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*Presents*

# The Vitamin B12 REPORT

By Judith Kingsbury



## **Are You Getting Enough Vitamin B12?**

What Is Vitamin B12?

How Much B12 Do You Need?

What Are Good Sources Of Vitamin B12?

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## Are You Getting Enough Vitamin B12?

### B12 Benefits for Vegetarians, Vegans, Pregnancy & Breastfeeding

Even doctors and nutritionists, who ought to know better, will insist that your vegetarian diet can't meet your nutritional needs, especially for Vitamin B12. If you don't know a great deal about nutrition, you may even start to worry that they're right.

The best way to deal with this annoying but well-meaning behavior is to know the facts about B12, the benefits of Vitamin B12, and make sure that you're getting enough of this critical nutrient. Even when you share these facts with them, not everyone will be convinced that your diet is adequate. But at least you'll have peace of mind.

### ***What is Vitamin B12?***

There are two types of Vitamin B12. The widely available commercial preparation is cyanocobalamin, found in supplements and fortified foods. Cobalamin is essential for a healthy central nervous system; it also plays a role in creating new blood cells and DNA. An untreated B12 deficiency can result in severe, permanent neurological damage.

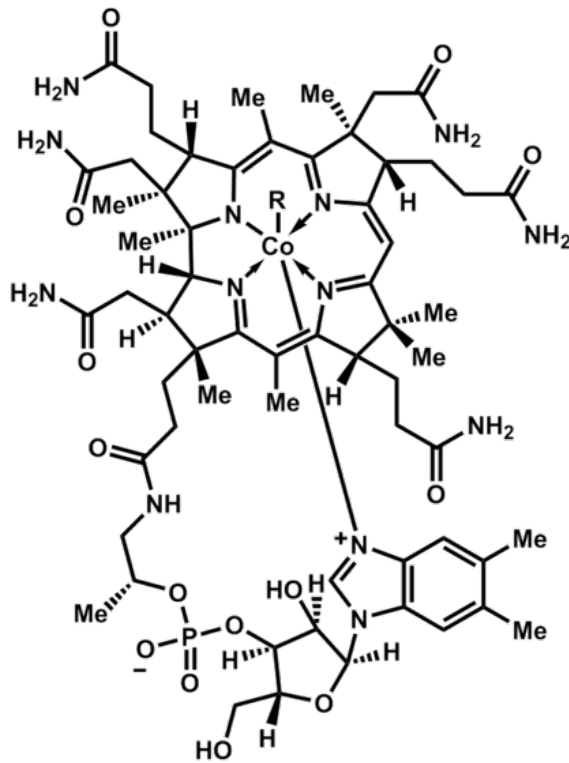
Vitamin B12 is a water-soluble vitamin that is naturally present in some foods, added to others, and available as a dietary supplement and a prescription medication. Vitamin B12 exists in several forms and contains the mineral cobalt [1-4], so compounds with vitamin B12 activity are collectively called "cobalamins". Methylcobalamin and 5-deoxyadenosylcobalamin are the forms of vitamin B12 that are active in human metabolism.

Vitamin B12 is required for proper red blood cell formation, neurological function, and DNA synthesis [1-5]. Vitamin B12 functions as a cofactor for methionine synthase and L-methylmalonyl-CoA mutase. Methionine synthase catalyzes the conversion of

homocysteine to methionine. Methionine is required for the formation of S-adenosylmethionine, a universal methyl donor for almost 100 different substrates, including DNA, RNA, hormones, proteins, and lipids. L-methylmalonyl-CoA mutase converts L-methylmalonyl-CoA to succinyl-CoA in the degradation of propionate, an essential biochemical reaction in fat and protein metabolism. Succinyl-CoA is also required for hemoglobin synthesis.

Vitamin B12, bound to protein in food, is released by the activity of hydrochloric acid and gastric protease in the stomach. When synthetic vitamin B12 is added to fortified foods and dietary supplements, it is already in free form and, thus, does not require this separation step.

Free vitamin B12 then combines with intrinsic factor, a glycoprotein secreted by the stomach's parietal cells, and the resulting complex undergoes absorption within the distal ileum by receptor-mediated endocytosis. Approximately 56% of a 1 mcg oral dose of vitamin B12 is absorbed, but absorption decreases drastically when the capacity of intrinsic factor is exceeded (at 1-2 mcg of vitamin B12).



R = CN, OH, Me, 5'-deoxyadenosyl

## ***How Much B12 Do You Need?***

It shouldn't be difficult for vegetarians, including vegans, to get the RDA (Recommended Daily Allowance) for adults. Besides animal products, many fortified vegan foods and supplements contain this crucial vitamin. If you used to eat meat, you may have enough B12 stored in your body to be recycled and re-used for up to twenty years, but it's safer not to assume that is so.

