

Vegetarian Sources for Various Nutrients and Food Elements

by Rose (Mirabai) Lord

Nutrient/Food Element: Vitamin A

Vegetarian Sources: In vegetarian diets most of the vitamin A is actually converted from beta carotene, the substance that gives orange and yellow vegetables their color. Obviously some of the best sources are orange and yellow vegetables (squash, carrots, pumpkin, sweet potatoes). Other sources include many green vegetables (spinach, broccoli, bok choy, beet and dandelion greens), fruits (tomato, cantaloupe, mango, papaya, apricots), dried dunaliella, spirulina, wild blue green

Role in the Body: Metabolism of protein; Vitamin A is essential for vision, growth, cell differentiation and proliferation, reproduction and the integrity of the immune system. It works as an antioxidant and is linked to cancer prevention and cure.

Results of Deficiency or Excess: Lack of vitamin A causes night blindness. Deficiency symptoms include dryness of the skin and mucosa, dandruff, allergies and the loss of a sense of smell. Massive doses of preformed vitamin A can result in vitamin toxicity with symptoms of bone and joint pain, fatigue and insomnia, hair loss, cracking of the lips, loss of appetite with resultant weight loss and enlargement of the liver. To consume enough vitamin A to cause this state of toxicity one would have to take about 50,000 IU a day (five standard capsules) for a prolonged period of time.

Amount Needed: Adult men and women - 4000-5000 IU/day

Availability Affected By: The chlorophyll in green vegetables enhances the absorption of vitamin A

Nutrient/Food Element: Vitamin B1 (Thiamin)

Vegetarian Sources: Breads, cereals and grains - particularly bran, oatmeal, barley, wheat germ; also peas, potatoes, squash, orange juice, legumes, sunflower seeds, tahini, brewer's yeast, seaweeds (nori and wakame)

Role in the Body: Thiamin is required for the metabolism of carbohydrates

Results of Deficiency or Excess: Mild thiamin deficiency can result in nervousness and anxiety. The deficiency disease, beri-beri, a disease of the nervous system, is a result of thiamin deficiency. Early symptoms consist of pins and needles in

the legs. Advanced cases involve a wasting away and, eventually, near paralysis of the limbs. Wernicke-Korsakoff syndrome, a degenerative brain disease, is also associated with thiamin deficiency. Symptoms include an unsteady, staggering gait, apathy and disorientation.

Amount Needed: 1.0 mg/day

Availability Affected By: Absorption of vitamin B1 is inhibited by caffeic acid, tannic acid, raw fish, tea, beetle nuts, blueberries and red cabbage

Nutrient/Food Element: Vitamin B2 (Riboflavin)

Vegetarian Sources: Green leafy vegetables, broccoli and mushrooms, sea vegetables, cheese and dairy, whole and enriched grains and cereals, brewer's yeast, soymilk, almonds and sunflower seeds

Role in the Body: Riboflavin is required for energy metabolism, maintenance of healthy skin and mucous membrane, especially the mouth and eyes.

Results of Deficiency or Excess: A deficiency of Riboflavin results in cracking at the corners of the mouth and changes in the tongue and mucous membrane of the mouth. Sensitivity to light may also occur.

Amount Needed: 0.6 mg/ each 1000 calories consumed per day

Availability Affected By: Riboflavin from plants appears to be somewhat less easily absorbed than riboflavin from animal products. Boiling vegetables causes a substantial amount to be lost in the water. Milling of grains such as rice and whole wheat also depletes this nutrient. Vegetarians should eat plenty of raw vegetables and whole grains.

Nutrient/Food Element: Vitamin B3 (Niacin)

Vegetarian Sources: Niacin is found in breads and cereals (esp. bran flakes, cheerios, corn flakes, granola, Grape Nuts, Rice Krispies), vegetables (esp. avocados, mushrooms, peas and potatoes), dried peas and beans, peanuts, peanut butter, tempeh, and brewer's yeast.

Role in the Body: Niacin is necessary for the proper metabolism of glucose and fatty acids and for tissue respiration.

Results of Deficiency or Excess: A deficiency of niacin results in pellegra, a disease whose symptoms include dermatitis, diarrhea and dementia.

Amount Needed: 19 and 15 NE (Niacin Equivalents) daily for men and women respectively. *An NE = 1 mg of niacin or 60 mg. of tryptophan.

