

Vitamin B₁₂ and the Hallelujah Diet

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Summary Points

How much do I need?

- ◆ Vitamin B₁₂ requirement is about 1-4 µg/week for healthy adults.

What happens if I don't have B₁₂?

- ◆ Deficiency of vitamin B₁₂ leads to anemia and neurological disorders; deficiency in children can cause profound damage, much of which is reversible.
- ◆ A normal level of serum vitamin B₁₂ does not guarantee adequacy, methylmalonic acid concentrations (either serum or urine) are a much more reliable metabolic measure of vitamin B₁₂ metabolism.
- ◆ People following a pure vegetarian (vegan) diet are at high risk (>50%) for metabolic vitamin B₁₂ deficiency.
- ◆ Metabolic vitamin B₁₂ deficiency can be detected in as little as 22 months on the Hallelujah diet. It does not take a long time.

Where do I get it in foods?

- ◆ Vitamin B₁₂ is found in all animal products (liver, muscle flesh, eggs, and dairy products are sources, in order from richest to poorest sources). Plant foods contain little if any active vitamin B₁₂; produce grown in soil fertilized with cow dung may contain more B₁₂ than commercially grown produce.
- ◆ Marine plant life (chlorella, dulse, nori, blue-green algae, spirulina) contain analogues of vitamin B₁₂ which can interfere with normal cobalamin metabolism; to rely on seaweed for vitamin B₁₂ is to lean on a splintered stick.
- ◆ Barleygreen does not supply sufficient amounts of vitamin B₁₂ for healthy adults.
- ◆ Bowel flora does not make enough vitamin B₁₂ for many healthy adults.
- ◆ Probiotic supplements are not a sufficient source of vitamin B₁₂; some products work better than others.

How do I know I'm getting enough?

- ◆ A simple urine assay for methylmalonic acid can determine metabolic cobalamin status.

What is the best supplement to use?

- ◆ Sublingual methylcobalamin is the best method for a person committed to a pure vegetarian diet to obtain their vitamin B₁₂. 1/2 of a “Bio-Active B₁₂” tablet twice a week should be sufficient for a healthy adult.

Detailed Information

How much do I need?

The amount of vitamin B₁₂ required is very minute. As little as 0.1-0.5 microgram (µg) per day (1-4 µg/week) is needed in a healthy adult (1). Stress, illness (especially involving the central nervous system), pregnancy, lactation, and rapid growth increase needs. The World Health Organization recommends 1 µg per day of vitamin B₁₂. The RDA for adults is 2.4 µg of vitamin B₁₂ per day, 2.6 µg during pregnancy, 2.8 µg during lactation, and proportionally less for children (2). Both have a significant margin of safety built into their recommendations. Unlike other B vitamins, B₁₂ is stored in the liver so daily consumption is not necessary. However, the normal uptake route of vitamin B₁₂ is saturated very quickly so that doses larger than 5 µg are poorly absorbed and are not more effective than smaller doses. A second uptake route, diffusion, allows about 1% of any dose to be absorbed (3).

What happens if I don't consume vitamin B₁₂?

Though the requirements are very low, deficiencies among vegetarians have been noted. There are at least 10 case reports in the medical literature of infants suffering *severe* neurological damage when solely breast-fed by their totally vegetarian mothers (4-15). Most of the damage is reversible by vitamin B₁₂ supplementation. Also, every study of vegan communities or populations has demonstrated low vitamin B₁₂ concentrations in 40-90 percent of the group. Since many of these studies only measured serum cobalamin concentrations, they underestimated the number of people with metabolic deficiencies. This includes macrobiotic communities (16-20), natural hygienists (21), "living food" vegans (22), vegan Seventh Day Adventists (23-26), and followers of the Hallelujah diet. Our study revealed early signs of vitamin B₁₂ deficiency in 26 of the 54 people tested, after following the Hallelujah diet for as little as 2 to 4 years.

Two important facts need to be noted. First, many, if not most, vegans have impaired vitamin B₁₂ metabolism. This has been verified time and again in vegan groups. Second, metabolic deficiency of vitamin B₁₂ can be detected after as little as 22 months on the Hallelujah diet. While serum vitamin B₁₂ levels may still be normal for several more years, the body, especially the central nervous system, may be deficient at the cellular level. 83% of the people in our study with metabolic vitamin B₁₂ deficiency had normal levels of serum vitamin B₁₂. These facts have not been widely appreciated by the vegetarian community.

Based on the published studies and our results, adequate vitamin B₁₂ status of vegans cannot be taken for granted. Pregnant women, nursing mothers, infants, and small children are particularly vulnerable to B₁₂ shortages. Ensuring adequate B₁₂ is critical for normal neurological development and maintenance, with shortages resulting in permanent damage.

