

<u>Vitamin</u>	<u>Functions</u>	<u>Sources</u> Plant-Based*	<u>Signs of Deficiencies</u>	<u>Signs of Excessive Intake</u>
<b>A</b> <b>(Retinol)</b>	Promotes skin integrity and healing. Essential for growth, immune function, epithelial cell health, and for night vision and vision in dim light, maintains soft mucous tissue.	Can be formed in the body from its precursor (beta-carotene), found in cabbage, carrots, kale, lettuce, broccoli, spinach, squash, pumpkin, papaya, mango, melon, guava, grapefruit, tomato, yellow/red fruits, orange/yellow vegetables.	Deficiency can lead to: Stunted growth; Night blindness; Xerophthalmia (dry, ulcerated eyes); Keratomalacia (dry, ulcerated eyes); Defective dental development; Skin Disorders.	Early indications of excess vitamin A can include dry skin and itching. Vitamin A can be stored in the body in such large quantities that it can become toxic. Symptoms may include: dizziness, nausea, headaches and vomiting.
<b>B1</b> (Thiamin, Aneurine)	Brain development and fxn, promotes normal metabolism, appetite, digestion and growth, turns carbs into energy and fat, vital in the complex process of converting fatty acids into proteins and enzymes; both of which enhance our ability to digest certain foods.	Green peas, beet greens, potatoes, asparagus, acorn squash, Brussels sprouts, yeast, soybeans, navy beans mung beans, Brazil nuts, macadamia and pistachio nuts, sunflower, sesame, and chia seeds, legumes, whole wheat.	Moderate deficiency may induce anxiety, depression and irritability.  Extreme deficiency can lead to the disease "Beriberi"-involving nerve inflammation, muscular weakness and, in extreme cases, heart failure.	Excessive doses (possibly by injection) may lead to toxic symptoms such as: Allergic reactions; Disturbance of heart beat; Nervousness; Shaking and Swellings.
<b>B2</b> <b>(Riboflavin)</b>	Production of acetylcholine, noradrenaline, serotonin (neurotransmitters essential to the brain); Release of energy from carbohydrates; Synthesis of arachidonic acid, linoleic acid and linolenic acid (essential fatty acids); Tissue respiration.	Soybeans, spinach, beet greens, collard greens, asparagus, almonds, pistachios, mushrooms, sesame, sunflower and chia seeds, pumpkin and squash seeds.	Deficiency can lead to: Ariboflavinosis; Dizziness; Eczema; Insomnia; Oversensitivity to light; Scaly Scalp.	Overdose is unlikely but extremely large doses are associated with numbness and itching.
<b>B6</b> <b>(Pyridoxine)</b>	Maintains healthy skin and nerves, may help with memory, formation of red blood cells and hormones essential for brain fxn, helpful for cardiovascular health, synthesis and breakdown of amino acids, Resistance to disease, fights signs of premature aging.	Green vegetables, spinach, onions, winter squash, sweet potatoes, potatoes, sunflower seeds, bananas, raisins, tofu, whole grains.	Rare, but can lead to: Loss of appetite; Anaemia; Fatigue; Nervousness; Insomnia; Memory problems; Menstrual problems.	Excessive intake can lead to poisoning and damage to the central and peripheral nervous systems, especially the sense of touch.

