Nutrient Needs at a Glance

Extension Nutrition Specialists
The Texas A&M University System

Glossary

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
Ecema: 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

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

Revised by Mary Kinney Bielamowicz, Professor and Extension Nutrition Specialist, The Texas A&M University System.
### Estimated safe and adequate daily dietary intakes of selected vitamins and minerals

<table>
<thead>
<tr>
<th>Nutrient and other associated names</th>
<th>RDA*</th>
<th>Functions in the body</th>
<th>Sources</th>
<th>Deficiency</th>
</tr>
</thead>
</table>
| **Protein (grams/kilogram (of body weight))** | | - 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 appetite, edema,* poor growth |
| **Fat (percentage) of total caloric intake** | 20-35 | - 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)** | 130**  
Median intake 200-330 | - 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 | - 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 B₁ (mg)  
Thiamin | 1.2  
1.1 | - 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 B₂ (mg)  
Riboflavin | 1.3  
1.1 | - 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)*  
Nicotinic acid  
Nicotinamide | 16  
14 | - 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 B₆ (mg)  
Three active forms: pyridoxine  
pyridoxal  
pyridoxamine | 1.3  
1.3 | - 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 B₁₂ (mcg)  
Cyanocobalamin  
Hydroxocobalamin | 2.4  
2.4 | - 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  
Tetrahydrofolate acid | 400  
400*** | - 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

<table>
<thead>
<tr>
<th>Fat-soluble vitamins</th>
<th>M RDA</th>
<th>F RDA</th>
<th>Functions in the body</th>
<th>Sources</th>
<th>Deficiency</th>
</tr>
</thead>
</table>
| **Vitamin A (mcg RAE)*** | 900   | 700   | • 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)** | 5 AI  | 5 AI  | • 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)*** | 15    | 15    | • 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)** | 120 AI | 90 AI | • 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

<table>
<thead>
<tr>
<th>Minerals</th>
<th>M RDA</th>
<th>F RDA</th>
<th>Functions in the body</th>
<th>Sources</th>
<th>Deficiency</th>
</tr>
</thead>
</table>
| **Calcium (mg)** | 1,000-1,200 AI | 1,000-1,200 AI | • 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)*** | 35 AI | 25 AI | • 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 | • 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 | • 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 |

---

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

(Continued on back)
<table>
<thead>
<tr>
<th>Minerals</th>
<th>RDA*</th>
<th>Functions in the Body</th>
<th>Sources</th>
<th>Deficiency</th>
</tr>
</thead>
</table>
| Iron (mg) | 8 | 18 | • 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 | • 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) | 2.3 AI | 1.8 AI | • Activates many enzymes used in carbohydrate and protein metabolism.  
• Helps build bones. | Legumes, nuts, whole-grain cereals | None known |
| Phosphorus (mg) | 700 | 700 | • 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 | • Antioxidant.*  
• Lessen breakdown of vitamin E. | Meat and seafoods, cereal foods | None known |
| Zinc (mg) | 11 | 8 | • 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) | 500 2400 | 500 2400 | • 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) | 2000 3500 | 2000 3500 | • 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 | • Transports nutrients.  
• Transports waste products.  
• Lubricates joints.  
• Regulates body temperature. | Juices, beverages, water, solid foods | Dehydration, constipation |