-nc-nd/4.0/>

