

## Micronutrients and minerals Chart

Micronutrients/Minerals		
Micronutrient	Sources	Function
<b><u>Boron (B)</u></b>	Green leafy vegetables, nuts, grains, beer, cider, wine, prunes, dates, raisins, honey, nuts, fresh fruit such as grapes and pears, beans.	Used to help with menopausal symptoms as well as maintaining healthy bones, hence its affinity to calcium and magnesium.
<b><u>Calcium (Ca)</u></b>	Almonds, Brazil nuts, broccoli, buchu leaves, cabbage, carob, caviar, cheese, collards, dairy foods, dandelion leaves, pulse, figs, filberts, green leafy vegetables, kale, kelp, milk, molasses, mustard greens, oats, parsley, pau d'arco bark, prunes, salmon, sardines, seafood, sesame seeds, shrimp, soybeans, tofu, turnip greens, valerian root, white oak bark, yogurt. Supplements: Bone meal, calcium amino acid chelate, calcium ascorbate, calcium carbonate, calcium caseinate, calcium citrate hydrate, calcium citrate malate (CCM), calcium gluconate, calcium lactate, di-calcium phosphate, hydroxyapatite, oyster shell, tricalcium phosphate. It has been reported that the most bioavailable form of calcium is calcium citrate malate. <sup>1</sup> Calcium carbonate is similar in bioavailability to milk.	Calcium is needed for so many different functions in the body, from bones, to blood clotting, your muscles, for the formation and maintenance of bones, the development of teeth and healthy gums, for blood clotting, stabilizes many body functions and is thought to assist in bowel cancer. It has a natural calming and tranquilizing effect and is necessary for maintaining a regular heartbeat and the transmission of nerve impulses. It helps with lowering cholesterol, muscular growth, the prevention of muscle cramps and normal blood clotting. Furthermore it also helps with protein structuring in DNA and RNA. It provides energy, breaks down fats, maintains proper cell membrane permeability, aids in neuromuscular activity and helps to keep the skin healthy. Calcium also stops lead from being absorbed into bone. <a href="#">[Top]</a>
<b><u>Chloride (Cl)</u></b>	Table salt, sea salt, kelp, olives, tomatoes, celery.	Production of stomach acid and the transmission of nerve impulses. Helps regulate water balance in cells, acid-base balance and electrolyte balance. Necessary for the production of hydrochloric acid in stomach acid. Required for the absorption of vitamin B12 and iron. Helps stop the growth of microorganisms that enter the stomach. Activates amylases. <a href="#">[Top]</a>
<b><u>Chromium (Cr)</u></b>	Apple peel, banana, beef, beer, blackstrap molasses, brewer's yeast, brown sugar, butter, calves' liver, cheese, chicken, corn, dairy products, dried beans, eggs, fish, liver, meat, mushrooms, oatstraw, oysters, potatoes with skin, seafood, shell fish, Stevia leaves, whole grains. Supplements: chromium picolinate,	Stimulates enzymes involved in glucose metabolism, and improves the effectiveness of insulin in its relationship with glucose. It competes with iron to transport protein in the blood and is involved in RNA-protein binding ability. Chromium is poorly absorbed (5% bioavailability). It is stored in the spleen, testicles, kidneys, pancreas, heart, lungs, and brain. Helps stabilize nucleic acids (DNA and RNA) against structural changes. Helps

	chromium nicotinate, chromium nicotinate, chromium (III) chloride hexahydrate, chromium amino acid chelate, GTF chromium.	stimulate the synthesis of fatty acids and cholesterol in the liver.  <a href="#">[Top]</a>
<b><u>Cobalt (Co)</u></b>	Beet greens, buckwheat, cabbage, clams, pulse, figs, goldenseal, Irish moss, kelp, kidney, lettuce, liver, milk, oysters, pau d'Arco, sarsaparilla, spinach, watercress.	Cobalt is an important element in the formation of cobalamin or vitamin B12. It is not easily assimilated in the body and is stored in red blood cells, liver, plasma, spleen, kidney, and pancreas. Promotes RBC formation. Activates enzymes, replaces zinc in some enzymes.  <a href="#">[Top]</a>