Availability Affected By: Niacin in grains, particularly corn, is poorly absorbed.

Nutrient/Food Element: Vitamin B6 (Pyridoxine)

Vegetarian Sources: Breads and cereals, potatoes, fruits (especially bananas and figs), brewer's yeast, chick peas, soybeans

Role in the Body: Vitamin B6 is needed for the metabolism of protein. It also appears to help regulate homocysteine, thereby decreasing the risk of heart disease.

Results of Deficiency or Excess: A deficiency of Vitamin B6 will increase the risk of the development of arteriosclerosis. There may also be a connection between B6 deficiency resulting in poor protein metabolism and certain complications of pregnancy such as pre-eclampsia and diabetes occurring during pregnancy.

Amount Needed: 1.6-2.0 mg/day, depending on protein intake. In other words, the higher the protein intake, the more B6 is required.

Availability Affected By: High fiber intake inhibits the absorption of B6. However, high fiber foods are often high in B6 as well, thereby creating a balance.

Nutrient/Food Element: Vitamin B12 (Cobalamin)

Vegetarian Sources: Fortified cereals, fortified soymilk, some meat analogues, milk, yogurt, eggs, nutritional yeast

Role in the Body: maintenance of normal red blood cells, peripheral nerves, spinal cord, cranial nerves and brain tissue

Results of Deficiency or Excess: A deficiency of vitamin B12 causes decreased sensation, difficulty walking, loss of bowel and bladder control, weakness, memory loss, depression, dementia and psychosis.

Amount Needed: Adults - 2 micrograms daily

Availability Affected By: Absorption of vitamin B12 is inhibited by reduced gastric acidity brought on by the aging process and also by large doses (500 mg. or more) of vitamin C.

Nutrient/Food Element: Vitamin C (Ascorbic Acid)

Vegetarian Sources: Citrus juices, strawberries, green peppers, guava, papaya,

kiwi, broccoli, tomatoes

Role in the Body: Vitamin C strengthens the immune system to fight infection. It also plays a role in the formation of collagen and aids in the absorption of iron.

Results of Deficiency or Excess: A deficiency of vitamin C causes scurvy, a disease characterized by inability of the body to heal wounds. A less severe deficiency may cause a generalized inability to fight infection by bacteria, viruses and allergens. It is thought that extremely high doses of vitamin C may affect calcium absorption and can cause the formation of a certain type of kidney stone in some people.

Amount Needed: 60 mg. daily for adults

Availability Affected By: Certain drugs such as birth control pills and aspirin may cause the depletion of vitamin C from the tissues.

Nutrient/Food Element: Vitamin D

Vegetarian Sources: Vitamin D is found in cereals (esp. bran, corn flakes, granola, Grape Nuts), fortified soy or vegetable milks, milk, eggs and margarine. Vitamin D is also produced by the body when a person is exposed to sufficient sunshine. People with light skin require from 10-15 minutes of sunshine per day on the face and hands. People with darker skin need from ½ hour up to 3 hours daily. The darker the skin color, the longer the exposure required.

Role in the Body: Vitamin D regulates calcium - increases blood calcium levels. It may also have a role in cancer prevention and treatment.

Results of Deficiency or Excess: A deficiency of Vitamin D causes rickets - bowed legs, knock knees, curvature of the upper and/or lower arms, swollen joints and enlarged head.

If too much Vitamin D (three times the RDA or greater) is taken over a period of time it can result in hypercalcemia - too much calcium in the blood, which is a serious condition.

Amount Needed: 5.0 micrograms daily for adults

Availability Affected By: The synthesis of Vitamin D is affected by the darkness of the skin, air pollution, the use of sunscreen, the season of the year and latitude.

Nutrient/Food Element: Vitamin E

Vegetarian Sources: Vitamin E. is found in wheat germ, avocados, asparagus, cabbage, mango, almond butter, hazelnuts, sweet potatoes, peanuts, peanut butter, sunflower seeds, vegetable oils (esp. olive and sunflower oils), wheat germ oil, mayonnaise and margarine

Role in the Body: Vitamin E acts as an antioxidant, decreases incidence of heart disease, cancer, cataracts and arthritis. It may also slow the aging process.

