

Vitamin E Fact Sheet for Consumers



Many foods have vitamin E including vegetable oils (such as wheat germ, sunflower, and safflower oils), nuts (such as almonds), seeds (such as sunflower seeds), and green vegetables (such as spinach and broccoli).

What is vitamin E and what does it do?

Vitamin E is a fat-soluble nutrient found in many foods. In the body, it acts as an antioxidant, helping to protect cells from the damage caused by free radicals. Free radicals are compounds formed when our bodies convert the food we eat into energy. People are also exposed to free radicals in the environment from cigarette smoke, air pollution, and ultraviolet light from the sun.

The body also needs vitamin E to boost its immune system so that it can fight off invading bacteria and viruses. It helps to widen blood vessels and keep blood from clotting within them. In addition, cells use vitamin E to interact with each other and to carry out many important functions.

How much vitamin E do I need?

The amount of vitamin E you need each day depends on your age. Average daily recommended amounts are listed below in milligrams (mg).

Life Stage	Recommended Amount
Birth to 6 months	4 mg
Infants 7–12 months	5 mg
Children 1–3 years	6 mg
Children 4–8 years	7 mg
Children 9–13 years	11 mg
Teens 14–18 years	15 mg
Adults	15 mg
Pregnant teens and women	15 mg
Breastfeeding teens and women	19 mg

What foods provide vitamin E?

Vitamin E is found naturally in foods and is added to some fortified foods. You can get recommended amounts of vitamin E by eating a variety of foods including the following:

- Vegetable oils like wheat germ, sunflower, and safflower oils are among the best sources of vitamin E. Corn and soybean oils also provide some vitamin E.
- Nuts (such as peanuts, hazelnuts, and, especially, almonds) and seeds (like sunflower seeds) are also among the best sources of vitamin E.
- Green vegetables, such as spinach and broccoli, provide some vitamin E.
- Food companies add vitamin E to some breakfast cereals, fruit juices, margarines and spreads, and other foods. To find out which ones have vitamin E, check the product labels.

What kinds of vitamin E dietary supplements are available?

Vitamin E supplements come in different amounts and forms. Two main things to consider when choosing a vitamin E supplement are:

- 1. The amount of vitamin E:** Most once-daily multivitamin-mineral supplements provide about 13.5 mg of vitamin E, whereas vitamin E-only supplements commonly contain 67 mg or more. The doses in most vitamin E-only supplements are much higher than the recommended amounts. Some people take large doses because they believe or hope that doing so will keep them healthy or lower their risk of certain diseases.
- 2. The form of vitamin E:** Although vitamin E sounds like a single substance, it is actually the name of eight related compounds in food, including alpha-tocopherol. Each form has a different potency, or level of activity in the body.

Vitamin E from natural sources is commonly listed as “*d*-alpha-tocopherol” on food packaging and supplement labels. Synthetic (laboratory-made) vitamin E is commonly listed as “*dl*-alpha-tocopherol.” The natural form is more potent; 1 mg vitamin E = 1 mg *d*-alpha-tocopherol (natural vitamin E) = 2 mg *dl*-alpha-tocopherol (synthetic vitamin E).

Some food and dietary supplement labels still list vitamin E in International Units (IUs) rather than mg. 1 IU of the natural form of vitamin E is equivalent to 0.67 mg. 1 IU of the synthetic form of vitamin E is equivalent to 0.45 mg.

Some vitamin E supplements provide other forms of the vitamin, such as gamma-tocopherol, tocotrienols, and mixed tocopherols. Scientists do not know if any of these forms are superior to alpha-tocopherol in supplements.

Am I getting enough vitamin E?

The diets of most Americans provide less than the recommended amounts of vitamin E. Nevertheless, healthy people rarely show any clear signs that they are not getting enough vitamin E (see next question for information on the signs of vitamin E deficiency).

What happens if I don't get enough vitamin E?