<b><u>Copper (Cu)</u></b>	Alfalfa, almonds, avocados, baker's yeast, barley, beans, beet roots, black pepper, blackstrap molasses, Brazil nuts, broccoli, cashews, cocoa, crab, dandelion leaves, garlic, grapes, green leafy vegetables, green olives, haddock, hazelnuts, herring, honey, horsetail, lentils, liver, lobster, molasses, mushrooms, mussels, nuts, oats, oranges, oysters, peanuts, pecans, radishes, raisins, sage, salmon, skullcap, seafood, sesame seeds, shrimp, soybeans, sunflower seeds, walnuts, wheat bran, wheat germ, white oak bark, yucca. Copper aspartate, copper gluconate (used in mouth deodorants), copper amino acid chelate, copper sulfate.	Copper is absorbed into the intestine and quickly moves to the blood stream. It is stored in the liver, kidneys, heart, brain, muscles, and bones. Copper aids in the formation of bones, conversion of iron into hemoglobin, and works with zinc and vitamin C for the production of elastin. It is necessary for the production of RNA, phospholipids, protein metabolism and adenosine triphosphate (ATP). Copper helps convert tyrosine into a pigment that colors the skin and hair. It is involved in the healing process, taste, healthy nerves, and the formation of collagen. Copper imbalance raises cholesterol by destroying proper HDL to LDL balance. Critical for metabolizing iron; plays a role in connective tissue formation (i.e.-muscle and blood vessels); protein synthesis. Necessary for the absorption & utilization of Iron; helps oxidize Vitamin C and works with Vitamin C to form Elastin, a chief component of the Elastin muscle fibers throughout the body; aids in the formation of red blood cells; helps proper bone formation & maintenance.  <a href="#">[Top]</a>
<b><u>Fluoride (F)</u></b>	Fluoridated water, apples, calves' liver, cheese, cod, eggs, kidneys, meat, salmon, sardines, seafood, seaweed, sodium fluoride, tea, toothpaste, seaweed.	Confers resistance to tooth decay. Fluorine is present in almost all tissue, especially the teeth and bones. It is absorbed in the intestines, transported in the blood stream, stored in teeth and bones. Fluorine increases the bioavailability of calcium and helps to buffer acids present in the mouth. Helps prevent dental caries in children; Interferes with the growth and development of bacteria that causes dental plaque.  <a href="#">[Top]</a>
<b><u>Iodine (I)</u></b>	Asparagus, chard, cod, cod-liver oil, pulse, garlic, haddock, herring, iodized salts, Irish moss, kelp, lima beans, lobster, mushrooms, oysters, salmon, sea salt, seafood, seaweed, sesame	Iodine is important for the development and proper function of the thyroid. It helps to metabolize fats, promotes growth, and regulates the production of energy. It is absorbed in the intestinal tract and is transported through the bloodstream to the thyroid

	seeds, shrimp, soybeans, spinach, squash, sunflower seeds, turnip greens.	were it becomes iodized and converted into thyroxin. Iodine is essential for absorption of carbohydrates, hair, mental health, nails, proper balance of cholesterol, proper metabolism, skin, speech, teeth, the conversion of carotene to vitamin A, and the synthesis of protein by ribosomes.  <a href="#">[Top]</a>
<b><u>Iron (Fe)</u></b>	Almonds, avocados, beans, beef, beets, blue cohosh, bran, brewer's yeast, broccoli, butchers broom, cashews, caviar, cheddar cheese, chickweed, cocoa, dates, devil's claw, dried fruit, pulse, eggs, egg yolk, garbanzo beans, green leafy vegetables, spinach, heart, kelp, kidneys, legumes, lentils, liver, millet, molasses, mullein, mussels, oysters, parsley, peaches, pears, pennyroyal, pistachios, potatoes, poultry, prunes, pumpkins, raisins, rice, seaweed, sesame seeds, soybeans, sunflower seeds, tongue, walnuts, wheat bran, wheat germ, whole grains. Supplements: Ferric citrate, ferrous fumarate, ferrous gluconate, ferrous salt of gluconic acid, ferrous succinate, ferrous sulfate, iron amino acid chelate.	Iron plays an important role in the production of hemoglobin with protein and copper and oxygenation of red blood cells and lymphocytes. Iron improves the function of enzymes in protein metabolism and enhances the functions of calcium and copper. It is absorbed in the small intestine and stored in the liver, spleen, bone marrow, and blood. Iron is needed to metabolize B vitamins.  <a href="#">[Top]</a>
