

Dietary Reference Intakes: Elements

| Nutrient | Function | Life Stage Group | RDA/AI* | UL ^a | Selected Food Sources | Adverse effects of excessive consumption | Special Considerations |
|----------|--|---|---|--|--|---|------------------------|
| Arsenic | No biological function in humans although animal data indicate a requirement | <p>Infants 0–6 mo 7–12 mo</p> <p>Children 1–3 y 4–8 y</p> <p>Males 9–13 y 14–18 y 19–30 y 31–50 y 50–70 y > 70 y</p> <p>Females 9–13 y 14–18 y 19–30 y 31–50 y 50–70 y > 70 y</p> <p>Pregnancy ≤ 18 y 19–30y 31–50 y</p> <p>Lactation ≤ 18 y 19–30y 31–50 y</p> | <p>ND^b ND</p> <p>ND ND</p> <p>ND ND ND ND ND ND</p> <p>ND ND ND ND ND ND</p> <p>ND ND ND ND ND</p> <p>ND ND ND</p> <p>ND ND ND</p> | <p>ND ND</p> <p>ND ND ND ND ND ND</p> <p>ND ND ND ND ND</p> <p>ND ND ND</p> <p>ND ND ND</p> | Dairy products, meat, poultry, fish, grains and cereal | <p>No data on the possible adverse effects of organic arsenic compounds in food were found. Inorganic arsenic is a known toxic substance.</p> <p>Although the UL was not determined for arsenic, there is no justification for adding arsenic to food or supplements.</p> | None |
| Boron | No clear biological function in humans although animal data indicate a functional role | <p>Infants 0–6 mo 7–12 mo</p> <p>Children 1–3 y 4–8 y</p> <p>Males 9–13 y 14–18 y 19–30 y 31–50 y 50–70 y > 70 y</p> <p>Females 9–13 y 14–18 y 19–30 y 31–50 y 50–70 y > 70 y</p> <p>Pregnancy ≤ 18 y 19–30y 31–50 y</p> <p>Lactation ≤ 18 y 19–30y 31–50 y</p> | <p>ND ND</p> <p>ND ND</p> <p>ND ND ND ND ND ND</p> <p>ND ND ND ND ND ND</p> <p>ND ND ND ND</p> <p>ND ND ND</p> | <p>(mg/d) ND ND</p> <p>3 6</p> <p>11 17 20 20 20 20</p> <p>11 17 20 20 20 20</p> <p>17 20 20</p> <p>17 20 20</p> | Fruit-based beverages and products, potatoes, legumes, milk, avocado, peanut butter, peanuts | Reproductive and developmental effects as observed in animal studies. | None |

NOTE: The table is adapted from the DRI reports, see www.nap.edu. It represents Recommended Dietary Allowances (RDAs) in **bold type**, Adequate Intakes (AIs) in ordinary type followed by an asterisk (*), and Tolerable Upper Intake Levels (ULs)^a. RDAs and AIs may both be used as goals for individual intake. RDAs are set to meet the needs of almost all (97 to 98 percent) individuals in a group. For healthy breastfed infants, the AI is the mean intake. The AI for other life stage and gender groups is believed to cover the needs of all individuals in the group, but lack of data prevent being able to specify with confidence the percentage of individuals covered by this intake.

