## **Chapter 12**

**Review Questions**

1. **c.** federal oversight of food safety is fragmented among 15 different agencies.

2. **a.** norovirus is responsible for the greatest number of illnesses.

3. **a.** between 40°F and 140°F.

4. **c.** within a maximum of 1 hour after serving.

5. **b.** modified atmosphere packaging.

6. **b.** sulfites and nitrites.

7. **a.** confer tolerance to herbicides.

8. **c.** they can act as neurotoxins, carcinogens, or endocrine disruptors.

9. true

10. true

**Math Review**

11. **a.** 145°F = 63°C

**b.** 160°F = 71°C

**c.** 165°F = 74°C

## **Chapter 13**

**Review Questions**

1. **a.** Between 1990-92 and 2014-16, the share of undernourished people worldwide fell by nearly 45%.

2. **c.** unequal distribution of food, largely because of poverty.

3. **b.** A majority of contingent farm workers in the United States live below the poverty line.

4. **b.** It has dramatically increased food security throughout South America, Asia, and Africa.

5. **c.** The U.S. food industry produces about twice as many Calories per capita per year than Americans require.

6. **d.** the Supplemental Nutrition Assistance Program (SNAP)

7. **d.** a pint of strawberries you pick yourself at an organic farm

8. false

9. true

10. true

**Math Review**

11. Steve earns $15,080 annually ($7.25/hour × 40 hours a week × 52 weeks a year). He and his family are currently living far below the federal poverty threshold, which in 2016 was $20,160 for a family of three. If Diane were to return to work for 40 hours a week, their annual income would double to $30,160 ($15,080 × 2 = $30,160). As you learned in this chapter, families earning at or below 185% of the federal poverty level are at increased risk for food insecurity: 185% of the poverty threshold of $20,160 = $37,296 ($20,160 × 1.85 = $37,296). Even if Steve and Diane both worked full time (80 hours a week combined), they would still be at high risk for food insecurity ($30,160 is significantly less than $37,296).

## **Chapter 14**

**Review Questions**

1. **b.** neural tube defects

2. **a.** 350 to 450 kcal/day

3. **c.** Keep dry cereal or crackers at the bedside to ease nighttime and morning nausea.

4. **c.** oxytocin

5. **a.** Lactating women need more Calories than pregnant women.

AN-4

6. **d.** Certain proteins in breast milk help protect the newborn from infection.

7. c. iron

8. **d.** none of the above.

9. true

10. false

**Math Review**

**11.** **(a)** To calculate the % of kcal in breast milk that comes from fat, first convert grams of fat to fat kcal: 35 g fat/liter **x** 9 kcal/g = 315 fat kcal/liter. Then calculate the % of total breast milk kcal from fat: [315 fat kcal ÷ 700 total kcal] × 100 (to convert to percentage) = 45% of kcal in breast milk are from fat.

**(b)** To calculate the % of kcal in breast milk that come from protein, first convert grams of protein to protein kcal: 9 g protein **x** 4 kcal/g = 36 protein kcal. Then calculate the % of total breast milk kcal from protein: [36 kcal ÷ 700 total kcal] × 100 (to convert to percentage) = 5% of kcal from protein.

**(c)** 45 % of kcal from fat is much higher than the range that is recommended for healthy young adults (20-35% of total kcal from fat), but a high fat diet is needed to meet the energy needs of rapidly growing infants. 5 % of kcal from protein is much lower than what is recommended for most young adults (10-35% of kcal from protein), but the kidneys of young infants are immature and not able to excrete large amounts of nitrogen. The small gastric capacity of infants and their relatively immature kidneys explain why the proportions of Calories from fat and protein in breast milk are ideally suited for young infants.

## **Chapter 15**

**Review Questions**

1. **a.** 1/2 cup of iron-fortified cooked oat cereal, 2 tbsp. of mashed pineapple, and 1 cup of whole milk

2. **c.** iron and zinc

3. **b.** Children require a diet providing between 25% to 35% of total energy as fat.

4. **b.** the epiphyseal plates close.

5. c. both boys and girls, age 9 to 18

6. **d.** None of the above is true.

7. **d.** All of the above occur with normal aging.

8. **d.** the prevalence of obesity declines after age 75.

9. true

10. true

**Math Review**

11. To calculate the total vitamin A intake of Kristina's grandmother, add up the amount of vitamin A in one dose of each of the three supplements: 3,333 + 1,500 + 2,200 = 7,033 µg of vitamin A per day.

To calculate the % of the RDA consumed by Kristina's grandmother, take her daily total intake, divide by the RDA, and multiply by 100 to convert to a percent: [7,033 µg ÷ 700 µg] × 100 = 1,005% of the UL, or ten times more than the recommended amount.

To calculate the % of the vitamin A UL consumed by Kristina's grandmother each day, take her total daily intake, divide by the UL, and multiply by 100 to convert to a percent: [7,033 µg ÷ 3,000 µg] × 100 = 234% of the UL, or more than twice the recommended upper limit. This amount of vitamin A, taken on a regular basis, could certainly lead to vitamin A toxicity over time. The UL for adults, including the elderly, is 3,000 µg per day.

*NOTE: These calculations reflect the % of the RDA, not % above the RDA.*

GL-1

# **glossary**

**A**

**absorption** The physiologic process by which molecules of food cross from the gastrointestinal tract into the circulation.

**Acceptable Daily Intake (ADI)** An FDA estimate of the amount of a nonnutritive sweetener that someone can consume each day over a lifetime without adverse effects.

**accessory organs of digestion** The salivary glands, liver, gallbladder, and pancreas, which contribute to GI function but are not anatomically part of the GI tract.

**acetylcholine** A neurotransmitter that is involved in many functions, including muscle movement and memory storage.

**acidosis** A disorder in which the blood becomes acidic; that is, the level of hydrogen in the blood is excessive. It can be caused by respiratory or metabolic problems.

**added sugars** Sugars and syrups that are added to food during processing or preparation.

**adenosine triphosphate (ATP)** The common currency of energy for virtually all cells of the body.

**adipokines** Cell signaling proteins secreted by adipose tissue; some promote inflammation.

**aerobic exercise** Exercise that involves the repetitive movement of large muscle groups, increasing the body's use of oxygen and promoting cardiovascular health.

**alcohol abuse** A pattern of alcohol consumption, whether chronic or occasional, that results in harm to one's health, functioning, or interpersonal relationships.

**alcohol** Chemically, a compound characterized by the presence of a hydroxyl group; in common usage, a beverage made from fermented fruits, vegetables, or grains and containing ethanol.

**alcohol dependence** A disease state characterized by alcohol craving, loss of control, physical dependence, and tolerance.

**alcohol hangover** A cluster of signs and symptoms, including headache, nausea, and vomiting, that occurs as a consequence of drinking too much alcohol.

**alcoholic hepatitis** A serious condition of inflammation of the liver caused by alcohol abuse.

**alcohol poisoning** A potentially fatal condition in which an overdose of alcohol results in cardiac and/or respiratory failure.

**alcohol use disorder (AUD)** Medical diagnosis for problem drinking that has become severe and is characterized by either abuse or dependence.

**alkalosis** A disorder in which the blood becomes basic; that is, the level of hydrogen in the blood is deficient. It can be caused by respiratory or metabolic problems. **alpha-linolenic acid (ALA)** An essential fatty acid found in leafy green vegetables, flaxseed oil, soy oil, and other plant foods; an omega-3 fatty acid.

**amenorrhea** The absence of menstruation. In females who had previously been menstruating, it is defined as the absence of menstrual periods for 3 or more continuous months.

**amino acids** Nitrogen-containing molecules that combine to form proteins.

**amniotic fluid** The watery fluid contained within the innermost membrane of the sac containing the fetus. It cushions and protects the growing fetus.

**anabolic** The characteristic of a substance that builds muscle and increases strength. **anaerobic** Means "without oxygen"; the term used to refer to metabolic reactions that occur in the absence of oxygen.

**anencephaly** A fatal neural tube defect in which there is partial absence of brain tissue, most likely caused by failure of the neural tube to close. **anorexia** An absence of appetite.

**anorexia nervosa** A serious, potentially life-threatening eating disorder that is characterized by self-starvation, which eventually leads to a deficiency in the energy and essential nutrients required by the body to function normally.

**antibodies** Defensive proteins of the immune system. Their production is prompted by the presence of bacteria, viruses, toxins, allergens, and other antigens.

