



## Frequently Asked Questions

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### Healthy Aging with FloraGLO® Lutein Important Information Consumers Should Know



#### About FloraGLO Lutein

##### 1. What is lutein?

Lutein is an important natural antioxidant that helps maintain healthy eyes and skin as we age. Lutein is a *carotenoid* found naturally in egg yolks and in fruits and vegetables, particularly dark green leafy vegetables such as spinach and kale. Carotenoids are compounds that provide color to plants and act as antioxidants. FloraGLO Lutein, the leading brand of purified lutein found in top supplement brands contains the exact same molecule as found in nature.

##### 2. Why is it important to include lutein in my diet?

Lutein provides nutritional support to our eyes and skin – the only organs of the body directly exposed to the outside environment. It is an antioxidant that appears to quench or reduce harmful free radicals, which can play a role in a variety of chronic diseases. Lutein also filters high-energy, blue wavelengths of light from the visible-light spectrum. Blue light, in both indoor lighting and sunlight, is believed to induce oxidative stress and possible free-radical damage in human organs exposed to light, such as the eyes and skin. Research shows lutein, in conjunction with zeaxanthin, reduces the intensity of blue light by as much as 90% in the retina, which could significantly reduce oxidative damage<sup>1</sup>.

##### 3. Can the body produce lutein?

**No.** Lutein is an important compound in the human body, but the body is unable to manufacture lutein. Eating foods containing lutein or consuming dietary supplements that contain lutein is the only way for your body to get lutein. Lutein is present in the eye, serum, skin, cervix, brain and breast. Within the eye, lutein is highly concentrated in the macular region of the retina and is dispersed in lesser amounts throughout the entire retina, iris, ciliary bodies and lens.

##### 4. How much lutein do I need each day?

**6-10 mg.** Research suggests 6-10 mg per day of lutein from dark green leafy vegetables or other sources is necessary to realize lutein's health benefits. Even if you eat a balanced diet, you would need a large bowl of fresh spinach each day to get about 6 mg of lutein.

Most Americans just don't consume enough foods rich in lutein. In fact, consumer statistics show that only 23% of Americans eat the recommended amounts of vegetables and fruits daily<sup>2</sup>. Supplementing your meals with 6-10 mg of FloraGLO Lutein each day gives you extra lutein identical to the lutein in spinach – making your diet even better for your eyes and skin.

#### **5. What is FloraGLO Lutein?**

FloraGLO Lutein is the leading brand of purified lutein found in top supplement brands and is the exact same lutein molecule found in nature. It is the original and patented supplement lutein introduced to the nutritional world.

#### **6. Why should I look for supplements containing FloraGLO Lutein?**

**Quality and safety.** The FloraGLO name assures you are consuming the highest quality lutein available – lutein that is trusted by researchers all over the world and thus used in more clinical trials than any other lutein source.

#### **7. Is FloraGLO Lutein safe?**

**Yes.** FloraGLO Lutein has been used extensively in vitamin and dietary supplements since the mid-1990's with no reported safety complaints.

Lutein was evaluated by an independent international body recognized throughout the world for establishing the safety of food additives. This organization is called JECFA [Joint (Food and Agriculture Organization/World Health Organization) Expert Committee on Food Additives]. JECFA established an acceptable daily intake (ADI) level for lutein of up to 2 mg per kg of body weight, which is equivalent to approximately 140 mg of lutein per day for a 154 pound person (70 kg)<sup>3</sup>.

The safety of FloraGLO Lutein was also evaluated by the Food and Drug Administration (FDA) in connection with a notification that FloraGLO Lutein is GRAS (generally recognized as safe) for a variety of uses in conventional and medical foods. The agency conducted its own evaluation of the GRAS findings from a food safety expert panel reviewing toxicological, genotox and human safety data. Visit <http://www.cfsan.fda.gov/~rdb/opa-g140.html> for the full FDA report. The FDA did not question the Expert Panel's conclusion that FloraGLO Lutein can be safely added to a variety of foods.