Results of Deficiency or Excess: It is suspected that a deficiency in vitamin E may lead to weakness on the cellular level leading to a wide range of problems. When excessive amounts of vitamin E are taken flu symptoms such as nausea and diarrhea, muscle weakness and fatigue may occur. Excessive vitamin E consumption can interfere with iron metabolism and affect the action of certain medications such as anticoagulants and digitalis.

Amount Needed: 0.4 mg per gram of PUFA (polyunsaturated fatty acids) consumed daily. The ingestion of polyunsaturated vegetable oils increases the level of free radical oxygen molecules in the body. Since vitamin E acts as an anti-oxidant, more is required for people who have a diet high in polyunsaturated fats.

Availability Affected By: The amount of vitamin E in the diet is affected by the degree of processing of the foods consumed. Whole grain foods are rich in vitamin E as compared to processed flours and sugar.

Nutrient/Food Element: Vitamin K

Vegetarian Sources: Vitamin K is found in green leafy vegetables (especially broccoli, kale, spinach, cabbage), lentils, split peas and soybean oil.

Role in the Body: Vitamin K is essential to the regulation of blood clotting; it may also have an important role in bone health.

Results of Deficiency or Excess: A lack of vitamin K causes poor blood clotting.

Amount Needed: 65-80 micrograms per day for adults

Availability Affected By: Treatment with broad spectrum antibiotics over a prolonged period of time reduces the bacterial synthesis of vitamin K. People with malabsorption syndrome may suffer from vitamin K deficiency.

Nutrient/Food Element: Calcium

Vegetarian Sources: Calcium is available in calcium-set tofu, milk, soymilk, turnip greens, cabbage, mustard greens, kale, broccoli, sesame seeds, pinto beans, brussel sprouts, figs, seaweeds and okra.

Role in the Body: Calcium is necessary for the maintenance of strong bones; it is involved with muscle contraction and relaxation, blood clotting, transmission of nerve impulses, and absorption of B12.

Results of Deficiency or Excess: Deficiency or poor absorption of calcium causes a loss of bone mass (osteoporosis), kidney stones, muscle and nerve dysfunction, arthritis, tooth and gum problems. Leg cramps are a common symptom of calcium deficiency.

Amount Needed: 1000-1500 mg daily for adults* This is a highly debatable issue in the nutrition field. Some nutritionists would say this amount is high.

Availability Affected By: Calcium absorption is enhanced by vitamin D and estrogen. It is inhibited by coffee, soft drinks, diuretics, excesses of protein - especially meat protein, refined sugar, alcohol, marijuana, cigarettes, excess salt and solanine (found in tomatoes, potatoes, eggplant and bell peppers)

Nutrient/Food Element: Carbohydrates

Vegetarian Sources: milk; legumes (esp. lentils, kidney beans, garbanzo beans), vegetables (esp. spinach, broccoli, carrots, potatoes), grains (esp. wheat, millet, rice, quinoa, oatmeal)

Role in the Body: Carbohydrates are the most efficient source of energy in the diet.

Results of Deficiency or Excess: A lack of adequate carbohydrates in the diet will lead to fatigue with prolonged exercise and lack of stamina.

Amount Needed: 55-75% of the calories in the diet should be derived from carbohydrates.

Nutrient/Food Element: Chloride

Vegetarian Sources: Salt

Role in the Body: Chloride is necessary for the maintenance of fluid and electrolyte balance and is a critical component of gastric juice.

Results of Deficiency or Excess: Electrolyte imbalance leads to weakness, dizziness and confusion.

Amount Needed: An amount equal to sodium consumption. Table salt (sodium chloride) is almost the exclusive source of chloride in the diet. It's loss parallels that of sodium. Therefore, sodium and chloride balance or imbalance go hand in hand.

Nutrient/Food Element: Cholesterol

Vegetarian Sources: Non-meat sources of cholesterol are eggs, dairy products (esp. butter) nuts and oils.

Role in the Body: Cholesterol is used to form the sex and adrenal hormones as well as vitamin D and bile, which is needed for digestion of fat.

Results of Deficiency or Excess: An excess of cholesterol causes arteriosclerotic disease.

Amount Needed: Sufficient cholesterol is produced by the body so that no dietary supply is necessary. Health experts recommend no more than 300 mg total dietary intake per day.

Availability Affected By: Saturated fats greatly increase the manufacture of blood cholesterol. The blood level is reduced by plant fiber (see section on fiber), lecithin, vitamins E and C and niacin.

