

Nutrient Needs at a Glance

Extension Nutrition Specialists The Texas A&M System

Glossary

set when there is no data to set the RDA	Н
range of intake for an energy source that reduces risk of chronic disease while providing essential nutrients. Excess leads to weight gain and increased risk of chronic disease.	K M M
loss of appetite	M
a substance that prevents the deterioration or rancidity of fats	N
inability to coordinate voluntary muscles	0
general physical wasting and malnutrition	0
cracks at the corner of the mouth	P
compound that forms the actual part in an enzyme after combining with a protein component	R
the amount of a nutrient needed daily as determined by the Food and Drug Administration (FDA)	R
inflammation of the skin	S
loss of a layer of skin	Te In
general term for a set of reference values for planning and assessing nutrient intakes of healthy people	X
an inflammatory condition of the skin characterized by redness and itching	R
abnormal accumulation of fluid in the body	Da Re
a dietary agent that facilitates the reaction of insulin	in Re
metric unit of mass equal to one thousandth (10 ⁻³) of a kilogram	Re ate Kii
	range of intake for an energy source that reduces risk of chronic disease while providing essential nutrients. Excess leads to weight gain and increased risk of chronic disease. loss of appetite a substance that prevents the deterioration or rancidity of fats inability to coordinate voluntary muscles general physical wasting and malnutrition cracks at the corner of the mouth compound that forms the actual part in an enzyme after combining with a protein component the amount of a nutrient needed daily as determined by the Food and Drug Administration (FDA) inflammation of the skin loss of a layer of skin general term for a set of reference values for planning and assessing nutrient intakes of healthy people an inflammatory condition of the skin characterized by redness and itching abnormal accumulation of fluid in the body a dietary agent that facilitates the reaction of insulin



Hemorrhagic:	loss of blood from blood vessels
Ketosis:	a condition caused by abnormal burning of fat in the body
Macronutrients:	nutrients—proteins, fats, carbohydrates, others—needed by the body in large amounts
Microgram (µg - mcg):	one millionth of a gram
Milligram (mg):	one thousandth of a gram
Neural Tube Defects (NTD):	birth defects due to failure of the neural tube to develop properly during fetal development
Osteomalacia:	softening of bones in adults
Osteoporosis:	porous, brittle bones
Photophobia:	sensitivity to light
Recommended Dietary Allowances (RDA):	the amount of nutrients needed to promote good growth and optimum health in people ages 25 to 50
Rickets:	bone deformation in children
Scurvy:	weakened cartilages and connective tissue
Tolerable Upper Intake Level (UL):	highest daily intake that will not cause adverse effects
Xerophthalmia:	an eye condition that can lead to blindness

References

Data compiled by the Standing Committee on the Scientific Evaluation of Dietary Reference Intakes for Nutrients Reports (*www.nap.edu*), the Food and Nutrition Board, Institute of Medicine, National Academy of Sciences, Washington, DC: National Academy Press, 1997-2009.

Recommended Dietary Allowances, 10th ed., Washington, DC: National Academy Press, 1989.

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Estimated safe and adequate daily dietary intakes of selected vitamins and minerals

