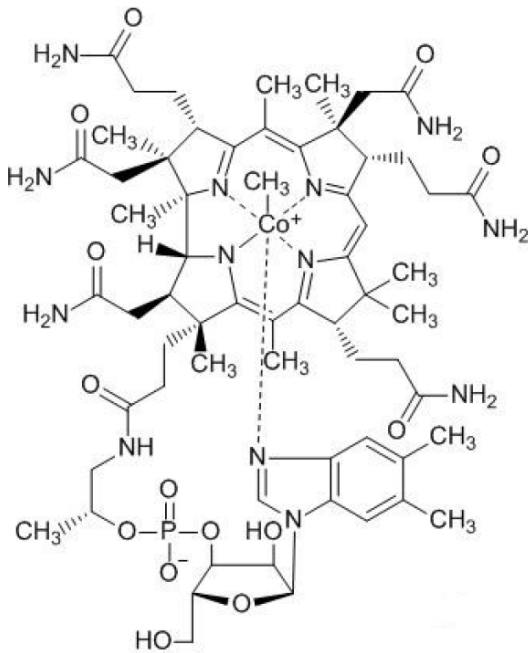


## Methyl B<sub>12</sub> 1,000 mcg Methylcobalamin

### TECHNICAL SUMMARY

Vitamin B<sub>12</sub> has the largest and most complex chemical structure of all the vitamins. Most of its functions are related to its co-enzyme activity, such as enzymes required for the production of DNA during cell division, as well as for the proper disposal of homocysteine.\* B<sub>12</sub> is also necessary for the maintenance of a healthy nervous system.\*

#### Structure formula:



**Chemical name:** Co-methyl (dimethyl-5,6-benzimidazolyl) cobalamin

**Allergen and Additive Disclosure:** Not manufactured with wheat, gluten, soy, milk, egg, fish, shellfish, tree nut or sesame ingredients. Produced in a GMP facility that processes other ingredients containing these allergens.

**Delivery Form:** Lozenge

### ROLE AS NUTRIENT/FUNCTION

Methylcobalamin (MeCbl) is a cofactor of methionine synthase, an enzyme responsible for the production of methionine from homocysteine.\* In vitamin B<sub>12</sub> deficiency, decreased MeCbl leads to the 'folate trap', a functional deficiency of folate.\* This notably affects the rapidly dividing cells of the bone marrow.\* U.S. data from the early 2000s show that B<sub>12</sub> depletion (148–221 pmol/L in serum) affects more than 20% of the population over the age of 60 and 14–16% of adults (20–59 y.o.). B<sub>12</sub> deficiency (<148 pmol/L in serum) affects up to 4% of adults (20–59 y.o.), and around 6% of persons aged 70 years and older.

### NATUROKINETICS®

**Liberation:** This product is in a lozenge form to deliver a delicious-tasting vitamin B<sub>12</sub> supplement.

## Supplement Facts

Serving Size 1 Lozenge

|   | Amount<br>Per Serving | % Daily<br>Value |
|---|-----------------------|------------------|
| Vitamin B <sub>12</sub><br>(as Methylcobalamin) | 1 mg (1,000 mcg)      | 41,667%          |

**Other ingredients:** Xylitol, Hydroxypropyl Cellulose, Microcrystalline Cellulose, Citric Acid, Stearic Acid (vegetable source), Natural Flavors, Organic Stevia Leaf Extract (Enzyme-Modified Steviol Glycosides) and Organic Monk Fruit Extract.

- **Healthy Homocysteine Metabolism\***
- **Supports Healthy Nervous System\***

**SUGGESTED USAGE:** Take 1 lozenge daily, or as directed by your healthcare practitioner. Chew lozenge or hold in mouth until dissolved and swallow.

**Absorption:** There are two known mechanisms of absorption for vitamin B<sub>12</sub>, one complex, limited, and Intrinsic Factor (IF)–dependent, and one virtually unlimited by passive diffusion. After a single oral administration of vitamin B<sub>12</sub>, no more than 3 µg can be absorbed through the (IF)–dependent mechanism. It occurs in the distal portion of the small intestine and requires IF, which is produced in the stomach, and requires a properly functioning pancreas. The amount of vitamin B<sub>12</sub> absorbed via passive diffusion is about 1% of the orally administered dose and occurs throughout the length of the intestine.

**Distribution:** Absorbed cobalamin gets bound to specific binding proteins (transcobalamin, haptocorrin) and is transported to various tissues. It is then stored in the liver or kidneys, which maintain much of the approximately 2,500 µg of cobalamin in the body. At the cellular level, MeCbl is the predominant form existing in the cytoplasm. B<sub>12</sub> is also present in red blood cells, muscle, bones, and the brain.

**Metabolism:** MeCbl, an active form of vitamin B<sub>12</sub>, is absorbed in the small intestine with the help of a protein called intrinsic factor. Once absorbed, it travels in the blood to different tissues, where it supports vital functions like DNA production and nerve health. It also helps in converting homocysteine to methionine, which is important for maintaining cellular health.

**Elimination:** Vitamin B<sub>12</sub> elimination is primarily through the bile, though the body conserves much of it by way of the enterohepatic circulation. Unlike other water-soluble vitamins, vitamin B<sub>12</sub> has a relatively slow elimination rate and can be stored in the liver for extended periods. Any excess that is not reabsorbed is eventually excreted in urine. Since the body stores significant amounts of B<sub>12</sub>, deficiency symptoms may take several years to appear in cases of inadequate intake or absorption issues.

### CLINICAL VALIDATION

- **Vitamin B<sub>12</sub> Deficiency.** In a randomized open-label trial with 10 individuals with marginal vitamin B<sub>12</sub> deficiency, daily high-dose methylcobalamin supplementation for 8 weeks (1,000 mcg/week)

was as effective in improving serum cobalamin levels, reducing homocysteine levels, and supporting general metabolic health.\*

- **Neurological Support.\*** In a randomized, open-label, controlled study with 135 individuals, daily methylcobalamin supplementation of 1,500 µg/d over 2 years was shown to support normal nerve conduction and sensory functions when compared to a control group not receiving supplementation.\*
- **Mood and Nervous system Support.\*** In a randomized, open-label controlled trial, with healthy adults, methylcobalamin supplementation for six weeks is associated with improvements in mood and nervous system support.\* Participants in the supplemented group reported an increase in general well-being and a reduction in mood variation.\*

### SAFETY INFORMATION

**Tolerability:** Vitamin B<sub>12</sub> supplementation is generally well-tolerated. However, high doses may unmask the symptoms of polycythemia vera, a rare blood condition affecting 22 of every 100,000 individuals in the United States.

**Contraindications:** None known.

### INTERACTIONS

**Drug Interactions:** Vitamin B<sub>12</sub> levels can be negatively affected by certain medications, including chloramphenicol, proton pump inhibitors, H<sub>2</sub> blockers, metformin, and certain antibiotics. Patients taking these medications should consult a healthcare provider before supplementing with vitamin B<sub>12</sub>.

**Supplement Interactions:** Standalone folic acid supplementation can mask symptoms of vitamin B<sub>12</sub> deficiency.

**Interaction with Lab Tests:** Vitamin B<sub>12</sub> supplementation may be responsible for false-positive results for the dosage of intrinsic factor antibody tests used to diagnose pernicious anemia

### STORAGE

Store in cool, dry environment in a tightly sealed container.