

# Summary Tables, Dietary Reference Intakes

Recommended Intakes for Individuals, Vitamins	1320
Recommended Intakes for Individuals, Elements	1322
Recommended Intakes for Individuals, Total Water and Macronutrients	1324
Acceptable Macronutrient Distribution Ranges	1325
Additional Macronutrient Recommendations	1325
Tolerable Upper Intake Levels (UL), Vitamins	1326
Tolerable Upper Intake Levels (UL), Elements	1328
Estimated Average Requirements for Groups	1330

**Dietary Reference Intakes (DRIs): Recommended Intakes for Individuals, Vitamins**  
 Food and Nutrition Board, Institute of Medicine, National Academies

Life Stage Group	Vitamin A (µg/d) <sup>a</sup>	Vitamin C (mg/d)	Vitamin D (µg/d) <sup>b,c</sup>	Vitamin E (mg/d) <sup>d</sup>	Vitamin K (µg/d)	Thiamin (mg/d)
<b>Infants</b>						
0–6 mo	400*	40*	5*	4*	2.0*	0.2*
7–12 mo	500*	50*	5*	5*	2.5*	0.3*
<b>Children</b>						
1–3 y	<b>300</b>	<b>15</b>	5*	<b>6</b>	30*	<b>0.5</b>
4–8 y	<b>400</b>	<b>25</b>	5*	<b>7</b>	55*	<b>0.6</b>
<b>Males</b>						
9–13 y	<b>600</b>	<b>45</b>	5*	<b>11</b>	60*	<b>0.9</b>
14–18 y	<b>900</b>	<b>75</b>	5*	<b>15</b>	75*	<b>1.2</b>
19–30 y	<b>900</b>	<b>90</b>	5*	<b>15</b>	120*	<b>1.2</b>
31–50 y	<b>900</b>	<b>90</b>	5*	<b>15</b>	120*	<b>1.2</b>
51–70 y	<b>900</b>	<b>90</b>	10*	<b>15</b>	120*	<b>1.2</b>
> 70 y	<b>900</b>	<b>90</b>	15*	<b>15</b>	120*	<b>1.2</b>
<b>Females</b>						
9–13 y	<b>600</b>	<b>45</b>	5*	<b>11</b>	60*	<b>0.9</b>
14–18 y	<b>700</b>	<b>65</b>	5*	<b>15</b>	75*	<b>1.0</b>
19–30 y	<b>700</b>	<b>75</b>	5*	<b>15</b>	90*	<b>1.1</b>
31–50 y	<b>700</b>	<b>75</b>	5*	<b>15</b>	90*	<b>1.1</b>
51–70 y	<b>700</b>	<b>75</b>	10*	<b>15</b>	90*	<b>1.1</b>
> 70 y	<b>700</b>	<b>75</b>	15*	<b>15</b>	90*	<b>1.1</b>
<b>Pregnancy</b>						
14–18 y	<b>750</b>	<b>80</b>	5*	<b>15</b>	75*	<b>1.4</b>
19–30 y	<b>770</b>	<b>85</b>	5*	<b>15</b>	90*	<b>1.4</b>
31–50 y	<b>770</b>	<b>85</b>	5*	<b>15</b>	90*	<b>1.4</b>
<b>Lactation</b>						
14–18 y	<b>1,200</b>	<b>115</b>	5*	<b>19</b>	75*	<b>1.4</b>
19–30 y	<b>1,300</b>	<b>120</b>	5*	<b>19</b>	90*	<b>1.4</b>
31–50 y	<b>1,300</b>	<b>120</b>	5*	<b>19</b>	90*	<b>1.4</b>

NOTE: This table (taken from the DRI reports, see [www.nap.edu](http://www.nap.edu)) presents Recommended Dietary Allowances (RDAs) in **bold type** and Adequate Intakes (AIs) in ordinary type followed by an asterisk (\*). 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 needs of all individuals in the group, but lack of data or uncertainty in the data prevent being able to specify with confidence the percentage of individuals covered by this intake.

<sup>a</sup> As retinol activity equivalents (RAEs). 1 RAE = 1 µg retinol, 12 µg β-carotene, 24 µg α-carotene, or 24 µg β-cryptoxanthin. The RAE for dietary provitamin A carotenoids is twofold greater than retinol equivalents (RE), whereas the RAE for preformed vitamin A is the same as RE.

<sup>b</sup> As cholecalciferol. 1 µg cholecalciferol = 40 IU vitamin D.

<sup>c</sup> In the absence of adequate exposure to sunlight.

