

Nutrient Needs at a Glance

Extension Nutrition Specialists
The Texas A&M University System



Glossary

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|--|---|
| Adequate Intake (AI): | sometimes used in place of RDA |
| Anorexia: | loss of appetite |
| Antioxidant: | a substance that prevents the deterioration or rancidity of fats |
| Ataxia: | inability to coordinate voluntary muscles |
| Cachexia: | general physical wasting and malnutrition |
| Cheilosis: | cracks at the corner of the mouth |
| Coenzyme: | compound that forms the actual part in an enzyme after combining with a protein component |
| Daily Values: (DVs): | the amount of a nutrient needed daily as determined by the Food and Drug Administration (FDA) |
| Dermatitis: | inflammation of the skin |
| Desquamation: | loss of a layer of skin |
| Eczema: | an inflammatory condition of the skin characterized by redness and itching |
| Edema: | abnormal accumulation of fluid in the body |
| Glucose Tolerance Factor (GTF): | a dietary agent that facilitates the reaction of insulin |
| Hemorrhagic: | loss of blood from blood vessels |
| Ketosis: | a condition caused by abnormal burning of fat in the body |
| Microgram (mcg): | one millionth of a gram |

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|--|--|
| Milligram (mg): | one thousandth of a gram |
| Neural Tube Defects (NTD): | birth defects due to failure of the neural tube to develop properly during fetal development |
| Osteomalacia: | softening of bones in adults |
| Osteoporosis: | porous, brittle bones |
| Photophobia: | sensitivity to light |
| Recommended Dietary Allowances (RDA): | the amount of nutrients needed to promote good growth and optimum health in people ages 25 to 50 |
| Rickets: | bone deformation in children |
| Scurvy: | weakened cartilages and connective tissue |
| Xerophthalmia: | an eye condition that can lead to blindness |

References

Data compiled Dietary Reference Intakes for Nutrients Reports (<http://nap.edu>), the Food and Nutrition Board, National Academy of Sciences. Washington, DC: National Academy Press, 1997-2002.

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Estimated safe and adequate daily dietary intakes of selected vitamins and minerals

| Nutrient and other associated names | RDA* | | Functions in the body | Sources | Deficiency |
|---|------------------|------------------|---|--|---|
| | M ¹ | F ² | | | |
| Protein (grams/kilogram (of body weight)) | .80 | .80 | <ul style="list-style-type: none"> Builds and repairs all body tissue Helps build blood Helps form antibodies to fight infection. Supplies food energy at 4 calories per gram | Animal protein: meat, fish, poultry, eggs, milk, cheese Vegetable protein: peas, beans, bread, cereal, nuts, peanut butter | Fatigue, loss of appetit edema,* poor growth |
| Fat (percentage) of total caloric intake (Acceptable Macronutrient Distribution Range) | 20-35 | 20-35 | <ul style="list-style-type: none"> Supplies large amount of energy in a small amount of food Nine calories per gram supplies essential fatty acids needed for body's proper use and storage of fat | Butter, margarine, shortening, oil, salad dressing, palm and coconut oil, egg yolk, meat with fat, whole milk, cheese, peanut butter | Eczema,* retarded growth, diarrhea, loss of hair |
| Carbohydrates (grams) Median intake | 130** 200-330 | 130** 180-230 | <ul style="list-style-type: none"> Supply energy at 4 calories per gram to all body cells Helps the body use other nutrients | Breads, cereals, flours, cornmeal, rice, macaroni, noodles, spaghetti, Irish and sweet potatoes, corn, dried fruits, sweetened fruits, bananas, sugar, syrup, jam, jellies, preserves, honey | Loss of energy, fatigue, ketosis* |
| Water-soluble vitamins | | | | | |
| Vitamin C (mg) Ascorbic acid | 90 | 75 | <ul style="list-style-type: none"> Helps the body maintain collagen (supportive material which gives structure to cells) Promotes iron absorption Helps wounds heal | All citrus fruits and juices, strawberries, cantaloupe, tomatoes, green and red peppers, raw cabbage, broccoli, kale, turnip greens, mustard greens, collards, Irish and sweet potatoes, spinach | Scurvy;* sore, bleeding gums; poor wound healing, pain in joints, bones, muscles |
| Vitamin B ₁ (mg) Thiamin | 1.2 | 1.1 | <ul style="list-style-type: none"> Helps the body use carbohydrates for energy Maintains appetite and muscle tone Involved in nervous system function | Meat (especially pork), liver, heart, kidney, poultry, eggs, milk, dried peas and beans, nuts, whole-grain or enriched breads and cereals | Poor appetite, constipation, depression, apathy, cachexia,* edema,* cardiac failure, cheilosis* |
| Vitamin B ₂ (mg) Riboflavin | 1.3 | 1.1 | <ul style="list-style-type: none"> Functions as a part of a coenzyme* that assists in energy release Helps in metabolism of amino acids | Milk, cheese, ice cream, organ meats, eggs, fish, dark green leafy vegetables, enriched breads and cereals | Cheilosis,* scaly desquamation* around nose and ears, sore tongue and mouth, burning and itching eyes, photophobia* |
| Niacin (mg) ³ Nicotinic acid Nicotinamide | 16 | 14 | <ul style="list-style-type: none"> Coenzyme* for carbohydrate metabolism Promotes normal appetite | Meat, liver, poultry, fish, dried peas and beans, nuts (especially peanuts), whole-grain or enriched cereals and breads, milk, cheese, yogurt | Anorexia,* diarrhea dermatitis, confusion, anxiety |
| Vitamin B ₆ (mg) Three active forms: pyridoxine pyridoxal pyridoxamine | 1.3 | 1.3 | <ul style="list-style-type: none"> Coenzyme* for protein utilization Helps convert the amino acid tryptophan to the vitamin niacin Helps convert complex carbohydrates to simple carbohydrates | Meat, poultry, fish, sweet potatoes, vegetables, whole grains, fortified cereal | Anemia, nervous irritability, convulsions, weakness, ataxia,* abdominal pain, dermatitis |
| Vitamin B ₁₂ (mcg) Cyanocobalamin Hydroxocobalamin | 2.4 | 2.4 | <ul style="list-style-type: none"> Helps maintain nerve tissue and normal blood formation Regeneration of folate | Animal foods only: organ meats, muscle meats, fish, poultry, eggs, milk | Anemia, neurologic disorders |
| Folate (mcg) Folic acid, folacin Tetrahydrofolic acid | 400 | 400*** | <ul style="list-style-type: none"> Helps red blood cells mature Interrelated with vitamin B₁₂ utilization | Organ meats, deep green leafy vegetables, muscle meats, poultry, fish eggs, whole-grain and fortified cereals | Anemia, gastrointestinal disturbances, fatigue, inadequate intake in early pregnancy related to neural tube birth defects |