**antioxidant** A compound that has the ability to prevent or repair the damage caused by oxidation.

**appetite** A psychological desire to consume specific foods.

**ariboflavinosis** A condition caused by riboflavin deficiency.

**atherosclerosis** A condition characterized by accumulation of cholesterol-rich plaque on artery walls; these deposits build up to such a degree that they impair blood flow.

**atrophic gastritis** A condition in which chronic inflammation of the stomach lining erodes gastric glands, reducing stomach acid secretion and thus absorption of vitamin from foods.

**atrophy** A decrease in the size and strength of muscles that occurs when they are not worked adequately.

**B**

**bacteria** Cellular microorganisms that lack a true nucleus and reproduce by cell division or by spore formation.

**bariatric surgery** Surgical alteration of the gastrointestinal tract performed to promote weight loss.

**basal metabolic rate (BMR)** The energy the body expends to maintain its fundamental physiologic functions.

**beriberi** A disease of muscle wasting and nerve damage caused by thiamin deficiency.

**bile** Fluid produced by the liver and stored in the gallbladder; it emulsifies fats in the small intestine.

**binge drinking** The consumption of five or more alcoholic drinks on one occasion for a man, or four or more drinks for a woman.

**binge eating** Consumption of a large amount of food in a short period of time, usually accompanied by a feeling of loss of self-control.

**binge-eating disorder** A disorder characterized by binge eating an average of twice a week or more, typically without compensatory purging.

**bioavailability** The degree to which the body can absorb and utilize any given nutrient.

**biomagnification** The process by which persistent organic pollutants become more concentrated in animal tissues as they move from one creature to another through the food chain.

**biopesticides** Primarily insecticides, these chemicals use natural methods to reduce damage to crops.

**blood volume** The amount of fluid in blood.

GL-2

**body composition** The ratio of a person's body fat to lean body mass.

**body dysmorphic disorder (BDD)** A clinically diagnosed psychiatric disorder characterized by a disabling preoccupation with perceived defects in appearance.

**body fat mass** The amount of body fat, or adipose tissue, a person has.

**body image** A person's perception, feelings about, and critique of his or her body's appearance and functioning.

**body mass index (BMI)** A measurement representing the ratio of a person's body weight to his or her height (kg/m2).

**bolus** A mass of food that has been chewed and moistened in the mouth.

**bone density** The degree of compactness of bone tissue, reflecting the strength of the bones. Peak bone density is the point at which a bone is strongest.

**brush border** The microvilli projecting from the membrane of enterocytes of the small intestine's villi. These microvilli tremendously increase the small intestine's absorptive capacity.

**buffers** Proteins that help maintain proper acid-base balance by attaching to, or releasing, hydrogen ions as conditions change in the body.

**bulimia nervosa** A serious eating disorder characterized by recurrent episodes of binge eating and recurrent inappropriate compensatory behaviors in order to prevent weight gain, such as self-induced vomiting, fasting, excessive exercise, or misuse of laxatives, diuretics, enemas, or other medications.

**C**

**calcitriol** The primary active form of vitamin D in the body.

**cancer** A group of diseases characterized by cells that reproduce spontaneously and independently and may invade other tissues and organs.

**carbohydrate loading** Also known as glycogen loading. A process that involves altering training and carbohydrate intake, so that muscle glycogen storage is maximized.

**carbohydrate** One of the three macronutrients, a compound made up of carbon, hydrogen, and oxygen, that is derived from plants and provides energy.

**carbohydrates** The primary fuel source for our bodies, particularly for our brain and for physical exercise.

**carcinogen** Any substance capable of causing the cellular mutations that lead to cancer.

**cardiovascular disease (CVD)** A general term for abnormal conditions involving dysfunction of the heart and blood vessels, which can result in heart attack or stroke.

**carotenoid** A fat-soluble plant pigment that the body stores in the liver and adipose tissues. The body is able to convert certain carotenoids to vitamin A.

**case control studies** Observational studies that compare groups with and without a condition, allowing researchers to gain a better understanding of factors that may influence disease.

**cash crops** Crops grown to be sold rather than eaten, such as cotton or tobacco.

**cataract** A damaged portion of the eye's lens, which causes cloudiness that impairs vision.

**celiac disease** An inherited disorder characterized by inflammation of the lining of the small intestine upon consumption of gluten.

**cell differentiation** The process by which immature, undifferentiated stem cells develop into highly specialized functional cells of discrete organs and tissues.

**cell membrane** The boundary of an animal cell that separates its internal cytoplasm and organelles from the external environment.

**cell** The smallest unit of matter that exhibits the properties of living things, such as growth and metabolism.

**Centers for Disease Control and Prevention (CDC)** The leading federal agency in the United States that protects the health and safety of people.

**cephalic phase** The earliest phase of digestion, in which the brain thinks about and prepares the digestive organs for the consumption of food.

**cholecalciferol** Vitamin D3, a form of vitamin D found in animal foods and the form we synthesize from the sun.

**chronic diseases** Diseases that come on slowly and can persist for years, often despite treatment.

**chylomicron** A lipoprotein produced in the enterocyte; transports dietary fat out of the intestinal tract.

**chyme** A semifluid mass consisting of partially digested food, water, and gastric juices. **cirrhosis of the liver** End-stage liver disease characterized by significant abnormalities in liver structure and function; may lead to complete liver failure.

**climate change** Any significant change in the measures of climate--such as temperature, precipitation, or wind patterns--that occurs over several decades or longer.

**clinical trials** Tightly controlled experiments in which an intervention is given to determine its effect on a certain disease or health condition.

**coenzyme** A molecule that combines with an enzyme to activate it and help it do its job.

**cofactor** A mineral or non-protein compound that is needed to allow enzymes to function properly.

**colic** A condition of inconsolable infant crying that lasts for hours at a time.

**collagen** A protein that forms strong fibers in the matrix of bone, blood vessels, and other connective tissues.

**colostrum** The first fluid made and secreted by the breasts from late in pregnancy to about a week after birth. It is rich in immune factors and protein.

**complementary proteins** Two or more foods that together contain all nine essential amino acids necessary for a complete protein. It is not necessary to eat complementary proteins at the same meal.

**complete protein** Food that contains sufficient amounts of all nine essential amino acids to support growth and health.

**complex carbohydrate** A nutrient compound consisting of long chains of glucose molecules, such as starch, glycogen, and fiber.

**conception** The uniting of an ovum (egg) and sperm to create a fertilized egg, or zygote. Also called fertilization.

**conditionally essential amino acids** Amino acids that are normally considered nonessential but become essential under certain circumstances when the body's need for them exceeds the ability to produce them.

**conditioned taste aversion** Avoidance of a food as a result of a negative experience, such as illness, even if the illness has no relationship with the food consumed.

**conflict of interest** A situation in which a person is in a position to derive personal benefit and unfair advantage from actions or decisions made in their official capacity. **constipation** A condition characterized by the absence of bowel movements for a period of time that is significantly longer than normal for the individual, and stools that are small, hard, and difficult to pass.

**cool-down** Activities done after an exercise session is completed; should be gradual and allow your body to slowly recover from exercise.

GL-3

**cortical bone (compact bone)** A dense bone tissue that makes up the outer surface of all bones as well as the entirety of most small bones of the body.

**creatine phosphate (CP)** A high-energy compound that can be broken down for energy and used to regenerate ATP.

**cretinism** A form of mental impairment that occurs in children whose mothers experienced iodine deficiency during pregnancy.

**crop rotation** The practice of alternating crops in a particular field to prevent nutrient depletion and erosion of the soil and to help with control of crop-specific pests.

**cross-contamination** Contamination of one food by another via the unintended transfer of microorganisms through physical contact.

**cytoplasm** The interior of an animal cell, not including its nucleus.

**D**

**danger zone** The range of temperature (about 40°F to 140°F, or 4°C to 60°C) at which many microorganisms capable of causing human disease thrive.

**DASH diet** The diet developed in response to research into hypertension funded by the National Institutes of Health: DASH stands for "Dietary Approaches to Stop Hypertension."

**deamination** The process by which an amine group is removed from an amino acid. The nitrogen is then transported to the kidneys for excretion in the urine, while the carbon and other components are metabolized for energy or used to make other compounds.

**dehydration** The depletion of body fluid. It results when fluid excretion exceeds fluid intake.

**denaturation** The process by which proteins uncoil and lose their shape and function when they are exposed to heat, acids, bases, heavy metals, alcohol, and other damaging substances.

**denature** The action of the unfolding of proteins in the stomach. Proteins must be denatured before they can be digested.

