

# Nutrient Needs at a Glance

Extension Nutrition Specialists  
 The Texas A&M University System



## Glossary

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

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

Recommended Dietary Allowances, 10th ed. Washington DC: National Academy Press, 1989.  
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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 <sup>1</sup>	F <sup>2</sup>			
Protein (grams/kilogram (of body weight))	.80	.80	<ul style="list-style-type: none"> <li>Builds and repairs all body tissue</li> <li>Helps build blood</li> <li>Helps form antibodies to fight infection.</li> <li>Supplies food energy at 4 calories per gram</li> </ul>	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"> <li>Supplies large amount of energy in a small amount of food</li> <li>Nine calories per gram supplies essential fatty acids needed for body's proper use and storage of fat</li> </ul>	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"> <li>Supply energy at 4 calories per gram to all body cells</li> <li>Helps the body use other nutrients</li> </ul>	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*
<b>Water-soluble vitamins</b>					
Vitamin C (mg) Ascorbic acid	90	75	<ul style="list-style-type: none"> <li>Helps the body maintain collagen (supportive material which gives structure to cells)</li> <li>Promotes iron absorption</li> <li>Helps wounds heal</li> </ul>	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 <sub>1</sub> (mg) Thiamin	1.2	1.1	<ul style="list-style-type: none"> <li>Helps the body use carbohydrates for energy</li> <li>Maintains appetite and muscle tone</li> <li>Involved in nervous system function</li> </ul>	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 <sub>2</sub> (mg) Riboflavin	1.3	1.1	<ul style="list-style-type: none"> <li>Functions as a part of a coenzyme* that assists in energy release</li> <li>Helps in metabolism of amino acids</li> </ul>	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) <sup>3</sup> Nicotinic acid Nicotinamide	16	14	<ul style="list-style-type: none"> <li>Coenzyme* for carbohydrate metabolism</li> <li>Promotes normal appetite</li> </ul>	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 <sub>6</sub> (mg) Three active forms: pyridoxine pyridoxal pyridoxamine	1.3	1.3	<ul style="list-style-type: none"> <li>Coenzyme* for protein utilization</li> <li>Helps convert the amino acid tryptophan to the vitamin niacin</li> <li>Helps convert complex carbohydrates to simple carbohydrates</li> </ul>	Meat, poultry, fish, sweet potatoes, vegetables, whole grains, fortified cereal	Anemia, nervous irritability, convulsions, weakness, ataxia,* abdominal pain, dermatitis
Vitamin B <sub>12</sub> (mcg) Cyanocobalamin Hydroxocobalamin	2.4	2.4	<ul style="list-style-type: none"> <li>Helps maintain nerve tissue and normal blood formation</li> <li>Regeneration of folate</li> </ul>	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"> <li>Helps red blood cells mature</li> <li>Interrelated with vitamin B<sub>12</sub> utilization</li> </ul>	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 <sup>1</sup>	F <sup>2</sup>			
Vitamin A (mcg RAE) <sup>4</sup> Retinol, Retinal Carotene	900	700	<ul style="list-style-type: none"> <li>Promotes growth and normal vision, and protects against night blindness</li> <li>Helps keep skin and mucous membrane linings healthy and resistant to infection</li> <li>Large amounts are toxic</li> </ul>	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 <sub>2</sub> Ergocalciferol Vitamin D <sub>3</sub> Cholecalciferol Antirachitic factor	5 AI	5 AI	<ul style="list-style-type: none"> <li>Synthesized in skin by ultraviolet light</li> <li>Functions as steroid hormone to regulate calcium and phosphorus absorption, mobilization and mineralization of bone</li> <li>Large amounts are toxic</li> </ul>	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) <sup>5</sup> Alpha-, beta- gamma-tocopherol	15	15	<ul style="list-style-type: none"> <li>Not stored in body to any extent</li> <li>Related to action of selenium</li> <li>Reduces oxidation of vitamin A, carotenes, and polyunsaturated fatty acids</li> </ul>	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 <sub>1</sub> ) Menaquinone (MK <sub>n</sub> ) Menadione	120 AI	90 AI	<ul style="list-style-type: none"> <li>Bile is necessary for absorption of the vitamin</li> <li>Necessary for formation of prothrombin</li> <li>Sulfa drugs and antibiotics interfere with absorption</li> <li>Large amounts are toxic</li> </ul>	Green leaves (alfalfa, spinach, cabbage), liver, egg yolk, butterfat (is synthesized in intestine by beneficial bacteria)	Prolonged clotting time, hemorrhagic* disease in newborn infants
<b>Minerals</b>					
Calcium (mg)	1,000- 1,200 AI	1,000- 1,200 AI	<ul style="list-style-type: none"> <li>Needed to build bones and teeth; helps clot blood</li> <li>Helps muscles contract and relax normally. Delays fatigue</li> </ul>	Milk, cheese, ice cream, greens (kale, broccoli, collards, turnips, mustard), dried peas and beans	Retarded bone mineralization, fragile bones, rickets,* osteomalacia*, osteoporosis*
Chromium (mcg) <sup>5</sup>	35 AI	25 AI	<ul style="list-style-type: none"> <li>Works along with insulin in carbohydrate, protein and fat metabolism; glucose tolerance factor (GTF)*</li> </ul>	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"> <li>Aids absorption and use of iron in synthesis of hemoglobin in blood cells</li> </ul>	Liver, shellfish, meats, nuts, legumes, whole-grain cereals	Anemia
Flouride (mg)	4.0 AI	3.0 AI	<ul style="list-style-type: none"> <li>Makes teeth resistant to decay</li> <li>Most effective in young children</li> <li>Moderate levels in bone may reduce osteoporosis*</li> </ul>	Water (1 part per million is added to some municipal water supplies)	None known

