

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) ^a	Vitamin C (mg/d)	Vitamin D (µg/d) ^{b,c}	Vitamin E (mg/d) ^d	Vitamin K (µg/d)	Thiamin (mg/d)	Riboflavin (mg/d)	Niacin (mg/d) ^e	Vitamin B-6 (mg/d)	Folate (µg/d) ^f	Vitamin B-12 (µg/d)	Pantothenic Acid (mg/d)	Biotin (µg/d)	Choline (mg/d) ^g
Infants														
0–6 mo	400*	40*	10	4*	2.0*	0.2*	0.3*	2*	0.1*	65*	0.4*	1.7*	5*	125*
7–12 mo	500*	50*	10	5*	2.5*	0.3*	0.4*	4*	0.3*	80*	0.5*	1.8*	6*	150*
Children														
1–3 y	300	15	15	6	30*	0.5	0.5	6	0.5	150	0.9	2*	8*	200*
4–8 y	400	25	15	7	55*	0.6	0.6	8	0.6	200	1.2	3*	12*	250*
Males														
9–13 y	600	45	15	11	60*	0.9	0.9	12	1.0	300	1.8	4*	20*	375*
14–18 y	900	75	15	15	75*	1.2	1.3	16	1.3	400	2.4	5*	25*	550*
19–30 y	900	90	15	15	120*	1.2	1.3	16	1.3	400	2.4	5*	30*	550*
31–50 y	900	90	15	15	120*	1.2	1.3	16	1.3	400	2.4	5*	30*	550*
51–70 y	900	90	15	15	120*	1.2	1.3	16	1.7	400	2.4 ^h	5*	30*	550*
>70 y	900	90	20	15	120*	1.2	1.3	16	1.7	400	2.4 ^h	5*	30*	550*
Females														
9–13 y	600	45	15	11	60*	0.9	0.9	12	1.0	300	1.8	4*	20*	375*
14–18 y	700	65	15	15	75*	1.0	1.0	14	1.2	400 ⁱ	2.4	5*	25*	400*
19–30 y	700	75	15	15	90*	1.1	1.1	14	1.3	400 ⁱ	2.4	5*	30*	425*
31–50 y	700	75	15	15	90*	1.1	1.1	14	1.3	400 ⁱ	2.4	5*	30*	425*
51–70 y	700	75	15	15	90*	1.1	1.1	14	1.5	400	2.4 ^h	5*	30*	425*
>70 y	700	75	20	15	90*	1.1	1.1	14	1.5	400	2.4 ^h	5*	30*	425*
Pregnancy														
≤18 y	750	80	15	15	75*	1.4	1.4	18	1.9	600 ^j	2.6	6*	30*	450*
19–30 y	770	85	15	15	90*	1.4	1.4	18	1.9	600 ^j	2.6	6*	30*	450*
31–50 y	770	85	15	15	90*	1.4	1.4	18	1.9	600 ^j	2.6	6*	30*	450*
Lactation														
≤18 y	1200	115	15	19	75*	1.4	1.6	17	2.0	500	2.8	7*	35*	550*
19–30 y	1300	120	15	19	90*	1.4	1.6	17	2.0	500	2.8	7*	35*	550*
31–50 y	1300	120	15	19	90*	1.4	1.6	17	2.0	500	2.8	7*	35*	550*

mg = milligram, µg = microgram

NOTE: This table (taken from the DRI reports; see 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%) 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 prevents being able to specify with confidence the percentage of individuals covered by this intake.

^aAs retinol activity equivalents (RAEs). 1 RAE = 1 µg retinol, 12 µg β-carotene, 24 µg α-carotene, or 24 µg β-cryptoxanthin. To calculate RAEs from REs of provitamin A carotenoids in foods, divide the REs by 2. For preformed vitamin A in foods or supplements and for provitamin A carotenoids in supplements, 1 RE = 1 RAE.

^bcholecalciferol. 1 µg cholecalciferol = 40 IU vitamin D.

