

Risk Factors for Vitamin B12 Deficiency

Advancing age, medication, and diet are the primary, but not the only, risk factors for vitamin B12 deficiency. It is recommended that individuals over fifty years of age get most of their intake from supplements or vitamin B12-fortified foods. This recommendation is based on estimates that up to 40 percent of older individuals may suffer from reduced gastric hydrochloric acid (*atrophic gastritis*), a condition that impairs absorption of protein-bound vitamin B12 such as that supplied by food. Medications for stomach ulcers, heartburn, or gastro-esophageal reflux inhibit gastric secretions, thereby also impairing vitamin B12 absorption. Any individual with disorders of the digestive tract, regardless of age, may be at risk for malabsorption and deficiency of various nutrients, including vitamin B12.

Diet is a major risk factor for vitamin B12 deficiency. The best sources of vitamin B12 are animal products, such as meat, eggs, and fish. Therefore, strict vegetarians (those who eat no animal products), are at considerable risk of developing a vitamin B12 deficiency.

Usage and Safety

Jarrow FORMULAS® Methyl B12 is suitable for vegetarians. Lozenges can be dissolved under the tongue or chewed prior to meals. Usage may vary as directed by your qualified health consultant. Vegetarians typically require B12 supplementation. **Jarrow FORMULAS® Methyl B12** is taken as a dietary supplement. The RDI for adolescents and adults is 6 mcg per day. Clinical trials have used up to 6,000 mcg daily.

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Jarrow FORMULAS®
 Los Angeles, CA 90035-4317
www.Jarrow.com

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Methyl B-12



- **Most Bioavailable Form of B12 with Superior Tissue Retention**
- **Reduces Levels of Toxic Homocysteine**
- **Assists in Nerve Cell Regeneration**
- **Supports the Production of Neurotransmitters Important for Energy and Mood**

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Human urinary excretion of methyl B12 is about one-third that of a similar dose of cyanocobalamin (the form of B12 most commonly used in vitamin supplements). This indicates a substantially greater rate of tissue retention than is found with other forms of B12.

Neurologically Active
 In nerve and brain tissue, only methyl B12 initiates methylation, a process by which methyl groups (CH₃) from methyl B12 are donated to the myelin sheath that insulates nerve fibers and regenerates neurons. Methyl B12 also plays a role in the synthesis of the neurotransmitters serotonin, dopamine, and norepinephrine.

Lowers Homocysteine Levels
 Methyl B12 is a catalyst for the biochemical conversion of homocysteine (linked to arterial damage) to methionine, an essential amino acid.

Documented Effects of Methyl B12
 Methyl B12 has demonstrated beneficial effects in a variety of physiological states. Some of the highlights of the current research are these:

Brain Aging
 Methyl B12 has been shown to prevent cellular degeneration in the brain due to glutamate-, aspartate-, and nitroprusside-induced cytotoxicity (cell toxicity). Such chemicals regularly circulate within the brain, but when present in excess can kill aging cells.

The ability of methyl B12 to protect brain cells against glutamate-induced cytotoxicity is synergistic with L-dopa supporting regimens. Based on this same protective mechanism, clinical studies

Nerve Function
 Methyl B12 supports nerve function by contributing to nerve myelination. It has also been shown to stimulate protein synthesis for repair and neural regeneration in motor neurons.

Irregular Cell Growth
 Administration of methyl B12 has been shown to facilitate normal cell division in mice.

Immune Function
 A clinical study showed that methyl B12 improved the activity of T-cells (cells involved in immune response).

Sleep Patterns
 Methyl B12 supports better 24-hour sleep patterns by provoking the pineal gland to release melatonin ("the sleep hormone") earlier in the evening. At the end of the sleep cycle, it causes the circulating melatonin levels to decrease earlier, which may make morning wake-ups easier.

Muscle Contraction
 A double-blind controlled study showed that high doses of methyl B12 significantly increased averaged Compound Muscle Action Potential Amplitudes (CMAPs). Extended clinical trials may be able to shed light on whether supplemental methyl B12 is useful in improving muscle maintenance.

Why B12 is Important
 Methylcobalamin (methyl B12) is the most bioavailable and best utilized form of vitamin B12. Methyl B12 is more effective than traditional forms of vitamin B12 in delivering benefits, such as its remedial effect on pernicious anemia (B12 deficiency). Methyl B12 is relatively well retained by the liver and other tissues and, unlike other forms of the vitamin, is active without the need for conversion by the body.

Clinical studies have documented the efficacy of methyl B12 in slowing the effects of aging on nerve tissue. Methyl B12 also appears to play a role in balancing brain chemicals and in promoting the synthesis of neurotransmitters, which are the chemical means of communication between nerve cells. Furthermore, studies demonstrate B12's ability to reduce high homocysteine serum levels. Elevated serum homocysteine levels have been linked to arterial injury as well as to a variety of other health concerns.

Methyl B12 exhibits beneficial effects in the areas of brain aging, irregular sleep patterns and reducing high homocysteine serum levels. It supports immune function and promotes normal cell growth. Finally, methyl B12 plays a significant role in the production of the blood's oxygen carrying cells.

Form of Vitamin B12
 Methyl B12 is the superior form of the active coenzyme form of the vitamin, possesses numerous distinct advantages over the other forms of this nutrient. These advantages include: