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Lutein: The Antiordinary Antioxidant

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Lutein belongs to a class of compounds known as carotenoids. Carotenoids in general are yellow, orange, or red pigments responsible for many of the colors of the foods we consume each day. To date, over 600 carotenoids have been identified in nature, but are only produced by plants, algae and bacteria leaving humans and animals to consume carotenoids in the diet. Forty to fifty carotenoids are consumed in the typical US diet, but only 14 have been detected in blood, indicating a selective use of specific carotenoids by the body. Lutein is one of these carotenoids found in the blood and has been increasingly associated with eye health over the last decade.

Lutein's role in eye health

In the human eye, lutein is concentrated in the center of the retina in an area known as the macula. Lutein is deposited in the macula through the lutein we consume in our diet or through supplements. This area is responsible for human central vision and is colored intensely yellow due to high concentrations of lutein. Lutein is thought to be beneficial for eye health by reducing damage in the eye in two ways: 1) by absorbing blue light (blue light is thought to increase free radical formation in the eye) and 2) by acting as an antioxidant, reducing damage in the eye caused by free radicals. Leading carotenoid researchers believe these functions may lead to a reduced risk of age-related macular degeneration (AMD) and cataracts.

Age-related macular degeneration

Macular degeneration is the leading cause of blindness in the US in those over 65. Twenty-five to thirty million people are afflicted worldwide and currently there are no effective treatments for the disease. The disease has two forms known as dry and wet AMD.

Ninety percent of the AMD cases diagnosed are the dry form. In dry AMD, also referred to as early AMD, debris deposits under the center of the retina (known as the macula) interfering with its normal function. Parts of the macula atrophy, causing the central vision to slowly become dimmer or more blurry. Wet age-related macular degeneration, also known as late AMD, often develops in areas where dry AMD exists. Abnormal blood vessels grow and leak blood and fluid under the macula, causing scarring, which leads to a rapid loss of central vision.

Dr. Joanna Seddon published one of the first studies demonstrating a link between lutein intake and AMD risk in 1994 (1). This epidemiological study compared the risk of developing AMD to nutrient intake and showed a significant reduction in risk for developing AMD as lutein intake reached 6 mg per day (57% reduction in risk). Since the Seddon study, researchers have shown that increasing dietary lutein intake raises blood levels of lutein as well as levels of lutein in the eye (2). Bone et al. demonstrated that eyes with higher levels of lutein were less likely to be afflicted with AMD (3).

The latest clinical trial that investigated lutein's role in AMD is known as the Lutein Antioxidant Supplementation Trial (L.A.S.T) (4). This study evaluated the effect of lutein supplementation for one year in 90 veterans diagnosed with dry AMD. Supplementation with lutein in these subjects significantly increased the concentration of lutein in the macula. Improvements in visual function were also detected with lutein supplementation. Glare recovery, visual acuity, and contrast sensitivity were all improved. This study continues to build on clinical evidence that the dry form of AMD may be responsive to changes in nutrition.

Cataracts
A cataract is a natural clouding of the lens, the area of the eye responsible for focusing light and producing clear, sharp images. For most people, cataracts are a natural result of aging. Currently in the US, cataracts are the second leading cause of blindness in the elderly behind AMD.

Lutein is the major carotenoid that has been identified in the human lens and is thought to provide similar benefits to the lens that are seen in the retina. Two large epidemiological studies consisting of >70,000 women (age 45-71) and >30,000 men (age 45-75) compared the risk of cataract extraction to nutrient intake (5,6). Similar to AMD, a significant reduction in risk of cataract extraction was associated with lutein intakes of 6 mg per day (20% reduction in risk). Besides cataract extraction, higher levels of lutein consumption have been associated with a decreased risk of cataract development and improvements in visual acuity and glare sensitivity in people with age-related cataracts.

Lutein consumption
The richest sources of free lutein in the typical US diet are dark green leafy vegetables, with the highest concentration found in kale followed by spinach.

The average daily lutein intake is low, averaging between 1-2 mg/day. Currently there is no recommended intake for lutein. However, if you were to eat according to the recommendations of the Dietary Guidelines for Americans 2005 (9 servings of fruits and vegetables every day) you would consume between 4 and 8 mg of lutein a day (7). Epidemiological evidence, animal models, and clinical data have indicated levels of 6-10 mg a day may be necessary to realize the health benefits associated with lutein consumption. By continuing to increase our intake of lutein, we begin to ensure the optimal health of our eyes.
(**Please Note:** OcuFactors eye support formula provides 15 mg of lutein.)

References:

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