Note to parents: It's very important for vegan mothers to make sure that their B12 intake is adequate during pregnancy and breastfeeding. Infants have no B12 stores to draw on and a B12 deficiency can be immediate and devastating.

<b><u>The RDAs For Vitamin B12</u></b>	
Adults over 19:	2.4mcg
Pregnant:	2.6mcg
Lactating:	2.8mcg

The Canadian Institute of Medicine has written a report establishing Dietary Reference Intakes for various nutrients. According to this report, RDA's are based on statistical averaging. The authors assume an average 50% absorption rate in the population as a whole. Also according to the above report, evidence indicates that B12 content of 1.5 to 2.5 mcg/meal saturates ileal receptors and limits further absorption.

They go on to say that in some unusual cases, such as someone eating a huge amount of liver paste, the absorption rate can be much higher. Since that isn't an option for vegetarians, it might be good to spread your B12 intake out over the day, or to take small dose supplements several times a day. There hasn't been an upper intake limit established for Vitamin B12.

## ***What Are Good Sources Of Vitamin B12?***

Dairy, eggs and fortified foods are all good vegetarian sources of Vitamin B12. Make sure you read the label when buying fortified food, as not all of them have equal amounts.

According to the ADA (American Dietetic Association): Miso and tempeh (fermented whole grain and/or soy products), algae, and sea vegetables are not reliable sources of B12. That's because the amount of B12 is generally quite small, varies widely from one brand or even from one batch to another, and is often analog B12 rather than the active type our body's need. If you tried to get all of your Vitamin B12 from these sources, you'd need ten times more than you could possibly eat.

Spirulina, an algae available as a dietary supplement in tablet form, and nori, a seaweed, have both appeared to contain significant amounts of B12 after analysis. However, it is thought that this is due to the presence of compounds structurally similar to B12, known as B12 analogues. These cannot be utilized to satisfy dietary needs. Assay methods used to detect B12 are unable to differentiate between B12 and its analogues, Analysis of possible B12 sources may give false positive results due to the presence of these analogues.

Our research indicates that there have been few conclusive studies done in the area of vegetarian sources of B12. But there are plenty of wild theories. For example, it's been suggested that lifetime lacto-vegetarians in India don't have Vitamin B12 deficiencies, because of all the B12 rich bugs and bacteria in their food, in their cooking areas, etc. So feel free to eat lots of the iffy sources of B12, even bugs and dirt. It's all good protein. Just don't include them in your count :>)

#### **Vegetarian Sources Of Vitamin B12:**

Milk, 8oz: 0.9mcg

Yogurt, 8oz: 0.9mcg

Cheese, 1oz: 0.2mcg

Egg, 1: 0.5mcg

Fortified cereals: read individual labels

Fortified milk substitutes: should also be fortified with calcium and vitamin D - read individual labels

Fortified meat substitutes: read individual labels

Nutritional yeast: (Red Star Vegetarian Support) 4.0 mcg

### ***Vitamin B12 Absorption***

Don't relax yet though. Even if your diet contains enough Vitamin B12, you may still be at risk for B12 deficiency.

Why? According to the National Institute of Health (NIH) website on dietary supplements, often the culprit behind deficiencies is not dietary, but problems with the digestive system that hinder the absorption of Vitamin B12. Plus, the body's ability to absorb B12 decreases as we age. Even if you consume enough B12, you may not be absorbing as much as your body needs.

The rate of absorption of Vitamin B12 depends on many factors, according to the Canadian Institute of Medicine (IOM) 2002 report on Dietary Reference Intakes. Absorption of Vitamin B12 is adversely affected by the following conditions:

- Lack of Intrinsic Factor, a glycoprotein secreted by the stomach. This condition is present in pernicious anemia.
- Poorly functioning terminal ileum (this refers to receptors in the small intestine).
- Part of the stomach surgically removed.
- Inadequate digestive enzymes and gastric acid.
- Impaired liver and/or pancreatic function: Liver stores B12, and secretes it in bile. The pancreas is part of the end stage of absorption.
- Old age: Absorption of Vitamin B12 tends to decrease as you age. There have been a few studies indicating that B12 is a factor in conditions normally associated with aging, which respond to supplements, although a lot more research needs to be done in this area.

So, take a good look at what you're eating and make sure you're getting enough Vitamin B12 in your diet. And then take a look at other factors like your health, your age and how long you've been a vegetarian.

If you're over 50 and/or you've been a vegetarian for fifteen or twenty years (more than long enough to use up your stores), you should get your B12 levels tested.

And here's an unscientific opinion based on my personal observations: Stressful physical events in your life, such as emotional trauma, major illness/injury, or birthing children one after another, may also quickly deplete your stores of B12.