Nutrient/Food Element: Chromium

Vegetarian Sources: Chromium is found in whole grain products, including ready-to-eat bran cereals, spices, dairy products, fruits and vegetables.

Role in the Body: Chromium potentiates insulin action and thus influences overall metabolism.

Results of Deficiency or Excess: A deficiency of chromium can result in glucose intolerance.

Amount Needed: 50 - 200 micrograms daily in adults

Availability Affected By: The amount of chromium in whole grains is reduced by processing.

Nutrient/Food Element: Copper

Vegetarian Sources: Copper is found in bran flakes, millet, avocados, mushrooms, potatoes, sweet potatoes, tomato juice, soybeans, tempeh, TVP (textured vegetable protein), tofu, nuts, pumpkin or squash seeds, sunflower seeds and tahini

Role in the Body: Essential for proper utilization of iron; maintenance of proper levels of this mineral appears to affect the function of the cardiovascular system; has also been used to treat pulmonary disease.

Results of Deficiency or Excess: A deficiency of copper may increase the risk of

heart and circulatory diseases, while an excess of copper may lead to mental and emotional disturbances.

Amount Needed: 1.5 - 3.0 mg daily

Availability Affected By: A high fiber/phytate diet may depress absorption of copper. Vitamin C at high levels decreases absorption. Also, protein tends to decrease copper requirements while zinc tends to increase copper requirements.

Nutrient/Food Element: Essential Fatty Acids (Omega 3 and Omega 6)

Vegetarian Sources: Flax, canola and soybean oils, flaxseed, walnuts, soybeans, tofu, dark green leafy vegetables, wheat germ (Omega-3); safflower, sunflower, corn, soybean and walnut oils, sunflower, sesame, poppy and pumpkin seeds, walnuts and wheat germ are good sources of essential fatty acids.

Role in the Body: The essential fatty acids are critical to the formation and maintenance of healthy cell membranes; proper development of eye and brain tissue; energy production, metabolism of cholesterol and triglycerides. They also assist in regulation of blood clotting, blood pressure, immune response and reactions to injury.

Results of Deficiency or Excess: Deficiency of Omega 3 and Omega 6 fatty acids in the diets of children may lead to nerve and brain dysfunction and learning disabilities.

Amount Needed: Omega 3 - 2-2 1/2 gm. daily; Omega 6 - 4-8 gm. daily.

Nutrient/Food Element: Non-essential Fatty Acids

Vegetarian Sources: Dairy products, coconut oil and palm oil are high in non-essential fatty acids.

Role in the Body: Fat is the most concentrated source of energy and the main energy store. It provides insulation for the body and protects vital organs as well as aiding in absorption and transportation of the fat soluble vitamins A, D, E, and K.

Results of Deficiency or Excess: Deficiency of fat in the diet, usually only seen in cases of malnutrition and starvation, could lead to poor development in childhood, particularly of the brain tissue. Some people on extremely low fat diets have reported experiencing depression. An excess of fat in the diet can lead to high blood pressure, arteriosclerosis, heart disease and stroke. There is evidence that diets high in fat also increase the risk of certain types of cancer. Obesity resulting from high fat diets exacerbates the development of respiratory problems and diseases of the bones and joints.

Amount Needed: It is recommended that 15-30% of the calories in a person's diet come from fat. Many nutritionists lean toward the lower end of that percentage, especially for people with heart and circulatory diseases.

Nutrient/Food Element: Fiber

Vegetarian Sources: Fiber is found only in plant foods - whole grains, bran, fruits and vegetables, legumes and nuts.

Role in the Body: Fiber cleanses the digestive tract and removes potential carcinogens from the body. Soluble fiber* prevents the absorption of excess cholesterol.

Results of Deficiency or Excess: Insufficient fiber in the diet can lead or contribute to diverticulitis and hemorrhoids, colon cancer, coronary artery disease, rapid rises and falls in blood sugar and weight problems. An excess of fiber in the diet can cause gaseousness and bowel irritability.

Amount Needed: 25-40 gm. of dietary fiber daily

Availability Affected By: Processing or grinding of fiber decreases its protective function. Therefore, fiber supplements are not as effective as dietary fiber.