**dental caries** Dental erosion and decay caused by acid-secreting bacteria in the mouth and on the teeth. The acid produced is a by-product of bacterial metabolism of carbohydrates deposited on the teeth.

**diabetes** A chronic disease in which the body can no longer regulate glucose normally.

**diarrhea** A condition characterized by the frequent passage of loose, watery stools. **dietary fiber** The nondigestible carbohydrate parts of plants that form the support structures of leaves, stems, and seeds.

**Dietary Guidelines for Americans** A set of principles developed by the U.S. Department of Agriculture and the U.S. Department of Health and Human Services to assist Americans in designing a healthful diet and lifestyle.

**Dietary Reference Intakes (DRIs)** A set of nutritional reference values for the United States and Canada that applies to healthy people.

**dietary supplement** A product taken by mouth that contains a "dietary ingredient" intended to supplement the diet.

**digestion** The process by which foods are broken down into their component molecules, either mechanically or chemically.

**disaccharide** A carbohydrate compound consisting of two sugar molecules joined together.

**disordered eating** A general term used to describe a variety of abnormal or atypical eating behaviors that are used to keep or maintain a lower body weight.

**diuretic** A substance that increases fluid loss via the urine.

**docosahexaenoic acid (DHA)** An omega-3 fatty acid available from marine foods and as a metabolic derivative of alpha-linolenic acid.

**drifty gene hypothesis** A hypothesis suggesting that random mutation and drift in the genes that control the upper limit of body fatness can help explain why some people become obese and others do not.

**drink** The amount of an alcoholic beverage that provides approximately 0.5 fl. oz of pure ethanol.

**dual-energy x-ray absorptiometry (DXA or DEXA)** Currently, the most accurate tool for measuring bone density.

**E**

**eating disorder** A clinically diagnosed psychiatric disorder characterized by severe disturbances in body image and eating behaviors.

**edema** A disorder in which fluids build up in the tissue spaces of the body, causing fluid imbalances and a swollen appearance.

**eicosapentaenoic acid (EPA)** An omega-3 fatty acid available from marine foods and as a metabolic derivative of alpha-linolenic acid.

**electrolyte** A substance that disassociates in solution into positively and negatively charged ions and is thus capable of carrying an electrical current; the ions in such a solution.

**electron** A negatively charged particle orbiting the nucleus of an atom.

**elimination** The process by which undigested portions of food and waste products are removed from the body.

**embryo** The human growth and developmental stage lasting from the third week to the end of the eighth week after fertilization.

**empty Calories** Calories from solid fats or added sugars that

provide few or no nutrients.

**energy cost of physical activity** The energy that is expended on body movement and muscular work above basal levels.

**energy expenditure** The energy the body expends to maintain its basic functions and to perform all levels of movement and activity.

**energy intake** The amount of energy a person consumes; in other words, the number of kcal consumed from food and beverages.

**enriched foods** Foods in which nutrients that were lost during processing have been added back, so that the food meets a specified standard.

**enteric nervous system (ENS)** The autonomic nerves in the walls of the GI tract.

**enterocytes** The cells lining the wall of the intestine.

**enzymes** Small chemicals, usually proteins, that act on other chemicals to speed up body processes but are not apparently changed during those processes.

**epidemiological studies** Studies that examine patterns of health and disease in defined populations.

**epiphyseal plates** Plates of cartilage located toward the end of long bones that provide for growth in the length of long bones.

**ergogenic aids** Substances used to improve exercise and athletic performance.

GL-4

**erythrocytes** The red blood cells, which are the cells that transport oxygen in our blood.

**esophagus** A muscular tube of the GI tract connecting the pharynx to the stomach. **essential amino acids** Amino acids not produced by the body that must be obtained from food.

**essential fatty acids (EFAs)** Fatty acids that must be consumed in the diet because they cannot be made by our body.

**exchange system** A diet planning tool in which exchanges, or portions, are organized according to the amount of carbohydrate, protein, fat, and Calories in each food.

**exercise** A subcategory of leisure-time physical activity; any activity that is purposeful, planned, and structured.

**extracellular fluid** The fluid outside the body's cells, either in the body's tissues or as the liquid portion of blood or lymph.

**F**

**fair trade** A trading partnership promoting equity in international trading relationships and contributing to sustainable development by securing the rights of marginalized producers and workers.

**famine** A severe food shortage affecting a large percentage of the population in a limited geographic area at a particular time.

**fats** An important energy source for our bodies at rest and during low-intensity exercise.

**fat-soluble vitamins** Vitamins that are not soluble in water but are soluble in fat. These are vitamins A, D, E, and K.

**fatty acids** Long chains of carbon atoms bound to each other as well as to hydrogen atoms.

**fatty liver** An abnormal accumulation of fat in the liver that develops in people who abuse alcohol.

**female athlete triad** A syndrome that consists of three clinical conditions in some physically active females: low energy availability (with or without eating disorders), menstrual dysfunction, and low bone density.

**fermentation** A process in which an agent causes an organic substance to break down into simpler substances resulting in the production of ATP.

**fetal adaptation** The process by which fetal metabolism, hormone production, and other physiologic processes shift in response to factors, such as inadequate energy intake, in the maternal environment.

**fetal alcohol syndrome (FAS)** The most severe consequence of maternal alcohol consumption; characterized by physical malformations and emotional, behavioral, and learning problems.

**fetus** The human growth and developmental stage lasting from the beginning of the ninth week after conception to birth.

**FITT principle** The principle used to achieve an appropriate overload for physical training; FITT stands for frequency, intensity, time, and type of activity.

**fluid** A substance composed of molecules that move past one another freely. Fluids are characterized by their ability to conform to the shape of whatever container holds them.

**fluorosis** A condition, marked by staining and pitting of the teeth, caused by an abnormally high intake of fluoride.

**food additive** A substance or mixture of substances intentionally put into food to enhance its appearance, safety, palatability, and quality.

**food allergy** An inflammatory reaction to food caused by an immune system hypersensitivity.

**foodborne illness** An illness transmitted by food or water contaminated by a pathogenic microorganism, its toxic secretions, or a toxic chemical.

**food desert** A geographic area where people lack access to fresh, healthy, and affordable food.

**food diversity** The variety of different species of food crops available.

**food insecurity** Unreliable access to a sufficient supply of nourishing food.

**food intolerance** Gastrointestinal discomfort caused by certain foods that is not a result of an immune system reaction.

**food residues** Chemicals that remain in foods despite cleaning and processing.

**food** The plants and animals we consume.

**fortified foods** Foods in which nutrients are added that did not originally exist in the food, or which existed in insignificant amounts.

**free radical** A highly unstable atom with an unpaired electron in its outermost shell.

**frequency** Refers to the number of activity sessions per week you perform.

**fructose** The sweetest natural sugar; a monosaccharide that occurs in fruits and vegetables; also called levulose, or fruit sugar.

**functional fiber** The nondigestible forms of carbohydrates that are extracted from plants or manufactured in a laboratory and have known health benefits.

**functional foods** Foods that may have biologically active ingredients that provide health benefits beyond basic nutrition.

**fungi** Plantlike, spore-forming organisms that have a true nucleus and can grow as either single cells or multicellular colonies.

**G**

**galactose** A monosaccharide that joins with glucose to create lactose, one of the three most common disaccharides.

**gallbladder** A saclike accessory organ of digestion, which lies beneath the liver; it stores bile and secretes it into the small intestine.

**gastric juice** Acidic liquid secreted within the stomach; it contains hydrochloric acid and other compounds.

**gastroesophageal reflux disease (GERD)** A chronic disease in which episodes of gastroesophageal reflux cause heartburn or other symptoms more than twice per week.

**gastrointestinal (GI) tract** A long, muscular tube consisting of several organs: the mouth, pharynx, esophagus, stomach, small intestine, and large intestine and rectum.

**gene expression** The process of using a gene to make a protein.

**Generally Recognized as Safe (GRAS)** A list of substances approved for use in food production because they have been determined safe for consumption based on a history of long-term use or on the consensus of qualified research experts.

**genetic modification** The process of changing an organism by manipulating its genetic material.

**gestational diabetes** A condition of insufficient insulin production or insulin resistance that results in consistently high blood glucose levels, specifically during pregnancy; the condition typically resolves after birth occurs.

**gestation** The period of intrauterine development from conception to birth; typically 38 to 42 weeks.

**ghrelin** A protein synthesized in the stomach that acts as a hormone and plays an important role in appetite regulation by stimulating appetite.