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| Calcium | Essential role in blood clotting, muscle contraction, nerve transmission, and bone and tooth formation | Infants | (mg/d) 210* | (mg/d) ND ^b ND | Milk, cheese, yogurt, corn tortillas, calcium-set tofu, Chinese cabbage, kale, broccoli | Kidney stones, hypercalcemia, milk alkali syndrome, and renal insufficiency | Amenorrheic women (exercise- or anorexia nervosa-induced) have reduced net calcium absorption. There is no consistent data to support that a high protein intake increases calcium requirement. |
| | | 0–6 mo | 270* | | | | |
| | | 7–12 mo | | | | | |
| | | Children | | | | | |
| | | 1–3 y | 500* | 2,500 | | | |
| | | 4–8 y | 800* | 2,500 | | | |
| | | Males | | | | | |
| | | 9–13 y | 1,300* | 2,500 | | | |
| | | 14–18 y | 1,300* | 2,500 | | | |
| | | 19–30 y | 1,000* | 2,500 | | | |
| | | 31–50 y | 1,000* | 2,500 | | | |
| | | 50–70 y | 1,200* | 2,500 | | | |
| | | > 70 y | 1,200* | 2,500 | | | |
| | | Females | | | | | |
| | | 9–13 y | 1,300* | 2,500 | | | |
| | | 14–18 y | 1,300* | 2,500 | | | |
| | | 19–30 y | 1,000* | 2,500 | | | |
| | | 31–50 y | 1,000* | 2,500 | | | |
| | | 50–70 y | 1,200* | 2,500 | | | |
| | | > 70 y | 1,200* | 2,500 | | | |
| Pregnancy | | | | | | | |
| ≤ 18 y | 1,300* | 2,500 | | | | | |
| 19–30y | 1,000* | 2,500 | | | | | |
| 31–50 y | 1,000* | 2,500 | | | | | |
| Lactation | | | | | | | |
| ≤ 18 y | 1,300* | 2,500 | | | | | |
| 19–30y | 1,000* | 2,500 | | | | | |
| 31–50 y | 1,000* | 2,500 | | | | | |
| Chromium | Helps to maintain normal blood glucose levels | Infants | (µg/d) 0.2* | ND | Some cereals, meats, poultry, fish, beer | Chronic renal failure | None |
| | | 0–6 mo | 5.5* | ND | | | |
| | | 7–12 mo | | | | | |
| | | Children | | | | | |
| | | 1–3 y | 11* | ND | | | |
| | | 4–8 y | 15* | ND | | | |
| | | Males | | | | | |
| | | 9–13 y | 25* | ND | | | |
| | | 14–18 y | 35* | ND | | | |
| | | 19–30 y | 35* | ND | | | |
| | | 31–50 y | 35* | ND | | | |
| | | 50–70 y | 30* | ND | | | |
| | | > 70 y | 30* | ND | | | |
| | | Females | | | | | |
| | | 9–13 y | 21* | ND | | | |
| | | 14–18 y | 24* | ND | | | |
| | | 19–30 y | 25* | ND | | | |
| | | 31–50 y | 25* | ND | | | |
| | | 50–70 y | 20* | ND | | | |
| | | > 70 y | 20* | ND | | | |
| Pregnancy | | | | | | | |
| ≤ 18 y | 29* | ND | | | | | |
| 19–30y | 30* | ND | | | | | |
| 31–50 y | 30* | ND | | | | | |
| Lactation | | | | | | | |
| ≤ 18 y | 44* | ND | | | | | |
| 19–30y | 45* | ND | | | | | |
| 31–50 y | 45* | ND | | | | | |