<b><u>Lithium (Li)</u></b>	Sugarcane, seaweed, natural mineral waters, tobacco. Supplements: Lithium Carbonate, Lithium Chloride, Lithium Citrate, Lithium Sulfate.	It is not yet known what particular function of lithium may make it an essential nutrient. It is thought to stabilize serotonin transmission in the nervous system; it influences sodium transport; and it may even increase lymphocytic (white blood cell) proliferation and depress the suppressor cell activity, thus strengthening the immune system. There is also speculation that lithium is in some way involved in cancer genesis or prevention.  <a href="#">[Top]</a>
<b><u>Magnesium (Mg)</u></b>	Almonds, barley, blackstrap molasses, bluefish, brewer's yeast, buckwheat, carp, cocoa, cod, cottonseed, figs, flounder, garlic, green leafy vegetables, halibut, herring, Irish moss, kelp, licorice, lima beans, meat, mackerel, millet, molasses, nettle, nuts, oat straw, oats, peaches, peanut butter, peanuts, peas, perch, seafood, sesame seeds, shrimp, snails, soybeans, sunflower seeds, swordfish, tofu, wheat, wheat bran, wheat germ, whole grains. Supplements: Dolomite, magnesium amino acid chelate, magnesium ascorbate, magnesium gluconate,	Plays an important role in regulating the neuromuscular activity of the heart; maintains normal heart rhythm; necessary for proper calcium & Vitamin C metabolism; converts blood sugar into energy. Magnesium is vital for many metabolic functions such as the activation of enzymes for proper metabolism of protein and carbohydrates for energy production. It is a constituent of bones and teeth and is important for the metabolism of phosphorus, calcium, potassium, sodium, B-complex vitamins, and vitamins C and E. Magnesium is absorbed in the small intestine and vitamin D is necessary for proper utilization of the mineral. Necessary in the production of testosterone and progesterone. It is essential for

	magnesium oxide.	normal heart beat, nerve transmission, bone growth, body temperature, and arterial health. Magnesium, in proper balance with calcium, is important for neuromuscular contractions and is vital for DNA and RNA production. Helpful in stroke prevention.  <a href="#">[Top]</a>
<b><u>Manganese (Mn)</u></b>	Avocados, barley, beans, bilberry fruit, blackberries, blackstrap molasses, blueberries, bran, brown rice, buckwheat, buchu leaves, chestnuts, cloves, coffee, egg yolks, ginger, grapevine, green leafy vegetables, hazelnuts, kelp, legumes, nuts, oatmeal, peanuts, peas, pecans, pineapples, red raspberry leaves, rice bran, rice polish, seaweed, seeds, spinach, walnuts, wheat bran, wheat germ, whole grain cereals. Supplements: manganese amino acid chelate, manganese gluconate, manganese sulfate,	A cofactor in many enzyme systems including those involved in bone formation, energy production, and metabolism of protein, carbohydrate, and fat. It is essential for the utilization of choline, thiamine, biotin, and vitamins C and E. It is absorbed in the small intestine and is stored in the bones, liver, kidney, pituitary gland, and pancreas. Manganese is required for choline acetylcholine transfer, enhances smooth muscle relaxation. Promotes normal growth and development, cell function. Manganese helps produce mucopolysaccharides, stimulates the production of cholesterol and is a co-factor in many of the body's enzymes.  <a href="#">[Top]</a>
