

SUMMARY TABLE 1 Dietary Reference Intakes (DRIs):
 Estimated Average Requirements for Groups
 Food and Nutrition Board, Institute of Medicine,
 National Academies

Life Stage Group	Carbo- hydrate (g/d)	Protein (g/d)	Vit A ($\mu\text{g}/\text{d}$) ^a	Vit C (mg/d)	Vit E (mg/d) ^b	Thiamin (mg/d)
Infants						
7–12 mo		10				
Children						
1–3 y	100	11	210	13	5	0.4
4–8 y	100	15	275	22	6	0.5
Males						
9–13 y	100	27	445	39	9	0.7
14–18 y	100	44	630	63	12	1.0
19–30 y	100	46	625	75	12	1.0
31–50 y	100	46	625	75	12	1.0
51–70 y	100	46	625	75	12	1.0
> 70 y	100	46	625	75	12	1.0
Females						
9–13 y	100	28	420	39	9	0.7
14–18 y	100	38	485	56	12	0.9
19–30 y	100	38	500	60	12	0.9
31–50 y	100	38	500	60	12	0.9
51–70 y	100	38	500	60	12	0.9
> 70 y	100	38	500	60	12	0.9
Pregnancy						
≤ 18 y	135	50	530	66	12	1.2
19–30 y	135	50	550	70	12	1.2
31–50 y	135	50	550	70	12	1.2
Lactation						
≤ 18 y	160	60	880	96	16	1.2
19–30 y	160	60	900	100	16	1.2
31–50 y	160	60	900	100	16	1.2

continued

NOTE: This table presents Estimated Average Requirements (EARs), which serve three purposes: for assessing adequacy of population intakes, for planning the adequacy of population intakes, and as the basis for calculating Recommended Dietary Allowances (RDAs) for individuals for those nutrients. 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.

^a 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 two-fold greater than retinol equivalents (RE), whereas the RAE for preformed vitamin A is the same as RE.

SUMMARY TABLE 1 continued Dietary Reference Intakes (DRIs): Estimated Average Requirements for Groups
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National Academies

Life Stage Group	Ribo-flavin (mg/d)	Niacin (mg/d) ^c	Vit B ₆ (mg/d)	Folate (µg/d) ^a	Vit B ₁₂ (µg/d)	Copper (µg/d)
Infants						
7–12 mo						
Children						
1–3 y	0.4	5	0.4	120	0.7	260
4–8 y	0.5	6	0.5	160	1.0	340
Males						
9–13 y	0.8	9	0.8	250	1.5	540
14–18 y	1.1	12	1.1	330	2.0	685
19–30 y	1.1	12	1.1	320	2.0	700
31–50 y	1.1	12	1.1	320	2.0	700
51–70 y	1.1	12	1.4	320	2.0	700
> 70 y	1.1	12	1.4	320	2.0	700
Females						
9–13 y	0.8	9	0.8	250	1.5	540
14–18 y	0.9	11	1.0	330	2.0	685
19–30 y	0.9	11	1.1	320	2.0	700
31–50 y	0.9	11	1.1	320	2.0	700
51–70 y	0.9	11	1.3	320	2.0	700
> 70 y	0.9	11	1.3	320	2.0	700
Pregnancy						
≤ 18 y	1.2	14	1.6	520	2.2	785
19–30 y	1.2	14	1.6	520	2.2	800
31–50 y	1.2	14	1.6	520	2.2	800
Lactation						
≤ 18 y	1.3	13	1.7	450	2.4	985
19–30 y	1.3	13	1.7	450	2.4	1,000
31–50 y	1.3	13	1.7	450	2.4	1,000

^b 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.

^c As niacin equivalents (NE). 1 mg of niacin = 60 mg of tryptophan.

^d 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.

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
65	3.0	65	13	380	17	2.5
65	4.1	110	17	405	23	4.0
73	5.9	200	26	1,055	35	7.0
95	7.7	340	33	1,055	45	8.5
95	6	330	34	580	45	9.4
95	6	350	34	580	45	9.4
95	6	350	34	580	45	9.4
95	6	350	34	580	45	9.4
73	5.7	200	26	1,055	35	7.0
95	7.9	300	33	1,055	45	7.3
95	8.1	255	34	580	45	6.8
95	8.1	265	34	580	45	6.8
95	5	265	34	580	45	6.8
95	5	265	34	580	45	6.8
160	23	335	40	1,055	49	10.5
160	22	290	40	580	49	9.5
160	22	300	40	580	49	9.5
209	7	300	35	1,055	59	10.9
209	6.5	255	36	580	59	10.4
209	6.5	265	36	580	59	10.4

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); *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). These reports may be accessed via www.nap.edu.

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SUMMARY TABLE 2 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}
Infants				
0–6 mo	600	ND ^f	25	ND
7–12 mo	600	ND	25	ND
Children				
1–3 y	600	400	50	200
4–8 y	900	650	50	300
Males, Females				
9–13 y	1,700	1,200	50	600
14–18 y	2,800	1,800	50	800
19–70 y	3,000	2,000	50	1,000
> 70 y	3,000	2,000	50	1,000
Pregnancy				
≤ 18 y	2,800	1,800	50	800
19–50 y	3,000	2,000	50	1,000
Lactation				
≤ 18 y	2,800	1,800	50	800
19–50 y	3,000	2,000	50	1,000

^a UL = 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.