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| Copper | Component of enzymes in iron metabolism | Infants | (µg/d) | (µg/d) | Organ meats, seafood, nuts, seeds, wheat bran cereals, whole grain products, cocoa products | Gastrointestinal distress, liver damage | Individuals with Wilson's disease, Indian childhood cirrhosis and idiopathic copper toxicosis may be at increased risk of adverse effects from excess copper intake. |
| | | 0-6 mo | 200* | ND ^b | | | |
| | | 7-12 mo | 220* | ND | | | |
| | | Children | | | | | |
| | | 1-3 y | 340 | 1,000 | | | |
| | | 4-8 y | 440 | 3,000 | | | |
| | | Males | | | | | |
| | | 9-13 y | 700 | 5,000 | | | |
| | | 14-18 y | 890 | 8,000 | | | |
| | | 19-30 y | 900 | 10,000 | | | |
| | | 31-50 y | 900 | 10,000 | | | |
| | | 50-70 y | 900 | 10,000 | | | |
| | | > 70 y | 900 | 10,000 | | | |
| | | Females | | | | | |
| | | 9-13 y | 700 | 5,000 | | | |
| | | 14-18 y | 890 | 8,000 | | | |
| | | 19-30 y | 900 | 10,000 | | | |
| | | 31-50 y | 900 | 10,000 | | | |
| | | 50-70 y | 900 | 10,000 | | | |
| | | > 70 y | 900 | 10,000 | | | |
| Pregnancy | | | | | | | |
| ≤ 18 y | 1000 | 8,000 | | | | | |
| 19-30y | 1000 | 10,000 | | | | | |
| 31-50 y | 1000 | 10,000 | | | | | |
| Lactation | | | | | | | |
| ≤ 18 y | 1300 | 8,000 | | | | | |
| 19-30y | 1300 | 10,000 | | | | | |
| 31-50 y | 1300 | 10,000 | | | | | |
| Fluoride | Inhibits the initiation and progression of dental caries and stimulates new bone formation | Infants | (mg/d) | (mg/d) | Fluoridated water, teas, marine fish, fluoridated dental products | Enamel and skeletal fluorosis | None |
| | | 0-6 mo | 0.01* | 0.7 | | | |
| | | 7-12 mo | 0.5* | 0.9 | | | |
| | | Children | | | | | |
| | | 1-3 y | 0.7* | 1.3 | | | |
| | | 4-8 y | 1* | 2.2 | | | |
| | | Males | | | | | |
| | | 9-13 y | 2* | 10 | | | |
| | | 14-18 y | 3* | 10 | | | |
| | | 19-30 y | 4* | 10 | | | |
| | | 31-50 y | 4* | 10 | | | |
| | | 50-70 y | 4* | 10 | | | |
| | | > 70 y | 4* | 10 | | | |
| | | Females | | | | | |
| | | 9-13 y | 2* | 10 | | | |
| | | 14-18 y | 3* | 10 | | | |
| | | 19-30 y | 3* | 10 | | | |
| | | 31-50 y | 3* | 10 | | | |
| | | 50-70 y | 3* | 10 | | | |
| | | > 70 y | 3* | 10 | | | |
| Pregnancy | | | | | | | |
| ≤ 18 y | 3* | 10 | | | | | |
| 19-30y | 3* | 10 | | | | | |
| 31-50 y | 3* | 10 | | | | | |
| Lactation | | | | | | | |
| ≤ 18 y | 3* | 10 | | | | | |
| 19-30y | 3* | 10 | | | | | |
| 31-50 y | 3* | 10 | | | | | |

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|-------------|--|------------------|------------|-----------------|--|--|--|