DRI's	Age range	RDA* (I	bold)/AI*	AMDR*	Functions in the body	Sources	Deficiency
Nutrients (macro*)	_	Males	Females	M + F			
Protein (g/d)	1–8 years	13-19	13-19	5-30	Builds and repairs all body tissue	Animal protein: meat, fish, poultry, eggs,	Fatigue, loss of appetite, edema*, poor growth
(grams*/day)	9–18 years	34-52	34-46	10-30	 Helps build blood 	milk, cheese, yogurt	
	19–50 years	56	46	10–35	 Helps form antibodies to fight infection 	Vegetable protein: legumes (peas, beans),	
	51–70 years	56	46	10–35	 Supplies food energy at 4 calories per gram 	whole grain breads and cereals, nuts, peanut butter, soy	
Fat (g/d)	1–8 years	-	-	25-40	• Supplies 9 calories per gram (more energy in a	Butter, margarine, shortening, oil, salad	Eczema*, retarded growth, diarrhea, loss of hair
	9–18 years	-	-	25-35	small amount of food)	dressing, palm and coconut oil, egg yolk,	
	19–50 years	-	-	25-35	 Transports fat-soluble vitamins and essential fatty 	meat with fat, whole milk, cheese, peanut	
	51–70 years	-	-	20–35	acids needed for body's proper use and storage of fat	butter	
Carbohydrates (g/d)	1–8 years	130**	130**	45-65	Supply energy at 4 calories per gram to all body	Breads, cereals, flours, cornmeal, rice,	Loss of energy, fatigue, ketosis*
	9–18 years	130**	130**	45-65	cells	macaroni, noodles, spaghetti, Irish and	577 5 7
	19–50 years	130**	130**	45-65	 Supply glucose to spare protein 	sweet potatoes, corn, dried fruits, bananas,	
	51–70 years	130**	130**	45-65	• Help the body use other nutrients	sugar, syrup, jam, jellies, preserves, honey	
Fiber (g/d)	1–8 years	19-25	19–25	None determined	May help lower cholesterol	Whole grains (wheat, unmilled rice, oats) or	Diarrhea; excess fiber makes bulk, which may
	9–18 years	31-38	26		Improves bowel motility	enriched products: cereals, bread, noodles,	prevent eating enough food energy or nutrients;
	19–50 years	38	25		 Gives feeling of fullness without extra calories, promoting satiety and weight loss 	tortillas, brown rice, oatmeal	high-fiber diets for elderly, very young or those on low-calorie diets may cause nutrient
	51–70 years	30	21		 Contains phytic acids that tie up minerals, which can prevent absorption 	Vegetables: broccoli, spinach, carrots, beans, peas	deficiencies
Water-soluble vitam	ins	RDA	*/AI*	UL*	Functions in the body	Sources	Deficiency
		Males	Females	M + F			
Vitamin C	1–8 years	15-25	15-25	400-650	• Helps wounds heal	All citrus fruits, fruit juices, strawberries,	Scurvy*, sore or bleeding gums, poor wound
Ascorbic Acid (mg/d)	9–18 years	45-75	45-65	1,200–1,800	 Promotes iron absorption 	cantaloupe; green or red peppers, raw	healing, pain in joints, bones, muscles
(milligrams*/day)	19–50 years 51–70 years	90 90	75 75	2,000 2,000	 Helps the body maintain collagen (fibrous part of protein for cell structure) 	cabbage, spinach, broccoli, turnip greens, collards, mustard greens, kale, tomatoes, Irish or sweet potatoes	