GL-5

**global warming** The increase of about 1.5°F (0.85°C) in temperature that has occurred near the Earth's surface over the past century.

**glucagon** The hormone secreted by the alpha cells of the pancreas in response to decreased blood levels of glucose; it causes the breakdown of liver stores of glycogen into glucose.

**gluconeogenesis** The generation of glucose from the breakdown of proteins into amino acids.

**glucose** The most abundant sugar molecule, a monosaccharide generally found in combination with other sugars; it is the preferred source of energy for the brain and an important source of energy for all cells.

**glycemic index** The system that assigns ratings (or values) for the potential of foods to raise blood glucose and insulin levels.

**glycemic load** The amount of carbohydrate in a food multiplied by the food's glycemic index, divided by 100.

**glycerol** An alcohol composed of three carbon atoms; it is the backbone of a triglyceride molecule.

**glycogen** A polysaccharide; the storage form of glucose in animals.

**glycolysis** The breakdown of glucose; yields two ATP

molecules and two pyruvic acid molecules for each molecule of glucose.

**goiter** Enlargement of the thyroid gland; can be caused by iodine toxicity or deficiency.

**grazing** Consistently eating small meals throughout the day; done by many athletes to meet their high energy demands.

**Green Revolution** The tremendous increase in global productivity between 1944 and 2000 due to selective cross-breeding or hybridization to produce high-yield grains and industrial farming techniques.

**H**

**healthful diet** A diet that provides the proper combination of energy and nutrients and is adequate, moderate, nutrient-dense, balanced, and varied.

**heartburn** A painful sensation that occurs over the sternum when gastric juice pools in the lower esophagus.

**heat cramps** Involuntary, spasmodic, and painful muscle

contractions that are caused by electrolyte imbalances occurring as a result of strenuous physical activity in high environmental heat.

**heat exhaustion** A serious condition, characterized by heavy sweating and moderately elevated body temperature, that develops from dehydration in high heat.

**heat stroke** A potentially fatal response to high temperature characterized by failure of the body's heat-regulating mechanisms; also commonly called sunstroke.

**helminth** A multicellular microscopic worm.

**heme iron** Iron that is a part of hemoglobin and myoglobin; found only in animal-based foods, such as meat, fish, and poultry.

**heme** The iron-containing molecule found in hemoglobin.

**hemoglobin** The oxygen-carrying protein found in our red blood cells; almost two-thirds of all the iron in our body is found in hemoglobin.

**herb** A plant or plant part used for its scent, flavor, and/or therapeutic properties (also called a botanical).

**hidden fats** Fats that are not apparent, or "hidden" in foods, such as the fats found in baked goods, regular-fat dairy products, marbling in meat, and fried foods.

**high-fructose corn syrup** A highly sweet syrup that is manufactured from corn and is used to sweeten soft drinks, desserts, candies, and jellies.

**high-yield varieties (HYVs)** Semi-dwarf varieties of plants that are unlikely to fall over in wind and heavy rains and thus can carry larger amounts of seeds, greatly increasing the yield per acre.

**homocysteine** An amino acid that requires adequate levels of folate, vitamin B6, and vitamin B12 for its metabolism. High levels of homocysteine in the blood are associated with an increased risk for vascular diseases, such as cardiovascular disease.

**hormone** A chemical messenger secreted into the bloodstream by a gland. Hormones regulate physiologic processes at sites distant from the glands that secrete them.

**human microbiome** The complete population of microorganisms, including their genes, that inhabit the human body.

**hunger** A physiologic drive for food.

**hydrogenation** The process of adding hydrogen to unsaturated fatty acids, making them more saturated and thereby more solid at room temperature.

**hypercalcemia** A condition marked by an abnormally high concentration of calcium in the blood.

**hyperglycemia** A condition in which blood glucose levels are higher than normal.

**hyperkalemia** A condition in which blood potassium levels are dangerously high.

**hypermagnesemia** A condition marked by an abnormally high concentration of magnesium in the blood.

**hypernatremia** A condition in which blood sodium levels are dangerously high.

**hypertension** A chronic condition characterized by above-average blood pressure levels--specifically, systolic blood pressure over 140 mmHg, or diastolic blood pressure over 90 mmHg.

**hypertrophy** The increase in strength and size that results from repeated work to a specific muscle or muscle group.

**hypocalcemia** A condition characterized by an abnormally low concentration of calcium in the blood.

**hypoglycemia** A condition marked by blood glucose levels that are below normal fasting levels.

**hypokalemia** A condition in which blood potassium levels are dangerously low.

**hypomagnesemia** A condition characterized by an abnormally low concentration of magnesium in the blood.

**hyponatremia** A condition in which blood sodium levels are dangerously low.

**hypothalamus** A region of the forebrain above the pituitary gland, where visceral sensations, such as hunger and thirst, are regulated.

**hypothesis** An educated guess as to why a phenomenon occurs.

**I**

**impaired fasting glucose** Fasting blood glucose levels that are higher than normal but not high enough to lead to a diagnosis of type 2 diabetes.

**incidence** The rate of new (or newly diagnosed) cases of a disease within a period of time.

**incomplete protein** Food that does not contain all of the essential amino acids in sufficient amounts to support growth and health.

**infant mortality** A population's rate of death of infants between birth and 1 year of age.

GL-6

**inorganic** A substance or nutrient that does not contain carbon and hydrogen.

**insensible water loss** The loss of water not noticeable by a person, such as through evaporation from the skin and exhalation from the lungs during breathing.

**insoluble fibers** Fibers that do not dissolve in water.

**insulin insensitivity (***insulin resistance)* A condition in which the body becomes less sensitive (or more resistant) to a given amount of insulin, resulting in insulin having a biological effect that is less than expected.

**insulin** The hormone secreted by the beta cells of the pancreas in response to increased blood levels of glucose; it facilitates the uptake of glucose by body cells.

**intensity** The amount of effort expended during an activity, or how difficult the activity is to perform.

**intracellular fluid** The fluid held at any given time within the walls of the body's cells. **ion** Any electrically charged particle, either positively or negatively charged.

**iron-deficiency anemia** A form of anemia that results from severe iron deficiency.

**irritable bowel syndrome (IBS)** A group of symptoms caused by changes in the normal functions of the GI tract.

**K**

**Keshan disease** A heart disorder caused by selenium deficiency. It was first identified in children in the Keshan province of China.

**ketoacidosis** A condition in which excessive ketones, which are acidic, lower the pH of blood, altering basic body functions and damaging tissues.

**ketones** Substances produced during the breakdown of fat when carbohydrate intake is insufficient to meet energy needs. Ketones provide an alternative energy source for the brain when glucose levels are low.

**ketosis** The process by which the breakdown of fat during fasting states results in the production of ketones.

**kwashiorkor** A form of protein-energy malnutrition that is typically seen in malnourished infants and toddlers and is characterized by wasting, edema, and other signs of protein deficiency.

**L**

**lactase** A digestive enzyme that breaks lactose into glucose and galactose.

**lactation** The production of breast milk.

**lacteal** A small lymph vessel located inside the villi of the small intestine.

**lactic acid** A compound that results when pyruvic acid is metabolized in the presence of insufficient oxygen.

**lactose** A disaccharide consisting of one glucose molecule and one galactose molecule. It is found in milk, including human breast milk; also called milk sugar.

**lactose intolerance** A disorder in which the small intestine does not produce enough lactase enzyme to break down the sugar lactose, which is found in milk and milk products.

**large intestine** The terminal region of the GI tract, in which most water is absorbed and feces are formed.

**lean body mass** The amount of fat-free tissue, or bone, muscle, and internal organs, a person has.

**leisure-time physical activity** Any activity not related to a person's occupation; includes competitive sports, recreational activities, and planned exercise training.

**leptin** A hormone, produced by body fat, that acts to reduce food intake and to decrease body weight and body fat.

**leukocytes** The white blood cells, which protect us from infection and illness.

**limiting amino acid** The essential amino acid that is missing or in the smallest supply in the amino acid pool and is thus responsible for slowing or halting protein synthesis.

**linoleic acid** An essential fatty acid found in vegetable and nut oils; one of the omega-6 fatty acids.

**lipids** A diverse group of organic substances that are insoluble in water; lipids include triglycerides, phospholipids, and sterols.

**lipoprotein** A spherical compound in which fat clusters in the center and phospholipids and proteins form the outside of the sphere.

