What is Vitamin B12?

Vitamin B12 (also known as Cobalamin due to its cobalt content) prevents pernicious anemia. This was discovered in 1926 by Drs. George. R. Minot and William. P. Murphy. It was first isolated from liver extract in 1948 and was identified as a bright red, cobalt-rich crystalline compound. It is the most structurally complex of all the vitamins. Cobalamin is one of the most important B vitamins. It works with folic acid (Vitamin B9) in many body processes. Vitamin B12 works to reactivate folic acid, so if B12 is deficient then it is likely that B9 will also be deficient. It occurs in two main forms – hydroxocobalamin and cyanocobalamin. Cyanocobalamin is converted in the body to methylcobalamin or adenosylcobalamin by the removal of the cyanide molecule. Methylcobalamin is the most active form.

Administering vitamin B12, in the form of injections, is often reported in the press as being the most effective method. In fact this is not essential. Oral administration of vitamin B12, even in the absence of intrinsic factor (an important protein that enables the absorption of vitamin B12) results in effective elevations of the blood level of B12.

Vitamin B12 mainly occurs in animal products. Since this is so, deficiencies in the diet of vegans and strict vegetarians may cause them to develop pernicious anemia. Vitamin B12 (unlike other B vitamins) is stored in the liver, kidneys and other body tissues and therefore deficiency symptoms may not appear for months, or years, until its reservoirs in the body are depleted.

Why is Vitamin B12 important and what does it do in the body?

Vitamin B12 or cobalamin is essential for the body's healthy metabolism and the function of all cells. It helps form red blood cells in the bone marrow and promotes growth and appetite in children. It is vital for the maintenance of a healthy nervous system and for brain function including memory, learning ability and balance. It assists in the function of iron, vitamin C, vitamin B5, folic acid and choline. It can also support regular menstruation and prevents postnatal depression. It is used in supporting the synthesis of DNA and the myelin sheath surrounding each nerve cell and fibre. The myelin sheath is similar to the plastic surround on an electrical wire and it allows the nerve signal to move along its electrical circuit.

Both vitamin B12 and folic acid are what are known as “methyl donors” that support the body in many positive ways especially in reducing homocysteine (an amino acid linked to possible cardiovascular disease), increasing energy metabolism and immune and nerve function. It has also been used to improve asthma and reduce sulfite sensitivity as well as to help symptoms of depression, diabetic neuropathy, low sperm counts, multiple sclerosis and tinnitus. It is also involved in
increasing the secretion of melatonin which supports our sleep patterns.

What amount of Vitamin B12 do you need each day?

Vitamin B12 or cobalamin can be found in multivitamins and B complex vitamins, or sold separately. It is available via injections but oral administration of 100-250mcg results in approximately 1.2-3.0 mcg being absorbed (approx 1%). Studies showing oral intake of 500mcg led to the lowest level absorbed as 1.8mcg (0.3%). To improve absorption it should be taken with calcium. Normal thyroid function helps with the absorption of B12.

The DRI (Daily Recommended Intake) /RDA (Recommended Daily Allowance) of dietary vitamin B12 are listed right:

Please Note: By definition, the DRI/RDA recommendations apply only to 98% of healthy individuals and are not sufficient for those with higher nutrient requirements based upon their biochemical individuality, genetics, health status, medications, deficiencies, lifestyle, and toxic exposures.

Daily intakes of dietary vitamin B12 are listed below:

**Adult**

- 19 years and older: 2.4 mcg (RDA)*
- Pregnant women: 2.6 mcg (RDA)
- Breastfeeding women: 2.8 mcg (RDA)

*Because 10 - 30% of older people may not absorb B12 from food very well, people over 50 should meet their daily requirement through either foods fortified with vitamin B12 or a supplement containing B12.

**Pediatric**

- Newborns - 6 months: 0.4 mcg (adequate intake)
- Infants 6 months - 1 year: 0.5 mcg (adequate intake)
- Children 1 - 3 years: 0.9 mcg (RDA)
- Children 4 - 8 years: 1.2 mcg (RDA)
- Children 9 - 13 years: 1.8 mcg (RDA)
- Teens 14 - 18 years: 2.4 mcg (RDA)

**RECOMMENDED DAILY ALLOWANCE** 2mcg/Day

**OPTIMAL DAILY ALLOWANCE** 25mcg/Day
What are possible Vitamin B12 (Cobalamin) deficiency conditions and symptoms?

- Pernicious anemia – where the body cannot make enough red blood cells
- Homocysteinemia - elevated homocysteine levels may be associated with coronary heart disease and atherosclerosis (increased fatty deposits in blood vessels)
- Macular degeneration – severe vision loss
- Diabetic neuropathy – this may present as numbness or altered sensation to the fingers/toes feet and hands or as visual and kidney problems
- Low monocytes (a form of white blood cell)
- Red Blood Cell hemolysis (breakdown of red cell)
- Asthma
- Sulfite sensitivities
- Low sperm counts
- Loss of co-ordination, poor balance (Ataxia)
- Sharp mood swings
- Constipation
- Hallucinations
- Ringing in ears (Tinnitus)
- Sleep/Wake disorder and insomnia
- Depression
- Multiple Sclerosis
- Fatigue
- Sore tongue or mouth

What are possible Vitamin B12 excess symptoms?