<sup>d</sup> As α-tocopherol. α-Tocopherol includes *RRR*-α-tocopherol, the only form of α-tocopherol that occurs naturally in foods, and the *2R*-stereoisomeric forms of α-tocopherol (*RRR*-, *RSR*-, *RRS*-, and *RSS*-α-tocopherol) that occur in fortified foods and supplements. It does not include the *2S*-stereoisomeric forms of α-tocopherol (*SRR*-, *SSR*-, *SRS*-, and *SSS*-α-tocopherol), also found in fortified foods and supplements.

<sup>e</sup> As niacin equivalents (NE). 1 mg of niacin = 60 mg of tryptophan; 0–6 months = preformed niacin (not NE).

<sup>f</sup> As dietary folate equivalents (DFE). 1 DFE = 1 µg food folate = 0.6 µg of folic acid

Riboflavin (mg/d)	Niacin (mg/d) <sup>e</sup>	Vitamin B <sub>6</sub> (mg/d)	Folate (µg/d) <sup>f</sup>	Vitamin B <sub>12</sub> (µg/d)	Pantothenic Acid (mg/d)	Biotin (µg/d)	Choline (mg/d) <sup>g</sup>
0.3*	2*	0.1*	65*	0.4*	1.7*	5*	125*
0.4*	4*	0.3*	80*	0.5*	1.8*	6*	150*
<b>0.5</b>	<b>6</b>	<b>0.5</b>	<b>150</b>	<b>0.9</b>	2*	8*	200*
<b>0.6</b>	<b>8</b>	<b>0.6</b>	<b>200</b>	<b>1.2</b>	3*	12*	250*
<b>0.9</b>	<b>12</b>	<b>1.0</b>	<b>300</b>	<b>1.8</b>	4*	20*	375*
<b>1.3</b>	<b>16</b>	<b>1.3</b>	<b>400</b>	<b>2.4</b>	5*	25*	550*
<b>1.3</b>	<b>16</b>	<b>1.3</b>	<b>400</b>	<b>2.4</b>	5*	30*	550*
<b>1.3</b>	<b>16</b>	<b>1.3</b>	<b>400</b>	<b>2.4</b>	5*	30*	550*
<b>1.3</b>	<b>16</b>	<b>1.7</b>	<b>400</b>	<b>2.4<sup>h</sup></b>	5*	30*	550*
<b>1.3</b>	<b>16</b>	<b>1.7</b>	<b>400</b>	<b>2.4<sup>h</sup></b>	5*	30*	550*
<b>0.9</b>	<b>12</b>	<b>1.0</b>	<b>300</b>	<b>1.8</b>	4*	20*	375*
<b>1.0</b>	<b>14</b>	<b>1.2</b>	<b>400<sup>i</sup></b>	<b>2.4</b>	5*	25*	400*
<b>1.1</b>	<b>14</b>	<b>1.3</b>	<b>400<sup>i</sup></b>	<b>2.4</b>	5*	30*	425*
<b>1.1</b>	<b>14</b>	<b>1.3</b>	<b>400<sup>i</sup></b>	<b>2.4</b>	5*	30*	425*
<b>1.1</b>	<b>14</b>	<b>1.5</b>	<b>400</b>	<b>2.4<sup>h</sup></b>	5*	30*	425*
<b>1.1</b>	<b>14</b>	<b>1.5</b>	<b>400</b>	<b>2.4<sup>h</sup></b>	5*	30*	425*
<b>1.4</b>	<b>18</b>	<b>1.9</b>	<b>600<sup>j</sup></b>	<b>2.6</b>	6*	30*	450*
<b>1.4</b>	<b>18</b>	<b>1.9</b>	<b>600<sup>j</sup></b>	<b>2.6</b>	6*	30*	450*
<b>1.4</b>	<b>18</b>	<b>1.9</b>	<b>600<sup>j</sup></b>	<b>2.6</b>	6*	30*	450*
<b>1.6</b>	<b>17</b>	<b>2.0</b>	<b>500</b>	<b>2.8</b>	7*	35*	550*
<b>1.6</b>	<b>17</b>	<b>2.0</b>	<b>500</b>	<b>2.8</b>	7*	35*	550*
<b>1.6</b>	<b>17</b>	<b>2.0</b>	<b>500</b>	<b>2.8</b>	7*	35*	550*

from fortified food or as a supplement consumed with food = 0.5 µg of a supplement taken on an empty stomach.

