Dietary Reference Intakes (DRIs): Vitamins

Food and Nutrition Board, Institute of Medicine, National Academies

Nutrient	Function	Life Stage Group	RDA/AI*	UL[a]	Selected Food Sources	Adverse Effects of Excessive Consumption	Special Considerations
Biotin	Coenzyme in synthesis of fat, glycogen, and amino acids	*Infants*			Liver and smaller amounts in fruits and meats.	No adverse effects of biotin in humans or animals were found. This does not mean that there is no potential for adverse effects resulting from high intakes. Because data on the adverse effects of biotin are limited, caution may be warranted.	None.
		0–6 mo	5 µg/d*	ND[b]			
		7–12 mo	6 µg/d*	ND			
		Children					
		1–3 y	8 µg/d*	ND			
		4–8 y	12 µg/d*	ND			
		Males, Females					
		9–13 y	20 µg/d*	ND			
		14–18 y	25 µg/d*	ND			
		19–30 y	30 µg/d*	ND			
		31–50 y	30 µg/d*	ND			
		50–70 y	30 µg/d*	ND			
		> 70 y	30 µg/d*	ND			
		Pregnancy					
		≤ 18 y	30 µg/d*	ND			
		19–30y	30 µg/d*	ND			
		31–50 y	30 µg/d*	ND			
		Lactation					
		≤ 18 y	35 µg/d*	ND			
		19–30y	35 µg/d*	ND			
		31–50 y	35 µg/d*	ND			

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.

[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 B_{12}, pantothenic acid, biotin, or carotenoids. In the absence of ULs, extra caution may be warranted in consuming levels above recommended intakes.

[b]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.

[c] Note: Given as dietary folate equivalents (DFE). 1 DFE = 1 µg food folate = 0.6 µg of folate from fortified food or as a supplement consumed with food = 0.5 µg of a supplement taken on an empty stomach.

[d]Includes nicotinic acid amide, nicotinic acid (pyridine-3-carboxylic acid), and derivatives that exhibit the biological activity of nicotinamide. Note: Given as niacin equivalents (NE). 1 mg of niacin = 60 mg of tryptophan; 0–6 months = preformed niacin (not NE).

[e]Includes provitamin A carotenoids that are dietary precursors of retinol. Note: Given as 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 = 1RAE.

[f]Note: 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.

SOURCES: *Dietary Reference Intakes for Calcium, Phosphorous, 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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Nutrient	Function	Life Stage Group	RDA/AI*	UL[a]	Selected Food Sources	Adverse Effects of Excessive Consumption	Special Considerations
Choline	Precursor for acetylcholine, phospholipids and betaine.	*Infants*			Milk, liver, eggs, peanuts.	Fishy body odor, sweating, salivation, hypotension, hepatotoxicity.	Individuals with trimethylaminuria, renal disease, liver disease, depression and Parkinson's disease, may be at risk of adverse effects with choline intakes at the UL. 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.
		0–6 mo	125 mg/d*	ND[b]			
		7–12 mo	150 mg/d*	ND			
		Children					
		1–3 y	200 mg/d*	1,000 mg/d			
		4–8 y	250 mg/d*	1,000 mg/d			
		Males					
		9–13 y	375 mg/d*	2,000 mg/d			
		14–18 y	550 mg/d*	3,000 mg/d			
		19–30 y	550 mg/d*	3,500 mg/d			
		31–50 y	550 mg/d*	3,500 mg/d			
		51–70 y	550 mg/d*	3,500 mg/d			
		> 70 y	550 mg/d*	3,500 mg/d			
		Females					
		9–13 y	375 mg/d*	2,000 mg/d			
		14–18 y	400 mg/d*	3,000 mg/d			
		19–30 y	425 mg/d*	3,500 mg/d			
		31–50 y	425 mg/d*	3,500 mg/d			
		51–70 y	425 mg/d*	3,500 mg/d			
		> 70 y	425 mg/d*	3,500 mg/d			
		Pregnancy					
		≤ 18 y	450 mg/d*	3,000 mg/d			
		19–30y	450 mg/d*	3,500 mg/d			
		31–50 y	450 mg/d*	3,500 mg/d			
		Lactation					
		≤ 18 y	550 mg/d*	3,000 mg/d			
		19–30y	550 mg/d*	3,500 mg/d			
		31–50 y	550 mg/d*	3,500 mg/d			

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[c] Note: Given as dietary folate equivalents (DFE). 1 DFE = 1 µg food folate = 0.6 µg of folate from fortified food or as a supplement consumed with food = 0.5 µg of a supplement taken on an empty stomach.