Vitamin E deficiency is very rare in healthy people. It is almost always linked to certain diseases where fat is not properly digested or absorbed. Examples include Crohn's disease, cystic fibrosis, and certain rare genetic diseases such as abetalipoproteinemia and ataxia with vitamin E deficiency (AVED).

Vitamin E needs some fat for the digestive system to absorb it.

Vitamin E deficiency can cause nerve and muscle damage that results in loss of feeling in the arms and legs, loss of body movement control, muscle weakness, and vision problems. Another sign of deficiency is a weakened immune system.

What are some effects of vitamin E on health?

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

Heart disease

Some studies link higher intakes of vitamin E from supplements to lower chances of developing heart disease. But the best research finds no benefit. People in these studies are randomly assigned to take vitamin E or a placebo (dummy pill with no vitamin E or active ingredients) and they don't know which they are taking. Vitamin E supplements do not seem to prevent heart disease, reduce its severity, or affect the risk of death from this disease. Scientists do not know whether high intakes of vitamin E might protect the heart in younger, healthier people who do not have a high risk of heart disease.

Cancer

Most research indicates that vitamin E does not help prevent cancer and may be harmful in some cases. Large doses of vitamin E have not consistently reduced the risk of colon and breast cancer in studies, for example. A large study found that taking vitamin E supplements (180 mg/day [400 IU]) for several years increased the risk of developing prostate cancer in men. Two studies that followed middle-aged men and women for 7 or more years found that extra vitamin E (201–268 mg/day [300–400 IU], on average) did not protect them from any form of cancer. However, one study found a link between the use of vitamin E supplements for 10 years or more and a lower risk of death from bladder cancer.

Vitamin E dietary supplements and other antioxidants might interact with chemotherapy and radiation therapy. People undergoing these treatments should talk with their doctor or oncologist before taking vitamin E or other antioxidant supplements, especially in high doses.

Eye disorders

Age-related macular degeneration (AMD), or the loss of central vision in older people, and cataracts are among the most common causes of vision loss in older people. The results of research on whether vitamin E can help prevent these conditions are inconsistent. Among people with AMD who were at high risk of developing advanced AMD, a supplement containing large doses of vitamin E combined with other antioxidants, zinc, and copper showed promise for slowing down the rate of vision loss.

Mental function

Several studies have investigated whether vitamin E supplements might help older adults remain mentally alert and active as

well as prevent or slow the decline of mental function and Alzheimer's disease. So far, the research provides little evidence that taking vitamin E supplements can help healthy people or people with mild mental functioning problems to maintain brain health.

Can vitamin E be harmful?

Eating vitamin E in foods is not risky or harmful.

In supplement form, however, high doses of vitamin E might increase the risk of bleeding (by reducing the blood's ability to form clots after a cut or injury) and of serious bleeding in the brain (known as hemorrhagic stroke). Because of this risk, the upper limit for adults is 1,000 mg/day for supplements of either natural or synthetic vitamin E. This is equal to 1,500 IU/day for natural vitamin E supplements and 1,100 IU/day for synthetic vitamin E supplements. The upper limits for children are lower than those for adults. Some research suggests that taking vitamin E supplements even below these upper limits might cause harm. In one study, for example, men who took 400 IU (180 mg) of synthetic vitamin E each day for several years had an increased risk of prostate cancer.

Are there any interactions with vitamin E that I should know about?

Vitamin E dietary supplements can interact or interfere with certain medicines that you take. Here are some examples:

- Vitamin E can increase the risk of bleeding in people taking anticoagulant or antiplatelet medicines, such as warfarin (Coumadin®).
- In one study, vitamin E plus other antioxidants (such as vitamin C, selenium, and beta-carotene) reduced the heart-protective effects of two drugs taken in combination (a statin and niacin) to affect blood-cholesterol levels.
- Taking antioxidant supplements while undergoing chemotherapy or radiation therapy for cancer could alter the effectiveness of these treatments.

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 E 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 E?

For general information on vitamin E:

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

For more information on food sources of vitamin E:

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

Updated: November 20, 2020