<sup>g</sup>Although AIs have been set for choline, there are few data to assess whether a dietary supply of choline is needed at all stages of the life cycle, and it may be that the choline requirement can be met by endogenous synthesis at some of these stages.

<sup>h</sup>Because 10 to 30 percent of older people may malabsorb food-bound B<sub>12</sub>, it is advisable for those older than 50 years to meet their RDA mainly by consuming foods fortified with B<sub>12</sub> or a supplement containing B<sub>12</sub>.

<sup>i</sup>In view of evidence linking folate intake with neural tube defects in the fetus, it is recommended that all women capable of becoming pregnant consume 400 µg from supplements or fortified foods in addition to intake of food folate from a varied diet.

<sup>j</sup>It is assumed that women will continue consuming 400 µg from supplements or fortified food until their pregnancy is confirmed and they enter prenatal care, which ordinarily occurs after the end of the periconceptual period—the critical time for formation of the neural tube.

SOURCES: *Dietary Reference Intakes for Calcium, Phosphorous, Magnesium, Vitamin D, and Fluoride* (1997); *Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B<sub>6</sub>, Folate, Vitamin B<sub>12</sub>, Pantothenic Acid, Biotin, and Choline* (1998); *Dietary Reference Intakes for Vitamin C, Vitamin E, Selenium, and Carotenoids* (2000); *Dietary Reference Intakes for Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Copper, Iodine, Iron, Manganese, Molybdenum, Nickel, Silicon, Vanadium, and Zinc* (2001); and *Dietary Reference Intakes for Water, Potassium, Sodium, Chloride, and Sulfate* (2005). These reports may be accessed via <http://www.nap.edu>.

**Dietary Reference Intakes (DRIs): Recommended Intakes for Individuals, Elements**  
 Food and Nutrition Board, Institute of Medicine, National Academies

Life Stage Group	Calcium (mg/d)	Chromium (µg/d)	Copper (µg/d)	Fluoride (mg/d)	Iodine (µg/d)	Iron (mg/d)	Magnesium (mg/d)
<b>Infants</b>							
0–6 mo	210*	0.2*	200*	0.01*	110*	0.27*	30*
7–12 mo	270*	5.5*	220*	0.5*	130*	<b>11</b>	75*
<b>Children</b>							
1–3 y	500*	11*	<b>340</b>	0.7*	<b>90</b>	<b>7</b>	<b>80</b>
4–8 y	800*	15*	<b>440</b>	1*	<b>90</b>	<b>10</b>	<b>130</b>
<b>Males</b>							
9–13 y	1,300*	25*	<b>700</b>	2*	<b>120</b>	<b>8</b>	<b>240</b>
14–18 y	1,300*	35*	<b>890</b>	3*	<b>150</b>	<b>11</b>	<b>410</b>
19–30 y	1,000*	35*	<b>900</b>	4*	<b>150</b>	<b>8</b>	<b>400</b>
31–50 y	1,000*	35*	<b>900</b>	4*	<b>150</b>	<b>8</b>	<b>420</b>
51–70 y	1,200*	30*	<b>900</b>	4*	<b>150</b>	<b>8</b>	<b>420</b>
> 70 y	1,200*	30*	<b>900</b>	4*	<b>150</b>	<b>8</b>	<b>420</b>
<b>Females</b>							
9–13 y	1,300*	21*	<b>700</b>	2*	<b>120</b>	<b>8</b>	<b>240</b>
14–18 y	1,300*	24*	<b>890</b>	3*	<b>150</b>	<b>15</b>	<b>360</b>
19–30 y	1,000*	25*	<b>900</b>	3*	<b>150</b>	<b>18</b>	<b>310</b>
31–50 y	1,000*	25*	<b>900</b>	3*	<b>150</b>	<b>18</b>	<b>320</b>
51–70 y	1,200*	20*	<b>900</b>	3*	<b>150</b>	<b>8</b>	<b>320</b>
> 70 y	1,200*	20*	<b>900</b>	3*	<b>150</b>	<b>8</b>	<b>320</b>
<b>Pregnancy</b>							
14–18 y	1,300*	29*	<b>1,000</b>	3*	<b>220</b>	<b>27</b>	<b>400</b>
19–30 y	1,000*	30*	<b>1,000</b>	3*	<b>220</b>	<b>27</b>	<b>350</b>
31–50 y	1,000*	30*	<b>1,000</b>	3*	<b>220</b>	<b>27</b>	<b>360</b>
<b>Lactation</b>							
14–18 y	1,300*	44*	<b>1,300</b>	3*	<b>290</b>	<b>10</b>	<b>360</b>
19–30 y	1,000*	45*	<b>1,300</b>	3*	<b>290</b>	<b>9</b>	<b>310</b>
31–50 y	1,000*	45*	<b>1,300</b>	3*	<b>290</b>	<b>9</b>	<b>320</b>

NOTE: This table presents Recommended Dietary Allowances (RDAs) in **bold type** and Adequate Intakes (AIs) in ordinary type followed by an asterisk (\*). 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 needs of all individuals in the group, but lack of data or uncertainty in the data prevent being able to specify with confidence the percentage of individuals covered by this intake.