[d]Includes nicotinic acid amide, nicotinic acid (pyridine-3-carboxylic acid), and derivatives that exhibit the biological activity of nicotinamide. Note: Given as niacin equivalents (NE). 1 mg of niacin = 60 mg of tryptophan; 0–6 months = preformed niacin (not NE).

[e]Includes provitamin A carotenoids that are dietary precursors of retinol. Note: Given as 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 = 1RAE.

[f]Note: 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.

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Dietary Reference Intakes (DRIs): Vitamins

Food and Nutrition Board, Institute of Medicine, National Academies

Nutrient	Function	Life Stage Group	RDA/AI*	UL[a]	Selected Food Sources	Adverse Effects of Excessive Consumption	Special Considerations
Folate[c] Also known as: Folic acid Folacin Pteroylpoly-glutamates.	Coenzyme in the metabolism of nucleic and amino acids; prevents megaloblastic anemia.	*Infants* 0–6 mo 7–12 mo *Children* 1–3 y 4–8 y *Males, Females* 9–13 y 14–18 y 19–30 y 31–50 y 50–70 y > 70 y *Pregnancy* ≤ 18 y 19–30y 31–50 y *Lactation* ≤ 18 y 19–30y 31–50 y	 65 µg/d* 80 µg/d* **150 µg/d** **200 µg/d** **300 µg/d** **400 µg/d** **400 µg/d** **400 µg/d** **400 µg/d** **400 µg/d** **600 µg/d** **600 µg/d** **600 µg/d** **500 µg/d** **500 µg/d** **500 µg/d**	 ND[b] ND 300 µg/d 400 µg/d 600 µg/d 800 µg/d 1,000 µg/d 1,000 µg/d 1,000 µg/d 1,000 µg/d 800 µg/d 1,000 µg/d 1,000 µg/d 800 µg/d 1,000 µg/d 1,000 µg/d	Enriched cereal grains, dark leafy vegetables, enriched and whole-grain breads and bread products, fortified ready-to-eat cereals.	Masks neurological complication in people with vitamin B12 deficiency. No adverse effects associated with folate from food or supplements have been reported. This does not mean that there is no potential for adverse effects resulting from high intakes. Because data on the adverse effects of folate are limited, caution may be warranted. The UL for folate applies to synthetic forms obtained from supplements and/or fortified foods.	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. 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 periconceptional period—the critical time for formation of the neural tube.

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[d] Includes nicotinic acid amide, nicotinic acid (pyridine-3-carboxylic acid), and derivatives that exhibit the biological activity of nicotinamide. Note: Given as niacin equivalents (NE). 1 mg of niacin = 60 mg of tryptophan; 0–6 months = preformed niacin (not NE).

[e] Includes provitamin A carotenoids that are dietary precursors of retinol. Note: Given as 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 = 1RAE.

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Dietary Reference Intakes (DRIs): Vitamins

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Nutrient	Function	Life Stage Group	RDA/AI*	UL[a]	Selected Food Sources	Adverse Effects of Excessive Consumption	Special Considerations
Niacin[d]	Coenzyme or cosubstrate in many biological reduction and oxidation reactions—thus required for energy metabolism.	*Infants*			Meat, fish, poultry, enriched and wholegrain breads and bread products, fortified ready-to-eat cereals.	There is no evidence of adverse effects from the consumption of naturally occurring niacin in foods. Adverse effects from niacin containing supplements may include flushing and gastrointestinal distress. The UL for niacin applies to synthetic forms obtained from supplements, fortified foods, or a combination of the two.	Extra niacin may be required by persons treated with hemodialysis or peritoneal dialysis, or those with malabsorption syndrome.
		0–6 mo	2 mg/d*	ND[b]			
		7–12 mo	4 mg/d*	ND			
		Children					
		1–3 y	**6 mg/d**	10 mg/d			
		4–8 y	**8 mg/d**	15 mg/d			
		Males					
		9–13 y	**12 mg/d**	20 mg/d			
		14–18 y	**16 mg/d**	30 mg/d			
		19–30 y	**16 mg/d**	35 mg/d			
		31–50 y	**16 mg/d**	35 mg/d			
		51–70 y	**16 mg/d**	35 mg/d			
		> 70 y	**16 mg/d**	35 mg/d			
		Females					
		9–13 y	**12 mg/d**	20 mg/d			
		14–18 y	**14 mg/d**	30 mg/d			
		19–30 y	**14 mg/d**	35 mg/d			
		31–50 y	**14 mg/d**	35 mg/d			
		51–70 y	**14 mg/d**	35 mg/d			
		> 70 y	**14 mg/d**	35 mg/d			
		Pregnancy					
		≤ 18 y	**18 mg/d**	30 mg/d			
		19–30y	**18mg/d**	35 mg/d			
		31–50 y	**18 mg/d**	35 mg/d			
		Lactation					
		≤ 18 y	**17 mg/d**	30 mg/d			
		19–30y	**17 mg/d**	35 mg/d			
		31–50 y	**17 mg/d**	35 mg/d			