(Continued on back)

<sup>1</sup> M = Males (19 to 50).

<sup>2</sup> F = Females (19 to 50).

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

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

<sup>5</sup> α tocopherol

<sup>6</sup> 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 <sup>1</sup>	F <sup>2</sup>			
Iron (mg)	8	18	<ul style="list-style-type: none"> <li>• Constituent of hemoglobin and myoglobin.</li> <li>• Enzyme involved in energy metabolism</li> </ul>	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"> <li>• Activates enzymes involved in protein synthesis.</li> <li>• Helps muscles and nerves work.</li> </ul>	Whole-grain cereals, nuts, legumes, meat, milk, green leafy vegetables	Tremors, growth failure
Manganese (mg) <sup>5</sup>	2.3 AI	1.8 AI	<ul style="list-style-type: none"> <li>• Activates many enzymes used in carbohydrate and protein metabolism.</li> <li>• Helps build bones.</li> </ul>	Legumes, nuts, whole-grain cereals	None known
Phosphorus (mg) <sup>5</sup>	700	700	<ul style="list-style-type: none"> <li>• Builds strong bones and teeth.</li> <li>• Releases energy from fat, protein and carbohydrates during metabolism.</li> <li>• Aids in formation of genetic material, cell membranes, and enzymes.</li> </ul>	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"> <li>• Antioxidant.*</li> <li>• Lessen breakdown of vitamin E.</li> </ul>	Meat and seafoods, cereal foods	None known
Zinc (mg)	11	8	<ul style="list-style-type: none"> <li>• A constituent of the enzymes carbonic anhydrase, carboxypeptidase, and lactic dehydrogenase.</li> </ul>	Seafoods, liver and other organ meats, meats, fish, wheat, yeast (Plant foods are generally low in zinc.)	Poor wound healing, decreased ability to taste
<b>Electrolytes</b>					
Sodium (mg) <sup>6</sup> (minimum)	500 <sup>6</sup> 2400	500 <sup>6</sup> 2400	<ul style="list-style-type: none"> <li>• Found in extracellular fluid (blood).</li> <li>• Maintains water balance and nerve transmission.</li> </ul>	Table salt, cheddar cheese, ham, snack foods	Lethargy caused by profuse sweating, vomiting or diarrhea
Potassium (mg) <sup>6</sup> (minimum)	2000 <sup>6</sup> 3500	2000 <sup>6</sup> 3500	<ul style="list-style-type: none"> <li>• Found inside the cell.</li> <li>• Maintains fluid balance, nerve transmission.</li> </ul>	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"> <li>• Transports nutrients.</li> <li>• Transports waste products.</li> <li>• Lubricates joints.</li> <li>• Regulates body temperature.</li> </ul>	Juices, beverages, water, solid foods	Dehydration, constipation

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