

[An Overview of Vitamins and Their Functions](#)

Many people take vitamins as part of an overall health and wellness program but few really know what they do in the body. Vitamins assist the many chemical reactions that occur in the body. They are often called coenzymes. A coenzyme is a substance that combines with another substance (usually a protein) to form an enzyme. Enzymes help chemical reactions along.

Enzymes work like templates. Let's say you would like to get two substances A and B together. You could put them in a beaker and eventually some of A would get together with some of B. You could heat up the beaker which would cause A and B to move around more which helps them to get together. But you could also add a third substance (the enzyme) that acts like a template or jig. Both A and B fit nicely into the template and are more likely to get together. Vitamins work like this when they combine with another protein substance. Think of vitamins as the keys that start the ignition for every metabolic process in the body.

Vitamins are divided into two broad categories; water soluble and fat soluble. Generally the water soluble vitamins are safer because they are more readily eliminated from the body. The fat soluble vitamins are more likely to be stored in the body and are more difficult to eliminate. Fat soluble vitamins pose a mild risk of building up to toxic levels in the body.

Here are the water soluble vitamins.

Vitamin C is also called ascorbic acid. Humans cannot make Vit C and must rely on outside sources. Sources of Vit C include citrus fruits, berries, potatoes, red and green peppers, broccoli, brussels sprouts. The recommended dietary allowance (RDA) for Vit C is now 75 mg/day for women and 90 mg/day for men. It is recommended that smokers take an additional 35 mg/day. The RDAs for children are as follows:

1-3 years = 15 mg

4-8 years = 25 mg

9-13 years = 45 mg

14-18 years = 75 mg (boys), 65 mg (girls)

Pregnant and lactating women also need more Vit C. If you take too much Vit C you can experience signs of toxicity which include diarrhea and kidney stones. These signs can appear at doses over 2000 mg for adults and as little as 400 mg for children.

Vitamin B1 (thiamin) acts as a coenzyme in carbohydrate metabolism. It comes from pork, beans, whole and enriched grains, liver, nuts, and squash. The RDA for Vit B1 is around 1.2-1.4 mg/day for males, 1.0-1.1 mg for females and .9-1.2 mg for children.

Toxic signs include headache, weakness, and irritability. Wernicke-Korsakoff syndrome is a degenerative disease of the brain caused by thiamin deficiency. This syndrome is sometimes seen in alcoholics (alcohol impairs the body's ability to absorb and store thiamin). The symptoms include severe mental confusion and memory loss. Damage to the nerves in the eyes can cause tremors or a fixation in a stare. Coordination can also be impaired. Wernicke-Korsakoff can be reversed with thiamin supplementation.

Vitamin B2 (riboflavin) is a coenzyme in energy and protein metabolism. It comes from meat, liver, dairy products, enriched grains, eggs, mushrooms, greens, broccoli, and milk. One cup of low fat 1 percent milk provides about one third of the RDA for riboflavin. Riboflavin also is what turns urine bright yellow. The RDA for Vit B2 is around 1.4-1.8 mg/day for men. 1.2-1.4 mg for women and 1.1-1.2 mg for children.

Niacin is a coenzyme in energy metabolism. It comes from liver, meat, fish, whole and enriched grains, beans, mushrooms and potatoes. Toxic signs include flushing of the face and hands, liver damage. Niacin comes in two forms (niacinamide, nicotinic acid). Both forms are considered to be equivalent. The body also converts tryptophan into niacin. The RDA for Niacin is 15-20 mg/day for men, 12-15 mg for women, and 12-16 mg for children.

Vitamin B6 (pyridoxine) is a coenzyme in amino acid metabolism. It comes from liver, meat, watermelon, beans, potatoes, organ meats, bananas, and broccoli. The RDA for Vit B6 is 2.0 mg/day for men, 1.5-2.0 mg for women and .6-1.2 mg for children. Toxic signs include weak and numb muscles, nerve damage.

Folic acid (folate, folacin) is a coenzyme in cell division. It comes from liver, beans, green leafy vegetables and whole grains. It is important as a prenatal vitamin. Anemia results from deficiency. Pregnancy doubles the folate requirements of the body (from 200 to 400 mcg).

Vit B12 (cobalamin) is a coenzyme in cell division. It comes from animal products (meats, eggs, milk). A deficiency of Vit B12 can cause an anemia known as pernicious anemia. The RDA for Vit B12 is 2-3 mcg/day for both males and females and 1.5-2.0 mcg for children.

Pantothenic acid (Vit B5) is a coenzyme in metabolism. It comes from liver, yeast, eggs, whole grains and beans.

Biotin is a coenzyme in carbohydrate and fat metabolism. It comes from liver, yeast, eggs, whole grains, and beans. Biotin is made by our intestinal bacteria so very difficult to get deficiency.

Here are the fat soluble vitamins.

Vitamin A helps us with night vision and maintains various tissues such as skin. It comes from liver, carrots, spinach, squash, apricots, papaya, greens, and tomatoes. Toxic signs (greater than 50,000iu/day) include dry, scaly skin, headaches, bone and joint pain, abnormal bone growth, chronic liver disease, and birth defects.

Vitamin D helps with the absorption of calcium. It comes from fortified milk, fish, liver, sun. The RDA of Vit D is 400 i.u./day for men, women and children.

Vitamin E is an important antioxidant. It comes from vegetable oil, margarine, whole grains, and egg yolks. The RDA for Vit E is 15 i.u. for men, and 9-10 i.u. for children. Vit E has been associated with decreased heart problems and may be an important antioxidant in cancer prevention.

Vitamin K helps the blood to clot. It comes from intestinal bacteria, liver, green leafy vegetables, milk, and meat. Vitamin K deficiency can occur with a number of gastrointestinal disorders.

Vitamins are very important for the overall functioning of the body and long term deficiencies can lead to a variety of diseases. The tide is changing with regard to recommending vitamin supplements as more doctors and health care practitioners are concerned about the poor American diet.

Bottom line is that a good multivitamin supplement in addition to healthy eating can go a long way in preventing disease and promoting health.

About the Author

Dr. Bruce Forcica is an author, educator and chiropractor. His new book "Unlocking the Healing Code" presents a new paradigm for healing. His site: [contains more information, free newsletter, free guided imagery download and New Age music downloads.](#)

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