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[e]Includes provitamin A carotenoids that are dietary precursors of retinol. Note: Given as 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 = 1RAE.

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Pantothenic Acid	Coenzyme in fatty acid metabolism.	*Infants*			Chicken, beef, potatoes, oats, cereals, tomato products, liver, kidney, yeast, egg yolk, broccoli, whole grains.	No adverse effects associated with pantothenic acid from food or supplements have been reported. This does not mean that there is no potential for adverse effects resulting from high intakes. Because data on the adverse effects of pantothenic acid are limited, caution may be warranted.	None.
		0–6 mo	1.7 mg/d*	ND[b]			
		7–12 mo	1.8 mg/d*	ND			
		Children					
		1–3 y	2 mg/d*	ND			
		4–8 y	3 mg/d*	ND			
		Males, Females					
		9–13 y	4 mg/d*	ND			
		14–18 y	5 mg/d*	ND			
		19–30 y	5 mg/d*	ND			
		31–50 y	5 mg/d*	ND			
		50–70 y	5 mg/d*	ND			
		> 70 y	5 mg/d*	ND			
		Pregnancy					
		≤ 18 y	6 mg/d*	ND			
		19–30y	6 mg/d*	ND			
		31–50 y	6 mg/d*	ND			
		Lactation					
		≤ 18 y	7 mg/d*	ND			
		19–30y	7 mg/d*	ND			
		31–50 y	7 mg/d*	ND			

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Nutrient	Function	Life Stage Group	RDA/AI*	UL[a]	Selected Food Sources	Adverse Effects of Excessive Consumption	Special Considerations
Riboflavin Also known as: Vitamin B_2	Coenzyme in numerous redox reactions.	*Infants* 0–6 mo 7–12 mo *Children* 1–3 y 4–8 y *Males* 9–13 y 14–18 y 19–30 y 31–50 y 51–70 y > 70 y *Females* 9–13 y 14–18 y 19–30 y 31–50 y 51–70 y > 70 y *Pregnancy* ≤ 18 y 19–30y 31–50 y *Lactation* ≤ 18 y 19–30y 31–50 y	 0.3 mg/d* 0.4 mg/d* **0.5 mg/d** **0.6 mg/d** **0.9 mg/d** **1.3 mg/d** **1.3 mg/d** **1.3 mg/d** **1.3 mg/d** **1.3 mg/d** **0.9 mg/d** **1.0 mg/d** **1.1 mg/d** **1.1 mg/d** **1.1 mg/d** **1.1 mg/d** **1.4 mg/d** **1.4 mg/d** **1.4 mg/d** **1.6 mg/d** **1.6 mg/d** **1.6 mg/d**	 ND[b] ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND	Organ meats, milk, bread products and fortified cereals.	No adverse effects associated with riboflavin consumption from food or supplements have been reported. This does not mean that there is no potential for adverse effects resulting from high intakes. Because data on the adverse effects of riboflavin are limited, caution may be warranted.	None.

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[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 B_{12}, pantothenic acid, biotin, or carotenoids. In the absence of ULs, extra caution may be warranted in consuming levels above recommended intakes.

[b]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.