* Fiber is the indigestible part of foods, the bran in grains, the pulp in fruits and the outer walls of vegetables. There are two kinds of fiber, soluble and insoluble. Soluble forms of fiber dissolve in water, insoluble forms generally do not, but they do attract and soak up water. Both types are present in all plant foods and both types are needed for healthy elimination. A diet rich in grains, fruit and vegetables will provide adequate fiber to cleanse the digestive tract and provide a feeling of fullness that will help prevent overeating and obesity.

Nutrient/Food Element: Flavanoids

Vegetarian Sources: Flavanoids are found in fruits, vegetables and red wine.

Role in the Body: Flavanoids act as antioxidants, neutralizing free radicals.

Results of Deficiency or Excess: Antioxidants reduce the risk of a wide array of diseases including arthritis, cancer and heart disease.

Amount Needed: undetermined

Nutrient/Food Element: Fluorine

Vegetarian Sources: Fluorine is found in goat's milk, seaweed, rice, rye, parsley, avocados, cabbage and black-eyed peas. Herbs high in fluorine include juniper berries, licorice, lemon grass, and some tea plants. Fluoridated drinking water contains sodium fluoride.

Role in the Body: Fluorine helps protect the body from germs and viruses. In combination with organic calcium, fluorine helps the body to form strong bones and teeth.

Results of Deficiency or Excess: A deficiency in fluorine may result in tooth decay. There is some evidence that an excess of sodium fluoride, the chemical that is added to water supplies, can result in improper functioning of the thyroid gland and all enzyme systems, cause damage to the immune system and increase the risk of cancer and other degenerative diseases

Amount Needed: 1.5-4 mg. daily

Nutrient/Food Element: Folate

Vegetarian Sources: Folate is found in cereals (esp. bran flakes, corn flakes, Most, oatmeal, Nutrigrain), asparagus, spinach, orange juice, black beans, lentils and pinto beans.

Role in the Body: Folate facilitates the metabolism of amino acids and synthesis of nucleic acids. It also regulates homocysteine, thereby reducing the risk of heart disease.

Results of Deficiency or Excess: A deficiency of folate may result in macrocytic anemia. It may also cause neural tube disorders in the unborn fetus.

Amount Needed: 200 micrograms daily for men; 180 micrograms daily for women.

Availability Affected By: The availability of folate is affected by adequate iron and vitamin C status.

Nutrient/Food Element: Galactose

Vegetarian Sources: Galactose is found in milk and dairy foods. It is not required for good health.

Role in the Body: Galactose is a sugar, therefore a source of quick energy.

Results of Deficiency or Excess: Diets high in galactose seem to increase the risk of cataracts.

Nutrient/Food Element: Iodine

Vegetarian Sources: Iodine is found in iodized salt, water and seafood in coastal areas and all kinds of seaweed. About 1/3 of a teaspoon of iodized salt per day is sufficient to meet the RDA.

Role in the Body: Iodine is an important component of thyroxin and tri-iodothyrene.

Results of Deficiency or Excess: Lack of iodine causes goiter, an enlargement of the thyroid gland. Deficiency of thyroxin during pregnancy can result in congenital myxedema or cretinism, a disease that is characterized by mental retardation, small stature and bone degeneration.

Amount Needed: 150 micrograms daily for adults.

Nutrient/Food Element: Iron

Vegetarian Sources: Iron is found in bran flakes, whole wheat bread, oatmeal, cream of wheat, squash, brussel sprouts, collard greens, peas, pumpkin, sea vegetables, legumes (esp. garbanzo beans, lentils, soy beans, tofu) and wheat germ

Role in the Body: The role of iron is to transport oxygen to all parts of the body.

Results of Deficiency or Excess: An inadequate intake of iron causes iron deficiency anemia, characterized by pallor, weakness and lack of energy or stamina.

Amount Needed: 10-15 mg. daily for men and women respectively; 10 mg. daily for post-menopausal women.