| Iodine | Component of the thyroid hormones; and prevents goiter and cretinism | Infants | (µg/d) | (µg/d) | Marine origin, processed foods, iodized salt | Elevated thyroid stimulating hormone (TSH) concentration | Individuals with autoimmune thyroid disease, previous iodine deficiency, or nodular goiter are distinctly susceptible to the adverse effect of excess iodine intake. Therefore, individuals with these conditions may not be protected by the UL for iodine intake for the general population. |
| | | 0–6 mo | 110* | ND ^b | | | |
| | | 7–12 mo | 130* | ND | | | |
| | | Children | | | | | |
| | | 1–3 y | 90 | 200 | | | |
| | | 4–8 y | 90 | 300 | | | |
| | | Males | | | | | |
| | | 9–13 y | 120 | 600 | | | |
| | | 14–18 y | 150 | 900 | | | |
| | | 19–30 y | 150 | 1,100 | | | |
| | | 31–50 y | 150 | 1,100 | | | |
| | | 50–70 y | 150 | 1,100 | | | |
| | | > 70 y | 150 | 1,100 | | | |
| | | Females | | | | | |
| | | 9–13 y | 120 | 600 | | | |
| | | 14–18 y | 150 | 900 | | | |
| | | 19–30 y | 150 | 1,100 | | | |
| | | 31–50 y | 150 | 1,100 | | | |
| | | 50–70 y | 150 | 1,100 | | | |
| | | > 70 y | 150 | 1,100 | | | |
| Pregnancy | | | | | | | |
| ≤ 18 y | 220 | 900 | | | | | |
| 19–30y | 220 | 1,100 | | | | | |
| 31–50 y | 220 | 1,100 | | | | | |
| Lactation | | | | | | | |
| ≤ 18 y | 290 | 900 | | | | | |
| 19–30y | 290 | 1,100 | | | | | |
| 31–50 y | 290 | 1,100 | | | | | |
| Iron (mg/d) | Component of hemoglobin and numerous enzymes; prevents microcytic hypochromic anemia | Infants | (mg/d) | (mg/d) | Fruits, vegetables and fortified bread and grain products such as cereal (non-heme iron sources), meat and poultry (heme iron sources) | Gastrointestinal distress | Non-heme iron absorption is lower for those consuming vegetarian diets than for those eating nonvegetarian diets. Therefore, it has been suggested that the iron requirement for those consuming a vegetarian diet is approximately 2-fold greater than for those consuming a nonvegetarian diet. Recommended intake assumes 75% of iron is from heme iron sources. |
| | | 0–6 mo | 0.27* | 40 | | | |
| | | 7–12 mo | 11 | 40 | | | |
| | | Children | | | | | |
| | | 1–3 y | 7 | 40 | | | |
| | | 4–8 y | 10 | 40 | | | |
| | | Males | | | | | |
| | | 9–13 y | 8 | 40 | | | |
| | | 14–18 y | 11 | 45 | | | |
| | | 19–30 y | 8 | 45 | | | |
| | | 31–50 y | 8 | 45 | | | |
| | | 50–70 y | 8 | 45 | | | |
| | | > 70 y | 8 | 45 | | | |
| | | Females | | | | | |
| | | 9–13 y | 8 | 40 | | | |
| | | 14–18 y | 15 | 45 | | | |
| | | 19–30 y | 18 | 45 | | | |
| | | 31–50 y | 18 | 45 | | | |
| | | 50–70 y | 8 | 45 | | | |
| | | > 70 y | 8 | 45 | | | |
| Pregnancy | | | | | | | |
| ≤ 18 y | 27 | 45 | | | | | |
| 19–30y | 27 | 45 | | | | | |
| 31–50 y | 27 | 45 | | | | | |
| Lactation | | | | | | | |
| ≤ 18 y | 10 | 45 | | | | | |
| 19–30y | 9 | 45 | | | | | |
| 31–50 y | 9 | 45 | | | | | |