#### **8. Is it safe to take FloraGLO Lutein supplements while I am taking medication?**

Kemin Health, makers of FloraGLO Lutein, pioneered the purification of natural lutein and is an industry leader in supporting and tracking research about lutein. At this time, Kemin Health is unaware of any studies that have examined interactions between medications and lutein. Kemin Health is also not aware of any adverse health reports from interactions between lutein and medications. However, Kemin Health recommends that you consult your health care professional about possible interactions between your medication and any supplement, including lutein, before beginning such a regimen.

**9. When is the best time to take FloraGLO Lutein supplements?**

The best time to take FloraGLO Lutein is with a meal. Lutein is lipid-soluble, so it will be better absorbed when taken with small amounts of fat.

**10. Where can I buy products that contain FloraGLO Lutein?**

You can find products containing FloraGLO Lutein in most health food stores, major supermarkets, drugstores and discount chains. Look for the FloraGLO logo on product labels. To obtain a list of products and contact information visit the FloraGLO Lutein website at [www.floraglolutein.com](http://www.floraglolutein.com) or call Kemin Health at (866) 536-4666.

**11. What are the differences between FloraGLO Lutein and lutein esters?**

FloraGLO Lutein is purified free lutein identical to that found in green leafy vegetables, the highest sources of lutein in our diet. Lutein esters are primarily found in low concentration in fruits and are sometimes used in products in place of free lutein. Lutein esters are chemically different from purified lutein, and require enzymatic digestion in the small intestine to allow any lutein to be taken up by the body. FloraGLO Lutein is absorbed directly by the body without the need for enzymatic digestion. Products containing lutein from lutein esters are identified as such on the ingredient list or supplement facts panel.

**12. What company manufactures FloraGLO Lutein?**

Kemin Health, L.C. is the world's leader in the production of purified lutein and pioneered the purification of FloraGLO Lutein. Starting with marigold flowers, Kemin maintains exacting quality standards for FloraGLO Lutein throughout every step of its exclusive patented process. Continuous improvement and ongoing refinement of customer-driven standards are a way of life at Kemin as the company operates within an ISO 9001:2000 environment.

Kemin Health, L.C. is part of a global company, Kemin Industries, Inc. which develops customer-specific nutritional solutions and has ingredient experts in the areas of animal feed, human dietary supplements and food products, and pet food. To learn more about Kemin and FloraGLO Lutein, visit [www.kemin.com](http://www.kemin.com) or [floraglolutein.com](http://floraglolutein.com).

## **Lutein's Role in Eye Health**

### **13. What is lutein's role in eye health?**

Studies have shown that lutein may reduce the risk of age-related macular degeneration (AMD) <sup>4,5,6</sup>. A newer research study on Veterans with AMD suggests that 10 mg a day of lutein may actually improve visual function of AMD sufferers<sup>7</sup>. Other work suggests that lutein may play a role in helping reduce the risk of cataracts <sup>8,9,10,11</sup>.

### **14. What is age-related macular degeneration (AMD)?**

Macular degeneration is a condition that may begin to develop as one ages, but usually does not manifest itself until later in life. Macular degeneration is the leading cause of loss of sight in the United States for individuals over 65 years of age. It occurs when the cells (rods and cones) in the macula degrade, causing loss of sight in the central part of the field of vision, but leaving peripheral vision intact.

- **“Dry” age-related macular degeneration**

Dry AMD occurs in 90 percent of the reported cases and is characterized by small yellow spots called *drusen* accumulating behind the macula. It is typically not associated with blindness but with loss of visual acuity. However, if left untreated, it could progress into wet AMD. A recent study suggests that lutein supplementation may have a positive effect on visual performance in subjects diagnosed with dry AMD <sup>7</sup>.