Availability Affected By: Availability is affected by the amount of iron in the body. In other words, the absorption of iron increases when there is less available. Vitamin C increases the absorption of non-heme iron. Tannic acid in tea, coffee, the calcium in dairy products, and some Indian spices (those containing tannin such as turmeric, coriander, chilies and tamarind) inhibit iron absorption. Fiber and phytate (the stored form of phosphorus) can inhibit iron absorption. Phytate also inhibits the absorption of other minerals such as calcium, magnesium and zinc. However, high fiber/phytate foods are also high in iron and many food preparation processes (presoaking beans, sprouting of seeds or legumes, cooking cereals, roasting nuts and fermentation) activate the phytate breakdown enzymes called phytases, thereby diminishing the mineral binding capacity of phytate. The phytate in wheat bran has a high mineral binding tendency, while the phytate in other high fiber foods such as many raw and prepared fruits and vegetables does not. Variety of food in the diet is an important factor.

Nutrient/Food Element: Isoflavanes, Indoles and Isothiocyanates -

These are but a few of the many phytochemicals that are found only in plant foods. They are not nutrients in that they do not provide calories and are not associated with any deficiency disease. Phytochemicals, of which there are probably thousands, are metabolites (organic compounds produced by metabolism).

Vegetarian Sources: Isoflavones - soybeans; Indoles and Isothiocyanates - cruciferous vegetables

Role in the Body: These substances inhibit the growth of a wide range of cancer cells.

Nutrient/Food Element: Magnesium

Vegetarian Sources: Magnesium is found in whole grains (esp. bran flakes, whole wheat bread, oatmeal, barley, brown rice and wheat germ), vegetables (esp. avocado, beet greens, okra, spinach), soybeans, tofu, nuts (esp. almonds), pumpkin, squash and sunflower seeds.

Role in the Body: Magnesium plays a role in the activation of more than 300 enzymes with very diverse functions.

Results of Deficiency or Excess: A deficiency of magnesium is believed to affect the risk of coronary artery disease, pre-eclampsia in pregnancy and asthma; it may play a role in the control of blood pressure and also in bone health.

Amount Needed: 350 and 280 mg. daily for adult male and females respectively.

Availability Affected By: The absorption of magnesium is decreased by phytate and fiber. (See section on iron.)

Nutrient/Food Element: Manganese

Vegetarian Sources: Manganese is found in bran flakes, brown rice, wheat germ, whole wheat pasta, spinach, pineapple, lentils, tempeh, many other grains, vegetables, fruits, legumes, nuts and seeds.

Role in the Body: Manganese is a cofactor in the metabolism of certain enzymes that aid in the conversion of food to usable energy.

Results of Deficiency or Excess: There is a possible connection between manganese deficiency and schizophrenia. Deficiencies have only been identified

in institutionalized individuals.

Amount Needed: 2-5 mg. daily

Nutrient/Food Element: Molybdenum

Vegetarian Sources: Molybdenum is found in milk, beans, breads and cereals.

Role in the Body: This substance is a cofactor in several enzymes. It may play an important role in the detoxification of foreign compounds.

Results of Deficiency or Excess: An excess of molybdenum may have an adverse effect on copper status. Extremely high intakes are thought to be responsible for gout-like symptoms.

Amount Needed: 75-250 micrograms daily.

Availability Affected By:

Nutrient/Food Element: Pantothenic Acid

Vegetarian Sources: Pantothenic Acid is found in vegetables and many other foods. It is widely distributed in the diet.

Role in the Body: Pantothenic acid plays a role in the release of energy from carbohydrates, the synthesis of glucose and the synthesis and degradation of fatty acids.

Results of Deficiency or Excess: No deficiency or excess has been identified in free-living populations.

Amount Needed: 6 mg daily. The average in the U.S. appears to be quite adequate.

Nutrient/Food Element: Phosphorus

Vegetarian Sources: Phosphorus is found in cereals and beans, additives (particularly those in convenience foods) and soft drinks.

Role in the Body: Phosphorus plays a critical role in bone development and maintenance and the storage and release of energy in the body.

Results of Deficiency or Excess: When phosphorus intake is too high in relation to the amount of calcium consumed (as can be the case with excessive intake of soft drinks), it may have a negative effect on bone health.

Amount Needed: 800 mg. daily for adult men and women.

Availability Affected By: Phosphorus in cereals and beans is not as well absorbed as that in animal sources, the main source of phosphorus in omnivore diets.

Nutrient/Food Element: Potassium

Vegetarian Sources: Potassium is found in grapefruit, bananas, cantaloupe, orange juice, bran flakes; many vegetables, including asparagus, beets, peas, potatoes, spinach, acorn squash, sweet potatoes, stewed tomatoes and tomato juice; legumes, almonds, milk, and yogurt.