<b>B7 (Biotin)</b>	Helps with breakdown of sugars, maintains already-healthy blood sugar levels, helps strengthen skin, hair and nails.	Almonds, bananas, carrots, cauliflower, cucumber, grapefruit, oats, onions, peanuts, straw and raspberries, tomato, watermelon.	Hair loss, scaly red rash, depression, lethargy, hallucination, numbness, tingling extremities.	Loss of appetite, excessive salivation, profuse sweating and difficult digestion.
<b>B9 (Folic Acid)</b>	Production of red blood cells, synthesis of DNA (controls heredity, guides cells in daily activities). Helps w/ tissue growth and cell fxn. Used in pre-conception and in pregnancy may prevent select defects.	Black-eyed peas, most beans, green leafy vegetables (spinach, turnip greens, etc.), asparagus, broccoli, cauliflower, cos or Romaine lettuce, nuts, avocado, whole grains, mango, guava, kiwi, papaya, pomegranate.	Megaloblastic anaemia (includes several types of anaemia); Apathy / Depression; Dizziness; Dull grey-looking skin.	
<b>B12 (Cyanocobalamin)</b>	Functions as a coenzyme and aids in the synthesis of DNA and RNA, maintenance of myelin in the nervous system, correct fxn of Vit B9 (Folic Acid).	(Derived from a bacteria found on food—may be in organic soil, unwashed raw mushrooms grown in manure enriched compost, fortified cereals, Brewer's yeast, soya milks, Vecon vegetable stock.)**	Affects most body tissues, especially those containing rapidly dividing cells; Pernicious anaemia; Degeneration of the nervous system (incl. loss of sensation and poor co-ordination); Tongue infections.	
<b>C (Ascorbic Acid)</b>	Antioxidant properties to maintain healthy connective tissue and integrity of cell walls, integral in formation of collagen, cartilage, muscle, and blood vessels. Improves resistance to infections, promotes healthy function of phagocytes (a type of white blood cell), May reduce allergic rxns by inhibiting action of histamine. Helps maintain capillaries, bones, teeth, and aids in the absorption of iron.	Citrus fruits (pineapple, oranges, kiwi, strawberries, etc), peaches, guavas, lemons, sweet peppers, potatoes, tomatoes, cauliflower, cabbage, broccoli, green leafy vegetables (spinach, lettuce, etc.).	Mild deficiency: Tender joints; Soft/Bleeding gums; Reduced immunity to diseases; Weakness.  Extreme Deficiency: Scurvy.	Sudden high intake of vitamin C can cause diarrhoea. Very high dosage can lead to stomach problems in some people.
<b>D</b>	Critical to digest, absorb and utilize calcium and phosphorus (from the intestine and deposits them in the bone), Important in formation, function, and health of normal bone and tooth structures, regulates permeability of cell membranes.	Ergocaldiferol (Vit D2) from plant sources: mushrooms.  Cholecalciferol (Vit D3) is produced by the action of sunlight on 7-dehydrocholesterol, which is in the skin. Enjoy 20 –60 minutes of ultraviolet B sun-rays per day on 50-75% of unclothed body. The darker the skin type the more the need for UVB rays. If over 50, you may need twice the sunshine as your younger counterpart.**	Deficiency may be due to poor diet or to insufficient sunlight and can lead to:  Decalcified bones; Rickets (in children); Problems in dental development (in children); Osteomalacia (in adults); Muscle weakness and cramps; Osteoporosis - if deficiency over extended period of time.	Over-calcification of the bones and teeth; Formation of calculus stones in the kidneys and other organs; Hardening of arteries.  In cases of extreme over-dose, vitamin D may lead to poisoning. Symptoms may include: General discomfort; Itchy eyes and skin; Extreme thirst; Diarrhoea.

<b>E</b> <b>(Tocopherols and Tocotrienols)</b>	An antioxidant to combat free radicals. Muscle development, production of red blood cells, and reproductive functions.	Spinach, asparagus, broccoli, soya beans, sweet potatoes, whole grains, avocados, tomatoes, sunflower seeds, hazelnuts, peanuts, almonds, kiwi, mango, peaches.		Some vitamin E can be safely stored in the body but excessive doses may result in stomach problems and diarrhoea.
<b>K</b>	An important antioxidant, protects against oxidation, reduces signs of skin aging, necessary for the formation of prothrombin by the liver for blood clotting.	Leafy greens (kale, collards, spinach, watercress, etc.), asparagus, cabbage, Brussels sprouts, broccoli, scallions, molasses, nuts, seaweed, herbs (basil, sage, thyme, curry), chili powder, cayenne. Also synthesized by bacteria in the large intestines.	Deficiency may lead to: Osteoporosis	Some people with liver diseases cannot tolerate supplements of vitamin K.

\*Plant-based vitamins are often superior to animal-based sources and without the ill effects of animal consumption which is correlated to high rates of chronic disease while the opposite is true for plant-based diets.

A calorie adequate balanced diet, rich in a wide variety of fresh fruit and vegetables, is sufficient to meet a person's nutritional requirements. This table is not all-inclusive and is sourced from multiple resources.

\*\*Due to our sterile environment, we do not consume bacteria the way we used to. Although B12 can be synthesized by some individuals in the gut, many have lost this ability and supplementation may be necessary. Likewise, in colder climates, adequate sunshine exposure might not be viable and Vitamin D supplementation may be considered. Other than Vitamin B12 and Vitamin D, supplements are only recommended short term (after blood work has confirmed a deficiency and in the rare circumstance that a dietary or lifestyle intervention has not proved fruitful). *Always consult with your physician or health care provider before taking any supplements or making any dietary changes.*

**Disclaimer:**

*These statements have not been evaluated by the U.S. Food and Drug Administration. Information is intended for the purpose of education only and is not intended to diagnose, treat, cure or prevent any disease. Before beginning any supplemental or dietary regime, consult a licensed medical physician.*