Vitamin A (retinol)

Function:

Vitamin A is a family of fat soluble compounds (carotinoids) that play an important role in vision, bone growth, reproduction and cell differentiation. It also helps regulate the immune system, promoting optimal lymphocyte function in defending against bacterial and viral infections. Retinol (Vitamin A) promotes healthy surface linings of the eyes and respiratory, urinary and intestinal tracts. Vitamin A also promotes healthy skin function and integrity. Retinol is the most active form of Vitamin A and is synthesized in the body by conversion of provitamin A, primarily beta-carotene, into retinol. Lycopene, lutein and zeaxathin are carotinoids that do not have Vitamin A activity, but have other health promoting properties. Studies are inconclusive in identifying vitamin A’s roles as an antioxidant.

Deficiency symptoms:

A large number of physiological systems may be affected by Vitamin A deficiency. Poor epithelial regeneration can result in skin hyperkeratization, problems with the genitourinary reproductive system (reduced fertility) dysfunction within the gastroenterological/biliary system or the pulmonary system. Patients with Celiac disease, Crohn’s disease and pancreatic disorders are particularly susceptible to Vitamin A deficiency due to malabsorption. Vitamin A deficiency may result in night blindness and/or epithelial degeneration of the eye. The immune system may also be adversely affected, reducing white blood cell levels and impairing both cell-mediated and humoral defense systems. Vitamin A is also essential for the developing skeletal system and deficiency can result in growth retardation or abnormal bone formation. Vitamin A deficiency is most often associated with strict dietary restrictions and excess alcohol intake.

Repletion Information:

Vitamin A is found in animal foods such as whole eggs, milk and liver. Fortified breakfast cereals also provide Vitamin A. Most plant sources contain provitamin A carotenoids and rich sources include fruits such as cantaloupe, apricots and mango. Vegetable sources include carrots, spinach, kale and green peas. RDA’s for Vitamin A are listed in micrograms of Retinol Activity Equivalents (RAE) to account for the different biological activities of retinol (Vitamin A) and provitamin A carotenoids. For adult males the RDA is 3000 IU. The RDA for non-pregnant females is 1500 IU. There is no RDA for provitamin a carotenoids. ADEQUATE ZINC IS REQUIRED to synthesize retinol binding protein (RAP) which transports vitamin A. Therefore a deficiency in zinc limits the body’s ability to mobilize Vitamin A stores from the liver.

EXCESSIVE VITAMIN A INTAKE IS TOXIC AND MUST BE AVOIDED. Liver abnormalities, reduced bone density (osteoporosis) and central nervous system disorders may result from hypervitaminosis A. Early toxicity signs include peeling/itching skin, brittle nails, yellowish skin, alopecia (hair loss), and bone/joint pain. Provitamin A (beta carotene and mixed carotenoids) are much less toxic and not associated with the commonly noted side effects of excess Vitamin A intake.