^cIn the absence of adequate exposure to sunlight.

^dAs 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.

^eAs niacin equivalents (NE). 1 mg of niacin = 60 mg of tryptophan; 0–6 months = preformed niacin (not NE).

^fAs 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.

^gAlthough 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.

^hBecause 10 to 30% of older people may malabsorb food-bound B-12, it is advisable for those older than 50 years to meet their RDA mainly by consuming foods fortified with B-12 or a supplement containing B-12.

ⁱIn 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.

^jIt 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.

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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)	Manganese (mg/d)	Molybdenum (µg/d)	Phosphorus (mg/d)	Selenium (µg/d)	Zinc (mg/d)
Infants												
0–6 mo	200*	0.2*	200*	0.01*	110*	0.27*	30*	0.003*	2*	100*	15*	2*
7–12 mo	260*	5.5*	220*	0.5*	130*	11	75*	0.6*	3*	275*	20*	3
Children												
1–3 y	700	11*	340	0.7*	90	7	80	1.2*	17	460	20	3
4–8 y	1000	15*	440	1*	90	10	130	1.5*	22	500	30	5
Males												
9–13 y	1300	25*	700	2*	120	8	240	1.9*	34	1250	40	8
14–18 y	1300	35*	890	3*	150	11	410	2.2*	43	1250	55	11
19–30 y	1000	35*	900	4*	150	8	400	2.3*	45	700	55	11
31–50 y	1000	35*	900	4*	150	8	420	2.3*	45	700	55	11
51–70 y	1000	30*	900	4*	150	8	420	2.3*	45	700	55	11
>70 y	1200	30*	900	4*	150	8	420	2.3*	45	700	55	11
Females												
9–13 y	1300	21*	700	2*	120	8	240	1.6*	34	1250	40	8
14–18 y	1300	24*	890	3*	150	15	360	1.6*	43	1250	55	9
19–30 y	1000	25*	900	3*	150	18	310	1.8*	45	700	55	8
31–50 y	1000	25*	900	3*	150	18	320	1.8*	45	700	55	8
51–70 y	1200	20*	900	3*	150	8	320	1.8*	45	700	55	8
>70 y	1200	20*	900	3*	150	8	320	1.8*	45	700	55	8
Pregnancy												
≤18 y	1300	29*	1000	3*	220	27	400	2.0*	50	1250	60	12
19–30 y	1000	30*	1000	3*	220	27	350	2.0*	50	700	60	11
31–50 y	1000	30*	1000	3*	220	27	360	2.0*	50	700	60	11
Lactation												
≤18 y	1300	44*	1300	3*	290	10	360	2.6*	50	1250	70	13
19–30 y	1000	45*	1300	3*	290	9	310	2.6*	50	700	70	12
31–50 y	1000	45*	1300	3*	290	9	320	2.6*	50	700	70	12

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%) 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 prevents being able to specify with confidence the percentage of individuals covered by this intake.

Sources: Dietary Reference Intakes for Calcium, Phosphorus, Magnesium, Vitamin D, and Fluoride (1997); Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B-6, Folate, Vitamin B-12, 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 Calcium and Vitamin D (2011). These reports may be accessed via www.nap.edu.

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

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

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%) 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 prevents being able to specify with confidence the percentage of individuals covered by this intake.

^aBased on 0.8g protein/kg body weight for reference body weight.

^bND = not determinable at this time.

Sources: Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids (2002). This report may be accessed via www.nap.edu.