- **“Wet” age-related macular degeneration**

Wet AMD derives its name from the tiny, abnormal vessels that grow behind the retina toward the macula that seep fluid into the tissue. As a result, the macula is damaged, leading to the onset of blindness.

### **15. What is the macula?**

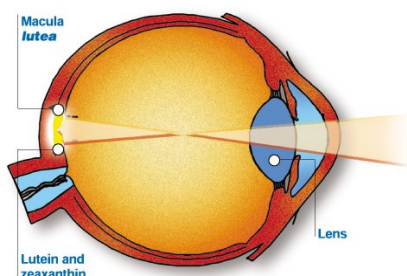
The macula lutea is a small area just two millimeters wide, located in the back of the eye, in the middle portion of the retina. The center portion of the macula is referred to as the fovea, and contains the highest concentration of rods and cones. It is responsible for central vision.

### **16. How is lutein related to macular degeneration?**

Lutein is deposited in the macula of the eye through the lutein we consume. Lutein filters blue light and may protect the macula from free-radical damage. A healthy macula provides good central vision. If through the years of exposure to light and other stressors, the macula begins deteriorating, age-related macular degeneration (AMD) can result.

By consuming fruits and vegetables in accordance with the current Dietary Guidelines for Americans, you may be getting an adequate amount of lutein in your diet to decrease the risk of developing AMD <sup>12</sup>. However, consumer statistics show

that only 23 percent of Americans eat the recommended amounts of vegetables and fruits daily <sup>2</sup>. Therefore, a dietary supplement or fortified foods and beverages containing lutein may be used as a complement to the diet.



**17. Who is susceptible to age-related macular degeneration?**

There are several factors that may increase your risk of developing AMD: age, poor diet, exposure to sunlight, smoking, heredity, gender, race, eye color, alcohol usage and heart disease. For example, individuals with blue or green eyes, seniors, women, smokers and Caucasians are all at higher risk.

**18. What can I do to protect myself from age-related macular degeneration?**

While there are factors that you cannot change, such as age, heredity and gender, several key risk factors are lifestyle related. Here are some tips: wear sunglasses and a wide-brimmed hat to protect you from direct or reflected sunlight; eat a diet rich in fruits and dark green, leafy vegetables that contain lutein; stop smoking and limit your intake of alcohol, saturated fats and cholesterol.

**19. Can lutein help promote eye health for other age related conditions?**

The latest progress report from the Beaver Dam eye study, which involves adults from 43-84 years of age, suggests that lutein and zeaxanthin intake may reduce the incidence of cataracts <sup>13</sup>. Cataracts are a generalized clouding of the lens and often associated with the aging process. Lutein and zeaxanthin are the only carotenoids found in the lens.

Chasan-Taber and co-workers conducted a prospective study of 77,466 female nurses 45-71 years of age, from 1980 through 1992. The results showed nurses with the highest intake of lutein and zeaxanthin had 22 percent lower risk of cataract extraction compared to those in the lowest quintile of intake. This study also showed high intake of spinach and kale, may reduce the risk of cataract extraction <sup>8</sup>. Both spinach and kale are rich in lutein.

In a similar study, Brown and collaborators studied the association between carotenoids (alpha-carotene, beta-carotene, lutein, beta-cryptoxanthin and lycopene) and Vitamin A intakes and cataract extraction in 36,344 male health professionals 45 to 75 years old. Researchers found that men with the highest consumption of lutein and zeaxanthin had a 19 percent lower risk of cataract extraction compared to men with the lowest consumption.

Furthermore, among foods consumed that were high in carotenoids, broccoli and spinach had the strongest association with a lower risk of cataracts <sup>7</sup>. Again, these vegetables are rich in lutein.

## **20. Has lutein been studied in other areas of human health?**

In addition to AMD and cataracts, emerging science suggests that lutein may play a role in skin <sup>14,15,16,17,18</sup>, cardiovascular <sup>19,20,21,22,23</sup> and women's health <sup>24,25</sup>.

