



# Eating Right

## *Vitamins and Minerals*

Many claims about vitamins and minerals may be misleading and confusing. The following lists tell what vitamins and minerals do, where they are found and the current recommendations for nutrient intake. Since 1941, Recommended Dietary Allowances (RDAs) have been the accepted standard for nutrient intake by all healthy people. The RDAs have been periodically revised and updated by the Food and Nutrition Board of the National Academy of Science.

Recognition of the importance of proper nutrition to health and disease prevention has led to the development of a new and expanded approach to nutrient guidelines: Dietary Reference Intakes (DRIs). The DRIs will replace and expand the RDAs. RDAs focused on the prevention of deficiency diseases, whereas the DRIs evaluate different nutrients for their impact on long-term health. There will be levels of DRIs, including RDAs and AIs (Adequate Intakes), which will both be used as goals of individual intakes.

DRIs were first established for calcium and its related nutrients: phosphorus, magnesium, vitamin D and fluoride in 1997. The second group of nutrients, completed in 1998, was folate, the B vitamins and choline. Vitamins C and E and selenium were added in 2000. Completion of all nutrient guidelines is expected by the year 2002. Nutrition experts recommend that nutrient needs should be met by eating a variety of foods.

The amounts for nutrients given below are for adults. **The DRI values in bold type are the new RDAs; the DRI values in ordinary type are AIs (Adequate Intakes).** Both RDAs and AIs may be used as goals for individual intake.

<b>Vitamins - Fat-soluble</b>				
<b>Nutrient</b>	<b>DRI (1997-2000)</b>	<b>RDA (1989)</b>	<b>Function</b>	<b>Major Sources</b>
Vitamin A*		1,000 RE (retinol equivalents) (M) 800 RE (F)	Needed for growth, healthy skin, bones and teeth. Helps maintain good vision, especially in dim light. Helps body resist infection.	Fish-liver oils, liver, butter, cream, whole and fortified milk, whole-milk cheeses, egg yolk, dark green leafy vegetables and fortified products. 1 cup spinach = 1479 RE 1 cup carrots = 3830 RE (To date, there is no separate recommendation for beta carotene, the plant source of vitamin A.)

\*Fat-Soluble vitamins A and D may be toxic in large amounts.

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Nutrient	DRI (1997-2000)	RDA (1989)	Function	Major Sources
Vitamin D*	Ages 31-50: 5 micrograms Ages 51-70: 10 micrograms Ages 70+: 15 micrograms	<b>Replaced by DRI</b>	Helps to maintain concentration of calcium and phosphorus in the blood, which aids in their absorption and use to promote healthy bones and teeth.	Fish-liver oils, fortified milk, exposure to sunlight. 2 cups vitamin D fortified milk = 5 micrograms
Vitamin E	<b>15 mg</b>	<b>Replaced by DRI</b>	Helps retard destruction of vitamin A and ascorbic acid. Protects red blood cells.	Widely distributed among many foods. Cereal seed oils such as wheat germ, soybeans, corn and cottonseed. 3 1/2 oz. Peanuts = 7.8 mg. 3 1/2T. corn oil = 7.1 mg
Vitamin K		80 micrograms (M) 65 micrograms (F)	Promotes normal blood clotting.	Green leaves such as spinach and cabbage. Cauliflower and liver. Made in intestinal tract by bacteria.

\*Fat-soluble vitamins A and D may be toxic in large doses

### Vitamins - Water-soluble

Nutrient	DRI (1997-2000)	RDA (1989)	Function	Major Sources
Vitamin C	90 mg (M) 75 mg (F)	<b>Replaced by DRI</b>	Formation of collagen (a material that holds cells together). For healthy teeth, gums and blood vessels. Aids in healing wounds and resisting infection.	Citrus fruits, tomatoes, strawberries, cantaloupe, cabbage, broccoli, kale, potatoes 1/2 cup orange juice = 52 mg 1 orange = 66 mg 1 cup cooked cabbage = 48 mg
Thiamin	1.2 mg (M) 1.1 mg (F)	<b>Replaced by DRI</b>	Promotes the use of carbohydrates for energy and helps maintain healthy nervous system.	Pork, liver and other organs, brewer's yeast, wheat germ, whole-grain or enriched cereals and breads, soybeans, peanuts and other legumes, and milk. 3 oz. pork roast = 0.78 mg 1 cup bran flakes = 0.46 mg
Riboflavin	1.3 mg (M) 1.1 mg (F)	<b>Replaced by DRI</b>	Helps use nutrients for energy and tissue building. Promotes healthy skin and eyes.	Milk, organ meats and enriched breads and cereals. 3 oz. liver = 3.56 mg 2 cups milk = 0.8 mg
Niacin	16 mg (M) 14 mg (F)	<b>Replaced by DRI</b>	Needed for healthy nervous system, skin and normal digestion. Helps cells use oxygen to release energy.	Lean meat, fish, poultry liver, kidney, whole-wheat and enriched cereals and breads, peanuts and brewer's yeast 3 oz. chicken = 11.6 mg 3 oz. tuna = 10.1 mg

