**Vitamins – an essential nutrient**

A **vitamin** is an [organic compound](https://en.wikipedia.org/wiki/Organic_compound) and an essential [nutrient](https://en.wikipedia.org/wiki/Nutrient) that an [organism](https://en.wikipedia.org/wiki/Organism) requires in limited amounts. An organic chemical compound (or related set of compounds) is called a vitamin when the organism cannot [synthesize](https://en.wikipedia.org/wiki/Biosynthesis) the compound in sufficient quantities, and it must be obtained through the diet.

Vitamins are classified as either [water](https://en.wikipedia.org/wiki/Water)-soluble or [fat-soluble](https://en.wikipedia.org/wiki/Lipophilicity). In humans there are 13 vitamins: 4 fat-soluble (A, D, E, and K) and 9 water-soluble (8 B vitamins and vitamin C). Water-soluble vitamins dissolve easily in water and, in general, are readily excreted from the body, to the degree that urinary output is a strong predictor of vitamin consumption. Because they are not as readily stored, more consistent intake is important. Fat-soluble vitamins are absorbed through the [intestinal tract](https://en.wikipedia.org/wiki/Intestinal_tract) with the help of [lipids](https://en.wikipedia.org/wiki/Lipid) (fats). Because they are more likely to accumulate in the body, they are more likely to lead to [hypervitaminosis](https://en.wikipedia.org/wiki/Hypervitaminosis) than are water-soluble vitamins.

**Requirement**

Age, exercise, pregnancy and breastfeeding, dink and tobacco, dietary habit, digestion, climate, medication.

**Provitamin**

A **provitamin** is a substance that may be converted within the body to a [vitamin](https://en.wikipedia.org/wiki/Vitamin). The term "provitamin" is used when it is desirable to label a substance with little or no vitamin activity, but which can be converted to an active form by normal [metabolic](https://en.wikipedia.org/wiki/Metabolism) processes. For example, "provitamin A" is a name for [β-carotene](https://en.wikipedia.org/wiki/Beta-Carotene), which has only about 1/6 the biological activity of [retinol](https://en.wikipedia.org/wiki/Retinol) ([vitamin A](https://en.wikipedia.org/wiki/Vitamin_A)). More examples: Provitamin [D2](https://en.wikipedia.org/wiki/Vitamin_D) is [ergosterol](https://en.wikipedia.org/wiki/Ergosterol), and provitamin D3 is [a form of cholesterol](https://en.wikipedia.org/wiki/7-dehydrocholesterol), microorganisms in the intestine — commonly known as "[gut flora](https://en.wikipedia.org/wiki/Gut_flora)" — produce vitamin K and biotin, while one form of vitamin D is synthesized in the [skin](https://en.wikipedia.org/wiki/Skin) with the help of the natural [ultraviolet](https://en.wikipedia.org/wiki/Ultraviolet) wavelength of [sunlight](https://en.wikipedia.org/wiki/Sunlight). Humans can produce some vitamins from precursors they consume. Examples include [vitamin A](https://en.wikipedia.org/wiki/Vitamin_A), produced from [beta carotene](https://en.wikipedia.org/wiki/Beta_carotene), and [niacin](https://en.wikipedia.org/wiki/Niacin), from the [amino acid](https://en.wikipedia.org/wiki/Amino_acid) [tryptophan](https://en.wikipedia.org/wiki/Tryptophan).

**Deficiencies**

A **vitamin deficiency** can cause a disease or syndrome known as an **avitaminosis** (complete deprivation) or **hypovitaminosis** (deficient quantity).

Humans must consume vitamins periodically but with differing schedules, to avoid [deficiency](https://en.wikipedia.org/wiki/Vitamin_deficiency). The [body's](https://en.wikipedia.org/wiki/Human_body) stores for different vitamins vary widely; vitamins A, D, and B12 are stored in significant amounts, mainly in the [liver](https://en.wikipedia.org/wiki/Liver), and an adult's diet may be deficient in vitamins A and D for many months and B12 in some cases for years, before developing a deficiency condition. However, vitamin niacin and niacinamide is not stored in significant amounts, so stores may last only a couple of weeks. For vitamin C, the first symptoms of [scurvy](https://en.wikipedia.org/wiki/Scurvy) in experimental studies of complete vitamin C deprivation in humans have varied widely, from a month to more than six months, depending on previous dietary history that determined body stores.

Deficiencies of vitamins are classified as either primary or secondary. A primary deficiency occurs when an organism does not get enough of the vitamin in its food. A secondary deficiency may be due to an underlying disorder that prevents or limits the absorption or use of the vitamin, due to a "lifestyle factor", such as smoking, excessive alcohol consumption, or the use of medications that interfere with the absorption or use of the vitamin. An underlying disorder may be metabolic as in a defect converting tryptophan to niacin.

Well-known human avitaminosis involve thiamine ([beriberi](https://en.wikipedia.org/wiki/Beriberi)), niacin ([pellagra](https://en.wikipedia.org/wiki/Pellagra)), vitamin C ([scurvy](https://en.wikipedia.org/wiki/Scurvy)), and vitamin D ([rickets](https://en.wikipedia.org/wiki/Rickets)).

**Hypervitaminosis**

**Hypervitaminosis** is a condition of abnormally high storage levels of [vitamins](https://en.wikipedia.org/wiki/Vitamin), which can lead to [toxic](https://en.wikipedia.org/wiki/Toxicity) [symptoms](https://en.wikipedia.org/wiki/Symptom). Hypervitaminoses are primarily caused by fat-soluble vitamins ([D](https://en.wikipedia.org/wiki/Vitamin_D), [E](https://en.wikipedia.org/wiki/Vitamin_E), [K](https://en.wikipedia.org/wiki/Vitamin_K) and [A](https://en.wikipedia.org/wiki/Vitamin_A)), as these are stored by the body for longer period than the water-soluble vitamins. Generally, toxic levels of vitamins stem from [high supplement intake](https://en.wikipedia.org/wiki/Megavitamin_therapy) and not from natural food. Toxicities of fat-soluble vitamins can also be caused by a large intake of highly [fortified](https://en.wikipedia.org/wiki/Food_fortification) foods. In the European Union the European Food Safety Authority has set ULs (Tolerable upper intake levels).

**Anti-vitamins**

Anti-vitamins are chemical compounds that inhibit the absorption or actions of vitamins. For example, [avidin](https://en.wikipedia.org/wiki/Avidin) is a protein in raw egg whites that inhibits the absorption of [biotin](https://en.wikipedia.org/wiki/Biotin); it is deactivated by cooking. Medication can be a anti-vitamin. For example, the birth control pill destroyed vitamin B6.