**lipoprotein lipase (LPL)** An enzyme that sits on the outside of cells and breaks apart triglycerides in chylomicrons, so that their fatty acids can be removed and taken up by the cell.

**listeriosis** Serious and sometimes fatal illness caused by

infection with the bacterium Listeria monocytogenes, typically from consumption of contaminated food.

**liver** The largest accessory organ of digestion and one of the most important organs of the body. Its functions include the production of bile and the processing of nutrient-rich blood from the small intestine.

**low birth weight** Having a weight of less than 5.5 pounds at birth.

**M**

**macrocytic anemia** A form of anemia manifested as the production of larger than normal red blood cells containing insufficient hemoglobin; also called megaloblastic anemia.

**macronutrients** Nutrients that our bodies need in relatively large amounts to support normal function and health. Carbohydrates, fats, and proteins are energy-yielding macronutrients.

**macular degeneration** A vision disorder characterized by deterioration of the macula, the central portion of the retina, and marked by loss or distortion of the center of the visual field.

**major minerals** Minerals we need to consume in amounts of at least 100 mg per day and of which the total amount in our bodies is at least 5 g.

**maltase** A digestive enzyme that breaks maltose into glucose.

**maltose** A disaccharide consisting of two molecules of glucose. It does not generally occur independently in foods but results as a by-product of digestion; also called malt sugar.

**marasmus** A form of protein-energy malnutrition that results from grossly inadequate intake of energy and protein and other nutrients and is characterized by extreme tissue wasting and stunted growth and development.

**maternal mortality** A population's rate of deaths of a woman during pregnancy, childbirth, or in the immediate postpartal period.

**maximal heart rate** The rate at which your heart beats during maximal-intensity exercise.

**meat factor** A special factor found in meat, fish, and poultry that enhances the absorption of non-heme iron.

**megadose** A nutrient dose that is 10 or more times greater than the recommended amount.

**megadosing** Taking a dose of a nutrient that is 10 or more times greater than the recommended amount.

GL-7

**metabolic syndrome** A cluster of five potentially modifiable factors, such as abdominal obesity, that increases the risk for cardiovascular disease and type 2 diabetes.

**metabolic water** The water formed as a by-product of our body's metabolic reactions.

**metabolism** The chemical reactions by which large compounds, such as carbohydrates, fats, and proteins, are broken down into smaller units the body can use. Also refers to the assembly of smaller units into larger compounds.

**micronutrients** Nutrients needed in relatively small amounts to support normal health and body functions. Vitamins and minerals are micronutrients.

**mindful eating** The nonjudgmental awareness of the emotional and physical sensations one experiences while eating or in a food-related environment.

**minerals** Inorganic elements that assist in the regulation of many body processes and the maintenance of many body tissues.

**moderate drinking** Alcohol consumption of up to one drink per day for women and up to two drinks per day for men.

**monoculture** A single crop species cultivated over a large area.

**monosaccharide** The simplest of carbohydrates, consisting of one sugar molecule, the most common form of which is glucose.

**monounsaturated fatty acid (MUFA)** A fatty acid that has two carbons in the chain bound to each other with one double bond; MUFAs are generally liquid at room temperature.

**morbid obesity** A condition in which a person's body weight exceeds 100% of normal, putting him or her at very high risk for serious health consequences; a BMI = 40 kg/m2.

**morning sickness** Varying degrees of nausea and vomiting associated with pregnancy, most commonly in the first trimester.

**mouthfeel** The tactile sensation of food in the mouth; derived from the interaction of physical and chemical characteristics of the food.

**multifactorial disease** A disease that may be attributable to one or more of a variety of causes.

**mutual supplementation** The process of combining two or more incomplete protein sources to make a complete protein.

**myoglobin** An iron-containing protein similar to hemoglobin except that it is found in muscle cells.

**MyPlate** The visual representation of the USDA Food Patterns and the website supporting their implementation.

**N**

**National Institutes of Health (NIH)** The world's leading medical research center and the focal point for medical research in the United States.

**neural tube** Embryonic tissue that forms a tube, which eventually becomes the brain and spinal cord.

**neurotransmitters** Chemical compounds that transmit messages from one nerve cell to another.

**night blindness** A vitamin A deficiency disorder that results in loss of the ability to see in dim light.

**night-eating syndrome** Disorder characterized by intake of the majority of the day's energy between 8:00 pm and 6:00 am. Individuals with this disorder also experience mood and sleep disorders.

**nonessential amino acids** Amino acids that can be manufactured by the body in sufficient quantities and therefore do not need to be consumed regularly in our diet.

**non-exercise activity thermogenesis (NEAT)** The energy that is expended to do all activities above BMR and TMF, but excluding volitional sporting activities.

**non-heme iron** The form of iron that is not a part of hemoglobin or myoglobin; found in animal- and plant-based foods.

**nonnutritive sweeteners** Manufactured sweeteners that provide little or no energy; also called alternative sweeteners.

**normal weight** Having an adequate but not excessive level of body fat for health.

**nucleus** The positively charged, central core of an atom. It is made up of two types of particles--protons and neutrons-bound tightly together. The nucleus of an atom contains

essentially all of its atomic mass.

**nutrient density** The relative amount of nutrients and fiber per amount of energy (or number of Calories).

**nutrients** Chemicals found in foods that are critical to human growth and function.

**nutrigenomics** A scientific discipline studying the interactions between genes, the environment, and nutrition.

**Nutrition Facts panel** The label on a food package that contains the nutrition information required by the FDA.

**nutrition paradox** The coexistence of aspects of both stunting and overweight/obesity within the same region, household, family, or person.

**nutrition** The science that studies food and how food nourishes our bodies and influences our health.

**nutritive sweeteners** Sweeteners, such as sucrose, fructose, honey, and brown sugar, that contribute Calories (energy).

**O**

**obesity** Having an excess of body fat that adversely affects health, resulting in a person having a weight that is substantially greater than some accepted standard for a given

height; a BMI of 30 to 39.9 kg/m2.

**observational studies** Studies that indicate relationships between nutrition habits, disease trends, and other health phenomena of large populations of humans.

**olfaction** Our sense of smell, which plays a key role in the stimulation of appetite.

**organ** A body structure composed of two or more tissues and performing a specific function; for example, the esophagus.

**organelle** A tiny "organ" within a cell that performs a discrete function necessary to the cell.

**organic agriculture** The application of practices that support the cycling of on-farm resources, ecological balance, and biodiversity.

**organic** A substance or nutrient that contains the elements carbon and hydrogen.

**osmosis** The movement of water (or any solvent) through a semipermeable membrane from an area where solutes are less concentrated to areas where solutes are highly concentrated.

**osteoblasts** Cells that prompt the formation of new bone matrix by laying down the collagen-containing component of bone, which is then mineralized.

**osteoclasts** Cells that erode the surface of bones by secreting enzymes and acids that dig grooves into the bone matrix.

**osteomalacia** A vitamin D-deficiency disease in adults, in which bones become weak and prone to fractures.

**osteoporosis** A disease characterized by low bone mass and deterioration of bone tissue, leading to increased bone fragility and fracture risk.

GL-8

**ounce-equivalent (oz-equivalent)** A serving size that is 1 ounce, or equivalent to an ounce, for the grains and the protein foods sections of MyPlate.

**overhydration** The dilution of body fluid. It results when water retention or intake is excessive.

**overload principle** Placing an extra physical demand on your body in order to improve your fitness level.

**overpopulation** Condition in which a region's available resources are insufficient to support the number of people living there.

**overweight** Having a moderate amount of excess body fat, resulting in a person having a weight that is greater than some accepted standard for a given height but is not considered obese; a BMI of 25 to 29.9 kg/m2.

**ovulation** The release of an ovum (egg) from a woman's ovary.

**oxidation** A chemical reaction in which molecules of a substance are broken down into their component atoms. During oxidation, the atoms involved lose electrons.

**P**

**pancreas** An accessory organ of digestion located behind the stomach; it secretes digestive enzymes and bicarbonate as well as hormones that help regulate blood glucose.

**pancreatic amylase** An enzyme secreted by the pancreas into the small intestine that digests any remaining starch into maltose.

**parasite** A microorganism that simultaneously derives benefit from and harms its host.

**parathyroid hormone (PTH)** A hormone secreted by the parathyroid gland when blood calcium levels fall. It increases blood calcium levels by stimulating the activation of vitamin D, increasing reabsorption of calcium from the kidneys, and stimulating osteoclasts to break down bone.

