



## Vitamin B12

### WHAT IS IT?

Vitamin B12 is a water-soluble vitamin. It is found in many foods, such as fish, meat, eggs, dairy products, shiitake mushrooms, and dried seaweed, and can also be found in fortified foods or as a dietary supplement.

Vitamin B12 is required for healthy red blood cell formation, nerves and neurologic function, gene synthesis and cell replication.

Vitamin B12 status in humans is often checked using serum or plasma vitamin B12 levels.

Vitamin B12 deficiency can cause anemia, with symptoms such as fatigue, and weakness. Vitamin B12 deficiency can also cause memory and mood changes, as well as numbness and tingling in the hands and feet, difficulty maintaining balance, and soreness of the mouth or tongue. Permanent nerve damage can occur if vitamin B12 deficiency is not treated.

### WHO MIGHT CONSIDER TAKING THIS?

Vitamin B12 is primarily used to treat B12 deficiency and its associated symptoms.

**Pregnancy and Lactation.** Vitamin B12 is able to cross the placenta and is found in breast milk. Infants who are exclusively breastfed by women with (or at risk for) B12 deficiency may have very limited reserves of vitamin B12, and may develop symptoms of deficiency within months of birth. The American Dietetic Association recommends that vegans and lacto-ovo vegetarians take B12 supplements during pregnancy and lactation to ensure sufficient vitamin B12 for the mother and fetus/infant.

### PREPARATIONS AND DOSAGE

#### FORMS

Vitamin B12 exists in several forms, collectively referred to as “cobalamins,” which includes cyanocobalamin and methylcobalamin. Cyanocobalamin, the form found in most dietary supplements, is readily converted to the two active forms in the body. Both oral and intramuscular injections of vitamin B12 can be used to correct deficiency. Methylcobalamin is the form of B12 that is better absorbed by many individuals, including those with kidney disease. Supplements of methylcobalamin can be found in a sublingual or oral form.

#### SOURCES

Natural food sources of B12 are mostly limited to animal foods. Fortified breakfast cereals, shiitake mushrooms, nori seaweed and yeast extracts or spreads are among the few non-animal sources of vitamin B12 and thus can be a dietary source of B12 for strict vegetarians and vegans.

#### DOSE

The Institute of Medicine (IOM) has set the Recommended Dietary Allowance or RDA for B12 at 2.4 mcg for teens and adults, 2.6 for pregnant, and 2.8 for lactating women, though optimal dose may be closer to 4.0–7.0 mcg per day to prevent subclinical deficiency.

The IOM did not establish an upper limit, or maximum dose, for vitamin B12 because of its low potential for toxicity. However, taking vitamin B12 supplements might be associated with diarrhea and itching, and very high doses may make acne and dermatitis worse. While vitamin B12 is safe, discontinue its use if you experience any side effects.

Recommended daily intake of vitamin B12 for children varies by age. Vitamin B12 supplements should not be given without prior discussion with your child’s health care provider.

## CONCERNS?

Those at greatest risk of B12 deficiency are vegans, pregnant women, alcoholics, individuals over 60 years of age, individuals with stomach and small intestine disorders, history of bariatric surgery, and those using certain medications, such as metformin (a medication used to treat diabetes) and proton-pump inhibitors (medications used to treat heartburn and other gastrointestinal conditions).

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