Manganese (mg/d)	Molybdenum (µg/d)	Phosphorus (mg/d)	Selenium (µg/d)	Zinc (mg/d)	Potassium (g/d)	Sodium (g/d)	Chloride (g/d)
0.003*	2*	100*	15*	2*	0.4*	0.12*	0.18*
0.6*	3*	275*	20*	3	0.7*	0.37*	0.57*
1.2*	17	460	20	3	3.0*	1.0*	1.5*
1.5*	22	500	30	5	3.8*	1.2*	1.9*
1.9*	34	1,250	40	8	4.5*	1.5*	2.3*
2.2*	43	1,250	55	11	4.7*	1.5*	2.3*
2.3*	45	700	55	11	4.7*	1.5*	2.3*
2.3*	45	700	55	11	4.7*	1.5*	2.3*
2.3*	45	700	55	11	4.7*	1.3*	2.0*
2.3*	45	700	55	11	4.7*	1.2*	1.8*
1.6*	34	1,250	40	8	4.5*	1.5*	2.3*
1.6*	43	1,250	55	9	4.7*	1.5*	2.3*
1.8*	45	700	55	8	4.7*	1.5*	2.3*
1.8*	45	700	55	8	4.7*	1.5*	2.3*
1.8*	45	700	55	8	4.7*	1.3*	2.0*
1.8*	45	700	55	8	4.7*	1.2*	1.8*
2.0*	50	1,250	60	12	4.7*	1.5*	2.3*
2.0*	50	700	60	11	4.7*	1.5*	2.3*
2.0*	50	700	60	11	4.7*	1.5*	2.3*
2.6*	50	1,250	70	13	5.1*	1.5*	2.3*
2.6*	50	700	70	12	5.1*	1.5*	2.3*
2.6*	50	700	70	12	5.1*	1.5*	2.3*

SOURCES: *Dietary Reference Intakes for Calcium, Phosphorous, Magnesium, Vitamin D, and Fluoride* (1997); *Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B<sub>6</sub>, Folate, Vitamin B<sub>12</sub>, Pantothenic Acid, Biotin, and Choline* (1998); *Dietary Reference Intakes for Vitamin C, Vitamin E, Selenium, and Carotenoids* (2000); *Dietary Reference Intakes for Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Copper, Iodine, Iron, Manganese, Molybdenum, Nickel, Silicon, Vanadium, and Zinc* (2001); and *Dietary Reference Intakes for Water, Potassium, Sodium, Chloride, and Sulfate* (2005). These reports may be accessed via <http://www.nap.edu>.