**pasteurization** A form of sterilization using high temperatures for short periods of time. **pellagra** A disease that results from severe niacin deficiency.

**pepsin** An enzyme in the stomach that begins the breakdown of proteins into shorter polypeptide chains and single amino acids.

**peptic ulcer** An area of the GI tract that has been eroded away by the acidic gastric juice of the stomach.

**peptide bond** Unique type of chemical bond in which the amine group of one amino acid binds to the acid group of another in order to manufacture dipeptides and all larger peptide molecules.

**peptide YY (PYY)** A protein produced in the gastrointestinal tract that is released after a meal in amounts proportional to the energy content of the meal; it decreases appetite and inhibits food intake.

**peristalsis** Waves of squeezing and pushing contractions that move food in one direction through the length of the GI tract.

**pernicious anemia** A vitamin B12 deficiency disease that occurs when immune destruction of parietal cells in the stomach reduces production of intrinsic factor, thereby limiting vitamin B12 absorption.

**persistent organic pollutants (POPs)** Chemicals released as a result of human activity into the environment, where they persist for years or decades.

**pesticides** Chemicals used either in the field or in storage to decrease destruction and crop losses by weeds, predators, or disease.

**pharynx** Segment of the GI tract connecting the back of the nose and mouth to the top of the esophagus.

**phospholipid** A type of lipid in which a fatty acid is combined with another compound that contains phosphate; unlike other lipids, phospholipids are soluble in water.

**photosynthesis** The process by which plants use sunlight to fuel a chemical reaction that combines carbon and water into glucose, which is then stored in their cells.

**physical activity** Any movement produced by muscles that increases energy expenditure; includes occupational, household, leisure-time, and transportation activities.

**physical fitness** The ability to carry out daily tasks with vigor and alertness, without undue fatigue, and with ample energy to enjoy leisure-time pursuits and meet unforeseen emergencies.

**phytochemicals** Naturally occurring plant compounds believed to have health-promoting effects in humans.

**pica** An abnormal craving to eat nonfood substances such as clay, paint, or chalk.

**placebo** An imitation treatment having no active ingredient that is sometimes used in a clinical trial.

**placenta** A pregnancy-specific organ formed from both maternal and embryonic tissues. It is responsible for oxygen, nutrient, and waste exchange between mother and fetus.

**plant-based diet** A diet consisting mostly of plant sources of foods, especially whole foods, with only limited amounts, if any, of animal-based and processed foods.

**plasma** The fluid portion of the blood; needed to maintain adequate blood volume so that the blood can flow easily throughout our body.

**platelets** Cell fragments that assist in the formation of blood clots and help stop bleeding.

**polypharmacy** The use of five or more prescription drugs at any one time.

**polysaccharide** A complex carbohydrate consisting of long chains of glucose.

**polyunsaturated fatty acid (PUFA)** A fatty acid that has more than one double bond in the chain; PUFAs are generally liquid at room temperature.

**poverty-obesity paradox** The high prevalence of obesity in low-income populations.

**prebiotics** Nondigestible food compounds that support the growth and/or activity of one or a limited number of bacteria in the large intestine.

**prediabetes** A term used synonymously with *impaired fasting glucose;* it is a condition considered to be a major risk factor for both type 2 diabetes and heart disease.

**preeclampsia** High blood pressure that is pregnancy specific and accompanied by protein in the urine, edema, and unexpected weight gain.

**preterm** The birth of a baby prior to 38 weeks' gestation.

**prevalence** The percentage of the population that is affected with a particular disease at a given time.

**prion** A protein that misfolds and becomes infectious and destructive; prions are not living cellular organisms or viruses.

**proteins** The only macronutrient that contains nitrogen; the basic building blocks of proteins are amino acids.

**probiotics** Foods, beverages, or supplements containing living microorganisms that beneficially affect consumers by improving the intestinal microbial balance.

**processed foods** Foods that have been manipulated in some way to transform raw ingredients into products for consumption.

GL-9

**proof** A measure of the alcohol content of a liquid; 100-proof liquor is 50% alcohol by volume, 80-proof liquor is 40% alcohol by volume, and so on,

**prooxidant** A substance that promotes oxidation and oxidative cell and tissue damage.

**proteases** Enzymes that continue the breakdown of polypeptides in the small intestine.

**protein-energy malnutrition** A disorder caused by inadequate consumption of protein. It is characterized by severe wasting.

**protein leverage hypothesis** A hypothesis suggesting that the body has a fixed daily dietary protein target, and because our current diets are proportionally higher in carbohydrates and fats and lower in protein, we overeat to meet this target.

**proteins** Large, complex molecules made up of amino acids and found as essential components of all living cells.

**protozoa** Single-celled, mobile parasites.

**provitamin** An inactive form of a vitamin that the body can convert to an active form. An example is beta-carotene.

**puberty** The period of life in which secondary sexual characteristics develop and people become biologically capable of reproducing.

**purging** An attempt to rid the body of unwanted food by vomiting or other compensatory means, such as excessive exercise, fasting, or laxative abuse.

**pyruvic acid** The primary end product of glycolysis.

**Q**

**quackery** The promotion of an unproven remedy, such as a supplement or other product or service, usually by someone unlicensed and untrained.

**R**

**recombinant bovine growth hormone (rBGH)** A genetically engineered growth hormone used in beef herds and some dairy cows.

**recombinant DNA technology** A type of genetic modification in which scientists combine DNA from different sources to produce a transgenic organism that expresses a desired trait.

**registered dietitian (RD)** A professional designation that requires a minimum of a bachelor's degree in nutrition, completion of a supervised clinical experience, a passing grade on a national examination, and maintenance of registration with the Academy of Nutrition and Dietetics (in Canada, the Dietitians of Canada). RDs are qualified to work in a variety of settings.

**remodeling** The two-step process by which bone tissue is recycled; includes the breakdown of existing bone and the formation of new bone.

**resistance training** Exercise in which our muscles act against resistance.

**resorption** The process by which the surface of bone is broken down by cells called osteoclasts.

**retinal** An active, aldehyde form of vitamin A that plays an important role in healthy vision and immune function.

**retina** The delicate, light-sensitive membrane lining the inner eyeball and connected to the optic nerve. It contains retinal.

**retinoic acid** An active, acid form of vitamin A that plays an important role in cell growth and immune function.

**retinol** An active, alcohol form of vitamin A that plays an important role in healthy vision and immune function.

**rhodopsin** A light-sensitive pigment found in the rod cells that is formed by retinal and opsin.

**rickets** A vitamin D-deficiency disease in children. Signs include deformities of the skeleton, such as bowed legs and knocked knees. Severe rickets can be fatal.

**S**

**saliva** A mixture of water, mucus, enzymes, and other chemicals that moistens the mouth and food, binds food particles together, and begins the digestion of carbohydrates.

**salivary amylase** An enzyme in saliva that breaks starch into smaller particles and eventually into the disaccharide maltose.

**salivary glands** A group of glands found under and behind the tongue and beneath the jaw that release saliva continually as well as in response to the thought, sight, smell, or presence of food.

**satiety** A physiologic sensation of fullness (from the Latin *satis* meaning enough, as in *satisfied).*

**saturated fatty acid (SFA)** A fatty acid that has no carbons joined together with a double bond; SFAs are generally solid at room temperature.

**scientific method** The standardized, multistep process scientists use to examine evidence and test hypotheses.

**screening test** Clinical exam performed on a large population to detect early evidence of disease.

**scurvy** Vitamin C deficiency disease caused by failure of collagen synthesis.

**sensible water loss** Water loss that is noticed by a person, such as through urine output and visible sweating.

**set-point hypothesis** A hypothesis suggesting that the body raises or lowers energy expenditure in response to increased and decreased food intake and physical activity. This action maintains an individual's body weight within a narrow range.

**severe acute malnutrition (SAM)** A state of severe energy deficit defined as a weight for height more than 3 standard deviations below the mean, or the presence of nutrition-related edema.

**simple carbohydrate** Commonly called sugar; can be either a monosaccharide (such as glucose) or a disaccharide.

**small intestine** The longest portion of the GI tract, where most digestion and absorption take place.

**soluble fibers** Fibers that dissolve in water.

**solvent** A substance that is capable of mixing with and breaking apart a variety of compounds. Water is an excellent solvent.

**sphincter** A tight ring of muscle separating some of the organs of the GI tract and opening in response to nerve signals indicating that food is ready to pass into the next section.

