

Vitamins

<https://medlineplus.gov/ency/article/002399.htm>

Vitamins

Vitamins are substances needed for normal cell function, growth, and development. There are 13 essential vitamins required for the body to function properly:

- Vitamin A
- Vitamin C
- Vitamin D
- Vitamin E
- Vitamin K
- Vitamin B1 (thiamine)
- Vitamin B2 (riboflavin)
- Vitamin B3 (niacin)
- Vitamin B6 (pyridoxine)
- Vitamin B12 (cyanocobalamin)
- Pantothenic acid (B5)
- Biotin (B7)
- Folate (folic acid or B9)

Vitamin Categories

Fat-soluble vitamins: A, D, E, and K. These are stored in the liver, fatty tissue, and muscles. They are better absorbed when taken with dietary fat.

Water-soluble vitamins: C and all B vitamins. These are not stored in the body and excess amounts are removed in urine. They need to be consumed regularly, except for B12 which can be stored in the liver for years.

Other vitamin-like nutrients

- Choline
- Carnitine

Functions of Key Vitamins

- Vitamin A: Maintains healthy teeth, bones, skin, and soft tissue.
- Vitamin B6: Helps form red blood cells and supports brain function.
- Vitamin B12: Supports metabolism, red blood cell formation, and nervous system health.
- Vitamin C: Antioxidant that supports teeth, gums, tissue repair, and iron absorption.
- Vitamin D: Aids in calcium absorption, supports bone and tooth health, and is made by the body with sunlight exposure.
- Vitamin E: Antioxidant that supports red blood cell formation and vitamin K usage.
- Vitamin K: Essential for blood clotting and may help bone health.
- Biotin: Supports metabolism of proteins and carbohydrates and hormone production.
- Niacin: Maintains skin and nerve health and lowers triglycerides at higher doses.
- Folate: Helps form red blood cells and DNA. Essential during pregnancy.
- Pantothenic acid: Helps metabolize food and produce hormones and cholesterol.
- Riboflavin: Supports growth and red blood cell production.
- Thiamine: Helps convert carbohydrates into energy and supports heart and nerve function.
- Choline: Supports brain and nervous system function.

- Carnitine: Converts fatty acids into energy.

Food Sources

Fat-soluble vitamins:

- Vitamin A: Dark fruits and leafy vegetables, egg yolk, liver, fortified dairy.
- Vitamin D: Fatty fish, cod liver oil, fortified cereals and dairy.
- Vitamin E: Avocado, green vegetables, nuts, seeds, oils, wheat germ.
- Vitamin K: Leafy greens, fish, eggs, liver, broccoli, cabbage.

Water-soluble vitamins:

- Biotin: Eggs, milk, legumes, nuts, organ meats, yeast.
- Folate: Leafy greens, beans, fortified cereals, citrus, wheat germ.
- Niacin: Avocado, eggs, meat, legumes, enriched bread, fish.
- Pantothenic acid: Broccoli, eggs, milk, poultry, sweet potatoes.
- Thiamine: Whole grains, dried milk, meat, legumes, nuts.
- Vitamin B6: Bananas, legumes, meat, nuts, poultry.
- Vitamin B12: Meat, eggs, milk, fortified foods, shellfish.
- Vitamin C: Citrus fruits, broccoli, cabbage, strawberries, tomatoes.

Side Effects

High doses of certain vitamins can be toxic. Always ask a healthcare provider before taking large doses, especially fat-soluble ones like vitamins A, D, E, and K.

Recommendations

The best way to get all essential vitamins is through a balanced diet that includes a variety of fruits, vegetables, dairy, legumes, lentils, and whole grains. Supplements may be helpful in certain situations like pregnancy or specific health issues. Do not exceed 100% of the recommended daily allowance (RDA) unless advised by a healthcare provider.

Supplements are available in pills, powders, liquids, and gummies. Always read the label to check vitamin type, dosage, and added ingredients like sugar or allergens.