



What are vitamins?

Vitamins are organic compounds which are needed in small quantities to sustain life. We get vitamins from food, because the human body either does not produce enough of them, or none at all.

An organic compound contains carbon. When an organism (living thing) cannot produce enough of an organic chemical compound that it needs in tiny amounts, and has to get it from food, it is called a vitamin.

Sometimes the compound is a vitamin for a human but not for some other animals. For example, vitamin C (ascorbic acid) is a vitamin for humans but not for dogs, because dogs can produce (synthesize) enough for their own needs, while humans cannot.

A vitamin is one of a group of organic substances, present in minute amounts in natural foodstuffs, that are essential to normal metabolism; insufficient amounts in the diet may cause deficiency diseases.

Put simply, a vitamin is both:

- An organic compound (contains carbon).
- An essential nutrient the body cannot produce enough of on its own, so it has to get it (tiny amounts) from food.

There are currently 13 recognized vitamins.

Fat soluble and water soluble vitamins

There are *fat-soluble* and *water-soluble* vitamins.

Fat-soluble vitamins are stored in the fat tissues of our bodies, as well as the liver. Fat-soluble vitamins are easier to store than water-soluble ones, and can stay in the body as reserves for days, some of them for months.¹

Fat-soluble vitamins are absorbed through the intestinal tract with the help of fats (lipids).

Water-soluble vitamins do not get stored in the body for long - they soon get expelled through urine.

Water-soluble vitamins need to be replaced more often than fat-soluble ones.

Vitamins A, D, E and K are fat-soluble.

Vitamins C and all the B vitamins are water-soluble.²

What vitamins do I need?

List of vitamins

- **Vitamin A**
 - Chemical names (vitamin) - retinol, retinal, and four carotenoids (including **beta carotene**).

- Fat soluble
- Deficiency may cause night-blindness and keratomalacia (eye disorder that results in a dry cornea)
- Good sources include: liver, cod liver oil, carrot, broccoli, sweet potato, butter, kale, spinach, pumpkin, collard greens, some cheeses, egg, apricot, cantaloupe melon, milk.

- **Vitamin B₁**

- Chemical name (vitamin) - thiamine
- Water soluble
- Deficiency may cause beriberi, Wernicke-Korsakoff syndrome
- Good sources include: yeast, pork, cereal grains, sunflower seeds, brown rice, whole grain rye, asparagus, kale, cauliflower, potatoes, oranges, liver, and eggs.

- **Vitamin B₂**

- Chemical name (vitamin) - riboflavin
 - Water soluble
 - Deficiency may cause ariboflavinosis
 - Good sources include: asparagus, bananas, persimmons, okra, chard, cottage cheese, milk, yogurt, meat, eggs, fish, and green beans.

- **Vitamin B₃**

- Chemical names (vitamin) - niacin, niacinamide - Water soluble
 - Deficiency may cause pellagra
 - Good sources include: liver, heart, kidney, chicken, beef, fish (tuna, salmon), milk, eggs, avocados, dates, tomatoes, leafy vegetables, broccoli, carrots, sweet potatoes, asparagus, nuts, whole grains, legumes, mushrooms, and brewer's yeast.

- **Vitamin B₅**

- Chemical name (vitamin) - pantothenic acid
 - Water soluble
 - Deficiency may cause paresthesia
 - Good sources include: meats, whole grains (milling may remove it), broccoli, avocados, royal jelly, fish ovaries.

- **Vitamin B₆**

- Chemical names (vitamin) - pyridoxine, pyridoxamine, pyridoxal
 - Water soluble
 - Deficiency may cause **anemia**, peripheral **neuropathy**
 - Good sources include: meats, bananas, whole grains, vegetables, and nuts. When milk is dried it loses about half of its B₆. Freezing and canning can also reduce content.

- **Vitamin B₇**

- Chemical name (vitamin) - biotin
 - Water soluble
 - Deficiency may cause dermatitis, enteritis
 - Good sources include: egg yolk, liver, some vegetables.

- **Vitamin B₉**
 - Chemical names (vitamin) - **folic acid**, folinic acid
 - Water soluble
 - Deficiency may cause pregnancy deficiency linked to birth defects
 - Good sources include: leafy vegetables, legumes, liver, baker's yeast, some fortified grain products, sunflower seeds. Several fruits have moderate amounts, as does beer.
- **Vitamin B₁₂**
 - Chemical names (vitamin) - cyanocobalamin, hydroxycobalamin, methylcobalamin
 - Water soluble
 - Deficiency may cause megaloblastic anemia
 - Good sources include: fish, shellfish, meat, poultry, eggs, milk, and dairy products. Some fortified cereals and soy products, as well as fortified nutritional yeast.

Vegans are advised to take B₁₂ supplements.⁴
- **Vitamin C**
 - Chemical names (vitamin) - ascorbic acid
 - Water soluble
 - Deficiency may cause megaloblastic anemia
 - Good sources include: fruit and vegetables. The Kakadu plum and the camu camu fruit have the highest vitamin C contents of all foods. Liver also has vitamin C.
- **Vitamin D**
 - Chemical names (vitamin) - ergocalciferol, cholecalciferol
 - Fat soluble
 - Deficiency may cause **rickets**, osteomalacia
 - Good sources: produced in the skin after exposure to ultraviolet B light from the sun or artificial sources. Also found in fatty fish, eggs, beef liver, and mushrooms.
- **Vitamin E**
 - Chemical names (vitamin) - tocopherols, tocotrienols
 - Fat soluble
 - Deficiency is uncommon. May cause mild hemolytic anemia in newborns
 - Good sources include: kiwi fruit, almonds, avocado, eggs, milk, nuts, leafy green vegetables, unheated vegetable oils, wheat germ, and wholegrains.
- **Vitamin K**
 - Chemical names (vitamin) - phyloquinone, menaquinones
 - Fat soluble
 - Deficiency may cause bleeding diathesis
 - Good sources include: leafy green vegetables, avocado, kiwi fruit. Parsley contain a lot of vitamin K.

The US **National Library of Medicine** says that the best way to get enough vitamins for good health is to follow a balanced diet with a wide range of foods. Some people may need to take a daily multivitamin.