Vitamin B12 is a water-soluble vitamin that is naturally present in some foods, added to others, and available as a dietary supplement and a prescription medication. Vitamin B12 exists in several forms and contains the mineral cobalt, so compounds with vitamin B12 activity are collectively called "cobalamins". Methylcobalamin and 5-deoxyadenosylcobalamin are the forms of vitamin B12 that are active in human metabolism.

Vitamin B12 is essential for normal energy metabolism of carbohydrates, fat and protein, and is also required for nucleic acid or DNA synthesis. Along with Vitamin B6 and Folic Acid, adequate levels of Vitamin B12 are required to maintain normal plasma homocysteine levels. Elevated plasma homocysteine may be an independent risk factor for developing cardiovascular disease.

**Vitamin B12 Deficiency**

Vitamin B12 deficiency is characterized by megaloblastic anemia, fatigue, weakness, constipation, loss of appetite, and weight loss. Neurological changes, such as numbness and tingling in the hands and feet, can also occur. Additional symptoms of vitamin B12 deficiency include difficulty maintaining balance, depression, confusion, dementia, poor memory, and soreness of the mouth or tongue. The neurological symptoms of vitamin B12 deficiency can occur without anemia, so early diagnosis and intervention is important to avoid irreversible damage. During infancy, signs of a vitamin B12 deficiency include failure to thrive, movement disorders, developmental delays, and megaloblastic anemia. Many of these symptoms are general and can result from a variety of medical conditions other than vitamin B12 deficiency.

**Vitamin B12 and Health**

**Cardiovascular Disease**

Cardiovascular disease is the most common cause of death in industrialized countries, such as the United States, and is on the rise in developing countries. Risk factors for cardiovascular disease include elevated low-density lipoprotein (LDL) levels, high blood pressure, low high-density lipoprotein (HDL) levels, obesity, and diabetes.

Elevated homocysteine levels have also been identified as an independent risk factor for cardiovascular disease. Homocysteine is a sulfur-containing amino acid derived from methionine that is normally present in blood. Elevated homocysteine levels are thought to promote thrombogenesis, impair endothelial vasomotor function, promote lipid peroxidation, and induce vascular smooth muscle proliferation. Evidence from retrospective, cross-sectional, and prospective studies links elevated homocysteine levels with coronary heart disease and stroke.

Vitamin B12, folate, and vitamin B6 are involved in homocysteine metabolism. In the presence of insufficient vitamin B12, homocysteine levels can rise due to inadequate function of methionine synthase. Results from several randomized controlled trials indicate that combinations of vitamin B12 and folic acid supplements with or without vitamin B6 decrease homocysteine levels in people with vascular disease or diabetes and in young adult women. In another study, older men and women who took a multivitamin/multimineral supplement for 8 weeks experienced a significant decrease in homocysteine levels.

**Dementia and Cognitive Function**

Researchers have long been interested in the potential connection between vitamin B12 deficiency and dementia. A deficiency in vitamin B12 causes an accumulation of homocysteine in the blood and might decrease levels of substances needed to metabolize neurotransmitters. Observational studies show positive associations between elevated homocysteine levels and the incidence of both Alzheimer's disease and dementia. Low vitamin B12 status has also been positively associated with cognitive decline.

**Energy and Endurance**

Due to its role in energy metabolism, Vitamin B12 is frequently promoted as an energy enhancer and an athletic performance and endurance booster. These claims are based on the fact that correcting the megaloblastic anemia caused by vitamin B12 deficiency should improve the associated symptoms of fatigue and weakness.
Interactions with Medications

Vitamin B12 has the potential to interact with certain medications. In addition, several types of medications might adversely affect vitamin B12 levels. A few examples are provided below. Individuals taking these and other medications on a regular basis should discuss their vitamin B12 status with their healthcare providers.

Chloramphenicol

Chloramphenicol is a bacteriostatic antibiotic. Limited evidence from case reports indicates that chloramphenicol can interfere with the red blood cell response to supplemental vitamin B12 in some patients.

Proton pump inhibitors

Proton pump inhibitors, such as omeprazole and lansoprazole, are used to treat gastroesophageal reflux disease and peptic ulcer disease. These drugs can interfere with vitamin B12 absorption from food by slowing the release of gastric acid into the stomach. However, the evidence is conflicting on whether proton pump inhibitor use affects vitamin B12 status. As a precaution, health care providers should monitor vitamin B12 status in patients taking proton pump inhibitors for prolonged periods.

H2 receptor antagonists

Histamine H2 receptor antagonists, used to treat peptic ulcer disease, include cimetidine, famotidine, and ranitidine. These medications can interfere with the absorption of vitamin B12 from food by slowing the release of hydrochloric acid into the stomach. Although H2 receptor antagonists have the potential to cause vitamin B12 deficiency, no evidence indicates that they promote vitamin B12 deficiency, even after long-term use. Clinically significant effects may be more likely in patients with inadequate vitamin B12 stores, especially those using H2 receptor antagonists continuously for more than 2 years.

Vinco’s Vitamin B12 - 2500

Supplement Facts

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<th>Supplement Facts</th>
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<tbody>
<tr>
<td>Serving Size: 1 Sublingual Tablet</td>
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<tr>
<td>Servings per Container: 60</td>
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<table>
<thead>
<tr>
<th>Amount per Serving</th>
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<tbody>
<tr>
<td>Vitamin B12 (as Cyanocobalamin)</td>
<td>2,500 mcg</td>
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*(DV) is based on a 2,000 calorie diet

**Daily Value (DV) not established

Other Ingredients: Mannitol, Crospovidone, Natural Flavor

Contains <2% of: Beet Juice Color, Sucralose, Vegetable Magnesium Stearate

This product contains NO sugar, starch, milk, lactose, soy, gluten, yeast, fish, artificial color, or preservatives. Sodium Free

These statements have not been evaluated by the FDA. This product is not intended to diagnose, treat, cure or prevent any disease.