<b><u>Molybdenum (Mo)</u></b>	Barley, beans, buckwheat, cereal grains, green leafy vegetables, legumes, lentils, lima beans, liver, meats, milk, organ meats, peas, sunflower seeds, whole grains, yeast.	Molybdenum plays an important role in 2 enzymatic reactions. They include aldehyde oxidase which is necessary for the oxidation of fats, and xanthine oxidase necessary for the movement of iron from liver reserves and converting nucleic acid to uric acid (waste product eliminated in the urine). Molybdenum is absorbed through the intestines and stored in the liver, bones, and kidneys. It is required for proper growth and development, the metabolism of fats and nucleic acids, metabolism of nitrogen, copper, and sulfur, and normal cellular functions. Cofactor in enzymatic systems involved in the metabolism of carbohydrates, fats, proteins, sulfur-containing amino acids, nucleic acids (DNA, RNA) and iron. Helps prevent cavities. Cancer-preventative (esophagus, stomach), helps detoxify or eliminate harmful sulfites from the body.  <a href="#">[Top]</a>
<b><u>Phosphorous (P)</u></b>	Beef, bran, cabbage herb, cheese, corn, cocoa, cottonseed, dairy products, dog grass, eggs, fish, fruit, garlic, legumes, liver, meat, nuts, peanuts, poultry, pumpkin seeds, rice polish, squash seeds, soda, soybeans, sunflower seeds, wheat bran, wheat germ, whole grains. Supplements: Ammonium phosphate, bone meal, brewer's yeast, dicalcium phosphate dihydrate,	Phosphorus is important to keep in balance with calcium and magnesium. It plays a role in every metabolic reaction in the body and is important for the metabolism of fats, carbohydrates, and protein for proper growth and production of energy. Phosphorus is absorbed through the intestines, transported in the bloodstream, and stored in the bones and teeth. 70% of ingested phosphorus is absorbed.

	dipotassium phosphate, hydroxyapatite, lecithin, monosodium phosphate, tricalcium phosphate.	<a href="#">[Top]</a>
<b><u>Potassium (K)</u></b>	Almonds, apricots, avocados, bananas, beef, bran, Brazil nuts, brewer's yeast, broccoli, brown rice, cabbage herb, cashews, celery herb, chard, citrus fruit, dairy foods, dates, figs, fish, fruit, garlic, grapefruit juice, green leafy vegetables, guava, legumes, lentils, meat, milk, molasses, nectarine, nuts, oranges, parsley, parsnips, peanuts, peaches, pork, potatoes, poultry, raisins, rice bran, sardines, seaweed, seeds, soybeans, spinach (fresh), squash, sunflower seeds, tomato juice, veal, walnuts, wheat bran, whole grains, yams. Supplements: potassium ascorbate, potassium aspartate, potassium benzoate, potassium carbonate, potassium chloride, potassium gluconate, potassium hydroxide.	<p>Potassium is important for chemical reactions within the cells, and regulates the transfer of nutrients to the cells. Potassium helps to regulate water balance in the body, and the distribution of fluids on both sides of the cell walls. It is an electrolyte needed to maintain fluid balance, normal heartbeat, and nerve transmission. Potassium is absorbed through the intestines and is stored in the cells and kidneys. It is necessary for adrenal glands. Potassium is important for proper muscle contractions, normal blood pressure, growth, nerve impulses, healthy skin, cell metabolism, and enzyme reactions. Potassium increases the metabolism. Helpful in stroke prevention. Antidepressant, antihypertensive, antispasmodic.</p> <p><a href="#">[Top]</a></p>
<b><u>Selenium (Se)</u></b>	Barley, beer, blackstrap molasses, bran, Brazil nuts, brewer's yeast, broccoli, brown rice, buchu leaves, butter, cabbage, catnip, celery, cereals, chicken, cider vinegar, cinnamon, clams, crab, cucumbers, dairy products, dog grass, eggs, garlic, grains, green leafy vegetables, hibiscus, ho shou wu root, kidneys, lamb, liver, lobster, meats, milk, milk thistle seeds, molasses, mushrooms, nutmeg, nuts, oats, onions, seafood, Swiss chard, tuna, turnips, wheat bran, wheat germ, whole grains. Supplements: selenium ascorbate, selenium amino acid chelate.	<p>Selenium is an antioxidant that protects vitamin E from degradation. It helps to build the immune system by destroying free radicals, and aid in the production of antibodies. Selenium is absorbed through the intestines and stored in the liver, kidneys, and muscles. The lower the selenium intake the higher the incidents of cancer. Selenium fortifies heart energy cells, making sure they get enough oxygen. Selenium helps eliminate arsenic. Helpful in stroke prevention. Helps protect against the effects from arsenic, cadmium and mercury. Component of glutathione peroxidase, protecting tissues from the effects of polyunsaturated fatty acid oxidation.</p> <p><a href="#">[Top]</a></p>