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Dietary Reference Intakes (DRIs): Recommended Intakes for Individuals, Electrolytes and Water

Food and Nutrition Board, Institute of Medicine, National Academies

Life Stage Group	Sodium (mg/d)	Potassium (mg/d)	Chloride (mg/d)	Water (L/d)
Infants				
0–6 mo	120*	400*	180*	0.7*
7–12 mo	370*	700*	570*	0.8*
Children				
1–3 y	1000*	3000*	1500*	1.3*
4–8 y	1200*	3800*	1900*	1.7*
Males				
9–13 y	1500*	4500*	2300*	2.4*
14–18 y	1500*	4700*	2300*	3.3*
19–30 y	1500*	4700*	2300*	3.7*
31–50 y	1500*	4700*	2300*	3.7*
51–70 y	1300*	4700*	2000*	3.7*
> 70 y	1200*	4700*	1800*	3.7*
Females				
9–13 y	1500*	4500*	2300*	2.1*
14–18 y	1500*	4700*	2300*	2.3*
19–30 y	1500*	4700*	2300*	2.7*
31–50 y	1500*	4700*	2300*	2.7*
51–70 y	1300*	4700*	2000*	2.7*
> 70 y	1200*	4700*	1800*	2.7*
Pregnancy				
14–18 y	1500*	4700*	2300*	3.0*
19–50 y	1500*	4700*	2300*	3.0*
Lactation				
14–18 y	1500*	5100*	2300*	3.8*
19–50 y	1500*	5100*	2300*	3.8*

NOTE: The table is adapted from the DRI reports. See www.nap.edu. Adequate Intakes (AIs) are followed by an asterisk (*). These may be used as a goal for individual intake. For healthy breastfed infants, the AI is the average 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; therefore, no Recommended Dietary Allowance (RDA) was set.

Source: *Dietary Reference Intakes for Water, Potassium, Sodium, Chloride, and Sulfate* (2005). This report may be accessed via www.nap.edu.

Acceptable Macronutrient Distribution Ranges

Macronutrient	Range (percent of energy)		
	Children, 1–3 y	Children, 4–18 y	Adults
Fat	30–40	25–35	20–35
<i>omega</i> -6 polyunsaturated fats (linoleic acid)	5–10	5–10	5–10
<i>omega</i> -3 polyunsaturated fats ^a (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

^aApproximately 10% of the total can come from longer-chain n-3 fatty acids.

SOURCE: *Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids* (2002). The report may be accessed via www.nap.edu.

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

Life Stage Group	Vitamin A (µg/d) ^b	Vitamin C (mg/d)	Vitamin D (µg/d)	Vitamin E (mg/d) ^{c,d}	Vitamin K	Thiamin	Riboflavin	Niacin (mg/d) ^d	Vitamin B-6 (mg/d)	Folate (µg/d) ^d	Vitamin B-12	Pantothenic Acid	Biotin	Choline (g/d)	Carotenoids ^e
Infants															
0–6 mo	600	ND	25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
7–12 mo	600	ND	38	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Children															
1–3 y	600	400	63	200	ND	ND	ND	10	30	300	ND	ND	ND	1.0	ND
4–8 y	900	650	75	300	ND	ND	ND	15	40	400	ND	ND	ND	1.0	ND
Males, Females															
9–13 y	1700	1200	100	600	ND	ND	ND	20	60	600	ND	ND	ND	2.0	ND
14–18 y	2800	1800	100	800	ND	ND	ND	30	80	800	ND	ND	ND	3.0	ND
19–70 y	3000	2000	100	1000	ND	ND	ND	35	100	1000	ND	ND	ND	3.5	ND
> 70 y	3000	2000	100	1000	ND	ND	ND	35	100	1000	ND	ND	ND	3.5	ND
Pregnancy															
≤ 18 y	2800	1800	100	800	ND	ND	ND	30	80	800	ND	ND	ND	3.0	ND
19–50 y	3000	2000	100	1000	ND	ND	ND	35	100	1000	ND	ND	ND	3.5	ND
Lactation															
≤ 18 y	2800	1800	100	800	ND	ND	ND	30	80	800	ND	ND	ND	3.0	ND
19–50 y	3000	2000	100	1000	ND	ND	ND	35	100	1000	ND	ND	ND	3.5	ND

^aUL = The maximum level of daily nutrient intake 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 B-12, pantothenic acid, biotin, or carotenoids. In the absence of ULs, extra caution may be warranted in consuming levels above recommended intakes.

