

## **Eye Health and Vital Carotenoids**

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### **SUMMARY**

The human body contains the many different carotenoids that can be found in nature. Humans do not synthesis these carotenoids, therefore they must get them from the foods or dietary supplements they ingest. Only lutein and its coexisting isomer, zeaxanthin, are found in the macula lutea, the area of the eye where light is focused by the lens, among the carotenoids that are present in the body. Zeaxanthin and lutein may offer strong defense against any harm brought on by light striking this area of the retina. According to research, lutein and zeaxanthin function as antioxidants in the eye to prevent the generation of free radicals and reactive oxygen species by filtering high-energy visible light wavelengths.

### **INTRODUCTION**

Without exception, nutrition is crucial to maintaining good health, even for the eyes. Having healthy eyes ensures clear vision, which is necessary for leading a fulfilling and successful life. Carotenoids are lipophilic pigments that contribute to many of the hues seen in nature because of how well they absorb light. Two important carotenoids that play a crucial role in eye health are lutein and zeaxanthin, which are generated by plants and give fruits and vegetables a yellow to reddish blue colour. They are well-known for their antioxidant and anti-inflammatory effects. A lack of carotenoids increases the risk of developing AMD and other eye disorders. However, the greatest carotenoids for combating the aforementioned illnesses are lutein and zeaxanthin.

### **Structure of lutein and zeaxanthin**

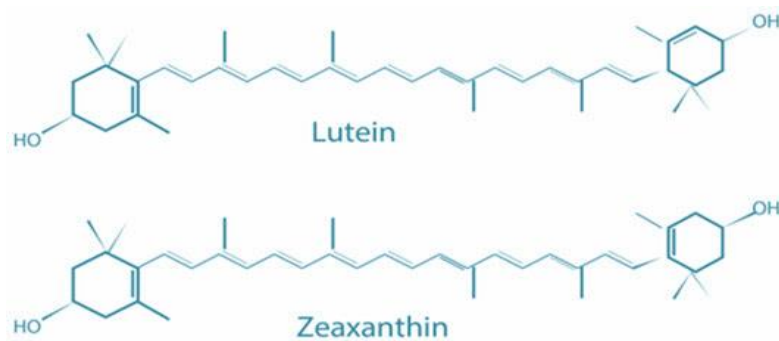
Lutein and zeaxanthin are relatively polar carotenoid pigments. They shows several beneficial health effects due to their ability to act as scavengers for reactive oxygen species and to bind with physiological proteins in humans. The structure of lutein and zeaxanthin similar to that of other carotenoids, with a skeleton made up of 40 carbon atoms, organized into eight isoprene units (Fig.1). However, an important chemical difference with functional implications is the presence of two oxygen atoms inside the structure thus making lutein and zeaxanthin a polar carotenoids which are classified as a xanthophyll, namely an oxygenated carotenoids. These are the main carotenoids mostly found in the human macula so referred to as macular pigments.

### **Dietary sources:**

The most prevalent xanthophylls are lutein and zeaxanthin, which are mostly found in green leafy foods including kale, spinach, broccoli, peas, and lettuce. A significant amount of lutein and zeaxanthin can be found in egg yolk, maize (corn), and durum wheat. The amounts of lutein and zeaxanthin in various meals are shown in Table 1. Additionally, kiwi fruit, grapes, spinach, orange juice, zucchini, and various squashes contain sizable levels of lutein and zeaxanthin.

### **Effect on eye:**

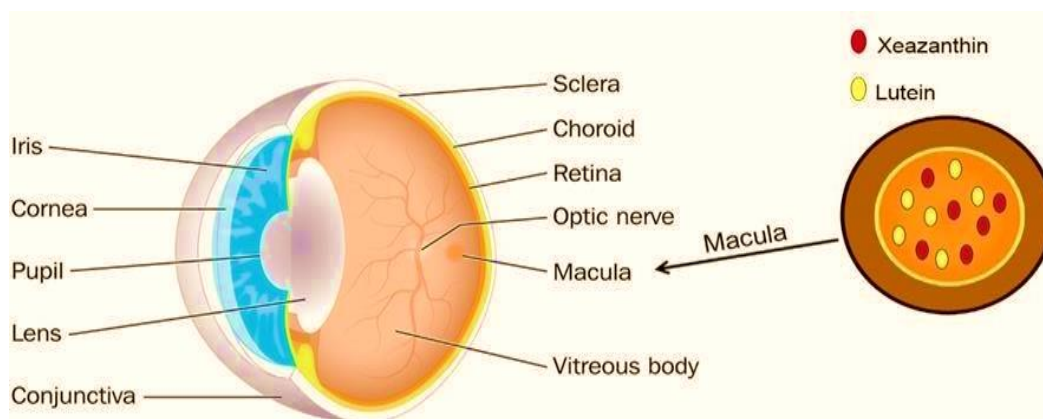
Maintaining eye health requires a nutritious diet. Lutein and zeaxanthin are nutrients for the eyes that are essential for clear vision and may lower your risk of cataracts and macular degeneration. They guard your eyes against dangerous free radicals. By preventing blue light from reaching the retina's supporting structures, lutein and zeaxanthin in the macula lower the risk of light-induced oxidative damage that could cause macular degeneration (AMD) (Fig. 2).



**Fig.1 Structure of lutein and zeaxanthin**

Sources	Mg/Cup
Kale	23.8
Spinach	20.4
Raw spinach	3.8
Corn	2.2
Green peas	2.2
Egg	0.3

**Table 1. Lutein and zeaxanthin in respective foods**



**Fig. 2: Existence of lutein and zeaxanthin in eye**

## CONCLUSION

The carotenoids such as lutein and zeaxanthin present in natural sources are beneficial for eye health. It is necessary to develop strategies for the prevention of the diseases with appropriate diets or supplements. Lutein and zeaxanthin full diet would be useful in developing such preventive strategies.

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