Vitamin B ₁ – Thiamin	1–8 years	0.5-0.6	0.5-0.6	None determined	Helps the body use carbohydrates for energy	Meat (especially pork), liver, heart, kidney,	Poor appetite, constipation, depression, apathy,
(mg/d)	9–18 years	0.9–1.2	0.9–1.0		 Maintains appetite and muscle tone 	poultry, eggs, milk, dried peas and beans,	cachexia*, edema*, cardiac failure, cheilosis*
	19–50 years	1.2	1.1		 Involved in nervous system function 	nuts, whole-grain or enriched bread and	
	51–70 years	1.2	1.1			cereals	
Vitamin B ₂ – Riboflavin (mg/d)	1–8 years	0.5–0.6 0.9–1.3	0.5–0.6 0.9–1.0	None determined	 Functions as a part of a coenzyme* that assists in energy release 	Milk, cheese, ice cream, organ meats, eggs, fish, dark green leafy vegetables, enriched	Cheilosis*, scaly desquamation* around nose and ears, sore tongue and mouth, burning and itching
Riboliavin (mg/u)	9–18 years 19–50 years	1.3	1.1		Helps in metabolism of amino acids	breads and cereals	eyes, photophobia*
	51–70 years	1.3	1.1		• Helps in metabolism of annuo acius	bleads and cereals	eyes, photophobia
Niacin (mg/d NE*)	1–8 years	6-8	6-8	10–15	Coenzyme* for carbohydrate metabolism	Meat, liver, poultry, fish, dried peas and	Anorexia*, diarrhea, dermatitis*, confusion,
Nicotinic acid	9–18 years	12-16	12–14	20-30	 Promotes normal appetite 	beans, nuts (especially peanuts), whole-	anxiety
Nicotinamide	19–50 years 51–70 years	16 16	14 14	35 35		grain or enriched cereals and breads, milk, cheese, yogurt	
Vitamin B ₆ (mg/d)	1–8 years	0.5-0.6	0.5-0.6	30-40	Coenzyme* for protein utilization	Meat, poultry, fish, sweet potatoes,	Anemia, nervous irritability, convulsions,
Pyridoxine	9–18 years	1.0-1.3	1.0-1.2	60-80	 Helps convert the amino acid tryptophan to the 	vegetables, whole grains, fortified cereals	weakness, ataxia*, abdominal pain, dermatitis*
Puridoxal	19–50 years	1.3	1.3	100	vitamin Niacin		
Pyridoxamine	51–70 years	1.7	1.5	100	 Helps convert complex carbohydrates to simple carbohydrates 		
Choline (mg/d)	1–8 years	200–250	200–250	1,000	Plays a role in cell structure in lipids in the cell	Egg yolks, milk, peanuts, soy, wheat germ,	When low during pregnancy, an increased risk of
	9–18 years	375-550	375-400	2,000-3,000	membranes	livers (beef, veal and turkey)	birth defects; low choline leads to increased risk
	19–50 years	550	425	3,500	 Promotes brain and memory functions 	·	of cardiovascular disease
	51–70 years	550	425	3,500	Gives to own manufacture in the body		
Vitamin \mathbf{B}_{12} (µg/d)	1-8 years	0.9-1.2	0.9-1.2	None determined	Helps maintain nerve tissue and normal blood	Animal foods: organ meats, muscle meats,	Anemia, neurologic disorders
(micrograms*/day)	9-18 years	1.8-2.4	1.8-2.4		formation	fish, poultry, eggs, milk; fortified cereals	
Cobalamin	19-50 years	2.4	2.4		Regeneration of folate		
	51-70 years	2.4	2.4				

