

Published based on [Diseases Caused by Vitamin Deficiencies](#)

Diseases Caused by Vitamin Deficiencies

Vitamins are natural compounds that are required in small quantities, but cannot be produced by our own bodies. Vitamins are normally absorbed through our diet, but can also be taken as [dietary supplements](#). Vitamins have multiple biological functions, some vitamins act as hormones while others function as enzyme co-factors. Vitamins can be either water soluble or fat soluble. The value of eating certain foods to prevent illness was known long before vitamins were discovered. The chemical structure for most vitamins was not discovered until the early to mid 20th century. Vitamins can be categorized as follows:

- Vitamin C
- Vitamin E
- Vitamin D
- B vitamins (B1, B2, B3, B5, B6, B7 and B9)
- Vitamin K
- Vitamin A

Vitamin A or retinol is fat soluble vitamin and has many biological functions. A deficiency in vitamin A can cause blindness (in extreme cases). The first signs of a vitamin A deficiency is night blindness (the inability to see in the dark). Vitamin A is present in butter fat, liver, dark leafy vegetables and dark colored fruits. Vitamin A also plays a role in maintaining healthy skin and a strong immune system. Vitamin A is also considered an antioxidant.

[B vitamins](#) are water soluble vitamins that often act as co-factors of enzymes. The first discovered B vitamin was **vitamin B1** (Thiamine) that when deficient causes the disease "**beri-beri**", which is characterized by extreme lethargy, fatigue, muscular and neurological symptoms. Foods high in thiamine are meat, dairy, whole grains, rice bran and fruit. People of Asian countries are at risk for developing beri-beri when their diet consists mainly of white rice.

Niacin (Vitamin B3) prevents the disease **pellagra**, which is often seen in communities that use un-processed corn as their main food supply. Processing corn with lime increases the bio-availability of niacin. Symptoms of pellagra include diarrhea, dermatitis, dementia, thickening of the skin, anxiety, depression and fatigue. Niacin is present in meat, liver, vegetables and fruits and mushrooms. Niacin can be synthesized from the amino acid tryptophan. Taking too much niacin (as a supplement) can cause flushing of the skin.

Vitamin B6 is an important co-factor for the metabolism of amino acids. It is also important for many neurological functions as it is needed for the production of the neurotransmitters adrenaline, nor-adrenaline, GABA and serotonin. It is also needed for the release of glucose from glycogen. People deficient in vitamin B6 may develop sleep disturbances, skin problems and neuropathy.

Vitamin C (ascorbic acid) is a water soluble vitamin found in citrus fruits, tomatoes, potatoes and green peppers. A vitamin C deficiency causes the disease **scurvy**, which symptoms include spongy bleeding gums and bleeding wounds on the body. Untreated scurvy is fatal. Vitamin C is required for the formation of collagen. Vitamin C an important nutrient for the proper functioning of our skin, mucous membranes and immune system.

Vitamin D is a group of fat soluble pro-hormones, vitamin D2 and vitamin D3 (cholecalciferol). [Vitamin d](#) is important for bone formation and bone maintenance and is necessary for a healthy immune system. Natural sources of Vitamin D are fatty fish (such as salmon), fish oils, egg and beef liver. Vitamin D is also produced by our skin when exposed to UV-B sunlight.

Vitamin E refers to a group of 8 related fat soluble vitamins, of which alpha-tocopherol is the most widely known. E vitamins are powerful antioxidants as they protect lipid membranes by neutralizing highly-reactive free radicals. Foods that are high in vitamin E are asparagus, avocado, green vegetables, vegetable oils, egg, milk, nuts and whole grains.

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