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|-----------|---|------------------|---------------------|-----------------|---|---|--|
| Magnesium | Cofactor for enzyme systems | Infants | (mg/d) | (mg/d) | Green leafy vegetables, unpolished grains, nuts, meat, starches, milk | There is no evidence of adverse effects from the consumption of naturally occurring magnesium in foods. Adverse effects from magnesium containing supplements may include osmotic diarrhea. The UL for magnesium represents intake from a pharmacological agent only and does not include intake from food and water. | None |
| | | 0–6 mo | 30* | ND ^b | | | |
| | | 7–12 mo | 75* | ND | | | |
| | | Children | | | | | |
| | | 1–3 y | 80 | 65 | | | |
| | | 4–8 y | 130 | 110 | | | |
| | | Males | | | | | |
| | | 9–13 y | 240 | 350 | | | |
| | | 14–18 y | 410 | 350 | | | |
| | | 19–30 y | 400 | 350 | | | |
| | | 31–50 y | 420 | 350 | | | |
| | | 50–70 y | 420 | 350 | | | |
| | | > 70 y | 420 | 350 | | | |
| | | Females | | | | | |
| | | 9–13 y | 240 | 350 | | | |
| | | 14–18 y | 360 | 350 | | | |
| | | 19–30 y | 310 | 350 | | | |
| | | 31–50 y | 320 | 350 | | | |
| | | 50–70 y | 320 | 350 | | | |
| | | > 70 y | 320 | 350 | | | |
| Pregnancy | | | | | | | |
| ≤ 18 y | 400 | 350 | | | | | |
| 19–30y | 350 | 350 | | | | | |
| 31–50 y | 360 | 350 | | | | | |
| Lactation | | | | | | | |
| ≤ 18 y | 360 | 350 | | | | | |
| 19–30y | 310 | 350 | | | | | |
| 31–50 y | 320 | 350 | | | | | |
| Manganese | Involved in the formation of bone, as well as in enzymes involved in amino acid, cholesterol, and carbohydrate metabolism | Infants | (mg/d) | (mg/d) | Nuts, legumes, tea, and whole grains | Elevated blood concentration and neurotoxicity | Because manganese in drinking water and supplements may be more bioavailable than manganese from food, caution should be taken when using manganese supplements especially among those persons already consuming large amounts of manganese from diets high in plant products. In addition, individuals with liver disease may be distinctly susceptible to the adverse effects of excess manganese intake. |
| | | 0–6 mo | 0.003* | ND | | | |
| | | 7–12 mo | 0.6* | ND | | | |
| | | Children | | | | | |
| | | 1–3 y | 1.2* | 2 | | | |
| | | 4–8 y | 1.5* | 3 | | | |
| | | Males | | | | | |
| | | 9–13 y | 1.9* | 6 | | | |
| | | 14–18 y | 2.2* | 9 | | | |
| | | 19–30 y | 2.3* | 11 | | | |
| | | 31–50 y | 2.3* | 11 | | | |
| | | 50–70 y | 2.3* | 11 | | | |
| | | > 70 y | 2.3* | 11 | | | |
| | | Females | | | | | |
| | | 9–13 y | 1.6* | 6 | | | |
| | | 14–18 y | 1.6* | 9 | | | |
| | | 19–30 y | 1.8* | 11 | | | |
| | | 31–50 y | 1.8* | 11 | | | |
| | | 50–70 y | 1.8* | 11 | | | |
| | | > 70 y | 1.8* | 11 | | | |
| Pregnancy | | | | | | | |
| ≤ 18 y | 2.0* | 9 | | | | | |
| 19–30y | 2.0* | 11 | | | | | |
| 31–50 y | 2.0* | 11 | | | | | |
| Lactation | | | | | | | |
| ≤ 18 y | 2.6* | 9 | | | | | |
| 19–30y | 2.6* | 11 | | | | | |
| 31–50 y | 2.6* | 11 | | | | | |