People who can't absorb Vitamin B12 from food sources, seem to be able to absorb B12 from supplements in crystalline form, because they enter the blood stream directly, without going through the whole digestive process involved in separating B12 from food.

If you are over fifty, most experts recommend taking a supplement, or adding fortified food to your diet. If your inability to absorb B12 is due to a lack of Intrinsic Factor in your digestive system, you'll need intramuscular B12 shots for the rest of your life. But not every day, fortunately.

## ***Vitamin B12 Deficiency***

Some symptoms of Vitamin B12 deficiency: Confusion, anemia, loss of appetite, diarrhea, fatigue, weakness, and poor balance. If you have any symptoms of B12 deficiency, talk to your doctor. It could be that you have some of these symptoms not just because you're old, or did drugs in the sixties, or you're going through menopause. It's important not to try self-diagnosis, since any of these symptoms can be the result of a different serious condition. It's best to find out for sure.

The fact is, those who insist that you can't possibly be getting enough Vitamin B12 as a vegetarian, are as likely to be deficient as you are. That's because B12 deficiency tends

to be caused more often by poor absorption than by inadequate intake. If you want to know for sure about your B12 status, get the blood tests done.

But be warned. Conventional MD's sometimes resist changing their minds. Let's say you have enough Vitamin B12 in your diet, as well as other key nutrients, and you have no health problems that would hinder absorption. But your doctor is still giving you grief about being vegetarian. Maybe it's time to vote with your feet, and look for a new doctor, one who is more tuned in to vegetarian diet and alternative health.

## ***Taking Vitamin B12***

Supposedly, methylcobalamin B12 is absorbed more readily by the body, especially if you take it sublingually. BUT - the doses (1000 mcg is typical) are much higher than what our bodies need, which is a few micrograms a day, so you won't lose much by taking cobalamin and making your body convert it.

You sure don't need 5000 mcg - go for 500 mcg if you can find that size. Most of it will still end up in the toilet. In my experience, once you're up to speed, you can usually take half a tablet every few days with no harm done.

Plus, any B12 tablet can be taken sublingually - just let it dissolve under your tongue. This method provides better absorption. Another point is that all B12 is made in labs, and is vegetarian by definition. Just watch out for non-veg gelatin capsules.



Now you understand B12 and vegetarianism but what do you do with that information? How can you apply it on a daily practical level? Wouldn't it be easy if you had a collection of the best recipes that were delicious and nutritious?

We want to make it easy for you so we have produced a collection of recipes that will help you get the nutrition you need. And we also include a sample menu planner so you will know what dishes to combine for a total meal. It's so much easier to have a handy booklet of recipes than to go searching through the site for them. They come in a downloadable e-book form. Just print them out and start cooking!

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## ***What our customers are saying...***

Thank-you Judy for putting together this collection of quinoa recipes. I am always in need of something different for a grain dish that I use often. Having the recipes in one handy booklet makes it easier to use them. And the ones I've tried so far really are the best!

-Jeannette K.

Love your recipes. Thanks for the easy and simple instructions. I'm a fan! - Shennan

Can I just say THANK YOU? All the other websites I've been on give me recipes that need lots of fancy sauces and whatnot. I only need enough tofu for just me, since I'm the only vegetarian in my family, and simplicity is key, especially with my family's budget. So thank you for providing me with the helpful information and recipes I needed!

- Gisell C.

I just wanted to say a huge THANK YOU for this fantastic site. While I don't find being a vegetarian a difficult choice by any means, I find that not cooking at 31 years old makes it quite hard! I just never picked up my basic cooking skills. I have sat here enjoying my morning coffee browsing recipes and how to's finally feeling like I can make some yummy meals!

Thanks so much for all the detailed information, every single recipe sounds delicious! - Jenn B.

Thank you so much for your website!! Your recipes help to make our new eating style easier. We were beginning to get bored with the few recipes I'd found else where. Your site has added much needed variety. We eat mostly tofu for protein as my husband has gout and tends to have problems if he eats too many beans. Again thank you so much for the great recipes! - Suzanne T.

Thank you so much! You've helped me turn a low-budget kitchen into a place where amazing animal-free feasts are enjoyed! - Brad V.

All your recipes, even the ones that have long lists of ingredients, are extremely simple to understand and to follow through on. And they are yummy, and healthy to boot! - Danielle C.

Yum! I love black bean burgers, but can't eat them all the time! This sounds like a great alternative. Love that you can freeze them, too!  
(re: quinoa burgers) - Kristi L.

I just discovered your site this afternoon and decided to make the Tofu Burgers. They were great, my kids even ate them, and they almost never eat dinner! Thanks for the recipe! - Teri D.

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