[c] Note: Given as dietary folate equivalents (DFE). 1 DFE = 1 µg food folate = 0.6 µg of folate from fortified food or as a supplement consumed with food = 0.5 µg of a supplement taken on an empty stomach.

[d]Includes nicotinic acid amide, nicotinic acid (pyridine-3-carboxylic acid), and derivatives that exhibit the biological activity of nicotinamide. Note: Given as niacin equivalents (NE). 1 mg of niacin = 60 mg of tryptophan; 0–6 months = preformed niacin (not NE).

[e]Includes provitamin A carotenoids that are dietary precursors of retinol. Note: Given as 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 = 1RAE.

[f]Note: 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.

SOURCES: *Dietary Reference Intakes for Calcium, Phosphorous, 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.

Dietary Reference Intakes (DRIs): Vitamins

Food and Nutrition Board, Institute of Medicine, National Academies

Nutrient	Function	Life Stage Group	RDA/AI*	UL[a]	Selected Food Sources	Adverse Effects of Excessive Consumption	Special Considerations
Thiamin Also known as: Vitamin B_1 Aneurin	Coenzyme in the metabolism of carbohydrates and branchedchain amino acids.	*Infants* 0–6 mo 7–12 mo *Children* 1–3 y 4–8 y *Males* 9–13 y 14–18 y 19–30 y 31–50 y 51–70 y > 70 y *Females* 9–13 y 14–18 y 19–30 y 31–50 y 51–70 y > 70 y *Pregnancy* ≤ 18 y 19–30y 31–50 y *Lactation* ≤ 18 y 19–30y 31–50 y	 0.2 mg/d* 0.3 mg/d* **0.5 mg/d** **0.6 mg/d** **0.9 mg/d** **1.2 mg/d** **1.2 mg/d** **1.2 mg/d** **1.2 mg/d** **1.2 mg/d** **0.9 mg/d** **1.0 mg/d** **1.1 mg/d** **1.1 mg/d** **1.1 mg/d** **1.1 mg/d** **1.4 mg/d** **1.4 mg/d** **1.4 mg/d** **1.4 mg/d** **1.4 mg/d** **1.4 mg/d**	 ND[b] ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND	Enriched, fortified, or whole-grain products; bread and bread products, mixed foods whose main ingredient is grain, and ready-to-eat cereals.	No adverse effects associated with thiamin from food or supplements have been reported. This does not mean that there is no potential for adverse effects resulting from high intakes. Because data on the adverse effects of thiamin are limited, caution may be warranted.	Persons who may have increased needs for thiamin include those being treated with hemodialysis or peritoneal dialysis, or individuals with malabsorption syndrome.

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.

[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 B_{12}, pantothenic acid, biotin, or carotenoids. In the absence of ULs, extra caution may be warranted in consuming levels above recommended intakes.

[b]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.

[c] Note: Given as dietary folate equivalents (DFE). 1 DFE = 1 µg food folate = 0.6 µg of folate from fortified food or as a supplement consumed with food = 0.5 µg of a supplement taken on an empty stomach.

[d]Includes nicotinic acid amide, nicotinic acid (pyridine-3-carboxylic acid), and derivatives that exhibit the biological activity of nicotinamide. Note: Given as niacin equivalents (NE). 1 mg of niacin = 60 mg of tryptophan; 0–6 months = preformed niacin (not NE).

[e]Includes provitamin A carotenoids that are dietary precursors of retinol. Note: Given as 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 = 1RAE.

[f]Note: 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.

SOURCES: *Dietary Reference Intakes for Calcium, Phosphorous, 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.