**Dietary Reference Intakes (DRIs): Recommended Intakes for Individuals, Total Water and Macronutrients**

Food and Nutrition Board, Institute of Medicine, National Academies

Life Stage Group	Total Water <sup>a</sup> (L/d)	Carbo- hydrate (g/d)	Total Fiber (g/d)	Fat (g/d)	Linoleic Acid (g/d)	α-Linolenic Acid (g/d)	Protein <sup>b</sup> (g/d)
<b>Infants</b>							
0–6 mo	0.7*	60*	ND	31*	4.4*	0.5*	9.1*
7–12 mo	0.8*	95*	ND	30*	4.6*	0.5*	<b>11.0+</b>
<b>Children</b>							
1–3 y	1.3*	<b>130</b>	19*	ND <sup>c</sup>	7*	0.7*	<b>13</b>
4–8 y	1.7*	<b>130</b>	25*	ND	10*	0.9*	<b>19</b>
<b>Males</b>							
9–13 y	2.4*	<b>130</b>	31*	ND	12*	1.2*	<b>34</b>
14–18 y	3.3*	<b>130</b>	38*	ND	16*	1.6*	<b>52</b>
19–30 y	3.7*	<b>130</b>	38*	ND	17*	1.6*	<b>56</b>
31–50 y	3.7*	<b>130</b>	38*	ND	17*	1.6*	<b>56</b>
51–70 y	3.7*	<b>130</b>	30*	ND	14*	1.6*	<b>56</b>
> 70 y	3.7*	<b>130</b>	30*	ND	14*	1.6*	<b>56</b>
<b>Females</b>							
9–13 y	2.1*	<b>130</b>	26*	ND	10*	1.0*	<b>34</b>
14–18 y	2.3*	<b>130</b>	26*	ND	11*	1.1*	<b>46</b>
19–30 y	2.7*	<b>130</b>	25*	ND	12*	1.1*	<b>46</b>
31–50 y	2.7*	<b>130</b>	25*	ND	12*	1.1*	<b>46</b>
51–70 y	2.7*	<b>130</b>	21*	ND	11*	1.1*	<b>46</b>
> 70 y	2.7*	<b>130</b>	21*	ND	11*	1.1*	<b>46</b>
<b>Pregnancy</b>							
14–18 y	3.0*	<b>175</b>	28*	ND	13*	1.4*	<b>71</b>
19–30 y	3.0*	<b>175</b>	28*	ND	13*	1.4*	<b>71</b>
31–50 y	3.0*	<b>175</b>	28*	ND	13*	1.4*	<b>71</b>
<b>Lactation</b>							
14–18 y	3.8*	<b>210</b>	29*	ND	13*	1.3*	<b>71</b>
19–30 y	3.8*	<b>210</b>	29*	ND	13*	1.3*	<b>71</b>
31–50 y	3.8*	<b>210</b>	29*	ND	13*	1.3*	<b>71</b>

NOTE: This table presents Recommended Dietary Allowances (RDAs) in **bold type** and Adequate Intakes (AIs) in ordinary type followed by an asterisk (\*). 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 or uncertainty in the data prevent being able to specify with confidence the percentage of individuals covered by this intake. The plus (+) symbol indicates a change from the prepublication copy due to a calculation error.

<sup>a</sup> Total water includes all water contained in food, beverages, and drinking water.

<sup>b</sup> Based on g protein per kg of body weight for the reference body weight, e.g., for adults 0.8 g/kg body weight for the reference body weight.

<sup>c</sup> Not determined.

SOURCES: *Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids* (2002/2005); *Dietary Reference Intakes for Water, Potassium, Sodium, Chloride, and Sulfate* (2005). These reports may be accessed via <http://www.nap.edu>.

**Dietary Reference Intakes (DRIs): Acceptable Macronutrient Distribution Ranges**  
 Food and Nutrition Board, Institute of Medicine, National Academies

Macronutrient	Range (percent of energy)		
	Children, 1–3 y	Children, 4–18 y	Adults
Fat	30–40	25–35	20–35
<i>n</i> -6 Polyunsaturated fatty acids <sup>a</sup> (linoleic acid)	5–10	5–10	5–10
<i>n</i> -3 Polyunsaturated fatty acids <sup>a</sup> (α-linolenic acid)	0.6–1.2	0.6–1.2	0.6–1.2
Carbohydrate	45–65	45–65	45–65
Protein	5–20	10–30	10–35

<sup>a</sup> Approximately 10 percent of the total can come from longer-chain *n*-3 or *n*-6 fatty acids.

SOURCE: *Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids* (2002/2005).

**Dietary Reference Intakes (DRIs): Additional Macronutrient Recommendations**  
 Food and Nutrition Board, Institute of Medicine, National Academies

Macronutrient	Recommendation
Dietary cholesterol	As low as possible while consuming a nutritionally adequate diet
Trans fatty acids	As low as possible while consuming a nutritionally adequate diet
Saturated fatty acids	As low as possible while consuming a nutritionally adequate diet
Added sugars	Limit to no more than 25% of total energy

SOURCE: *Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids* (2002/2005).

**Dietary Reference Intakes (DRIs): Tolerable Upper Intake Levels (UL<sup>a</sup>), Vitamins**  
 Food and Nutrition Board, Institute of Medicine, National Academies