<b>Nutrient</b>	<b>DRI (1997-2000)</b>	<b>RDA (1989)</b>	<b>Function</b>	<b>Major Sources</b>
Folate	<b>400 micrograms</b>	<b>Replaced by DRI</b>	Necessary for development of red blood cells and normal metabolism of nutrients. Can prevent neural tube defects in babies if consumed by women of child-bearing age.	Widespread in foods. Liver, legumes, yeast and deep green leafy vegetables are highest sources. 3 oz. liver = 145 micrograms 1 cup raw spinach = 193 micrograms
B-6	1.3 mg (Ages 31-50) 1.7 mg (M Ages 51+) 1.5 mg (F Ages 51+)	<b>Replaced by DRI</b>	Needed for use of protein. Prevents certain forms of anemia.	Wheat germ, meat, liver, kidney, whole-grain cereals, soybeans, peanuts and corn. 3 oz. chicken = 0.7 mg 3 oz. liver = 0.85 mg
B-12	<b>2.4 micrograms</b>	<b>Replaced by DRI</b>	Helps prevent certain forms of anemia. Needed for proper growth and a healthy nervous system.	Liver, meat, milk, eggs and cheese 3 oz. beef = 1.8 micrograms 3 oz. fish = 1.3 micrograms
Biotin	30 micrograms	<b>Replaced by DRI</b>	Needed for normal metabolism of carbohydrates, protein and fats.	Cauliflower, organ meats, egg yolk and legumes. Synthesized in intestinal tract.
Pantothenic Acid	5 mg	<b>Replaced by DRI</b>	Helps to metabolize nutrients to produce energy. Aids in the synthesis of amino acids, fatty acids and hormones.	Almost universally present in plant and animal tissue. Especially rich sources: liver, yeast, eggs, peanuts, whole-grain cereals. 1 cup bran flakes = 0.9 mg 1 egg = 0.9 mg 3 oz. roasted peanuts = 2.1 mg
Choline	550 mg (M) 425 mg (F)	<b>Added in DRI</b>	Needed for normal function of cells and cell membranes.	Lettuce, peanuts, coffee and cauliflower.

## Minerals

<b>Nutrient</b>	<b>DRI (1997-2000)</b>	<b>RDA (1989)</b>	<b>Function</b>	<b>Major Sources</b>
Calcium	Ages 31-50: 1000 mg Ages 51+: 1200 mg	<b>Replaced by DRI</b>	Assists in clotting of blood and building bones and teeth. Minimizes bone loss and can help prevent osteoporosis. Promotes proper function of nerves, heart and muscles.	Milk, cheese, ice cream, turnips, collards and mustard greens, broccoli and cabbage. 1 cup milk = 300 mg 8 oz. plain yogurt = 415 mg 1 cup collard greens = 357 mg

Nutrient	DRI (1997-2000)	RDA (1989)	Function	Major Sources
Phosphorus	700 mg	Replaced by DRI	Needed for bones and teeth and for enzymes used in energy metabolism. Acts as blood buffer.	Milk, cheese, ice cream, meat, poultry, fish, whole-grain cereals, nuts and legumes. 1 cup milk = 247 mg 3 oz pork chop = 209 mg
Magnesium	420 mg (M) 320 mg (F)	Replaced by DRI	Needed for regulation of body temperature, contraction of nerves and muscles, and synthesis of protein. A cofactor for enzymes involved in cellular metabolism.	Nuts, soybeans, seafood, whole grains, meat, dried peas and beans 1/2 cup cooked dried peas = 180 mg 3 oz. roasted peanuts = 175 mg

### Other Trace Elements

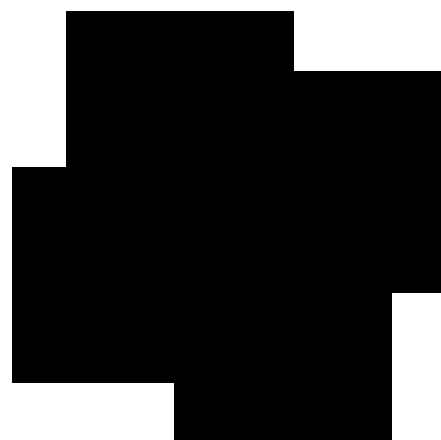
Nutrient	DRI (1997-2000)	RDA (1989)	Function	Major Sources
Iron		Ages 21+ (M): 10 mg Ages 21-50 (F): 15 mg Ages 51+ (F): 10 mg	Makes hemoglobin, the red substance in blood. Transports oxygen to and from cells.	Organ meats, oysters, meats, leafy green vegetables, dried peas, enriched breads and cereals. 3 oz. lean ground beef = 3.0 mg 1 cup oysters = 13.2 mg 1 cup spinach 5.3 mg
Iodine		150 micrograms	Needed for regulation of the use of energy in body. Prevents goiter.	Seafood, iodized salt
Zinc		15 mg (M) 12 mg (F)	Needed for wound healing, normal development, healthy skin and many body chemical reactions.	Meat, liver, eggs, shellfish, green leafy vegetables, fruit. 3 oz. roast beef = 5.8 mg 3 oz. shrimp = 2.1 mg 3 oz. turkey = 4.4 mg
Copper*		No RDA 1.5 - 3 mg (Estimated safe and adequate intake)	Needed for proper use of iron, red blood cell formation, part of many enzymes.	Oysters, nuts, liver, kidney, dried legumes. 3 oz. oysters = 17 mg 3 oz. crabmeat = 1.5 mg
Manganese		No RDA 2-5 mg (Estimated safe and adequate intake)	Part of several enzymes. Minor component in bone.	Nuts and unrefined grains are rich sources. Vegetables and fruits contain moderate amounts.