^bAs preformed vitamin A only.

^cAs α-tocopherol; applies to any form of supplemental α-tocopherol.

^dThe ULs for vitamin E, niacin, and folate apply to synthetic forms obtained from supplements, fortified foods, or a combination of the two.

^eβ-Carotene supplements are advised only to serve as a provitamin A source for individuals at risk of vitamin A deficiency.

^fND = 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 and Vitamin D (2011); Dietary Reference Intakes for Calcium, Phosphorus, Magnesium, Vitamin D, and Fluoride (1997); Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B-6, Folate, Vitamin B-12, Pantothenic Acid, Biotin, and Chlorine (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.

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Dietary Reference Intakes (DRIs): Tolerable Upper Intake Levels (UL^a), Elements and Electrolytes^{b,c}

Food and Nutrition Board, Institute of Medicine, National Academies

Life Stage Group	Arsenic ^b	Boron (mg/d)	Calcium (g/d)	Copper (µg/d)	Fluoride (mg/d)	Iodine (µg/d)	Iron (mg/d)	Magnesium (mg/d) ^d	Manganese (mg/d)	Molybdenum (µg/d)	Nickel (mg/d)	Phosphorus (g/d)	Selenium (µg/d)	Vanadium (mg/d) ^e	Zinc (mg/d)	Sodium (mg/d)	Chloride (mg/d)
Infants																	
0–6 mo	ND ^f	ND	1	ND	0.7	ND	40	ND	ND	ND	ND	ND	45	ND	4	ND	ND
7–12 mo	ND	ND	1.5	ND	0.9	ND	40	ND	ND	ND	ND	ND	60	ND	5	ND	ND
Children																	
1–3 y	ND	3	2.5	1000	1.3	200	40	65	2	300	0.2	3	90	ND	7	1500	2300
4–8 y	ND	6	2.5	3000	2.2	300	40	110	3	600	0.3	3	150	ND	12	1900	2900
Males, Females																	
9–13 y	ND	11	3	5000	10	600	40	350	6	1100	0.6	4	280	ND	23	2200	3400
14–18 y	ND	17	3	8000	10	900	45	350	9	1700	1.0	4	400	ND	34	2300	3600
19–70 y	ND	20	2.5 ^g	10000	10	1100	45	350	11	2000	1.0	4	400	1.8	40	2300	3600
>70 y	ND	20	2	10000	10	1100	45	350	11	2000	1.0	3	400	1.8	40	2300	3600
Pregnancy																	
≤18 y	ND	17	3	8000	10	900	45	350	9	1700	1.0	3.5	400	ND	34	2300	3600
19–50 y	ND	20	2.5	10000	10	1100	45	350	11	2000	1.0	3.5	400	ND	40	2300	3600
Lactation																	
≤18 y	ND	17	3	8000	10	900	45	350	9	1700	1.0	4	400	ND	34	2300	3600
19–50 y	ND	20	2.5	10000	10	1100	45	350	11	2000	1.0	4	400	ND	40	2300	3600

^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 arsenic, chromium, and silicon. In the absence of ULs, extra caution may be warranted in consuming levels above recommended intakes.

^bAlthough a UL was not determined for arsenic, there is no justification for adding arsenic to food or supplements.

^cAlthough silicon has not been shown to cause adverse effects in humans, there is no justification for adding silicon to supplements.

^dThe ULs for magnesium represent intake from a pharmacological agent only and do not include intake from food and water.

^eAlthough vanadium in food has not been shown to cause adverse effects in humans, 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.

^fND = 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.

^gUpper Limit declines to 2 after age 50.

SOURCES: Dietary Reference Intakes for Calcium and Vitamin D (2011); Dietary Reference Intakes for Calcium, Phosphorus, Magnesium, Vitamin D, and Fluoride (1997); Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B-6, Folate, Vitamin B-12, 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* (2004). These reports may be accessed via www.nap.edu.

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