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1 9	Biotin (μg/d)						Liver, and smaller amounts in meats and	Because data on biotin's adverse effects are
Rate soluble vitamins RDA*/Al* UL* Functions in the body Sources Deficiency Itemin A logid MT 1-8 years (memore defined Activity etrinol, Activity and resistant to infection (activity and resinthilly adted boose and test), the inferent (activity and resista		9–18 years 19–50 years	20–25 30	30		(carbohydrate stored in muscle and liver), and	fruits	limited, caution may be needed
Main Females M + F Vitamin A (up) (BAE) 1-9 years 9-9 years 9-10 y		51–70 years					-	
Water In Jung of IAE ¹ 1-3 years (1-3 year) 30-40 (-3 year) 300-40 (-3 year) 300-40 (-3 year) 300-40 (-3 year) Promotes growth and oronal vicin, and protects (1-3 year) Dark key years or deep yellow segretables (the protects) yellow fults (pach key) (the protects) Faulty bore and bor (the protects) Faulty bo	Fat-soluble vitamins				UL*	Functions in the body	Sources	Deficiency
Remote,			Males	Females	M + F			
DC calceler Image space S	Retinol, Retinal Carotene *Retinol Activity Equivalent:	9–18 years 19–50 years	600-900 900	600-700 700	1,700–2,800 3,000	against night blindness • Helps keep skin and mucous membrane linings healthy and resistant to infection	(carrots, winter squash, cushaw, pumpkin, sweet potatoes); yellow fruits (peaches, cantaloupe, apricots); liver, fish liver oils,	Faulty bone and tooth development in infants, poor growth, xerophthalmia*, night blindness
D. G. Good Collection 1-3 years 5 5 50 phosphorus absorbed in the bload to mobilize and immeralize the bone in the some instruction and sardines. Using amounts are toxic butter, liver, egg yolk, salmon and sardines. deformities; convulsi and immeralize the bone in the some instruction. Some instruction and sardines. Large amounts are toxic butter, liver, egg yolk, salmon and sardines. deformities; convulsi and immeralize the bone in the bone in the bone in the some instruction. Some instruction and sardines. The some instruction and sardine readones instructing provide sardines. The some instruction an			Note: 1	µg Calciferol	= 40 IU Vitamin D			Rickets* (soft, fragile bones, enlarged joints,
D, Cholecalcifered 9-18 years 13-0 years 5 5 5 7 5 5 7 5		1–8 years	5	5	50			bowed legs); chest, spinal and pelvic bone deformities; convulsions; osteomalacia*
1-0 years 10 10 50 Calge antomina set toxin Vitamic (mg/d) h/b, beta, gamme-locopherol 51-70 years 6-7 bits 6-7 bits<							Surrei, ivel, egg yon, sumon and surames	
Alpha ¹ , beta ² , gamma-tocopherol 9-18 years 15 11-15 15 11-15 15 600-800 15 ··Reduce solution of leaderod action of selenium polyunsaturated fatty actions and polyunsaturated fatty actions polyunsaturated fatty actions polyun		,				Large amounts are toxic		
giamma-iocopherol 15 15 10 Reduces oxidation of vitamin A, carotenes and polyunsturated atty acids meats (other animal foods are poor sources) Vitamin K (µg/d) 19-50 years 30-55 30-55 None determined polyunsturated atty acids Deep green leaves (alialfa, spinach, carbobage), liver, egg yolk, butterfat, (is whore more thromined in blood sources) Prolonged dotting ti newborn infants Windenuinne (K), µg-18 years 30-55 80-55 G0-75 G	Vitamin E (mg/d)	1–8 years	6-7	6-7	200-300	Not stored in body to any extent	Plant tissues: wheat or rice germ, vegetable	Anemia in premature infants, problems of
15-70 years 15 15 1,000 polyunaturated fitxy adds Witamin K (ug/d) Mineadioner (K/, Menadioner							oils, green leafy vegetables, nuts, legumes;	nervous system
Phylloquinone (K) 9-18 years 9-18 years 9-18 years 90 Needed to form protrombin in blood subfactorial registering newborn infants Menadulone (K) 19-50 years 120 90 Needed to form protrombin in blood subfactorial registering newborn infants Minerals/Elements E RDA*/Al* UL* Functions in the body Sources Deficiency Calcium (mg/d) 1-8 years 50-800 500-800 2.500 Needed to buil bones and teeth; helps clot blood Milk, cheese. les crean, greens (kale, interstine by beneficial bone mine rickets*, osteomalace faigue Males Retarded bone mine rickets*, osteomalace faigue Chromium (µg/d) 1-8 years 50-800 500-800 2.500 Needed to buil bones and teeth; helps clot blood helps clot blood faigue, liver, seg yeak, liver, meat, cheese, whole- grain creals Institute of cells to us grain creals Ins	gamma-tocopheroi					,	meats (other animal roods are poor sources)	
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9–18 years 8–11 8–15 45 • Enzyme involved in energy metabolism enriched and whole-grain breads, cereals, teenage girls and pre	lron (mg/d)	-				Part of blood hemoglobin and myoglobin	Liver, organ meats, meat, poultry, egg volk,	Anemia (frequent in infants, preschool children,
		9–18 years	8–11	8–15	45		enriched and whole-grain breads, cereals,	teenage girls and pregnant women)
		19–50 years	8	18	45		legumes, dark green vegetables, black strap	
50-70 years8845molasses, peaches, apricots, raisins, prunes		50–70 years	8	8	45		molasses, peaches, apricots, raisins, prunes	

