

# Vitamin B12

## Fact Sheet for Consumers



**Foods from animals, but not plants, naturally have vitamin B12. These include fish, meat, poultry, eggs, milk, and other dairy products.**



**National Institutes of Health**  
*Office of Dietary Supplements*

# What is vitamin B12 and what does it do?

Vitamin B12 is a nutrient that helps keep the body's nerve and blood cells healthy and helps make DNA, the genetic material in all cells. Vitamin B12 also helps prevent a type of anemia called megaloblastic anemia that makes people tired and weak.

Two steps are required for the body to absorb vitamin B12 from food. First, hydrochloric acid in the stomach separates vitamin B12 from the protein to which vitamin B12 is attached in food. After this, vitamin B12 combines with a protein made by the stomach called intrinsic factor and is absorbed by the body. Some people have pernicious anemia, a condition where they cannot make intrinsic factor. As a result, they have trouble absorbing vitamin B12 from all foods and dietary supplements.

## How much vitamin B12 do I need?

The amount of vitamin B12 you need each day depends on your age. Average daily recommended amounts for different ages are listed on the next page in micrograms (mcg):

## Life Stage

## Recommended Amount

Birth to 6 months

0.4 mcg

Infants 7–12 months

0.5 mcg

Children 1–3 years

0.9 mcg

Children 4–8 years

1.2 mcg

Children 9–13 years

1.8 mcg

Teens 14–18 years

2.4 mcg

Adults

2.4 mcg

Pregnant teens and women

2.6 mcg

Breastfeeding teens and women

2.8 mcg

# What foods provide vitamin B12?

Vitamin B12 is found naturally in a wide variety of animal foods and is added to some fortified foods. Plant foods have no vitamin B12 unless they are fortified. You can get recommended amounts of vitamin B12 by eating a variety of foods including the following:

- Beef liver and clams, which are the best sources of vitamin B12.
- Fish, meat, poultry, eggs, milk, and other dairy products, which also contain vitamin B12.
- Some breakfast cereals, nutritional yeasts, and other food products that are fortified with vitamin B12. To find out if vitamin B12 has been added to a food product, check the product labels.

# What kinds of vitamin B12 dietary supplements are available?

Vitamin B12 is found in almost all multivitamins. Dietary supplements that contain only vitamin B12, or vitamin B12 with nutrients such as folic acid and other B vitamins, are also available. Check the Supplement Facts label to determine the amount of vitamin B12 provided.

Vitamin B12 is also available in sublingual forms (which are dissolved under the tongue). There is no evidence that sublingual forms are better absorbed than pills that are swallowed.

A prescription form of vitamin B12 can be administered as a shot. This is usually used to treat vitamin B12 deficiency. Vitamin B12 is also available as a prescription medication in nasal gel form (for use in the nose).

## Am I getting enough vitamin B12?

Most people in the United States get enough vitamin B12 from the foods they eat. But some people have trouble absorbing vitamin B12 from food. As a result, vitamin B12 deficiency affects between 1.5% and 15% of the public. Your doctor can test your vitamin B12 level to see if you have a deficiency.

Certain groups may not get enough vitamin B12 or have trouble absorbing it:

- Many older adults, who do not have enough hydrochloric acid in their stomach to absorb the vitamin B12 naturally present in food. People over 50 should get most of their vitamin B12 from fortified foods or dietary supplements because, in most cases, their bodies can absorb vitamin B12 from these sources.
- People with pernicious anemia whose bodies do not make the intrinsic factor needed to absorb vitamin B12. Doctors usually treat pernicious anemia with vitamin B12 shots, although very high oral doses of vitamin B12 might also be effective.

- People who have had gastrointestinal surgery, such as weight loss surgery, or who have digestive disorders, such as celiac disease or Crohn's disease. These conditions can decrease the amount of vitamin B12 that the body can absorb.
- Some people who eat little or no animal foods such as vegetarians and vegans. Only animal foods have vitamin B12 naturally. When pregnant women and women who breastfeed their babies are strict vegetarians or vegans, their babies might also not get enough vitamin B12.

## What happens if I don't get enough vitamin B12?

Vitamin B12 deficiency causes tiredness, weakness, constipation, loss of appetite, weight loss, and megaloblastic anemia. Nerve problems, such as numbness and tingling in the hands and feet, can also occur. Other symptoms of vitamin B12 deficiency include problems with balance, depression, confusion, dementia, poor memory, and soreness of the mouth or tongue. Vitamin B12 deficiency can damage the nervous system even in people who don't have anemia, so it is important to treat a deficiency as soon as possible.