| Fat-soluble vitamins | RDA* | | Functions in the body | Sources | Deficiency |
|---|--------------------|--------------------|--|---|---|
| | M ¹ | F ² | | | |
| Vitamin A (mcg RAE) ⁴ Retinol, Retinal Carotene | 900 | 700 | <ul style="list-style-type: none"> Promotes growth and normal vision, and protects against night blindness Helps keep skin and mucous membrane linings healthy and resistant to infection Large amounts are toxic | Dark green leafy vegetables, deep yellow vegetables (carrots, pumpkin, sweet potatoes, winter squash, cushaw), yellow fruits (peaches, apricots, cantaloupe), fish liver oils, butter, margarine, egg yolks | Faulty bone and tooth development in infants, poor growth, xerophthalmia,* night blindness |
| Vitamin D (mcg) Vitamin D ₂ Ergocalciferol Vitamin D ₃ Cholecalciferol Antirachitic factor | 5 AI | 5 AI | <ul style="list-style-type: none"> Synthesized in skin by ultraviolet light Functions as steroid hormone to regulate calcium and phosphorus absorption, mobilization and mineralization of bone Large amounts are toxic | Fish-liver oils, fortified milk, exposure to sunlight. Very small amounts in butter, liver, egg yolk, salmon, sardines | Rickets;* soft, fragile bones; enlarged joints; bowed legs; chest, spinal and pelvic bone deformities; convulsions; osteomalacia* |
| Vitamin E (mg) ⁵ Alpha-, beta- gamma-tocopherol | 15 | 15 | <ul style="list-style-type: none"> Not stored in body to any extent Related to action of selenium Reduces oxidation of vitamin A, carotenes, and polyunsaturated fatty acids | Plant tissues, vegetable oils, wheat germ, rice germ, green leafy vegetables, nuts, legumes (Animal foods are poor sources.) | Anemia in premature infants; problems of nervous system |
| Vitamin K (mcg) Phylloquinone (K ₁) Menaquinone (MK _n) Menadione | 120 AI | 90 AI | <ul style="list-style-type: none"> Bile is necessary for absorption of the vitamin Necessary for formation of prothrombin Sulfa drugs and antibiotics interfere with absorption Large amounts are toxic | Green leaves (alfalfa, spinach, cabbage), liver, egg yolk, butterfat (is synthesized in intestine by beneficial bacteria) | Prolonged clotting time, hemorrhagic* disease in newborn infants |
| Minerals | | | | | |
| Calcium (mg) | 1,000- 1,200 AI | 1,000- 1,200 AI | <ul style="list-style-type: none"> Needed to build bones and teeth; helps clot blood Helps muscles contract and relax normally. Delays fatigue | Milk, cheese, ice cream, greens (kale, broccoli, collards, turnips, mustard), dried peas and beans | Retarded bone mineralization, fragile bones, rickets,* osteomalacia*, osteoporosis* |
| Chromium (mcg) ⁵ | 35 AI | 25 AI | <ul style="list-style-type: none"> Works along with insulin in carbohydrate, protein and fat metabolism; glucose tolerance factor (GTF)* | Brewer's yeast, liver, meat, cheese, whole-grain cereals | Inability of cells to use glucose for energy |
| Copper (mcg) | 900 | 900 | <ul style="list-style-type: none"> Aids absorption and use of iron in synthesis of hemoglobin in blood cells | Liver, shellfish, meats, nuts, legumes, whole-grain cereals | Anemia |
| Flouride (mg) | 4.0 AI | 3.0 AI | <ul style="list-style-type: none"> Makes teeth resistant to decay Most effective in young children Moderate levels in bone may reduce osteoporosis* | Water (1 part per million is added to some municipal water supplies) | None known |

