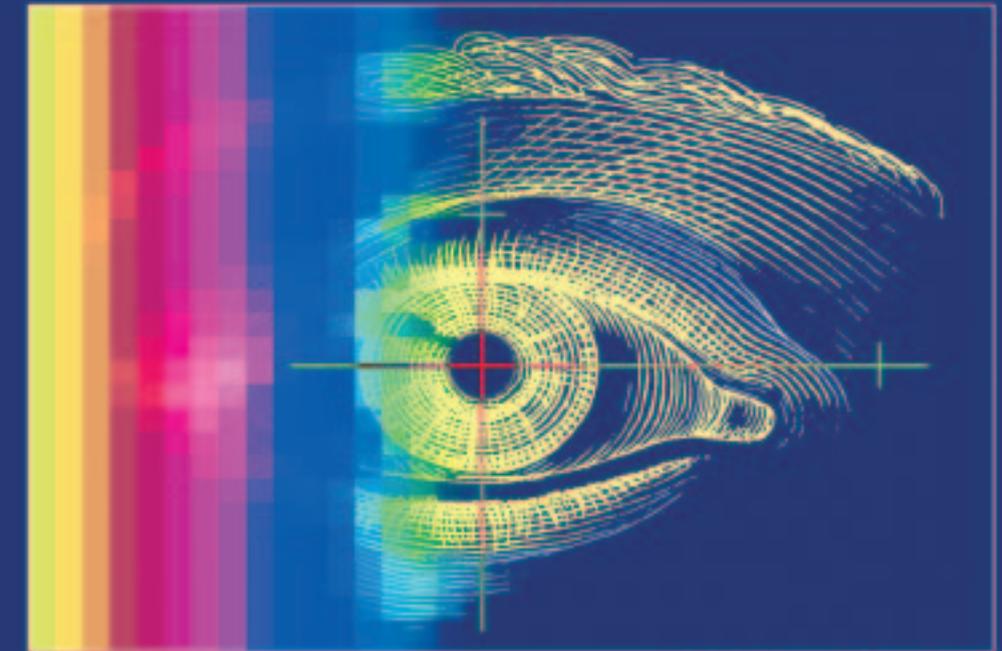
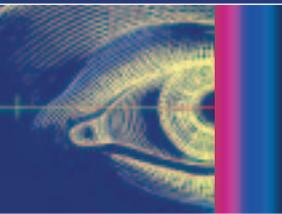


Age-related Macular Degeneration (AMD)

## What's On Your Plate May Help Save Your Sight



egg yolks  
corn  
broccoli  
kale  
spinach  
peas  
seafood



Age-related Macular Degeneration (AMD)

If your vision is not as sharp as it used to be, don't despair. There's plenty you can do to preserve your vision—beginning with what's on your plate.

**It's true!** Specific foods and nutrients are proving to be some of the best defenses against vision-zapping eye disorders.



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# Eating for Your Eyes

**Age-related macular degeneration (AMD) is one of the most common degenerative eye diseases afflicting older Americans.** AMD involves a deterioration of the macula—the densely packed cells that enable you to see color and fine details when you look directly at something. When the cells of the macula are damaged and begin to break down, central vision is impaired. There are a few established treatments for the disease; however, their effectiveness is limited. Your diet and lifestyle, though, may help reduce the risk or slow the progression of AMD, cataracts, and other eye diseases.

Harmful molecules called free radicals can damage the fragile cells of the macula, an action that appears to contribute significantly to the development and progression of AMD. Free radicals occur naturally as a by-product of oxygen metabolism but are also produced by environmental insults such as cigarette smoke, blue light, and ultraviolet light exposure.

Antioxidants in foods help fight free radicals by neutralizing them and rendering them harmless. The antioxidants you are probably most familiar with are vitamin C, vitamin E, and beta-carotene. Many of these antioxidants are also plant pigments and give fruits and vegetables their vibrant colors. The family of antioxidants that appears to be highly protective to your eyes is the carotenoids. Using food records from large population studies, researchers have found that people who ate the most antioxidant-rich foods reduced their risk of AMD and cataracts.

<sup>1</sup> J. A. Mares-Perlman and R. Klein, "A Randomized, Placebo-Controlled, Clinical Trial of High-Dose Supplementation with Vitamins C and E, Beta Carotene, and Zinc for Age-Related Macular Degeneration and Vision Loss: AREDS Report no. 8," *Arch Ophthalmol* 119, no. 10 (2001): 1417-36.

<sup>2</sup> J. M. Seddon, U. A. Ajani, et al., "Dietary Carotenoids, Vitamins A, C, and E, and Advanced Age-Related Macular Degeneration: Eye Disease Case-Control Study Group," *J Am Med Assoc* 272, no. 18 (1994): 1455-6.