In infants, signs of a vitamin B12 deficiency include failure to thrive, problems with movement, delays in reaching the typical developmental milestones, and megaloblastic anemia.

Large amounts of folic acid can hide a vitamin B12 deficiency by correcting megaloblastic anemia, a hallmark of vitamin B12 deficiency. But folic acid does not correct the progressive damage to the nervous system that vitamin B12 deficiency also causes. For this reason, healthy adults should not get more than 1,000 mcg of folic acid a day.

## What are some effects of vitamin B12 on health?

Scientists are studying vitamin B12 to see how it affects health. Here are several examples of what this research has shown.

### **Heart disease**

Vitamin B12 supplements (along with folic acid and vitamin B6) do not reduce the risk of getting heart disease. Scientists had thought that these vitamins might be helpful because they reduce blood levels of homocysteine, a compound linked to an increased risk of having a heart attack or stroke.

### **Dementia**

As they get older, some people develop dementia. These people often have high levels of homocysteine in the blood. Vitamin B12 (with folic acid and vitamin B6) can lower homocysteine levels, but scientists don't know yet whether these vitamins actually help prevent or treat dementia.

## **Energy and athletic performance**

Advertisements often promote vitamin B12 supplements as a way to increase energy or endurance. Except in people with a vitamin B12 deficiency, no evidence shows that vitamin B12 supplements increase energy or improve athletic performance.

## **Can vitamin B12 be harmful?**

Vitamin B12 has not been shown to cause any harm.

## **Are there any interactions with vitamin B12 that I should know about?**

Yes. Vitamin B12 can interact or interfere with medicines that you take, and in some cases, medicines can lower vitamin B12 levels in the body. Here are several examples of medicines that can interfere with the body's absorption or use of vitamin B12:

- Chloramphenicol (Chloromycetin<sup>®</sup>), an antibiotic that is used to treat certain infections.
- Proton pump inhibitors, such as omeprazole (Prilosec<sup>®</sup>) and lansoprazole (Prevacid<sup>®</sup>), that are used to treat acid reflux and peptic ulcer disease.



- Histamine H2 receptor antagonists, such as cimetidine (Tagamet®), famotidine (Pepcid®), and ranitidine (Zantac®), that are used to treat peptic ulcer disease.
- Metformin, a drug used to treat diabetes.

Tell your doctor, pharmacist, and other health care providers about any dietary supplements and medicines you take. They can tell you if those dietary supplements might interact or interfere with your prescription or over-the-counter medicines or if the medicines might interfere with how your body absorbs, uses, or breaks down nutrients.

## Vitamin B12 and healthful eating

People should get most of their nutrients from food, advises the federal government's *Dietary Guidelines for Americans*. Foods contain vitamins, minerals, dietary fiber and other substances that benefit health. In some cases, fortified foods and dietary supplements may provide nutrients that otherwise may be consumed in less-than-recommended amounts. For more information about building a healthy diet, refer to the *Dietary Guidelines for Americans* and the U.S. Department of Agriculture's MyPlate.

# Where can I find out more about vitamin B12?

## **For general information on vitamin B12:**

- Office of Dietary Supplements Health Professional Fact Sheet on Vitamin B12
- Vitamin B12, MedlinePlus®

## **For more information on food sources of vitamin B12:**

- U.S. Department of Agriculture's (USDA's) National Nutrient Database
- Nutrient list for vitamin B12 (listed by food or by vitamin B12 content), USDA

## **For more advice on buying dietary supplements:**

- Office of Dietary Supplements Frequently Asked Questions: Which brand(s) of dietary supplements should I purchase?

## **For information about building a healthy diet:**

- MyPlate
- *Dietary Guidelines for Americans*

# Disclaimer

This fact sheet by the Office of Dietary Supplements provides information that should not take the place of medical advice. We encourage you to talk to your health care providers (doctor, registered dietitian, pharmacist, etc.) about your interest in, questions about, or use of dietary supplements and what may be best for your overall health. Any mention in this publication of a specific brand name is not an endorsement of the product.



For more information on this and other supplements, please visit our Web site at: <http://ods.od.nih.gov> or e-mail us at: [ods@nih.gov](mailto:ods@nih.gov)