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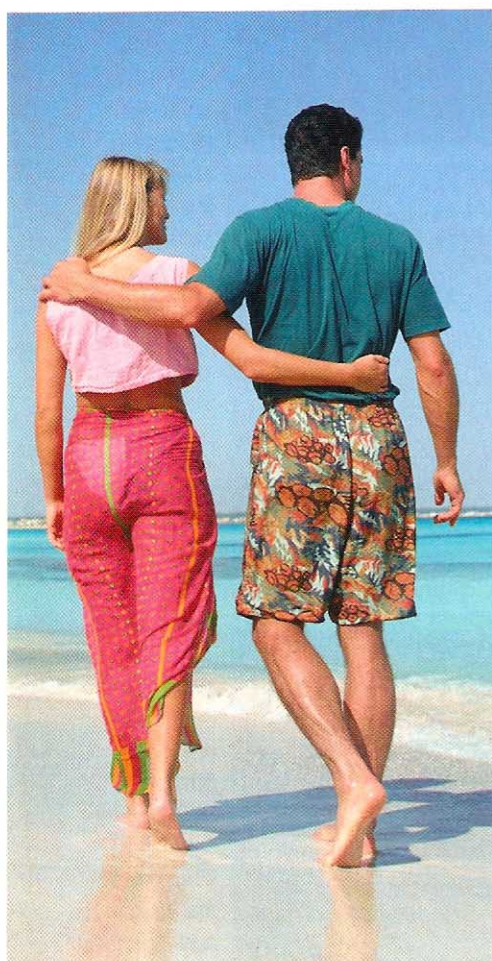
**New
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Astaxanthin

- a gift from nature

Extracted from a new book on Astaxanthin by Emma Wells, to be published in the autumn.



References:

- 1 Lignell A, et al. *Method for increasing the production of/in breeding and production animals in the poultry industry.* United States Patent Number US5744502, Astacarotene AB, Sweden, 1998.
- 2 Lignell A. *Medicament for improvement of duration of muscle function or treatment of muscle disorders or diseases.* Patent Co-operation Treaty application WO991251, Astacarotene AB, Sweden, 1999.
- 3 Snodderly DM. *Evidence for protection against age-related macular degeneration by carotenoids and antioxidant vitamins.* Am J Clin Nutr 1995 Dec 62:1448S-1461S
- 4 Seddon JM, et al. *Dietary carotenoids, vitamins A, C, and E, and advanced age-related macular degeneration.* Eye Disease Case-Control Study Group. JAMA 1994 Nov 9;272(18):1413-20
- 5 Tso MOM, Lam TT. *Method of retarding and ameliorating central nervous system and eye damage.* United States Patent Number US5527533.

Astaxanthin is new as a food supplement, but of course nature has been using it for millennia. Throughout the animal kingdom astaxanthin carries out a number of essential protective biological functions. In the case of visual protection, shore birds such as kingfishers have larger amounts of astaxanthin in their eyes than land birds, because they need more protection from the glare of the sun. In salmon and shrimps astaxanthin has been found to be essential to normal growth and survival. When added to poultry feeds, egg production and the general health of hens improve (1). In veterinary applications chronic muscular conditions in horses have been greatly eased (2). Reproduction in pigs and horses also improves. Aside from its magical pink colour, astaxanthin has an array of properties that make it unique.

Free Radicals

We are constantly under attack from free radicals. Free radicals are the reason that old car tyres become brittle and cracked; in the human body they are the main culprit responsible for premature ageing. Not only can they upset the body's equilibrium they can lead to over sixty diseases.

Another name for free radicals is an *oxidant*, as oxygen plays a pivotal role in the process. Anything that helps to protect against oxidants is called an 'antioxidant'. When our diet is rich in antioxidants free radicals are kept within a natural balance so that we do not age prematurely.

Every day the human body creates huge amounts of free radicals as a by-product of turning oxygen into energy. The more exercise we do, the more energy we use, the more free radicals are created. Other sources of free radicals are from the sun, fried foods, a westernised diet and a stressful lifestyle.

In summary, free radicals are a major drain on the body's natural resources, and have a damaging effect. Antioxidants however are important raw materials, found in foods, which can counteract this damage and help to protect the body from their harmful effect.

Although astaxanthin was discovered in the 17th century, its potent antioxidant action has only recently been researched and acknowledged (it has more than 500 times the antioxidant power of vitamin E). Now many trials and scientific studies into astaxanthin have shown its remarkable protective action as an antioxidant. Research

has also revealed many other ways that astaxanthin can benefit the body and overall health. Here we concentrate on astaxanthin and the eyes.

Astaxanthin and antioxidant protection

As eyes age they contain decreasing levels of certain antioxidants, called carotenoids. In 1994/5 scientists acknowledged that carotenoids played a part in protecting the eye from free radical damage. These findings were published in reputable medical journals such as *The American Journal of Clinical Nutrition* (3) and the *Journal of the American Medical Association* (4). In order to be of any use to the eye, two special properties are needed, which only a few carotenoids possess.

Research has shown that astaxanthin and canthaxanthin, both carotenoids, are able to cross not only the blood brain barrier (into the brain) but also the blood retinal barrier (into the eye). Both of these barriers are in place to protect entry into the brain and the eye from substances in the blood that could be harmful. But these special properties enable astaxanthin and canthaxanthin to enter and protect the eye from free radical damage, one of the major causes of cataracts and other eye problems. The use of canthaxanthin however is not recommended. It can form crystals in the inner layer of the retina, thus hampering the adjustment of the eye to the dark. The same is not true of astaxanthin.

Currently trials are underway at the Eye Institute of Oakland University in Rochester, USA, researching eye health and astaxanthin. It was another leading research scientist, Dr. Mark Tso, who proved that astaxanthin has the ability to cross not only into the brain but also into the eyes to give antioxidant protection (5). Dr. Tso then went on to show how astaxanthin protects the macula of the eyes from damage. A good indication of damage to the retina is to measure its thickness. In the absence of damaging light the thickness of the retina of a normal eye is around 45 micrometers. Astaxanthin has shown significant protective qualities in maintaining retinal thickness and it is for this reason that it is the preferred antioxidant for helping to protect the eyes against the damaging effects of free radicals.

The eyes, however, are only one aspect of health that can be optimally supported by astaxanthin.