Magnesium (mg/d)	1–8 years 9–18 years	80–130 240–410	80–130 240–360	65–100 350	Activates enzymes involved in protein synthesis Helps muscles and nerves work	Whole-grain cereals, nuts, legumes, meats, milk, green leafy vegetables	Tremors, growth failure
	19–50 years 51–70 years	400-420 420	310-320 320	350 350 350	- neps museles and nerves work	mink, green reary vegetables	
Manganese (mg/d)	1–8 years	1.2–1.5	1.2–1.5	2–3	Activates many enzymes used in carbohydrate	Legumes, whole-grain cereals, nuts, tea	None known
	9–18 years	1.9-2.2	1.6	6–9	and protein metabolism		
	19–50 years	2.3	1.8	11	Bone formation		
	51–70 years	2.3	1.8	11			
Phosphorus (mg/d)	1–8 years	460-500	460-500	3,000	Builds strong bones and teeth	Breads, cereals, lima beans, meat, poultry,	Found widely in foods, so deficiency is rare.
	9–18 years	1,250	1,250	4,000	 Releases energy from fat, protein and 	fish, meat alternates, milk, cheese, yogurt	Bone loss characterized by weakness, anorexia*,
	19–50 years	700	700	4,000	carbohydrates during metabolism		malaise, and pain
	51–70 years	700	700	4,000	 Aids in formation of genetic material, cell membranes and enzymes 		
Selenium (µg/d)	1–8 years	20-30	20-30	90–150	• Antioxidant	Organ meats, seafoods, cereal foods and	Hair and nail brittleness and loss
	9–18 years	40-55	40-55	280-400	 Lessens breakdown of vitamin E 	plants grown in selenium-rich soil	
	19–50 years	55	55	400			
	51–70 years	55	55	400			
Zinc (mg/d)	1–8 years	3-5	3–5	7–12	Component of many enzymes (carbonic	Seafoods, liver and other organ meats,	Poor wound healing, decreased taste ability
	9–18 years	8–11	8-9	23-34	anhydrase and anhydrase carboxypeptidase) and	meats, fish, wheat, yeast. Plant foods are	
	19–50 years	11	8	40	proteins	generally low in zinc	
	51–70 years 11 8 40 • Controls information from gene to gene so living things develop and function						
Electrolytes		RDA*/AI*		UL*	Functions in the body	Sources	Deficiency
		Males	Females	M + F			
Sodium (g/d) ⁴	1–8 years	1–1.2	1–1.2	1.5–1.9	Found in extracellular fluid (blood)	Table salt, cheddar cheese, ham, snack	
	9–18 years	1.5	1.5	2.2–2.3	 Maintains fluid balance and nerve transmission 	foods, most processed foods, salt (sodium	and diarrhea
	19–50 years	1.5	1.5	2.3		chloride) and sodium benzoate/phosphate	
	51–70 years	1.3	1.3	2.3		are added	
Chloride (g/d)	1–8 years	1.5–1.9	1.5–1.9	2.3-2.9	Helps maintain normal pH of blood (7.35)	Table salt (sodium chloride), barley, wheat,	Heat cramps, hair loss, tooth loss
	9–18 years	2.3	2.3	3.4–3.6	 Maintains fluid balance and nerve transmission 	green leafy vegetables, melon, pineapple	
	19–50 years	2.3	2.3	3.6 3.6			
	51–70 years	2	2	3.6			
Potassium (g/d) ⁴	1–8 years	3-3.8	3–3.8	None determined	 Found inside the cell 	Bananas, orange juice, most fruits, potatoes,	Weakness, poor muscle tone, heart abnormalitie
	9–18 years	4.5-4.7	4.5-4.7		 Maintains fluid balance and nerve transmission 	dried peas, peanuts, nuts, dairy products,	apathy (lack of energy)
	19–50 years	4.7	4.7			and meats	
	51–70 years	4.7	4.7				
Water (liters/day)	1–8 years	1.3–1.7	1.3–1.7	None determined	• Transports nutrients	Water, juices, beverages, high-moisture	Dehydration, constipation
	9–18 years	2.4-3.3	2.1–2.3		Transports waste	solid foods (soups, watermelon, meats, etc.)	
	19–50 years	3.7	2.7		 Lubricates joints 		
	51–70 years	3.7	2.7		 Regulates body temperature 		

* See Glossary for definitions

**Average minimum amounts of glucose used by brain

***Supplement during pregnancy of 400 µg or mcg folic acid plus folate intake of a varied diet

¹ NE (niacin equivalent) is equal to 1 mg of niacin or 60 mg of dietary tryptophan

² RAE = Retinol activity equivalents. 1 retinol equivalent = 1 μ g retinol or 6 μ g beta-carotene

³ a-tocopherol includes the only form (RRR-a-tocopherol) that occurs naturally in foods and with variations of this form in fortified foods and supplements.

⁴ Estimated sodium and potassium minimum requirements. Al* has been set for healthy individuals and the UL* may be too high for persons with hypertension.

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