Role in the Body: Potassium plays a role in the control of skeletal muscle contractions and nerve impulses. It also balances the metabolic action of sodium, and therefore influences the maintenance of normal blood pressure

Results of Deficiency or Excess: Deficient potassium, relative to sodium, causes weakness, loss of muscle tone and poor reflexes.

Amount Needed: 1600-2000 mg. daily

Availability Affected By: The refining of processed foods removes potassium and the consumption of coffee, alcohol and refined sugar depletes the body of its potassium stores.

Nutrient/Food Element: Protein

Vegetarian Sources: The best vegetarian sources of protein are rice, garbanzo beans, lentils, lima beans, kidney beans, tofu, soymilk, nuts and seeds (esp. peanuts). Other sources include whole grain bread and bagels*, barley, and grains (esp. amaranth and quinoa). For lacto-ovo vegetarians, dairy products provide an excellent source of protein, however, too much animal protein can adversely affect blood calcium levels and therefore bone health.

*Whole grain products are about 14-15% protein, precisely the recommended dietary percentage.

Role in the Body: Protein is needed for the development and maintenance of muscle tissue; it functions as hormones, enzymes, blood components and antibodies and is part of every cell membrane.

Results of Deficiency or Excess: A deficiency of protein causes body tissue deterioration, leading to hemorrhoids, weak muscles and nails, hair loss, slow healing of wounds, general lack of energy and strength, degeneration of mental capacity and emotional stability, the loss of immune response leading to allergies and infections.

Excess consumption of animal protein leads to loss of body calcium and the deterioration of bone health. It can also increase the risk of, or exacerbate, certain types of kidney ailments.

Amount Needed: 0.8 gm. per kg. of body weight

Availability Affected By: Plant protein is somewhat less readily absorbed than animal protein. Fiber tends to decrease protein digestibility. Processing conditions can adversely affect digestion. Some nutritionists recommend that vegetarians, and especially vegans, consume 10-15% more protein than omnivores.

Nutrient/Food Element: Selenium

Vegetarian Sources: Selenium is found in whole wheat bread, oatmeal, lentils, navy beans, brazil nuts and eggs and to a lesser extent, in white bread, bran flakes and barley.

Role in the Body: Selenium is an antioxidant. It helps prevent the oxidative damage to tissues that may lead to cancer and other degenerative diseases.

Results of Deficiency or Excess: Increased susceptibility to degenerative diseases.

Amount Needed: 70 and 55 micrograms daily for adult men and women respectively.

Availability Affected By: The selenium content in plants is largely dependent on the amount of selenium in the soil in which they are grown. In areas where the soil content is low, vegetarians should identify good sources of this nutrient for their diets or find sources grown in healthy, well-cared for soil such as on biodynamic farms.

Nutrient/Food Element: Sodium

Vegetarian Sources: The main source of sodium is salt. Many processed foods have a high salt content. Thus, a diet high in processed foods provides much more sodium than is needed. Certain vegetables, especially sea vegetables (seaweeds), have a significant sodium content.

Role in the Body: Sodium regulates extracellular fluid volume. It is also involved in acid/base balance and the status of the cell membrane.

Results of Deficiency or Excess: Excessive intake of sodium is linked to high blood pressure. It also increases urinary calcium loss and can therefore cause a threat to bone health.

Amount Needed: 500-mg. daily.

Nutrient/Food Element: Zinc

Vegetarian Sources: nuts, seeds, legumes, whole grains, wheat germ, soy products (tofu, tempeh), eggs and dairy

Role in the Body: Zinc is probably the most important of the trace elements. It plays an important role in metabolism, protein synthesis and blood formation. It is necessary for reproduction, growth, sexual maturation, wound healing and health of the immune systems. Zinc also protects against free radicals.

Results of Deficiency or Excess: A deficiency of zinc can lead to poor appetite, lack of growth and development, impaired taste acuity and slow wound healing. It has also been associated with hypogonadism (small and undeveloped testicles) which results in dwarfism.

Amount Needed: 12 mg/day for women; 15 mg/day for men

Availability Affected By: Phytates, which are found in whole grains and legumes, inhibit zinc absorption. Phosphorus and protein raise zinc requirements. Vegetarians should be conscientious about getting a sufficient amount of zinc in their diets.