

Vitamins A to K

Your body needs **vitamins** (substances essential to nutrition in very small quantities) for a variety of functions. Since most vitamins are not made naturally by the body, the food we eat is our primary source of these substances.

Vitamin **deficiencies** (extremely low levels) and even poor intake of some vitamins can affect resistance to infections, risk of birth defects, and risk of diseases such as cancer, heart disease, and **osteoporosis** (thinning of the bones). On the other hand, too much of certain vitamins, especially A and D, results in **toxicity**, which causes bad effects such as headache, nausea, and diarrhea. Be sure to tell your doctor if you are taking any vitamin supplements.

The June 19, 2002, issue of *JAMA* includes 2 articles about vitamins that prevent disease in adults.

VITAMIN	FOOD SOURCES
A (retinol): Important for vision (especially night vision), a healthy immune system, and cell growth. Excessive doses from supplements can cause liver toxicity, visual problems, and increased risk of hip fractures.	Organ meats, fish, egg yolks, and fortified milk. Many carotenoids (see below) are converted to vitamin A. If you eat adequate amounts of fruits and vegetables, you will not become vitamin A deficient.
Carotenoids: Act as antioxidants (which prevent cell damage) and may help prevent some forms of cancer, including prostate and breast cancer. Excessive supplement doses can cause yellowing of the skin.	Carrots, pumpkins, sweet potatoes, peaches, apricots, and many other fruits and vegetables.
Folate (folic acid): A B-vitamin compound that helps prevent birth defects and anemia and may help prevent breast cancer, colon cancer, and heart disease. Women who might become pregnant or are trying to conceive should begin taking 800 micrograms of folate daily as a supplement before pregnancy occurs.	Dark green leafy vegetables, whole grains, fortified breads and cereals, beans, avocados, bananas, orange juice, asparagus, and yeast.
B₆ (pyridoxine): Necessary for cellular and nervous system functions.	Poultry, fish, soybeans, whole grains, nuts, peas, and bananas.
B₁₂ (cyanocobalamin): Necessary for blood cell and nervous system functions. Deficiency can occur from poor food absorption due to stomach or intestinal disease.	Fish, meat, poultry, eggs, and dairy products. If you are a vegan (do not eat any animal products at all), you need to take a supplement to get vitamin B ₁₂ .
C: Acts as an antioxidant and promotes wound healing and iron absorption. May help prevent some types of cancer.	Citrus fruits (such as orange and grapefruit), strawberries, melons, tomatoes, green and red peppers, and broccoli.
D (calciferol): Helps prevent osteoporosis and bone fractures. Excessive supplement doses can cause high calcium levels and calcium deposits.	Vitamin D–fortified milk and cereals, liver, saltwater fish, and fish liver oil. The body can make vitamin D (the “sunshine vitamin”) with adequate sunlight exposure.
E (tocopherol): An antioxidant that promotes healthy function of the immune system and may help prevent blockage in the arteries. Excessive supplement doses can cause headache, fatigue, nausea, and diarrhea.	Vegetable oils, wheat germ, whole-grain products, and nuts.
K: Promotes normal blood clotting and bone health.	Dark green leafy vegetables (spinach, cabbage, brussels sprouts).

SOURCES OF VITAMINS

The best way to get vitamins is from whole foods—fruits, grains, vegetables, dairy products, and lean meat. However, taking a daily multivitamin supplement will also ensure adequate amounts of the important vitamins.

FOR MORE INFORMATION

- National Institutes of Health (Clinical Center)
www.cc.nih.gov/cc/supplements
301/496-2563
- American Dietetic Association
Consumer Nutrition Hot Line
800/366-1655
- Mayo Clinic Health Oasis
www.mayoclinic.com/findinformation/conditioncenters

INFORM YOURSELF

To find this and previous JAMA Patient Pages, go to the Patient Page Index on JAMA's Web site at www.jama.com. A Patient Page on vitamin C was published in the April 21, 1999, issue and one on nutrition in the April 26, 2000, issue.

Sources: American Dietetic Association, British Nutrition Foundation, National Institutes of Health, Mayo Clinic, US Pharmacopeia

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