

Vitamin B-12 Deficiency

A **vitamin** is an organic compound (a chemical compound molecule that contains carbon) that organisms require as a nutrient. An example of a vitamin is vitamin B. There are eight different types of B vitamins, which are all water-soluble vitamins. One type of vitamin B is vitamin B-12. Vitamin B-12, the largest vitamin with the most complicated structure, is stored in the liver until the body needs it.

Vitamin B-12 is needed by the body and it comes from diet. More specifically, vitamin-B-12 can't be produced by the bodies of plants and animals. Only bacteria can synthesize vitamin B-12. Given this, animals that are herbivores eat bacteria to get vitamin B-12. Then omnivores, including humans, eat foods that come from animals to get their supply of vitamin B-12. Examples of foods humans eat that contain vitamin B-12 are fish, shellfish, meat (especially liver), poultry, eggs, milk, milk products, and fortified foods (such as fortified breakfast cereals, fortified soy products, and fortified energy bars). There are also vitamin B-12 supplements available.

Vitamin B-12 is involved with the normal functioning of the brain and nervous system; blood formation and regeneration; child growth; calcium absorption and cell metabolism, with emphasis on DNA synthesis and the conversion of carbohydrates, fats, and proteins into energy. In regard to the nervous system and the brain, vitamin B-12 is used to create a protective fatty covering on all nerve cells in the body. This layer is essential for all the nerves, especially the nerve cells in the brain. Without this protective layer, the brain will not function properly. The most important function of vitamin B-12 is to form healthy red blood cells.

The recommended dietary allowance (RDA) of vitamin B-12 is small. Teens over 14 and adults need only 2.4 mg daily. Children need a little less. Meanwhile, pregnant and breastfeeding women need a little more because the fetus and/or breastfeeding child absorbs the vitamin B-12 from the mother. Although the human body only needs a small amount of vitamin B-12, it's important that humans consistently take in the required amount. If not, a vitamin B-12 deficiency can develop. Vitamin B-12 deficiency is a nutritional-related disease.

Generally, vitamin B-12 deficiencies can develop from a lack of vitamin B-12 in the diet. Also, when eaten, vitamin B-12 must be absorbed properly by the small intestine to be beneficial to the body. Thus problems with vitamin B-12 absorption can also cause a vitamin-B-12 deficiency.

One cause of a vitamin B-12 deficiency is being a vegetarian. Since vitamin B-12 is not available in plant products, vegetarians sometimes have vitamin B-12 deficiencies.

Another cause of a vitamin B-12 deficiency, the most common cause, is the autoimmune disease pernicious anemia. The human body has parietal cells located in the gastric mucosa of the stomach. These parietal cells secrete intrinsic factor. In order for vitamin B-12 to be absorbed by the small intestine, it has to bind to intrinsic factor. Pernicious anemia destroys parietal cells.

When the parietal cells are destroyed, the body lacks intrinsic factor. So, if the body lacks intrinsic factor, vitamin B-12 can't be absorbed. Consequently, this causes a vitamin B-12 deficiency.

In addition to pernicious anemia, these other conditions can cause vitamin B-12 to not be absorbed properly: (1) too much bacteria in the small intestine; (2) inflammatory bowel disease; (3) fish tapeworm infection; (4) surgery that removes the ileum section of the small intestine, which is the part of the small intestine that absorbs vitamin B-12; (5) some medications that are used to treat other ailments; and (6) decreased stomach acidity, which is common in the elderly.

Vitamin B-12 deficiencies cause health problems. Most symptoms of a vitamin-B12 deficiency are similar to a folic acid (which is another type of B vitamin, B9) deficiency. At vitamin B-12 levels that are only slightly less than normal, the person has symptoms, such as fatigue, depression, and poor memory.

The most common health problem associated with a Vitamin B-12 deficiency is macrocytic anemia. Kids, especially, are at risk of this anemia. Macrocytic anemia is a type of anemia that comes from DNA-synthesis inhibition by red blood cells. Symptoms of anemia are paleness, weakness, and fatigue. If the anemia is severe, it can cause shortness of breath and dizziness.

When the vitamin B-12 deficiency is severe, neurological symptoms (also called neuropathy) can develop, such as tingling or loss of sensation in the hands and feet; muscle weakness; reflex loss; difficulty walking; confusion; dementia; mania; and psychosis. It can also cause severe and irreversible damages to the brain and nervous system. Symptoms due to nerve damage, such as neuropathy or dementia in older people, may persist, even after the older person takes supplements.

The good news is that vitamin B-12 deficiencies can be easily treated and cured by taking vitamin B-12 supplements. These supplements can be taken either orally or via injection. Some vitamins, including the B vitamins, if taken in excess can cause pathologies. However, vitamin B-12 is not known to be harmful if too much is taken.