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| Nutrient | Function | Life Stage Group | RDA/AI ^a | UL ^a | Selected Food Sources | Adverse effects of excessive consumption | Special Considerations |
|------------|---|------------------|---------------------|-----------------|--|---|--|
| Molybdenum | Cofactor for enzymes involved in catabolism of sulfur amino acids, purines and pyridines. | Infants | (µg/d) | (µg/d) | Legumes, grain products and nuts | Reproductive effects as observed in animal studies. | Individuals who are deficient in dietary copper intake or have some dysfunction in copper metabolism that makes them copper-deficient could be at increased risk of molybdenum toxicity. |
| | | 0–6 mo | 2* | ND ^b | | | |
| | | 7–12 mo | 3* | ND | | | |
| | | Children | | | | | |
| | | 1–3 y | 17 | 300 | | | |
| | | 4–8 y | 22 | 600 | | | |
| | | Males | | | | | |
| | | 9–13 y | 34 | 1,100 | | | |
| | | 14–18 y | 43 | 1,700 | | | |
| | | 19–30 y | 45 | 2,000 | | | |
| | | 31–50 y | 45 | 2,000 | | | |
| | | 50–70 y | 45 | 2,000 | | | |
| | | > 70 y | 45 | 2,000 | | | |
| | | Females | | | | | |
| | | 9–13 y | 34 | 1,100 | | | |
| | | 14–18 y | 43 | 1,700 | | | |
| | | 19–30 y | 45 | 2,000 | | | |
| | | 31–50 y | 45 | 2,000 | | | |
| | | 50–70 y | 45 | 2,000 | | | |
| | | > 70 y | 45 | 2,000 | | | |
| Pregnancy | | | | | | | |
| ≤ 18 y | 50 | 1,700 | | | | | |
| 19–30y | 50 | 2,000 | | | | | |
| 31–50 y | 50 | 2,000 | | | | | |
| Lactation | | | | | | | |
| ≤ 18 y | 50 | 1,700 | | | | | |
| 19–30y | 50 | 2,000 | | | | | |
| 31–50 y | 50 | 2,000 | | | | | |
| Nickel | No clear biological function in humans has been identified. May serve as a cofactor of metalloenzymes and facilitate iron absorption or metabolism in microorganisms. | Infants | | (mg/d) | Nuts, legumes, cereals, sweeteners, chocolate milk powder, chocolate candy | Decreased body weight gain Note: As observed in animal studies | Individuals with preexisting nickel hypersensitivity (from previous dermal exposure) and kidney dysfunction are distinctly susceptible to the adverse effects of excess nickel intake |
| | | 0–6 mo | ND | ND | | | |
| | | 7–12 mo | ND | ND | | | |
| | | Children | | | | | |
| | | 1–3 y | ND | 0.2 | | | |
| | | 4–8 y | ND | 0.3 | | | |
| | | Males | | | | | |
| | | 9–13 y | ND | 0.6 | | | |
| | | 14–18 y | ND | 1.0 | | | |
| | | 19–30 y | ND | 1.0 | | | |
| | | 31–50 y | ND | 1.0 | | | |
| | | 50–70 y | ND | 1.0 | | | |
| | | > 70 y | ND | 1.0 | | | |
| | | Females | | | | | |
| | | 9–13 y | ND | 0.6 | | | |
| | | 14–18 y | ND | 1.0 | | | |
| | | 19–30 y | ND | 1.0 | | | |
| | | 31–50 y | ND | 1.0 | | | |
| | | 50–70 y | ND | 1.0 | | | |
| | | > 70 y | ND | 1.0 | | | |
| Pregnancy | | | | | | | |
| ≤ 18 y | ND | 1.0 | | | | | |
| 19–30y | ND | 1.0 | | | | | |
| 31–50 y | ND | 1.0 | | | | | |
| Lactation | | | | | | | |
| ≤ 18 y | ND | 1.0 | | | | | |
| 19–30y | ND | 1.0 | | | | | |
| 31–50 y | ND | 1.0 | | | | | |