Life Stage Group	Vitamin A (µg/d) <sup>b</sup>	Vitamin C (mg/d)	Vitamin D (µg/d)	Vitamin E (mg/d) <sup>c,d</sup>	Vitamin K	Thiamin
<b>Infants</b>						
0–6 mo	600	ND <sup>f</sup>	25	ND	ND	ND
7–12 mo	600	ND	25	ND	ND	ND
<b>Children</b>						
1–3 y	600	400	50	200	ND	ND
4–8 y	900	650	50	300	ND	ND
<b>Males, Females</b>						
9–13 y	1,700	1,200	50	600	ND	ND
14–18 y	2,800	1,800	50	800	ND	ND
19–70 y	3,000	2,000	50	1,000	ND	ND
> 70 y	3,000	2,000	50	1,000	ND	ND
<b>Pregnancy</b>						
14–18 y	2,800	1,800	50	800	ND	ND
19–50 y	3,000	2,000	50	1,000	ND	ND
<b>Lactation</b>						
14–18 y	2,800	1,800	50	800	ND	ND
19–50 y	3,000	2,000	50	1,000	ND	ND

<sup>a</sup>UL = The highest level of daily nutrient intake that is likely to pose no risk of adverse health effects to almost all individuals in the general population. 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 B<sub>12</sub>, pantothenic acid, biotin, and carotenoids. In the absence of ULs, extra caution may be warranted in consuming levels above recommended intakes.

<sup>b</sup>As preformed vitamin A only.

<sup>c</sup>As α-tocopherol; applies to any form of supplemental α-tocopherol.

<sup>d</sup>The ULs for vitamin E, niacin, and folate apply to synthetic forms obtained from supplements, fortified foods, or a combination of the two.

<sup>e</sup>β-Carotene supplements are advised only to serve as a provitamin A source for individuals at risk of vitamin A deficiency.

Ribo- flavin	Niacin (mg/d) <sup>d</sup>	Vitamin B <sub>6</sub> (mg/d)	Folate (µg/d) <sup>d</sup>	Vitamin B <sub>12</sub>	Pantothenic Acid	Biotin	Choline (g/d)	Carote- noids <sup>e</sup>
ND	ND	ND	ND	ND	ND	ND	ND	ND
ND	ND	ND	ND	ND	ND	ND	ND	ND
ND	10	30	300	ND	ND	ND	1.0	ND
ND	15	40	400	ND	ND	ND	1.0	ND
ND	20	60	600	ND	ND	ND	2.0	ND
ND	30	80	800	ND	ND	ND	3.0	ND
ND	35	100	1,000	ND	ND	ND	3.5	ND
ND	35	100	1,000	ND	ND	ND	3.5	ND
ND	30	80	800	ND	ND	ND	3.0	ND
ND	35	100	1,000	ND	ND	ND	3.5	ND
ND	30	80	800	ND	ND	ND	3.0	ND
ND	35	100	1,000	ND	ND	ND	3.5	ND

<sup>f</sup>ND = 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 B<sub>6</sub>, Folate, Vitamin B<sub>12</sub>, 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 <http://www.nap.edu>.

**Dietary Reference Intakes (DRIs): Tolerable Upper Intake Levels (UL<sup>a</sup>), Elements**  
 Food and Nutrition Board, Institute of Medicine, National Academies

Life Stage Group	Arsenic <sup>b</sup>	Boron (mg/d)	Calcium (g/d)	Chromium	Copper (µg/d)	Fluoride (mg/d)	Iodine (µg/d)	Iron (mg/d)	Magnesium (mg/d) <sup>c</sup>
<b>Infants</b>									
0–6 mo	ND <sup>f</sup>	ND	ND	ND	ND	0.7	ND	40	ND
7–12 mo	ND	ND	ND	ND	ND	0.9	ND	40	ND
<b>Children</b>									
1–3 y	ND	3	2.5	ND	1,000	1.3	200	40	65
4–8 y	ND	6	2.5	ND	3,000	2.2	300	40	110
<b>Males, Females</b>									
9–13 y	ND	11	2.5	ND	5,000	10	600	40	350
14–18 y	ND	17	2.5	ND	8,000	10	900	45	350
19–70 y	ND	20	2.5	ND	10,000	10	1,100	45	350
> 70 y	ND	20	2.5	ND	10,000	10	1,100	45	350
<b>Pregnancy</b>									
14–18 y	ND	17	2.5	ND	8,000	10	900	45	350
19–50 y	ND	20	2.5	ND	10,000	10	1,100	45	350
<b>Lactation</b>									
14–18 y	ND	17	2.5	ND	8,000	10	900	45	350
19–50 y	ND	20	2.5	ND	10,000	10	1,100	45	350

<sup>a</sup>UL = The highest level of daily nutrient intake that is likely to pose no risk of adverse health effects to almost all individuals in the general population. 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 arsenic, chromium, silicon, potassium, and sulfate. In the absence of ULs, extra caution may be warranted in consuming levels above recommended intakes.