<sup>3</sup> G. J. Handelman, Z. D. Nightingale, et al., "Lutein and Zeaxanthin Concentrations in Plasma after Dietary Supplementation with Egg Yolk," *Am J Clin Nutr* 70, no. 2 (1999): 247-51.

<sup>4</sup> H. Chung, H. M. Rasmussen, E. J. Johnson, et al., "Lutein Bioavailability is Higher from Lutein-Enriched Eggs than from Supplements and Spinach in Men," *J Nutr* 134 (2004): 1887-93.

<sup>5</sup> J. M. Seddon, J. Cote, et al., "Progression of Age-Related Macular Degeneration," *Arch Ophthalmol* 121 (2003): 785-92.

# A Closer Look at Lutein and Zeaxanthin

**When it comes to preventing AMD, two carotenoids—lutein and zeaxanthin**—which provide the yellow pigment in foods like corn and egg yolks, are the only antioxidants specifically transported into the macula and concentrated in this tissue. Due to their yellow pigment, researchers believe that lutein and zeaxanthin may protect against AMD by blocking harmful blue wavelength light from reaching and damaging the cells of the macula.

Previous research has suggested that other nutrients play an important role in the prevention and treatment of AMD. A National Eye Institute (NEI) study found that those with AMD who took a supplement containing vitamin C, vitamin E, beta-carotene, and zinc reduced their risk of developing advanced AMD by about 25 percent and the associated vision loss by 19 percent<sup>1</sup>. Lutein may also prove to be an effective lifestyle intervention treatment and the NEI is now sponsoring lutein intervention trials for AMD.

A study from the Massachusetts Eye and Ear Infirmary in Boston found that among those aged 55 to 80, there was a 43 percent lower risk of developing AMD among those who ate the most carotenoids compared to those who ate the least.<sup>2</sup> In addition, when specific carotenoids were analyzed, researchers found that lutein and zeaxanthin offered the most protection.

Broccoli, kale, and other dark green vegetables are the richest sources of lutein, but egg yolks are also a good way to get these carotenoids. What's more, the lipid matrix of the yolk increases the absorbability of both lutein and zeaxanthin. One study found that supplementing the diet with 1.3 egg yolks per day for just over four weeks caused an increase in blood lutein concentration by 28 percent to 50 percent and zeaxanthin by 114 percent to 142 percent.<sup>3</sup>

In another study, researchers at Tufts University in Boston looked at how well men absorbed similar amounts of lutein from common dietary sources (lutein-enriched eggs, spinach, and supplements). They found that the men's blood lutein concentrations were about two to three times higher after eating eggs as compared to when eating the other sources. Researchers believe that the lutein in eggs may be 200 percent to 300 percent more absorbable than vegetable sources of lutein.<sup>4</sup>

# A Diet and Lifestyle to Focus On

While emerging research holds promise for more information about diet and AMD in the future, here are some best steps for saving your sight today:

- **Load up on lutein- and zeaxanthin-rich foods**  
Think food first when it comes to getting enough lutein and zeaxanthin. Good choices include dark-green leafy vegetables, corn, egg yolks, and peas. As found by researchers at Tufts University, eggs are a highly bioavailable source of lutein. In fact, the bioavailability of egg yolk lutein is two to three times higher than vegetable sources. Evidence today indicates that a diet rich in these colorful pigments may be a good bet for eye health.
- **Pack in produce**  
Fruits and vegetables are filled with beneficial phytonutrients that help prevent oxidation. They also help you achieve a healthy weight because they fill you up on few calories. The National Cancer Institute recommends adults eat five to nine servings a day. A serving can be one medium piece of fruit; one-cup leafy greens; a half-cup cooked or canned fruits or vegetables; or six ounces fruit or vegetable juice.

- **Eat healthy fats**  
Keep your overall fat intake in check by following the MyPyramid guidelines. Choose healthy, omega-3 fatty acids found in seafood, nuts, flax, and canola oil and limit saturated fat and trans fatty acids.

- **Maintain an ideal weight and watch your waist**  
If you need another reason to lose weight, do it for your eyes. New research has found that being overweight or obese doubled the risk of developing advanced AMD among individuals with early signs of the disease.<sup>5</sup> What's more, fat concentrated in one's middle was also found to double subjects' odds of developing advanced AMD. According to the National Institutes of Health if your waist measures more than 35 inches for a woman or 40 inches for a man, you are at increased risk for chronic diseases, including those that affect your vision.

- **Get a move on**  
Individuals with AMD who exercised three times per week were found to be 25 percent less likely to get advanced AMD, compared to couch potatoes.

- **Minimize exposure to environmental insults**  
Wear a wide-brimmed hat and use sunglasses that protect against exposure to blue light and ultraviolet light. If you smoke, stop. Smoking greatly increases your risk for developing vision-related diseases.