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^aUL = The maximum level of daily nutrient intake that is likely to pose no risk of adverse effects. Unless otherwise specified, the UL represents total intake from food, water, and supplements. Due to lack of suitable data, ULs could not be established for vitamin K, thiamin, riboflavin, vitamin B₁₂, pantothenic acid, biotin, or carotenoids. In the absence of ULs, extra caution may be warranted in consuming levels above recommended intakes.

^bND = Not determinable due to lack of data of adverse effects in this age group and concern with regard to lack of ability to handle excess amounts. Source of intake should be from food only to prevent high levels of intake.

SOURCES: *Dietary Reference Intakes for Calcium, Phosphorous, Magnesium, Vitamin D, and Fluoride* (1997); *Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B₆, Folate, Vitamin B₁₂, Pantothenic Acid, Biotin, and Choline* (1998); *Dietary Reference Intakes for Vitamin C, Vitamin E, Selenium, and Carotenoids* (2000); and *Dietary Reference Intakes for Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Copper, Iodine, Iron, Manganese, Molybdenum, Nickel, Silicon, Vanadium, and Zinc* (2001). These reports may be accessed via www.nap.edu.

Dietary Reference Intakes: Elements

| Nutrient | Function | Life Stage Group | RDA/AI ^a | UL ^a | Selected Food Sources | Adverse effects of excessive consumption | Special Considerations |
|------------|--|------------------|---------------------|---------------------------|--|---|--|
| Phosphorus | Maintenance of pH, storage and transfer of energy and nucleotide synthesis | Infants | (mg/d) 100* | (mg/d) ND ^b | Milk, yogurt, ice cream, cheese, peas, meat, eggs, some cereals and breads | Metastatic calcification, skeletal porosity, interference with calcium absorption | Athletes and others with high energy expenditure frequently consume amounts from food greater than the UL without apparent effect. |
| | | 0–6 mo | 275* | ND | | | |
| | | 7–12 mo | | | | | |
| | | Children | | | | | |
| | | 1–3 y | 460 | 3,000 | | | |
| | | 4–8 y | 500 | 3,000 | | | |
| | | Males | | | | | |
| | | 9–13 y | 1,250 | 4,000 | | | |
| | | 14–18 y | 1,250 | 4,000 | | | |
| | | 19–30 y | 700 | 4,000 | | | |
| | | 31–50 y | 700 | 4,000 | | | |
| | | 50–70 y | 700 | 4,000 | | | |
| | | > 70 y | 700 | 3,000 | | | |
| | | Females | | | | | |
| | | 9–13 y | 1,250 | 4,000 | | | |
| | | 14–18 y | 1,250 | 4,000 | | | |
| | | 19–30 y | 700 | 4,000 | | | |
| | | 31–50 y | 700 | 4,000 | | | |
| | | 50–70 y | 700 | 4,000 | | | |
| | | > 70 y | 700 | 3,000 | | | |
| Pregnancy | | | | | | | |
| ≤ 18 y | 1,250 | 3,500 | | | | | |
| 19–30y | 700 | 3,500 | | | | | |
| 31–50 y | 700 | 3,500 | | | | | |
| Lactation | | | | | | | |
| ≤ 18 y | 1,250 | 4,000 | | | | | |
| 19–30y | 700 | 4,000 | | | | | |
| 31–50 y | 700 | 4,000 | | | | | |
| Selenium | Defense against oxidative stress and regulation of thyroid hormone action, and the reduction and oxidation status of vitamin C and other molecules | Infants | (µg/d) 15* | (µg/d) 45 | Organ meats, seafood, plants (depending on soil selenium content) | Hair and nail brittleness and loss | None |
| | | 0–6 mo | 20* | 60 | | | |
| | | 7–12 mo | | | | | |
| | | Children | | | | | |
| | | 1–3 y | 20 | 90 | | | |
| | | 4–8 y | 30 | 150 | | | |
| | | Males | | | | | |
| | | 9–13 y | 40 | 280 | | | |
| | | 14–18 y | 55 | 400 | | | |
| | | 19–30 y | 55 | 400 | | | |
| | | 31–50 y | 55 | 400 | | | |
| | | 50–70 y | 55 | 400 | | | |
| | | > 70 y | 55 | 400 | | | |
| | | Females | | | | | |
| | | 9–13 y | 40 | 280 | | | |
| | | 14–18 y | 55 | 400 | | | |
| | | 19–30 y | 55 | 400 | | | |
| | | 31–50 y | 55 | 400 | | | |
| | | 50–70 y | 55 | 400 | | | |
| | | > 70 y | 55 | 400 | | | |
| Pregnancy | | | | | | | |
| ≤ 18 y | 60 | 400 | | | | | |
| 19–30y | 60 | 400 | | | | | |
| 31–50 y | 60 | 400 | | | | | |
| Lactation | | | | | | | |
| ≤ 18 y | 70 | 400 | | | | | |
| 19–30y | 70 | 400 | | | | | |
| 31–50 y | 70 | 400 | | | | | |

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^aUL = The maximum level of daily nutrient intake that is likely to pose no risk of adverse effects. Unless otherwise specified, the UL represents total intake from food, water, and supplements. Due to lack of suitable data, ULs could not be established for vitamin K, thiamin, riboflavin, vitamin B₁₂, pantothenic acid, biotin, or carotenoids. In the absence of ULs, extra caution may be warranted in consuming levels above recommended intakes.

^bND = Not determinable due to lack of data of adverse effects in this age group and concern with regard to lack of ability to handle excess amounts. Source of intake should be from food only to prevent high levels of intake.

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Dietary Reference Intakes: Elements