<sup>b</sup>Although the UL was not determined for arsenic, there is no justification for adding arsenic to food or supplements.

<sup>c</sup>The ULs for magnesium represent intake from a pharmacological agent only and do not include intake from food and water.

<sup>d</sup>Although silicon has not been shown to cause adverse effects in humans, there is no justification for adding silicon to supplements.

<sup>e</sup>Although vanadium in food has not been shown to cause adverse effects in humans,

Manga- nese (mg/d)	Molyb- denum (µg/d)	Nickel (mg/d)	Phos- phorus (g/d)	Potas- sium	Sele- nium (µg/d)	Sili- con <sup>d</sup>	Sul- fate	Vana- dium (mg/d) <sup>e</sup>	Zinc (mg/d)	Sodi- um (g/d)	Chlo- ride (g/d)
ND	ND	ND	ND	ND	45	ND	ND	ND	4	ND	ND
ND	ND	ND	ND	ND	60	ND	ND	ND	5	ND	ND
2	300	0.2	3.0	ND	90	ND	ND	ND	7	1.5	2.3
3	600	0.3	3.0	ND	150	ND	ND	ND	12	1.9	2.9
6	1,100	0.6	4.0	ND	280	ND	ND	ND	23	2.2	3.4
9	1,700	1.0	4.0	ND	400	ND	ND	ND	34	2.3	3.6
11	2,000	1.0	4.0	ND	400	ND	ND	1.8	40	2.3	3.6
11	2,000	1.0	3.0	ND	400	ND	ND	1.8	40	2.3	3.6
9	1,700	1.0	3.5	ND	400	ND	ND	ND	34	2.3	3.6
11	2,000	1.0	3.5	ND	400	ND	ND	ND	40	2.3	3.6
9	1,700	1.0	4.0	ND	400	ND	ND	ND	34	2.3	3.6
11	2,000	1.0	4.0	ND	400	ND	ND	ND	40	2.3	3.6

there is no justification for adding vanadium to food and vanadium supplements should be used with caution. The UL is based on adverse effects in laboratory animals and this data could be used to set a UL for adults but not children and adolescents.

<sup>f</sup>ND = 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 B<sub>6</sub>, Folate, Vitamin B<sub>12</sub>, Pantothenic Acid, Biotin, and Choline* (1998); *Dietary Reference Intakes for Vitamin C, Vitamin E, Selenium, and Carotenoids* (2000); *Dietary Reference Intakes for Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Copper, Iodine, Iron, Manganese, Molybdenum, Nickel, Silicon, Vanadium, and Zinc* (2001); and *Dietary Reference Intakes for Water, Potassium, Sodium, Chloride, and Sulfate* (2005). These reports may be accessed via <http://www.nap.edu>.

**Dietary Reference Intakes (DRIs): Estimated Average Requirements for Groups**  
 Food and Nutrition Board, Institute of Medicine, National Academies

Life Stage Group	CHO (g/d)	Protein (g/kg/d)	Vit A (µg/d) <sup>a</sup>	Vit C (mg/d)	Vit E (mg/d) <sup>b</sup>	Thiamin (mg/d)	Ribo-flavin (mg/d)	Niacin (mg/d) <sup>c</sup>	Vit B <sub>6</sub> (mg/d)
<b>Infants</b>									
7–12 mo		1.0							
<b>Children</b>									
1–3 y	100	0.87	210	13	5	0.4	0.4	5	0.4
4–8 y	100	0.76	275	22	6	0.5	0.5	6	0.5
<b>Males</b>									
9–13 y	100	0.76	445	39	9	0.7	0.8	9	0.8
14–18 y	100	0.73	630	63	12	1.0	1.1	12	1.1
19–30 y	100	0.66	625	75	12	1.0	1.1	12	1.1
31–50 y	100	0.66	625	75	12	1.0	1.1	12	1.1
51–70 y	100	0.66	625	75	12	1.0	1.1	12	1.4
> 70 y	100	0.66	625	75	12	1.0	1.1	12	1.4
<b>Females</b>									
9–13 y	100	0.76	420	39	9	0.7	0.8	9	0.8
14–18 y	100	0.71	485	56	12	0.9	0.9	11	1.0
19–30 y	100	0.66	500	60	12	0.9	0.9	11	1.1
31–50 y	100	0.66	500	60	12	0.9	0.9	11	1.1
51–70 y	100	0.66	500	60	12	0.9	0.9	11	1.3
> 70 y	100	0.66	500	60	12	0.9	0.9	11	1.3
<b>Pregnancy</b>									
14–18 y	135	0.88	530	66	12	1.2	1.2	14	1.6
19–30 y	135	0.88	550	70	12	1.2	1.2	14	1.6
31–50 y	135	0.88	550	70	12	1.2	1.2	14	1.6
<b>Lactation</b>									
14–18 y	160	1.05	885	96	16	1.2	1.3	13	1.7
19–30 y	160	1.05	900	100	16	1.2	1.3	13	1.7
31–50 y	160	1.05	900	100	16	1.2	1.3	13	1.7