Dietary Reference Intakes (DRIs): Vitamins

Food and Nutrition Board, Institute of Medicine, National Academies

Nutrient	Function	Life Stage Group	RDA/AI*	UL[a]	Selected Food Sources	Adverse Effects of Excessive Consumption	Special Considerations
Vitamin A[e]	Required for normal vision, gene expression, reproduction, embryonic development and immune function.	*Infants*			Liver, dairy products, fish, darkly colored fruits, leafy vegetables.	Teratological effects, liver toxicity Note: From preformed Vitamin A only.	Individuals with high alcohol intake, preexisting liver disease, hyperlipidemia or severe protein malnutrition may be distinctly susceptible to the adverse effects of excess preformed vitamin A intake. β-carotene supplements are advised only to serve as a provitamin A source for individuals at risk of vitamin A deficiency.
		0–6 mo	400 µg/d*	600 µg/d			
		7–12 mo	500 µg/d*	600 µg/d			
		Children					
		1–3 y	**300 µg/d**	600 µg/d			
		4–8 y	**400 µg/d**	900 µg/d			
		Males					
		9–13 y	**600 µg/d**	1,700 µg/d			
		14–18 y	**900 µg/d**	2,800 µg/d			
		19–30 y	**900 µg/d**	3,000 µg/d			
		31–50 y	**900 µg/d**	3,000 µg/d			
		51–70 y	**900 µg/d**	3,000 µg/d			
		> 70 y	**900 µg/d**	3,000 µg/d			
		Females					
		9–13 y	**600 µg/d**	1,700 µg/d			
		14–18 y	**700 µg/d**	2,800 µg/d			
		19–30 y	**700 µg/d**	3,000 µg/d			
		31–50 y	**700 µg/d**	3,000 µg/d			
		51–70 y	**700 µg/d**	3,000 µg/d			
		> 70 y	**700 µg/d**	3,000 µg/d			
		Pregnancy					
		≤ 18 y	**750 µg/d**	2,800 µg/d			
		19–30y	**770 µg/d**	3,000 µg/d			
		31–50 y	**770 µg/d**	3,000 µg/d			
		Lactation					
		≤ 18 y	**1,200 µg/d**	2,800 µg/d			
		19–30y	**1,300 µg/d**	3,000 µg/d			
		31–50 y	**1,300 µg/d**	3,000 µg/d			

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.

[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 B_{12}, pantothenic acid, biotin, or carotenoids. In the absence of ULs, extra caution may be warranted in consuming levels above recommended intakes.

[b]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.

[c] Note: Given as dietary folate equivalents (DFE). 1 DFE = 1 µg food folate = 0.6 µg of folate from fortified food or as a supplement consumed with food = 0.5 µg of a supplement taken on an empty stomach.

[d]Includes nicotinic acid amide, nicotinic acid (pyridine-3-carboxylic acid), and derivatives that exhibit the biological activity of nicotinamide. Note: Given as niacin equivalents (NE). 1 mg of niacin = 60 mg of tryptophan; 0–6 months = preformed niacin (not NE).

[e]Includes provitamin A carotenoids that are dietary precursors of retinol. Note: Given as 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 = 1RAE.

[f]Note: 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.

SOURCES: *Dietary Reference Intakes for Calcium, Phosphorous, 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.

Dietary Reference Intakes (DRIs): Vitamins

Food and Nutrition Board, Institute of Medicine, National Academies

Nutrient	Function	Life Stage Group	RDA/AI*	UL[a]	Selected Food Sources	Adverse Effects of Excessive Consumption	Special Considerations
Vitamin B_6 Vitamin B_6 comprises a group of six related compounds: pyridoxal, pyridoxine, pyridoxamine, and 5'-phosphates (PLP, PNP, PMP).	Coenzyme in the metabolism of amino acids, glycogen and sphingoid bases	*Infants* 0–6 mo 7–12 mo *Children* 1–3 y 4–8 y *Males* 9–13 y 14–18 y 19–30 y 31–50 y 51–70 y > 70 y *Females* 9–13 y 14–18 y 19–30 y 31–50 y 51–70 y > 70 y *Pregnancy* ≤ 18 y 19–30y 31–50 y *Lactation* ≤ 18 y 19–30y 31–50 y	 0.1 mg/d* 0.3 mg/d* **0.5 mg/d** **0.6 mg/d** **1.0 mg/d** **1.3 mg/d** **1.3 mg/d** **1.3 mg/d** **1.7 mg/d** **1.7 mg/d** **1.0 mg/d** **1.2 mg/d** **1.3 mg/d** **1.3 mg/d** **1.5 mg/d** **1.5 mg/d** **1.9 mg/d** **1.9 mg/d** **1.9 mg/d** **2.0 mg/d** **2.0 mg/d** **2.0 mg/d**	 ND[b] ND 30 mg/d 40 mg/d 60 mg/d 80 mg/d 100 mg/d 100 mg/d 100 mg/d 100 mg/d 60 mg/d 80 mg/d 100 mg/d 100 mg/d 100 mg/d 100 mg/d 80 mg/d 100 mg/d 100 mg/d 80 mg/d 100 mg/d 100 mg/d	Fortified cereals, organ meats, fortified soy-based meat substitutes.	No adverse effects associated with Vitamin B_6 from food have been reported. This does not mean that there is no potential for adverse effects resulting from high intakes. Because data on the adverse effects of Vitamin B_6 are limited, caution may be warranted. Sensory neuropathy has occurred from high intakes of supplemental forms.	None.