^b As preformed vitamin A only.

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

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

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

Vitamin K	Thiamin	Ribo- flavin	Niacin (mg/d) ^d	Vitamin B ₆ (mg/d)	Folate (µg/d) ^d
ND	ND	ND	ND	ND	ND
ND	ND	ND	ND	ND	ND
ND	ND	ND	10	30	300
ND	ND	ND	15	40	400
ND	ND	ND	20	60	600
ND	ND	ND	30	80	800
ND	ND	ND	35	100	1,000
ND	ND	ND	35	100	1,000
ND	ND	ND	30	80	800
ND	ND	ND	35	100	1,000
ND	ND	ND	30	80	800
ND	ND	ND	35	100	1,000

continued

f 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 B₆, Folate, Vitamin B₁₂, Pantothenic Acid, Biotin, and Choline* (1998); *Dietary Reference Intakes for Vitamin C, Vitamine 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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SUMMARY TABLE 2 continued Dietary Reference Intakes (DRIs): Tolerable Upper Intake Levels (UL^a), Vitamins Food and Nutrition Board, Institute of Medicine, National Academies

Life Stage Group	Vitamin B ₁₂	Pantothenic Acid	Biotin	Choline (g/d)	Carotenoids ^e
Infants					
0-6 mo	ND	ND	ND	ND	ND
7-12 mo	ND	ND	ND	ND	ND
Children					
1-3 y	ND	ND	ND	1.0	ND
4-8 y	ND	ND	ND	1.0	ND
Males, Females					
9-13 y	ND	ND	ND	2.0	ND
14-18 y	ND	ND	ND	3.0	ND
19-70 y	ND	ND	ND	3.5	ND
> 70 y	ND	ND	ND	3.5	ND
Pregnancy					
≤ 18 y	ND	ND	ND	3.0	ND
19-50 y	ND	ND	ND	3.5	ND
Lactation					
≤ 18 y	ND	ND	ND	3.0	ND
19-50 y	ND	ND	ND	3.5	ND

SUMMARY TABLE 3 Dietary Reference Intakes (DRIs):
Tolerable Upper Intake Levels (UL^a), Elements
Food and Nutrition Board, Institute of Medicine,
National Academies

Life Stage Group	Arsenic ^b	Boron (mg/d)	Calcium (g/d)	Chromium	Copper (µg/d)	Fluoride (mg/d)
Infants						
0-6 mo	ND ^f	ND	ND	ND	ND	0.7
7-12 mo	ND	ND	ND	ND	ND	0.9
Children						
1-3 y	ND	3	2.5	ND	1,000	1.3
4-8 y	ND	6	2.5	ND	3,000	2.2
Males, Females						
9-13 y	ND	11	2.5	ND	5,000	10
14-18 y	ND	17	2.5	ND	8,000	10
19-70 y	ND	20	2.5	ND	10,000	10
> 70 y	ND	20	2.5	ND	10,000	10
Pregnancy						
≤ 18 y	ND	17	2.5	ND	8,000	10
19-50 y	ND	20	2.5	ND	10,000	10
Lactation						
≤ 18 y	ND	17	2.5	ND	8,000	10
19-50 y	ND	20	2.5	ND	10,000	10

continued

^a UL = 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.

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

SUMMARY TABLE 3 continued Dietary Reference Intakes (DRIs): Tolerable Upper Intake Levels (UL^a), Elements Food and Nutrition Board, Institute of Medicine, National Academies

Life Stage Group	Iodine (µg/d)	Iron (mg/d)	Magnesium (mg/d) ^c	Manganese (mg/d)
Infants				
0-6 mo	ND	40	ND	ND
7-12 mo	ND	40	ND	ND
Children				
1-3 y	200	40	65	2
4-8 y	300	40	110	3
Males, Females				
9-13 y	600	40	350	6
14-18 y	900	45	350	9
19-70 y	1,100	45	350	11
> 70 y	1,100	45	350	11
Pregnancy				
≤ 18 y	900	45	350	9
19-50 y	1,100	45	350	11
Lactation				
≤ 18 y	900	45	350	9
19-50 y	1,100	45	350	11

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

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

^e Although 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.

^f 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.

Molybdenum (µg/d)	Nickel (mg/d)	Phosphorus (g/d)	Selenium (µg/d)	Silicon ^d	Vanadium (mg/d) ^e	Zinc (mg/d)
ND	ND	ND	45	ND	ND	4
ND	ND	ND	60	ND	ND	5
300	0.2	3	90	ND	ND	7
600	0.3	3	150	ND	ND	12
1,100	0.6	4	280	ND	ND	23
1,700	1.0	4	400	ND	ND	34
2,000	1.0	4	400	ND	1.8	40
2,000	1.0	3	400	ND	1.8	40
1,700	1.0	3.5	400	ND	ND	34
2,000	1.0	3.5	400	ND	ND	40
1,700	1.0	4	400	ND	ND	34
2,000	1.0	4	400	ND	ND	40

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, Vitamine 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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