



Vitamin K	0.9 mcg
Thiamin	0.5 mg
Riboflavin	0.5 mg
Niacin	5.3 mg
Vitamin B6	0.5 mg
Folate	273 mcg
Vitamin B12	1.7 mcg
Pantothenic Acid	0.3 mg
Choline	7.3 mg
Betaine	9.7 mg

Vegetarian Nutrition

a dietetic practice group of the



Academy of Nutrition and Dietetics

RD Resources for Consumers:

Vitamin B12 in Vegetarian Diets

A Critical Nutrient

Vitamin B12 is a very important nutrient. It is required for proper red blood cell formation and for the development of the nervous system. A deficiency of vitamin B12 is a serious nutritional concern, resulting in anemia and changes in the function of the nervous system. While milk and eggs contain vitamin B12, no plant food naturally contains the vitamin. Unless they consume a B12 supplement or foods fortified with B12, a vegan is at risk of vitamin B12 deficiency.

What are the symptoms of B12 deficiency?

If blood levels of vitamin B12 drop below normal values, anemia results. This may be followed by impairment in cognitive function. Other symptoms include numbness and tingling in the arms and legs, weakness and excessive fatigue, and a range of psychiatric disorders including disorientation, depression, mood disturbances, irritability, memory loss, difficulty in concentration, and dementia. Some people also experience an inability to maintain balance when walking, and a loss of position sense. Many B12 deficiency symptoms may be due to other causes, therefore, it is wise to be examined by a health care provider to determine the cause of the symptoms.

What are the long-term consequences of vitamin B12 deficiency?

Infants who are vitamin B12 deficient often display signs of developmental delay or regression both physically and mentally. These delays may have a long term consequence on the child, lasting into adulthood. In the elderly, neuropsychiatric disorders caused from a vitamin B12 deficiency are often irreversible.

Why are babies at risk of vitamin B12 deficiency?

A baby born to a mother who has been a strict vegetarian and who has not had reliable sources of vitamin B12 for a number of years is especially at risk. Unborn babies have a special need for vitamin B12 and this need may not be met by a mother deficient in the nutrient. In addition, the infant may not receive sufficient levels of B12 in breast milk, when breast-fed by a vitamin B12-deficient mother or a woman whose diet is not adequate in vitamin B12. Vitamin B12 deficiency may develop in a breast fed infant within 3-6 months of age. A child with a vitamin B12 deficiency may become apathetic, lethargic, and experience failure to thrive.



Can the elderly also be at risk for vitamin B12 deficiency?

Yes. As people age, there is a decrease in the secretion of stomach acid as well as a drop in the digestive enzyme pepsin. As a result, digestion of vitamin B12 from protein is diminished, inhibiting the amount of B12 available for absorption. People over 50 years of age may show neurological changes due to vitamin B12 deficiency. It is believed that a considerable number of elderly patients have neuropsychiatric disorders due to vitamin B12 deficiency.



How long does it take to develop a vitamin B12 deficiency?

Since the liver does store extra vitamin B12, and the body has a recycling process for B12, it may take an adult 3-10 years to develop a deficiency once intake of the nutrient has ceased. If one's past vitamin B12 intake has been very low, a deficiency may manifest itself in much less than 3 years after cessation of intake.

How much B12 do we need?

Only about 2 ½ micrograms of vitamin B12 is required per day. A cup of milk has about 1 microgram of B12, while a cup of soy or rice milk contains from 1 to 3 micrograms, and a serving of B12-fortified commercial cereal has 1.5 micrograms. Vegetarian meat analogs that are fortified may contain anywhere from 1 to 6 micrograms of vitamin B12. More and more vegetarian foods are being fortified with B12, but it is imperative that one read the food label, as fortification levels may change from time to time.

What foods are reliable sources of B12?

Milk, yogurt and cheese, along with eggs, are the only vegetarian food items that naturally contain significant levels of vitamin B12. Plant foods may be fortified with B12. These include rice and soy beverages, plant-derived meat analogs, ready-to-eat breakfast cereals, and nutritional yeast. It is important to read the labels for these foods as not all products and brands have B12 fortification, and the amount of fortification can change with time.



What foods are unreliable sources of vitamin B12 although they claim to contain a sufficient amount?

While claims are made for tempeh, miso, and other fermented soy products, as well as spirulina, some seaweeds, brewers yeast, and leafy vegetables, these foods do not contain any significant level of vitamin B12.

Can't we make our own B12?

Yes. The bacteria in our colon make vitamin B12. However, the absorption of B12 takes place higher up in the gastrointestinal tract, near the end of the small intestine. Therefore, it is unavailable for use in the body.

Are all supplements good sources of the vitamin?

Since the body has a limited capacity for absorption, there is really no reason to ingest more than 10 to 50 micrograms of vitamin B12 supplement per day. Larger amounts are very poorly absorbed and wasted. For effective absorption, a B12 tablet must be dissolved under the tongue or chewed. B12 capsules normally dissolve in the gastrointestinal tract and are readily absorbed. Sub-lingual B12 sprays are also a useful source of B12.

Summary

Vitamin B12 deficiency is not uncommon. Vegans must be especially careful to get adequate amounts on a regular basis, preferably daily. A daily B12 supplement is necessary when B12-fortified plant foods are not regularly consumed. Nutrition labels on processed foods must be carefully studied to determine how much B12 is supplied by one serving of the food.