



## Colour of Food: Carotenoids

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### COMMENTARY

Carotenoids are pigments present in plant and are responsible for yellow, orange and red color found in fruits and vegetables. These are basically a class of Phytonutrients widely found in plants and aids plants by absorbing light which is used in photosynthesis. Carotenoids has antioxidant function which deactivates free radicals damaging cells and has anti-cancer property. Carotenoids can also be converted into vitamin A (Retinol) in the body and vitamin A is a necessary vitamin responsible for healthy eye. Carotenoid are found in many foods such as carrots, yams, sweet potatoes, papaya, watermelon, cantaloupe, mangos, spinach, tomatoes, bell peppers and oranges. Carotenoids should be consumed through diet as they are best absorbed through a source of fat. 600 types of carotenoids are present but more common ones are: Alpha-Carotene, Beta-Carotene, Beta-Cryptoxanthin, Lutein, Zeaxanthin and Lycopene. Carotenoids are divided into two sub categories: Carotenes and Xanthophylls. Xanthophylls (Yellow) contains oxygen whereas Carotenes (Orange) do not contain oxygen [1-5].

#### **Xanthophylls**

##### **Lutein and zeaxanthin**

Lutein and Zeaxanthin are useful for eye health as these are the only carotenoids present in retina of eye and is responsible for central vision in addition to protection of retina from blue light damaging retina. Apart from Eye health these carotenoids are also good for heart health as Lutein prevents atherosclerosis by antioxidants present in it. Foods containing these carotenoids are: kale, spinach, turnip greens, summer squash, pumpkin, paprika, yellow-fleshed fruits and avocado.

##### **Beta-cryptoxanthin**

It is a xanthophyll carotenoid also called provitamin A. It is a source of vitamin A are found in papaya, mango and oranges. Beta-cryptoxanthin helps in preventing lung cancer and reduces the risk of inflammatory polyarthritis including rheumatoid arthritis. It has antioxidant abilities which helps in reducing chronic inflammation.

#### **Carotenes**

##### **Beta-carotene**

Cantaloupe, mangoes, papaya, carrots, sweet potatoes, spinach, kale and pumpkin are rich in Beta-Carotene. Beta-Carotene helps in protecting from sunburn, in lowering risk of metabolic syndrome (high blood pressure, high blood sugar, abnormal cholesterol levels and excess fat around the waist) and thus is very useful for maintaining health of body.

##### **Alpha-carotene**

Alpha-carotene produces vitamin A but less than beta-carotene.

##### **Lycopene**

Lycopene is a pigment of bright red color which provides colors to watermelons, tomatoes, guavas and grapefruit. It acts as an oxidant and removes single oxygen molecules and thus reduces oxidative damage. Lycopene reduces risk of prostate cancer, promotes bone health and helps in preventing osteoporosis. It also decreases chances of Bone resorption (breakdown of bones).

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