**spina bifida** The embryotic neural tube defect that occurs when the spinal vertebrae fail to completely enclose the spinal cord, allowing it to protrude.

**spontaneous abortion** The natural termination of a pregnancy and expulsion of pregnancy tissues because of a genetic, developmental, or physiologic abnormality that is so severe that the pregnancy cannot be maintained. Also called miscarriage.

**starch** A polysaccharide stored in plants; the storage form of glucose in plants.

**sterol** A type of lipid found in foods and the body that has a ring structure; cholesterol is the most common sterol in our diets.

**stomach** A J-shaped organ where food is partially digested, churned, and stored until it is released into the small intestine.

GL-10

**stretching** Exercise in which muscles are gently lengthened using slow, controlled movements.

**stunted growth** A condition of shorter stature than expected for chronological age, often defined as 2 or more standard deviations below the mean reference value.

**sucrase** A digestive enzyme that breaks sucrose into glucose and fructose.

**sucrose** A disaccharide composed of one glucose molecule and one fructose molecule; sucrose is sweeter than lactose or maltose.

**sudden infant death syndrome (SIDS)** The sudden death of a previously healthy infant; the most common cause of death in infants over 1 month of age.

**sustainability** The ability to meet or satisfy basic economic, social, and security needs now and in the future without undermining the natural resource base and environmental quality on which life depends.

**sustainable agriculture** Term referring to techniques of food production that preserve the environment indefinitely.

**system** A group of organs that work together to perform a unique function; for example, the gastrointestinal system.

**T**

**teratogen** Any substance known to have the potential to harm a developing embryo or fetus.

**teratogen** Any substance that can cause a birth defect.

**theory** A conclusion, or scientific consensus, drawn from repeated experiments.

**thermic effect of food (TEF)** The energy expended as a result of processing food consumed.

**thirst mechanism** A cluster of nerve cells in the hypothalamus that stimulate the desire to drink fluids in response to an increase in the concentration of blood solutes or a decrease in blood pressure and blood volume.

**thrifty gene hypothesis** A hypothesis suggesting that some people possess a gene (or genes) that causes them to be energetically thrifty, resulting in their expending less energy at rest and during physical activity.

**time of activity** How long each exercise session lasts.

**tissue** A grouping of like cells that performs a function; for example, muscle tissue.

**total fiber** The sum of dietary fiber and functional fiber.

**toxin** Any harmful substance; in microbiology, a harmful chemical secretion of a microorganism.

**trabecular bone (spongy bone)** A porous bone tissue that makes up only 20% of our skeletons and is found within the ends of the long bones, inside the spinal vertebrae, inside the flat bones (sternum, ribs, and most bones of the skull), and inside the bones of the pelvis.

**trace minerals** Minerals we need to consume in amounts less than 100 mg per day and of which the total amount in our bodies is less than 5 g.

**transamination** The process of transferring the amine group from one amino acid to another in order to manufacture a new amino acid.

**transcription** The process through which messenger RNA copies genetic information from DNA in the nucleus.

**translation** The process that occurs when the genetic information carried by messenger RNA is translated into a chain of amino acids at the ribosome.

**transport proteins** Protein molecules that help transport substances throughout the body and across cell membranes.

**triglyceride** A molecule consisting of three fatty acids attached to a three-carbon glycerol backbone.

**trimester** Any one of three stages of pregnancy, each lasting 13 to 14 weeks.

**T-score** A comparison of an individual's bone density to the average peak bone density of a 30-year-old healthy adult.

**tumor** Any newly formed mass of undifferentiated cells.

**type 1 diabetes** A disorder in which the body cannot produce enough insulin.

**type 2** **diabetes** A progressive disorder in which body cells become less responsive to insulin.

**type of activity** The range of physical activities a person can engage in to promote health and physical fitness.

**U**

**umbilical cord** The cord containing the arteries and veins that connect the baby (from the navel) to the mother via the placenta.

**underweight** Having too little body fat to maintain health, causing a person to have a weight that is below an acceptable defined standard for a given height; a BMI less than 18.5 kg/m2.

**urinary tract infection** A bacterial infection of the urethra, the tube leading from the bladder to the body exterior.

**USDA Food Patterns** A set of recommendations for types and amounts of foods to consume from the five major food groups and subgroups to help people meet the Dietary Guidelines for Americans.

**V**

**vegetarianism** The practice of restricting the diet to foods and food substances of plant origin, including vegetables, fruits, grains, nuts, and seeds.

**viruses** A group of infectious agents that are much smaller than bacteria, lack independent metabolism, and are incapable of growth or reproduction outside of living cells.

**viscous** Having a gel-like consistency; viscous fibers form a gel when dissolved in water.

**visible fats** Fats that are clearly present and visible in our food, or visibly added to food, such as butter, margarine, cream, shortening, salad dressings, chicken skin, and untrimmed fat on meat.

**vitamins** Organic compounds that assist in the regulation of many body processes and the maintenance of many body tissues.

**vomiting** The involuntary expulsion of the contents of the stomach and duodenum from the mouth.

**W**

**warm-up** Also called preliminary exercise; includes activities that prepare you for an exercise bout, including stretching, calisthenics, and movements specific to the exercise bout.

**wasting** A physical condition of very low body-weight-for-height or extreme thinness.

**water-soluble vitamins** Vitamins that are soluble in water. These include vitamin C and the B vitamins.

**wellness** A multidimensional, active process by which people make choices that enhance their lives.

**whole foods** Foods that have been modified as little as possible, remaining in or near their natural state.

**Z**

**zygote** A fertilized ovum (egg) consisting of a single cell.

IN-1

# **Index**

Note: Page numbers followed by *f* and *t* indicate figures and tables, respectively.

**A**

AARP Drive to End Hunger Campaign,

web link for, 485 ABCDE acronym, for melanoma, 296f abortion. *See* spontaneous abortion absorption, 70, 71f, 80

of calcium, 218, 319-21, 320f

of cholesterol, 159

of copper, 309

decreased, in older adults, 551

of fats, 150-53, 151f, 152f

of iron, 218, 304-305, 313, 314, 498

breast milk and, 509 of magnesium, 324 of micronutrients, 80, 218 of minerals, 80, 218 of proteins, 192f, 193 in small intestine, 77, 80, *82f,* 150 in stomach, 77, 77f of vitamins, 75, 80 of water, 80

of zinc, 218, 308, *30f,* 498 Alc. *See* glycosylated hemoglobin test Academy of Nutrition and Dietetics, 23, 24, 25

vegetarian diet information, web link for, 210

web link for, 28, 58, 63, 137, 371 Acceptable Daily Intake, 124 Acceptable Macronutrient Distribution Range (AMDR), 13f, 14

for carbohydrates, 114, 114f

for fats, 156 accessory factors, 212 accessory organs of digestion, 71f, 72 Accutane, 545 acesulfame-K, 124 acetaminophen

and alcohol, interactions of, 252, 254

and gastrointestinal bleeding, 252, 254 acetylcholine, 273 acid-base balance, 188 acidosis, 188 acne

adolescent, 545

treatment of, vitamin A derivatives

for, 287-88, 545 ACSM. *See* American College of Sports

Medicine (ACSM) active transport, 80, 82f activity. *See* exercise; physical activity adapalene, 288

added sugars, 47, 114-15, 114t, 359

beverages with, 236

consumption of, guidelines for, 117

and diabetes, 135

in energy drinks, 236

and obesity, 127

replacement of fat by, 156

terminology for, 115, 116t Addison, Thomas, 270 adenosine diphosphate (ADP), 391, 391f

from fat metabolism, 394 adenosine triphosphate (ATP), 242, 391, 391f

in active transport, 80, *82f*

breakdown of, 391, 391f

production of, 68, 148, 391-92, 393f, 394f in fermentation, 101

regeneration of, 391, 392f Adequate Intake (AI), 13f, 14

of biotin, 263t

of chloride, 216f, 237t

of choline, 264t

of fiber, 118, 121f for children, 536 for toddlers, 531

of manganese, 264t

of pantothenic acid, 263t

of potassium, 216t, *237t,* 240, 241f

of sodium, 216t, 237t

of vitamin K, 2131, 302f

ADH. *See* antidiuretic hormone (ADH)