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[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 B_{12}, pantothenic acid, biotin, or carotenoids. In the absence of ULs, extra caution may be warranted in consuming levels above recommended intakes.

[b]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.

[c] Note: Given as dietary folate equivalents (DFE). 1 DFE = 1 µg food folate = 0.6 µg of folate from fortified food or as a supplement consumed with food = 0.5 µg of a supplement taken on an empty stomach.

[d]Includes nicotinic acid amide, nicotinic acid (pyridine-3-carboxylic acid), and derivatives that exhibit the biological activity of nicotinamide. Note: Given as niacin equivalents (NE). 1 mg of niacin = 60 mg of tryptophan; 0–6 months = preformed niacin (not NE).

[e]Includes provitamin A carotenoids that are dietary precursors of retinol. Note: Given as 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 = 1RAE.

[f]Note: 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.

SOURCES: *Dietary Reference Intakes for Calcium, Phosphorous, 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.

Dietary Reference Intakes (DRIs): Vitamins

Food and Nutrition Board, Institute of Medicine, National Academies

Nutrient	Function	Life Stage Group	RDA/AI*	UL[a]	Selected Food Sources	Adverse Effects of Excessive Consumption	Special Considerations
Vitamin B_{12} Also known as: Cobalamin	Coenzyme in nucleic acid metabolism; prevents megaloblastic anemia.	*Infants* 0–6 mo 7–12 mo *Children* 1–3 y 4–8 y *Males, Females* 9–13 y 14–18 y 19–30 y 31–50 y 50–70 y > 70 y *Pregnancy* ≤ 18 y 19–30y 31–50 y *Lactation* ≤ 18 y 19–30y 31–50 y	 0.4 µg/d* 0.5 µg/d* **0.9 µg/d** **1.2 µg/d** **1.8 µg/d** **2.4 µg/d** **2.4 µg/d** **2.4 µg/d** **2.4 µg/d** **2.4 µg/d** **2.6 µg/d** **2.6 µg/d** **2.6 µg/d** **2.8 µg/d** **2.8 µg/d** **2.8 µg/d**	 ND[b] ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND	Fortified cereals, meat, fish, poultry.	No adverse effects have been associated with the consumption of the amounts of vitamin B_{12} normally found in foods or supplements. This does not mean that there is no potential for adverse effects resulting from high intakes. Because data on the adverse effects of vitamin B_{12} are limited, caution may be warranted.	Because 10 to 30 percent of older people may malabsorb foodbound vitamin B_{12}, it is advisable for those older than 50 years to meet their RDA mainly by consuming foods fortified with vitamin B_{12} or a supplement containing vitamin B_{12}.

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[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 B_{12}, pantothenic acid, biotin, or carotenoids. In the absence of ULs, extra caution may be warranted in consuming levels above recommended intakes.

[b]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.

[c] Note: Given as dietary folate equivalents (DFE). 1 DFE = 1 µg food folate = 0.6 µg of folate from fortified food or as a supplement consumed with food = 0.5 µg of a supplement taken on an empty stomach.

[d]Includes nicotinic acid amide, nicotinic acid (pyridine-3-carboxylic acid), and derivatives that exhibit the biological activity of nicotinamide. Note: Given as niacin equivalents (NE). 1 mg of niacin = 60 mg of tryptophan; 0–6 months = preformed niacin (not NE).

[e]Includes provitamin A carotenoids that are dietary precursors of retinol. Note: Given as 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 = 1RAE.

[f]Note: 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.