## **Lutein's Role in Skin Health**

### **21. How does UVA, UVB, and visible light affect skin health?**

Damage occurs to all layers of the skin as a result of environmental exposure<sup>15</sup>. The shorter wavelengths of ultraviolet light, the UVB, have been shown to penetrate only the outermost layers, the epidermis, of the skin. Conversely, the longer wavelengths, the UVA, have been shown to penetrate through the epidermis and into the dermis. Visible light can penetrate the entire depth of the skin. Therefore, light has the potential of doing damage throughout the entire depth of the skin. This damage may be associated with a depletion of the skin's natural antioxidant system<sup>16</sup>.

### **22. What role does lutein play in skin health?**

As with our eyes, nature also deposits lutein throughout our skin. Research suggests that lutein may play a role in maintaining healthy skin <sup>15-17</sup>. In fact, a recent human clinical study showed 10 mg of FloraGLO Lutein daily increased skin hydration and elasticity and decreased skin lipid peroxidation. Lipids are oily components within the skin critical to healthy skin appearance. Furthermore, they provide a barrier function that slows the loss of moisture in the skin. Lutein used in topical preparation applied to the skin showed significant improvements in these categories, and when combined with oral lutein supplements, generated even greater results than oral or topical lutein separately <sup>18</sup>. This is the first research to show improvement in skin health through lutein supplementation alone.

## **Lutein's Role in Cardiovascular Health**

### **23. Can lutein help promote good cardiovascular health?**

The cardio-protective role of carotenoids stems from the finding in epidemiological studies that persons with higher intakes of fruits and vegetables are at a reduced risk of coronary heart disease and stroke<sup>26,27</sup>. Mediterranean populations have the lowest mortality rate from coronary heart disease in Europe<sup>28</sup>. When foods common to the Mediterranean diet were analyzed for carotenoid content, high levels of lutein were detected and correlated well with the relatively high serum levels of lutein found in Greek people<sup>29</sup>. The authors of this study theorize this may contribute to the lower mortality rate from coronary heart disease exhibited by this group.

### **24. How does lutein promote cardiovascular health?**

The exact mechanism of lutein's suggested connection to cardiovascular health is unknown at this time. However, three studies (collectively known as The Los Angeles atherosclerosis study<sup>19</sup>) published by Dr. James Dwyer at the University of Southern California suggest that the protective effect of lutein is at least partially due to an antioxidant mechanism.

First, Dr. Dwyer's research indicated that as plasma lutein concentration increased, carotid artery intima-media thickness decreased in women and men. Carotid artery intima-media thickness has been strongly associated with the risk of both coronary heart disease and stroke. Next, he incubated endothelial and smooth muscle cells from human aortas with lutein and found a significant inhibition of the inflammatory response of monocytes to LDL (Low Density Lipoprotein) trapped in the artery wall. Finally, Dr. Dwyer's research found that in mice known to develop severe atherosclerotic lesions, lutein supplementation significantly reduced the size of atherosclerotic lesions in the aortic arch.

In addition, lutein significantly reduced markers of oxidative stress and plasma VLDL+IDL (Very Low Density Lipoprotein + Intermediate Density Lipoprotein) levels. These results suggest there may be a positive effect of lutein on the progression of early atherosclerosis.

## **Lutein's Role in Women's Health**

### **25. What role does lutein play in woman's/infant health?**

Lutein has been detected both in breast and cervical/ovarian tissue<sup>24,25</sup>. Other functions of lutein in the body currently being investigated include lutein's role during pregnancy and lactation. Studies have indicated that the level of lutein increases in the plasma throughout pregnancy, although the reason for this has not been defined at this time.

Lutein has also been detected in cord blood after delivery and is found in colostrum and mature breast milk. It has been theorized that lutein may be actively secreted into the breast milk. This is based on the finding that the levels of lutein and beta-carotene in the serum are equal, but lutein levels are significantly higher than beta-carotene in breast milk<sup>30-34</sup>.

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