

BETA CAROTENE

NOURISHMENT FOR UNDERNOURISHED

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INTRODUCTION-

Vitamins are organic compounds required by the body in trace amounts to perform specific cellular functions. It is not synthesized by humans and therefore must be supplied by the diet. Vitamin A is an isoprenoid alcohol and functions as hormone as well as visual pigment. It is essential for vision, reproduction growth and maintenance of epithelial tissues. Beta carotene is the precursor of vitamin A1 (retinol), which is highly pigmented - red, orange and yellow coloured compound. It is fat soluble and generally present in many fruits, grains, oils and vegetables. The fat soluble vitamin A as such is present only in foods of animal origin. However, it is provitamin carotenes are found in plants.

Carotenoids, especially β carotene functions as antioxidants and reduces the risk of cancer initiated by free radicals and strong oxidants. Beta carotene is biosynthesized from geranylgeranyl pyrophosphate. It is a member of the carotene which is tetraterpenes, synthesized biochemically from eight isoprene units and thus having 40 carbons. Among this general class of carotene, β carotene is distinguished by having beta – rings at both ends of the molecule. Carotenes especially beta carotene occurs abundantly in the nature. It is estimated that nearly more than 500 different carotenoids such as β carotene, α carotene, lutein, cryptoxanthin, zeaxanthin etc are distributed throughout the plant and algae kingdom.

BETA CAROTENE RICH FOODS

The best sources of beta carotene are yellow/orange vegetables. Some of the examples are carrots, sweet potatoes, pumpkins and winter squash. In fruits – apricots, cantaloups, papayas mangoes and peaches, in dark green leafy vegetables – spinach, broccoli, kale etc.



Almost all the green, yellow and orange vegetables and fruits are rich sources for beta carotene. Absorption of beta carotene is enhanced if eaten with fats, as carotenes are fat soluble. The proportion of beta carotene that can be absorbed, transported and utilized by the body is influenced by number of factors. Some of the examples are listed below:

Vegetables	Beta carotene/ 100g
Carrots	8285 μg
Pumpkin	3100 μg
Spinach	5626 μg
Sweet potato	8509 μg
Tomato	449 μg
Lettuce	5226 μg

Fruits	
Apricots	1094 μg
Guava	374 μg
Mango	445 μg
Orange	71 μg
Papaya	276 μg
Plums	190 μg
Water melon	303 μg

(Source: USDA National Nutrient Database)

HEALTH BENEFITS OF BETA CAROTENE:

Beta carotene is the main dietary source of vitamin A, which is essential for normal growth and development, immune system function and vision. Some of its health benefits as follows.

• **Heart Disease:**

Diets rich in beta carotene have lower risk of heart diseases. Moreover beta carotene works with vitamin E to reduce the oxidation of LDL cholesterol, which lowers the risk of atherosclerosis and coronary heart diseases.

• **Respiratory Diseases:**

High intake of beta carotene was found to increase lung capacity and relieves respiratory problems such as asthma, bronchitis and emphysema.

• **Immune system:**

Beta carotene strengthens the immune system by activating thymus gland, enables the immune system to fight against infectious pathogens.

• **Cancer:**

Foods rich in carotenoids, have lower risk of lung cancer, colon and breast cancer. Beta carotene is an antioxidant. It protects the body against the cancer cells, by fight cancer cells through its antioxidant activity.

• **Brain:**

Consumption of beta carotene is good for brain, as it significantly delays cognitive ageing.

• **Other Benefits:**

It is effective against dry skin, eczema and psoriasis treatment

It prevents muscular degeneration and Rheumatoid Arthritis

It is used for the treatment of oral leukoplakia and also prevents dandruff and other hair problems.

DEFICIENCY OF BETA CAROTENE:

If a population consumes low amount of vitamin A, it results in occurrence of vitamin A deficiency. It is associated with normal visual adaptation to darkness (night blindness), dry skin, decreased resistance to infections and other symptoms.

EXCESS OF BETA CAROTENE:

Addition of excess beta carotene causes deposition of carotenes in the skin and tissues which results in a condition called “Carotenemia”.

RECOMMENDED DIETARY ALLOWANCE:

The daily requirement of vitamin A is expressed as retinol equivalents rather than International Units (IU).

1 retinol equivalent = 1 μg retinol (10 IU of vitamin A activity from β carotene)

The RDA of vitamin A for adults is around 1000 retinol equivalents (3500 IU) for man and 800 retinol equivalents (2500 IU) for women. The requirement increases in pregnant and lactating mothers.