NOTE: This table presents Estimated Average Requirements (EARs), which serve two purposes: for assessing adequacy of population intakes and as the basis for calculating Recommended Dietary Allowances (RDAs) for individuals. EARs have not been established for vitamin D, vitamin K, pantothenic acid, biotin, choline, calcium, chromium, fluoride, manganese, or other nutrients not yet evaluated via the DRI process.

<sup>a</sup>As retinol activity equivalents (RAEs). 1 RAE = 1 µg retinol, 12 µg β-carotene, 24 µg α-carotene, or 24 µg β-cryptoxanthin. The RAE for dietary provitamin A carotenoids is twofold greater than retinol equivalents (RE), whereas the RAE for preformed vitamin A is the same as RE.

<sup>b</sup>As α-tocopherol. α-Tocopherol includes *RRR*-α-tocopherol, the only form of α-tocopherol that occurs naturally in foods, and the *2R*-stereoisomeric forms of α-tocopherol (*RRR*-, *RSR*-, *RRS*-, and *RSS*-α-tocopherol) that occur in fortified foods and supplements. It does not include the *2S*-stereoisomeric forms of α-tocopherol (*SRR*-, *SSR*-, *SRS*-, and *SSS*-α-tocopherol), also found in fortified foods and supplements.

Folate (µg/d) <sup>a</sup>	Vit B <sub>12</sub> (µg/d)	Copper (µg/d)	Iodine (µg/d)	Iron (mg/d)	Magnesium (mg/d)	Molybdenum (µg/d)	Phosphorus (mg/d)	Selenium (µg/d)	Zinc (mg/d)
				6.9					2.5
120	0.7	260	65	3.0	65	13	380	17	2.5
160	1.0	340	65	4.1	110	17	405	23	4.0
250	1.5	540	73	5.9	200	26	1,055	35	7.0
330	2.0	685	95	7.7	340	33	1,055	45	8.5
320	2.0	700	95	6	330	34	580	45	9.4
320	2.0	700	95	6	350	34	580	45	9.4
320	2.0	700	95	6	350	34	580	45	9.4
320	2.0	700	95	6	350	34	580	45	9.4
250	1.5	540	73	5.7	200	26	1,055	35	7.0
330	2.0	685	95	7.9	300	33	1,055	45	7.3
320	2.0	700	95	8.1	255	34	580	45	6.8
320	2.0	700	95	8.1	265	34	580	45	6.8
320	2.0	700	95	5	265	34	580	45	6.8
320	2.0	700	95	5	265	34	580	45	6.8
520	2.2	785	160	23	335	40	1,055	49	10.5
520	2.2	800	160	22	290	40	580	49	9.5
520	2.2	800	160	22	300	40	580	49	9.5
450	2.4	985	209	7	300	35	1,055	59	10.9
450	2.4	1,000	209	6.5	255	36	580	59	10.4
450	2.4	1,000	209	6.5	265	36	580	59	10.4

<sup>c</sup>As niacin equivalents (NE). 1 mg of niacin = 60 mg of tryptophan.

<sup>d</sup>As dietary folate equivalents (DFE). 1 DFE = 1 µg food folate = 0.6 µg of folic acid from fortified food or as a supplement consumed with food = 0.5 µg of a supplement taken on an empty stomach.

SOURCES: *Dietary Reference Intakes for Calcium, Phosphorous, Magnesium, Vitamin D, and Fluoride* (1997); *Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B<sub>6</sub>, Folate, Vitamin B<sub>12</sub>, Pantothenic Acid, Biotin, and Choline* (1998); *Dietary Reference Intakes for Vitamin C, Vitamin E, Selenium, and Carotenoids* (2000); *Dietary Reference Intakes for Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Copper, Iodine, Iron, Manganese, Molybdenum, Nickel, Silicon, Vanadium, and Zinc* (2001), and *Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids* (2002/2005). These reports may be accessed via [www.nap.edu](http://www.nap.edu).