<b><u>Silicon (Si)</u></b>	Alfalfa, beets, bell peppers, brown rice, pulse, Echinacea root, eyebright herb, goldenseal root, green leafy vegetables, horsetail grass, liver, mother's milk, soybeans, whole grains.	<p>Anti-arteriosclerotic. Silicon is needed for bone structure, growth, and connective tissue production of collagen. Silicon is important for healthy nails, skin, hair, and bone formation. It is needed to maintain healthy arteries and prevents cardiovascular disease. It counteracts the effects of aluminum toxicity and improves calcium intake.</p> <p><a href="#">[Top]</a></p>
<b><u>Sodium (Na)</u></b>	Anchovies, bacon, beef, bologna, bran, butter, Canadian bacon, clams, corned beef, pulse, green beans, green olives, ham, Irish moss, kelp, margarine, meat, milk, poultry, rose hips, salt, sardines,	<p>Sodium is necessary for proper water balance in the body, transition of fluids across cell walls, and proper blood pH. Sodium works in conjunction with potassium for extracellular fluid balances. Sodium is easily absorbed in the small intestine and stomach</p>

	seafood, tomatoes. Supplements: Baking soda, monosodium glutamate, sodium ascorbate, sodium chloride.	and transported through the blood to the kidneys where it is filtered out of the body. Sodium is important for proper digestion in the stomach, nerve function, and muscle contractions. Also helps keep the blood soluble, and aids in the cleansing process of carbon dioxide from the body.  <a href="#">[Top]</a>
<b><u>Strontium (Sr)</u></b>	Trace amounts in foods from plant and animal sources.	Strontium may be essential for proper bone growth. May help prevent tooth decay.  <a href="#">[Top]</a>
<b><u>Sulfur (S)</u></b>	Beans, brussels sprouts, cabbage, clams, dairy products, eggs, fish, garlic, meat, milk, onions, soybeans, taurine, turnips, wheat. Supplements: glutathione, horsetail herb, kale, L-cysteine, L-cystine, L-lysine, L-methionine, methylsulfonylmethane (MSM).	Sulfur is found in the amino acids cysteine, cystine and methionine. Sulfur is also found in cells, hemoglobin, collagen, keratin, insulin, heparin, hair, skin, nails, among many other biological structures. Sulfur is necessary for synthesizing collagen. It is required for the metabolism of several vitamins including thiamine, biotin and pantothenic acid. It is also required for cellular respiration. Sulfur is a component of biotin, insulin, glutathione, thiamine, coenzyme A. Helps in carbohydrate metabolism, helps detoxify by converting toxins to nontoxic forms. Sulfur aids in bile secretion in the liver.  <a href="#">[Top]</a>
<b><u>Zinc (Zn)</u></b>	Beans, beef, bilberry fruit, black strap molasses, brewer's yeast, buchu leaves, capsicum fruit, chicken heart, crab, egg yolk, fish, herring, lamb, legumes, liver, maple syrup, meats, milk, oysters, peanuts, pork, poultry, pumpkin seeds, skullcap herb, seafood, sesame seeds, soybeans, sunflower seeds, turkey, wheat bran, wheat germ, whole grains, yeast. Supplements: Zinc aspartate, zinc gluconate, zinc oxide, zinc picolinate, zinc sulfate.	Zinc is important for absorption and action of B-complex vitamins. It is required for protein synthesis, collagen formation, healthy immune system, and the ability of the body to heal from wounds. Zinc is absorbed in the small intestine and is stored in the liver, eyes, kidneys, pancreas, bones, muscles, prostate gland, sperm, nails, skin, hair, and white blood cells. Zinc inhibits 5-alpha reductase from converting testosterone into dihydrotestosterone (DHT) a form of testosterone that promotes prostate growth. Zinc increases testosterone, and sperm count. If a zinc deficiency exists sex drive is reduced in order to conserve the zinc (zinc is concentrated in semen). Zinc is involved in protein synthesis, muscle contraction, formation of insulin, maintaining acid-base balance, synthesis of DNA, brain functions. Excessive sweating leads to loss of up to 3 mg per day.