Nutrient	DRI (1997-2000)	RDA (1989)	Function	Major Sources
Fluoride*	4 mg (M) 3 mg (F)	<b>Replaced by DRI</b>	For normal formation and development of teeth and bones. Decreases tooth decay.	Fluoridated water.
Chromium*		No RDA 50-200 micrograms (Estimated safe and adequate intake)	Maintaining normal glucose metabolism.	Brewer's yeast, meat products, cheeses, whole grains.
Selenium*	<b>55 micrograms</b>	<b>Replaced by DRI</b>	Part of enzyme that protects cells against oxidation.	Seafood, kidney, liver, meat. Grains vary, depending on where they were grown.
Molybdenum*		No RDA 75-250 micrograms (Estimated safe and adequate intake)	Essential for the function of important enzymes.	Varies with where food was grown. Meat, grains and legumes make main contribution.

*\*Since the toxic levels for many trace elements may be only several times usual intake, the upper levels for the trace elements should not be habitually exceeded.*

## Electrolytes

Nutrient	DRI (1997-2000)	RDA (1989)	Function	Major Sources
Potassium		No RDA 2000 mg (Estimated minimum requirement)	Involved in fluid balance and muscle activity.	Potatoes, prunes, oranges, bananas, red meat and whole-grain products. A balanced diet usually contains enough if energy (calorie) and protein intakes are adequate.
Sodium	500 mg	No RDA (Estimated minimum requirement)	Maintenance of fluid balance of acids and bases in the body.	Sodium chloride (table salt), most processed and canned foods 1 teaspoon salt = 2300 mg
Chloride		No RDA 750 mg (Estimated minimum requirement)	Maintenance of fluid and electrolyte balance. Component of gastric juice.	Sodium chloride (table salt).



## Using the Recommended Dietary Allowances

The Food Guide Pyramid is a guide to help you get the nutrients you need for good health and, at the same time, the right amount of calories to maintain a healthy weight. Since no one food or food group contains all of the nutrients needed for good health, include a variety of different foods. The minimum number of servings from the Pyramid will provide about 1400 calories. Plan your meals and snacks to include the minimum number of recommended servings from the Pyramid, using more from each group to supply additional calories and nutrients as needed.

### Food Guide Pyramid

Group	Nutrients Provided	Recommended Servings	1 Serving is:
Bread, Cereal, Rice and Pasta Group	B vitamins, Iron, Protein, Magnesium, Zinc	6-11	Bread - 1 slice Cooked cereal, pasta or rice - 1/2 cup Ready-to-eat cereal - 1 oz.
Vegetable Group	Vitamin A, Vitamin C, Folate, Iron, Pantothenic Acid, Potassium	3-5	Cooked or chopped raw vegetables - 1/2 cup Raw leafy vegetables - 1 cup
Fruit Group	Vitamin A Vitamin C Folate Iron Pantothenic Acid Potassium	2-4	Orange, apple or banana - 1 medium Cooked or canned fruit - 1/2 cup
Milk, Yogurt and Cheese Group	Protein, Calcium, Phosphorus, Vitamin D, Vitamin B12, Riboflavin	2-3	Milk - 1 cup Natural cheese - 1-1/2 oz. Process cheese - 2 oz.
Meat, Poultry, Fish, Dry Beans, Eggs and Nuts Group	Protein, Iron, Zinc, Vitamin B6, Vitamin B12	2-3	Meat - 2-3 oz. Eggs - 2-3 Dry beans and peas - 1 - 1 1/2 cups Peanut butter - 4-6 T. Nuts, sesame or sunflower seeds - 1/2 - 1 cup
Fats, Oils and Sweets	Supply calories, but few other nutrients		Use in moderation to provide extra calories as needed.

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1997-98 DRI revisions by Fay Barnett, School of Human Ecology Foods and Nutrition graduate student

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