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Dietary Reference Intakes (DRIs): Vitamins

Food and Nutrition Board, Institute of Medicine, National Academies

Nutrient	Function	Life Stage Group	RDA/AI*	UL[a]	Selected Food Sources	Adverse Effects of Excessive Consumption	Special Considerations
Vitamin C Also known as: Ascorbic acid Dehydroascorbic acid (DHA)	Cofactor for reactions requiring reduced copper or iron metalloenzyme and as a protective antioxidant	*Infants* 0–6 mo 7–12 mo *Children* 1–3 y 4–8 y *Males* 9–13 y 14–18 y 19–30 y 31–50 y 51–70 y > 70 y *Females* 9–13 y 14–18 y 19–30 y 31–50 y 51–70 y > 70 y *Pregnancy* ≤ 18 y 19–30y 31–50 y *Lactation* ≤ 18 y 19–30y 31–50 y	 40 mg/d* 50 mg/d* **15 mg/d** **25 mg/d** **45 mg/d** **75 mg/d** **90 mg/d** **90 mg/d** **90 mg/d** **90 mg/d** **45 mg/d** **65 mg/d** **75 mg/d** **75 mg/d** **75 mg/d** **75 mg/d** **80 mg/d** **85 mg/d** **85 mg/d** **115 mg/d** **120 mg/d** **120 mg/d**	 ND[b] ND 400 mg/d 650 mg/d 1,200 mg/d 1,800 mg/d 2,000 mg/d 2,000 mg/d 2,000 mg/d 2,000 mg/d 1,200 mg/d 1,800 mg/d 2,000 mg/d 2,000 mg/d 2,000 mg/d 2,000 mg/d 1,800 mg/d 2,000 mg/d 2,000 mg/d 1,800 mg/d 2,000 mg/d 2,000 mg/d	Citrus fruits, tomatoes, tomato juice, potatoes, brussel sprouts, cauliflower, broccoli, strawberries, cabbage and spinach.	Gastrointestinal disturbances, kidney stones, excess iron absorption.	Individuals who smoke require an additional 35 mg/d of vitamin C over that needed by nonsmokers. Nonsmokers regularly exposed to tobacco smoke are encouraged to ensure they meet the RDA for vitamin C.

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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[c] Note: Given as dietary folate equivalents (DFE). 1 DFE = 1 µg food folate = 0.6 µg of folate from fortified food or as a supplement consumed with food = 0.5 µg of a supplement taken on an empty stomach.

[d]Includes nicotinic acid amide, nicotinic acid (pyridine-3-carboxylic acid), and derivatives that exhibit the biological activity of nicotinamide. Note: Given as niacin equivalents (NE). 1 mg of niacin = 60 mg of tryptophan; 0–6 months = preformed niacin (not NE).

[e]Includes provitamin A carotenoids that are dietary precursors of retinol. Note: Given as 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 = 1RAE.

[f]Note: 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.

SOURCES: *Dietary Reference Intakes for Calcium, Phosphorous, 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.

Dietary Reference Intakes (DRIs): Vitamins

Food and Nutrition Board, Institute of Medicine, National Academies

Nutrient	Function	Life Stage Group	RDA/AI*	UL[a]	Selected Food Sources	Adverse Effects of Excessive Consumption	Special Considerations
Vitamin D Also known as: Calciferol Note: 1 µg calciferol = 40 IU vitamin D The DRI values are based on minimal sun exposure.	Maintain serum calcium and phosphorus concentrations, and in turn, bone health.	*Infants* 0–6 mo 7–12 mo *Children* 1–3 y 4–8 y *Males, Females* 9–13 y 14–18 y 19–30 y 31–50 y 50–70 y > 70 y *Pregnant/Lactating* 14–18 y 19–50 y	 400 IU/d* 400 IU/d* **600 IU/d** **600 IU/d** **600 IU/d** **600 IU/d** **600 IU/d** **600 IU/d** **600 IU/d** **800 IU/d** **600 IU/d** **600 IU/d**	 1,000 IU/d 1,500 IU/d 2,500 IU/d 3,000 IU/d 4,000 IU/d 4,000 IU/d 4,000 IU/d 4,000 IU/d 4,000 IU/d 4,000 IU/d 4,000 IU/d 4,000 IU/d	Fish liver oils, flesh of fatty fish, egg yolk, fortified dairy products and fortified cereals.	Hypercalcemia which can lead to decreased renal function and hypercalciuria, kidney failure, cardiovascular system failure, and calcification of soft tissues.	None.