No side effects have been identified even on mega dose regimens.

What steals or depletes Vitamin B12 from the body?

- Oral contraceptives
- Anti-Hyperlipidemia drugs such as bile acid sequestrants such as Cholestyramine (Questran) and Colestipol (Colestid).
- Anti-seizure drugs such as Phenytoin (Dilantin), Carbazepine (Tegratol), Primidone (Mysoline)
- Anti-rheumatic drugs such as Sulfasalazine (Azulfidine)
- The use of broad spectrum antibiotics such as Amoxicillin, Vancomycin and Augmentin.
- Anti Diabetic drugs such as Metformin (Glucophage)
- Antacid drugs such as H-2 Receptor antagonists such as Cimetidine (Tagamet), Famotidine (Pepcid), Nizatidine (Axid) and Ranitidine (Zantac) and proton pump inhibitors such as Omeprazole (Prilosec), Lansoprazole (Prevacid) and Rabeprazole (Aciphex).

Note: The use of Potassium chloride may alter the acidity of the intestine which may decrease absorption.

What tests can be used to assess Vitamin B12 or Cobalamin levels?

- Elevated Homocysteine in plasma (>9.8nmol/ml suggests B12 deficiency)
- Homocysteine in urine (>25ug/mg creatinine suggests deficiency)
- B12 in serum (<150pg/ml suggests deficiency)
- Methylmalonic acid in blood >0.4umol/ml suggests deficiency
- Methylmalonic acid in urine >3ug/mg creatinine suggests deficiency
What foods contain the highest amounts of Vitamin B12 or Cobalamin?

**TOP 10 VITAMIN B12 (COBALAMIN) RICH FOODS ARE:**

1. Cooked clams  
   98.9mcg/100g  
2. Liver  
   83.1mcg/100g  
3. Rice bran  
   20mcg/100g  
4. Mackerel  
   19mcg/100g  
5. Herring  
   10mcg/100g  
6. Sardines  
   8 mcg/100g  
7. Egg yolk  
   2.0mcg/100g  
8. Beef  
   6.0mcg/100g  
9. Lamb  
   5.2mcg/100g  
10. Eggs  
   2.0mcg/100g

What are the best Vitamin B12 products?

Methylcobalamin lozenges

(Avoid cyanocobalamin as a supplement as it has to be converted to methylcobalamin or adensoylcobalamin by the removal of the cyanide molecule).

**REFERENCES**

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All the statements, including product labels, supporting literature and/or product manufacturers websites have not been evaluated by FDA. These products are not intended to diagnose, treat, cure or prevent any disease.
Vitamin B12 (Cobalamin)

What are the very best Vitamin B12 or Cobalamin products to buy?

**PRL Max B-ND**
Dietary Supplement
Max B-ND™ is a nutritional industry first - with never before available probiotic-cultured B vitamins. It contains a high-energy, end-chain, B vitamin complex derived from live sources for …

**ProThera Thera-B**
B-complex with activated folate and B12. Thera-B™ provides a full-complement of essential B-complex vitamins and related nutrients in high potency amounts. Inclusion of Metafolin™** L-5-methyltetrahydrofolate (L-5-MTHF, a bioactive …

**ProThera B12 Lozenge**
Active methylcobalamin form of vitamin B12. Provides 5,000 mcg (5 mg) of vitamin B12 as methylcobalamin, the active form especially useful for supporting neurological function and homocysteine metabolism. These fast …

**Neurobiologix Stabilizer Cream**
Topical Cream for Neurological, Nervous & Immune System Support / Ultimate Methylation Support. As a solution, our unique topical delivery system, assures that our pharmaceutical grade Neuro …

**ProThera MultiThera 3**
Iron- and copper-free multiple formula. Both iron and copper have been eliminated from this version of MultiThera® to address the needs of patients who may have elevated tissue identical in all other respects to MultiThera® 1 …

**Klaire VitaSpectrum**
Powdered multiple vitamin/mineral supplement for children with Autism Spectrum Disorders. Natural berry-pomegranate flavor. This comprehensive multiple vitamin/mineral supplement contains 28 highly bioavailable …