| Nutrient | Function | Life Stage Group | RDA/AI* | UL ^a | Selected Food Sources | Adverse effects of excessive consumption | Special Considerations |
|-----------|---|------------------|-----------------|-----------------|---|--|------------------------|
| Silicon | No biological function in humans has been identified. Involved in bone function in animal studies. | Infants | | | Plant-based foods | There is no evidence that silicon that occurs naturally in food and water produces adverse health effects. | None |
| | | 0–6 mo | ND ^b | ND | | | |
| | | 7–12 mo | ND | ND | | | |
| | | Children | | | | | |
| | | 1–3 y | ND | ND | | | |
| | | 4–8 y | ND | ND | | | |
| | | Males | | | | | |
| | | 9–13 y | ND | ND | | | |
| | | 14–18 y | ND | ND | | | |
| | | 19–30 y | ND | ND | | | |
| | | 31–50 y | ND | ND | | | |
| | | 50–70 y | ND | ND | | | |
| | | > 70 y | ND | ND | | | |
| | | Females | | | | | |
| | | 9–13 y | ND | ND | | | |
| | | 14–18 y | ND | ND | | | |
| | | 19–30 y | ND | ND | | | |
| | | 31–50 y | ND | ND | | | |
| | | 50–70 y | ND | ND | | | |
| | | > 70 y | ND | ND | | | |
| | | Pregnancy | | | | | |
| ≤ 18 y | ND | ND | | | | | |
| 19–30y | ND | ND | | | | | |
| 31–50 y | ND | ND | | | | | |
| Lactation | | | | | | | |
| ≤ 18 y | ND | ND | | | | | |
| 19–30y | ND | ND | | | | | |
| 31–50 y | ND | ND | | | | | |
| Vanadium | No biological function in humans has been identified. | Infants | | | Mushrooms, shellfish, black pepper, parsley, and dill seed. | Renal lesions as observed in animal studies. | None |
| | | 0–6 mo | ND | (mg/d) ND | | | |
| | | 7–12 mo | ND | ND | | | |
| | | Children | | | | | |
| | | 1–3 y | ND | ND | | | |
| | | 4–8 y | ND | ND | | | |
| | | Males | | | | | |
| | | 9–13 y | ND | ND | | | |
| | | 14–18 y | ND | ND | | | |
| | | 19–30 y | ND | 1.8 | | | |
| | | 31–50 y | ND | 1.8 | | | |
| | | 50–70 y | ND | 1.8 | | | |
| | | > 70 y | ND | 1.8 | | | |
| | | Females | | | | | |
| | | 9–13 y | ND | ND | | | |
| | | 14–18 y | ND | ND | | | |
| | | 19–30 y | ND | 1.8 | | | |
| | | 31–50 y | ND | 1.8 | | | |
| | | 50–70 y | ND | 1.8 | | | |
| | | > 70 y | ND | 1.8 | | | |
| | | Pregnancy | | | | | |
| ≤ 18 y | ND | ND | | | | | |
| 19–30y | ND | ND | | | | | |
| 31–50 y | ND | ND | | | | | |
| Lactation | | | | | | | |
| ≤ 18 y | ND | ND | | | | | |
| 19–30y | ND | ND | | | | | |
| 31–50 y | ND | ND | | | | | |

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Dietary Reference Intakes: Elements

| Nutrient | Function | Life Stage Group | RDA/AI ^a | UL ^a | Selected Food Sources | Adverse effects of excessive consumption | Special Considerations |
|-----------|--|------------------|---------------------|-----------------|---|--|--|
| Zinc | Component of multiple enzymes and proteins; involved in the regulation of gene expression. | Infants | (mg/d) | (mg/d) | Fortified cereals, red meats, certain seafood | Reduced copper status | Zinc absorption is lower for those consuming vegetarian diets than for those eating nonvegetarian diets. Therefore, it has been suggested that the zinc requirement for those consuming a vegetarian diet is approximately 2-fold greater than for those consuming a nonvegetarian diet. |
| | | 0–6 mo | 2* | 4 | | | |
| | | 7–12 mo | 3 | 5 | | | |
| | | Children | | | | | |
| | | 1–3 y | 3 | 7 | | | |
| | | 4–8 y | 5 | 12 | | | |
| | | Males | | | | | |
| | | 9–13 y | 8 | 23 | | | |
| | | 14–18 y | 11 | 34 | | | |
| | | 19–30 y | 11 | 40 | | | |
| | | 31–50 y | 11 | 40 | | | |
| | | 50–70 y | 11 | 40 | | | |
| | | > 70 y | 11 | 40 | | | |
| | | Females | | | | | |
| | | 9–13 y | 8 | 23 | | | |
| | | 14–18 y | 9 | 34 | | | |
| | | 19–30 y | 8 | 40 | | | |
| | | 31–50 y | 8 | 40 | | | |
| | | 50–70 y | 8 | 40 | | | |
| | | > 70 y | 8 | 40 | | | |
| Pregnancy | | | | | | | |
| ≤ 18 y | 12 | 34 | | | | | |
| 19–30y | 11 | 40 | | | | | |
| 31–50 y | 11 | 40 | | | | | |
| Lactation | | | | | | | |
| ≤ 18 y | 13 | 34 | | | | | |
| 19–30y | 12 | 40 | | | | | |
| 31–50 y | 12 | 40 | | | | | |

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