(Continued on back)

¹ M = Males (19 to 50).

² F = Females (19 to 50).

³ 1 NE (niacin equivalent) is equal to 1 mg of niacin or 60 mg of dietary tryptophan

⁴ RAE = Retinol activity equivalents. 1 retinal equivalent = 1 mcg retinol or 6 mcg beta-carotene

⁵ α tocopherol

⁶ Estimated sodium and potassium minimum requirements

* See Glossary for definitions

**Average minimum amounts of glucose used by brain

***Supplement during pregnancy of 400 mcg folic acid plus folate intake of a varied diet

| Minerals | RDA* | | Functions in the Body | Sources | Deficiency |
|------------------------------|----------------|----------------|---|--|---|
| | M ¹ | F ² | | | |
| Iron (mg) | 8 | 18 | <ul style="list-style-type: none"> • Constituent of hemoglobin and myoglobin. • Enzyme involved in energy metabolism | Liver, organ meats, meat, poultry, egg yolk, enriched and whole-grain breads, cereals, dark green vegetables, legumes, dark molasses, peaches, apricots, prunes, raisins | Anemia (frequent in infants, preschool children, teenage girls, pregnant women) |
| Magnesium (mg) | 400-420 | 310-320 | <ul style="list-style-type: none"> • Activates enzymes involved in protein synthesis. • Helps muscles and nerves work. | Whole-grain cereals, nuts, legumes, meat, milk, green leafy vegetables | Tremors, growth failure |
| Manganese (mg) ⁵ | 2.3 AI | 1.8 AI | <ul style="list-style-type: none"> • Activates many enzymes used in carbohydrate and protein metabolism. • Helps build bones. | Legumes, nuts, whole-grain cereals | None known |
| Phosphorus (mg) ⁵ | 700 | 700 | <ul style="list-style-type: none"> • Builds strong bones and teeth. • Releases energy from fat, protein and carbohydrates during metabolism. • Aids in formation of genetic material, cell membranes, and enzymes. | Breads, cereals, lima beans, meat, poultry, fish, milk, cheese and yogurt | Bone loss, weakness, anorexia, malaise and pain (Found in many foods, so deficiency is rare.) |
| Selenium (mcg) | 55 | 55 | <ul style="list-style-type: none"> • Antioxidant.* • Lessen breakdown of vitamin E. | Meat and seafoods, cereal foods | None known |
| Zinc (mg) | 11 | 8 | <ul style="list-style-type: none"> • A constituent of the enzymes carbonic anhydrase, carboxypeptidase, and lactic dehydrogenase. | Seafoods, liver and other organ meats, meats, fish, wheat, yeast (Plant foods are generally low in zinc.) | Poor wound healing, decreased ability to taste |

Electrolytes

| | | | | | |
|---------------------------------------|--|---------------------------|--|---|---|
| Sodium (mg) ⁶ (minimum) | 500 ⁶ 2400 | 500 ⁶ 2400 | <ul style="list-style-type: none"> • Found in extracellular fluid (blood). • Maintains water balance and nerve transmission. | Table salt, cheddar cheese, ham, snack foods | Lethargy caused by profuse sweating, vomiting or diarrhea |
| Potassium (mg) ⁶ (minimum) | 2000 ⁶ 3500 | 2000 ⁶ 3500 | <ul style="list-style-type: none"> • Found inside the cell. • Maintains fluid balance, nerve transmission. | Bananas, orange juice, most fruits, potatoes, peanuts | Weakness, poor muscle tone, heart abnormalities, apathy |
| Water | 1.0-1.5 ml/kcal of energy expended | | <ul style="list-style-type: none"> • Transports nutrients. • Transports waste products. • Lubricates joints. • Regulates body temperature. | Juices, beverages, water, solid foods | Dehydration, constipation |

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