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[d]Includes nicotinic acid amide, nicotinic acid (pyridine-3-carboxylic acid), and derivatives that exhibit the biological activity of nicotinamide. Note: Given as niacin equivalents (NE). 1 mg of niacin = 60 mg of tryptophan; 0–6 months = preformed niacin (not NE).

[e]Includes provitamin A carotenoids that are dietary precursors of retinol. Note: Given as 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 = 1RAE.

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Dietary Reference Intakes (DRIs): Vitamins

Food and Nutrition Board, Institute of Medicine, National Academies

Nutrient	Function	Life Stage Group	RDA/AI*	UL[a]	Selected Food Sources	Adverse Effects of Excessive Consumption	Special Considerations
Vitamin E Also known as: α-tocopherol	A metabolic function has not yet been identified. Vitamin E's major function appears to be as a nonspecific chain-breaking antioxidant.	*Infants* 0–6 mo 7–12 mo *Children* 1–3 y 4–8 y *Males, Females* 9–13 y 14–18 y 19–30 y 31–50 y 50–70 y > 70 y *Pregnancy* ≤ 18 y 19–30y 31–50 y *Lactation* ≤ 18 y 19–30y 31–50 y	 4 mg/d* 5 mg/d* **6 mg/d** **7 mg/d** **11 mg/d** **15 mg/d** **15 mg/d** **15 mg/d** **15 mg/d** **15 mg/d** **15 mg/d** **15 mg/d** **15 mg/d** **19 mg/d** **19 mg/d** **19 mg/d**	 ND[b] ND 200 mg/d 300 mg/d 600 mg/d 800 mg/d 1,000 mg/d 1,000 mg/d 1,000 mg/d 1,000 mg/d 800 mg/d 1,000 mg/d 1,000 mg/d 800 mg/d 1,000 mg/d 1,000 mg/d	Vegetable oils, unprocessed cereal grains, nuts, fruits, vegetables, meats.	There is no evidence of adverse effects from the consumption of vitamin E naturally occurring in foods. Adverse effects from vitamin E containing supplements may include hemorrhagic toxicity. The UL for vitamin E applies to any form of α-tocopherol obtained from supplements, fortified foods, or a combination of the two.	Patients on anticoagulant therapy should be monitored when taking vitamin E supplements.

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[d]Includes nicotinic acid amide, nicotinic acid (pyridine-3-carboxylic acid), and derivatives that exhibit the biological activity of nicotinamide. Note: Given as niacin equivalents (NE). 1 mg of niacin = 60 mg of tryptophan; 0–6 months = preformed niacin (not NE).

[e]Includes provitamin A carotenoids that are dietary precursors of retinol. Note: Given as 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 = 1RAE.

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Dietary Reference Intakes (DRIs): Vitamins

Food and Nutrition Board, Institute of Medicine, National Academies

Nutrient	Function	Life Stage Group	RDA/AI*	UL[a]	Selected Food Sources	Adverse Effects of Excessive Consumption	Special Considerations
Vitamin K	Coenzyme during the synthesis of many proteins involved in blood clotting and bone metabolism.	*Infants* 0–6 mo 7–12 mo *Children* 1–3 y 4–8 y *Males* 9–13 y 14–18 y 19–30 y 31–50 y 51–70 y > 70 y *Females* 9–13 y 14–18 y 19–30 y 31–50 y 51–70 y > 70 y *Pregnancy* ≤ 18 y 19–30y 31–50 y *Lactation* ≤ 18 y 19–30y 31–50 y	 2.0 µg/d* 2.5 µg/d* 30 µg/d* 55 µg/d* 60 µg/d* 75 µg/d* 120 µg/d* 120 µg/d* 120 µg/d* 120 µg/d* 60 µg/d* 75 µg/d* 90 µg/d* 90 µg/d* 90 µg/d* 90 µg/d* 75 µg/d* 90 µg/d* 90 µg/d* 75 µg/d* 90 µg/d* 90 µg/d*	 ND[b] ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND	Green vegetables (collards, spinach, salad greens, broccoli), brussel sprouts, cabbage, plant oils and margarine.	No adverse effects associated with vitamin K consumption from food or supplements have been reported in humans or animals. This does not mean that there is no potential for adverse effects resulting from high intakes. Because data on the adverse effects of vitamin K are limited, caution may be warranted.	Patients on anticoagulant therapy should monitor vitamin K intake.

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