Deficiency of vitamin B₁₂ leads to anemia and neurological abnormalities. Vegetarians' abundant dietary intake of folate masks much of the anemia due to vitamin B₁₂ deficiency. So the first signs of vitamin B₁₂ deficiency are neurological symptoms. These symptoms can include parathesia, especially numbness and tingling in the hands and feet, diminution of

vibration sense and/or position sense (usually but not always occurring first in the ankles and feet), unsteadiness, poor muscular coordination with ataxia, moodiness, mental slowness, poor memory, confusion, agitation, and depression. Delusions, hallucinations, and even overt psychosis (usually with paranoid ideas) may occur (27). By the time vitamin B₁₂ deficiency can be detected clinically significant neurological damage has already occurred and an aggressive supplementation program should be begun with methylcobalamin. Symptoms caused by a deficiency can usually be alleviated by vitamin B₁₂ supplementation.

Healthy vegans with a healthy bowel flora should produce B₁₂ in their small intestine. This may be the natural way God intended for us to receive our vitamin B₁₂, but our study showed that this was not a reliable and sufficient source of B₁₂. All people produce B₁₂ in their colon, but this is not available for the body since B₁₂ is absorbed in the small intestine.

Improving the bowel flora by using probiotic supplements (*L. acidophilus*, *B. bifidus*, etc.) may be helpful for supplying vitamin B₁₂. However, our study revealed that daily use for 3 months of either of two different brands of probiotics was not sufficient to restore people's vitamin B₁₂ status to normal.

Where do I get vitamin B₁₂ in foods?

The use of dulse, chlorella, nori, blue-green algae, spirulina, and fermented soy products have been promoted for their plant-based vitamin B₁₂ content. However, when some of these products were analyzed for true cobalamin activity, they were shown to contain almost all analogues of vitamin B₁₂ which are not active in the human body (1). In fact, some of these analogues interfere with normal cobalamin metabolism by competitive binding, resulting in poorer vitamin B₁₂ status. Serum vitamin B₁₂ levels may improve, while metabolic indicators deteriorate (28). Nori and spirulina have both been shown to be ineffective at improving vitamin B₁₂ status of children²⁸. It is not safe to rely on marine plant life or soy products for vitamin B₁₂.

We see then, that dietary vegan sources of vitamin B₁₂ are very sparse since plant foods do not contain vitamin B₁₂ in appreciable amounts (1). There is some evidence that plants grown in soil fertilized with cow dung (rich in B₁₂) contain higher levels of B₁₂ within the plant (29). Whether the reported B₁₂ was true cobalamin and useful for people needs to be confirmed. Other vegan food sources include fortified breakfast cereals, fortified vegan products, fortified nutritional yeast, and dehydrated cereal grasses (like Barleygreen). The amount of B₁₂ in Barleygreen has been shown not to provide adequate amounts of B₁₂ for mature adults' needs. Needs of infants and children are proportionally greater, so Barleygreen alone will not supply sufficient vitamin B₁₂ for a child. Nutritional yeast, (Red Star Vegetarian Support Formula) is fortified with an adequate amount of B₁₂ and is a good source of other B vitamins, trace minerals, and nucleotides as well. Many vegans have found this to be an acceptable and reliable source of vitamin B₁₂.

What is the best supplemental form of vitamin B₁₂?

Sublingual tablets or low dose sprays are the best delivery forms of B₁₂ supplements;

swallowed tablets are not as effective. The best, most bio-available form of cobalamin appears to be methylcobalamin (30). This form of B₁₂ (methylcobalamin) appears to be taken up by the body and used more efficiently than the more common cyanocobalamin. Cyanocobalamin is typically made by chemical synthesis, or by isolation from animal products or waste. The manufacturer will report the source of the vitamin if asked.

Methylcobalamin is marketed by Enzymatic Therapy as "Bio-Active B-12" and is available from Hallelujah Acres. "Bio-Active B-12" is made from fermented plants and is an inexpensive, vegetarian product. 1/2 of a "Bio-Active B₁₂" tablet twice a week should be sufficient for a healthy adult. If I had consumed very little vitamin B₁₂ in the last couple of years, I would take one tablet a day for ten days and then begin this maintenance program.

How do I know I am getting enough vitamin B₁₂?

A simple urine assay can be done through the mail with the Norman Clinical Laboratory, Inc. (Cincinnati, OH 1-800-397-7408, www.b12.com, \$70). The urinary MMA assay is very specific for B₁₂ and much more reliable than a serum B₁₂ assay (31-35). If anyone has doubts about their B₁₂ status this is the lab test to order. Your physician can order this commonly available test for you as well.

Conclusion

There are many ways to get your vitamin B₁₂ but you must get it in your diet or ensure that your body makes it. You will not have excellent health without it.

Please take this information to heart, take precautions, and keep all of this in eternal perspective. "Set your affection on things above, not on things on the earth. For ye are dead, and your life is hid with Christ in God. When Christ, who is our life, shall appear, then shall ye also appear with him in glory." Col 3:2-5.

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