ADI. *See* Acceptable Daily Intake Adipex-P, 376

adipokines, 373f, 374 adipose tissue, 11, 140, 147, 153-54, 153f, 347

protective function of, 149 Administration on Aging, 561 adolescent(s)

acne in, 545

alcohol consumption by, 545 body image concerns, 543 calcium requirements, 530f, 542 carbohydrate requirements, 530t, 542 eating disorders in, 543 energy requirements, 541 fat requirements, 530t, 542 fluid recommendations for, 530t, 542-43

fluid requirements, 530t, 542-43

food choices for, 543

growth of, 541, 541f

healthful eating patterns for, 547-48

illegal drug use by, 545 iron requirements, 530t, 542 micronutrient requirements, 530t, 542 nutrient recommendations for, 530t nutrient requirements, 530t, 541-43 physical activity for, 548, 549t protein requirements, 530t, 542 smoking by, 545

vitamin A requirements, 530t, 542 vitamin D requirements, 542 ADP. *See* adenosine diphosphate (ADP) adrenaline, 148 adult-onset diabetes, 135 advantame, 125 Adverse Reaction Monitoring

System, 442 advertising, by food and beverage

industry, 470 aerobic exercise, 382 aerobic metabolism, 392-94, 393f, 394f age, maternal, and pregnancy, 502 aging. *See also* older adults

physiologic changes related to, 550-51 supplements and, 565 agouti gene, 30-31 agouti mice, 30-31, 30f agribusiness, environmental effects

of, 205

agriculture. *See also* community- supported agriculture crop destruction, climate change and, 466

crop yields, climate change and, 466

as dangerous industry, 467

genetically modified crops in, 443-44

industrial

and environment, 468-69 and food security, 468-69

monopolization of, 469-70

organic, 449-50

practices, and food shortages, 465

sustainable, 472-73

urban, 472 Al. *See* Adequate Intake (Al) ALA. *See* alpha-linolenic acid Al-Anon Family Group Headquarters,

web link for, 259 albumin, 148

alcohol, 250. *See also* blood alcohol concentration in breast milk, 257, 511 Calories in, 251, 252f and colorectal cancer, 89

IN-2

alcohol (*continued)* consumption of, 48 by adolescents, 545 and blood pressure, 175 and cancer, 295 diabetes and, 136 and mortality risk, 253, 253f in pregnancy, 256, 504 recommendations for, 175 drug interactions with, 252 energy provided by, 8, 10, 251, 252f and food intake, 252 intake, controlling, 257-58 and liver function, 83, 255 metabolism of, 250-51

myths about, 250-51, 251t moderate drinking benefits of, 251 and bone density, 337 definition of, 251 risks of, 251-52 as teratogen, 256-57, 504 tolerance, 253 functional, 251 metabolic, 251 alcohol abuse, 252-53, 265 and bone health, 337 and cancer, 297 alcohol dehydrogenase, 250 alcohol dependence, 252-53 alcohol hangover, 253-54 alcoholic hepatitis, 255 Alcoholics Anonymous, web link

for, 259 alcoholism, 252-53 alcohol poisoning, 249, 254-55 alcohol use disorder(s), 252-57 approaching person with, 258 and chronic disease risk, 255 and malnutrition, 255-56, 256f and risk of traumatic injury, 256 signs of, 258 toxic effects of, 253-57 aldehyde dehydrogenase, 250 alendronate, 339 algae, toxins produced by, 432 alkalosis, 188 allergen(s), 94, 95, 189

in pediatric food allergy, 521 allergy(ies)

in infants, smoking and, 504 prevention/reduction *H. pylori* and, 90 microbiome and, 32 phytochemicals and, 35 protection against, in breast-fed infants, 510 Alli. *See* orlistat allylic sulfur compounds, 34f almond milk, 234 almonds, fiber content of, 121 alpha-carotene, 34/

alpha cells, pancreatic, 110, 111f alpha-linolenic acid, 146

Dietary Reference Intake for, 156-57

food sources of, 160, 174

intake of, recommendations for, 174 alpha-tocopherol, 278. *See also* vitamin E Alpha-Tocopherol Beta-Carotene (ATBC)

Cancer Prevention Study, 289 alpha-tocopherol equivalents, 278 alternate-day fasting, 564 alternative sweeteners, 123-26

and body weight, 125-26 altitude, high, and fluid loss, 232 Alzheimer's disease

free radical production and, 277

metabolic syndrome and, 374

obesity and, 373

prevention/reduction, phytochemicals and, 35 amaranth, 198 amenorrhea

in anorexia nervosa, 418 in female athlete triad, 421-22, 421/ American Academy of Pediatrics recommendations for

breastfeeding, 510 web link for, 523 American Association of Retired Persons,

web link for, 566 American Cancer Society, web link for, 291, 299

American College of Obstetrics and

Gynecology, web link for, 527 American College of Sports Medicine

(ACSM), 25 web link for, 28, 412 American Dental Association, web link

for, 129, 333 American Diabetes Association, 62

web link for, 63, 137, 523 American Dietetic Association. *See*

Academy of Nutrition and

Dietetics

American Heart Association, web link

for, 166, 248, 412 American Institute for Cancer

research, 35 American Society for Nutrition (ASN), 25

web link for, 28 amino acid(s), 11, 180-81 absorption of, 192f, 193 bonding of, 182, 182f branched-chain, 264 conditionally essential, 181 energy from, in exercise, 396 essential, 180-81, 181t, 193 in human body, 180, 181t limiting, 186 metabolism folate in, 269 thiamin and, 264-65 vitamin B6 in, 267

vitamin B12 in, 270

nonessential, 181, 181t

from protein digestion, 191-93, 192f

side chains of, 180, 180f

structure of, 180, 180f

sulfur in, 275

supplements, 368, 396 amino acid pool, 184, 184f, 186 amniotic fluid, 227, 498 amputations, diabetes and, 131, 131f amylase

pancreatic, 78f, 79, 107, 108f

salivary, 72f, 73, 107, 108f anabolic steroids, 407, 416 anabolic substances, 368, 407-408 anaerobic metabolism, 393f, 394f anaerobic reaction, definition of, 391 anal canal, 78, 79f anaphylaxis, 94 androstenedione, 407 anemia. *See also* iron-deficiency anemia

definition of, 307

hemorrhagic, 307

in infants, 520

macrocytic, 307, 310, 311f

in marasmus, 202

megaloblastic, 310, 311f

microcytic, 307, 310, 311f

micronutrient deficiencies and, 307

milk, 518

pernicious, 270, 271-72 in pregnancy, 307 sickle cell, 307 sports, 406

vitamin C deficiency and, 314 vitamin E deficiency and, 280

anencephaly, 496

angina pectoris, 168

animal products. *See* beef; fish; meat; pork; poultry

animal studies, 18, 19f

anorexia, 68

anorexia nervosa, 367, 414

comorbidity with other psychological disorders, 417

death caused by, 417, 418

definition of, 417

diagnostic criteria for, 418

gender distribution of, 417

health risks of, 418, 41*9f*

signs and symptoms, 417-18

social factors and, 417 antacid(s), 85, 86

interactions with nutrients, 557, 557t anthocyanidins, 34f anthocyanins, 299 antibiotics

broad-spectrum, 90

and GI flora, 83

interactions with nutrients, 557, 557t and microbiome, 32 use in animals, 449

IN-3

antibodies, 95, 189

in breast milk, 509 anticoagulants, interactions with

nutrients, 557, 557t anticonvulsants, interactions with

nutrients, 557, 557t antidepressants, interactions with

nutrients, 557, 557t antidiuretic hormone (ADH), 230, 230f antigen(s), 189 antioxidants, 198, 205

and cancer, 289, 292

and cancer prevention, 298-99

and cardiovascular disease, 289

definition of, 275

in food, 289, 299

mechanism of action of, 277

in supplements, 289, 299 antiretroviral agents, interactions with

nutrients, 557, 557t anus, 78, 79f anxiety

body image and, 414

and eating disorders, 416

and exercise addiction, 414

and muscle dysmorphia, 416

social physique, 414 apigenin, 299 appetite, 68

definition of, 40 apple-shaped fat patterning, 347, 349f apricots, phytochemicals in, 34f aquifer(s), 233-34 ARA. *See* arachidonic acid arachidonic acid, 147

in breast milk, 509, 515

food sources of, 495

in maternal diet in pregnancy, 495

requirements, of toddlers, 530 arginine, 181 ariboflavinosis, 265-66 ARMS. *See* Adverse Reaction Monitoring System arsenic, 218 arthritis

free radical production and, 277 selenium deficiency and, 281 ascorbic acid. *See* vitamin C (ascorbic acid)

aseptic packaging, 440 ASN. *See* American Society for Nutrition (ASN)

asparagus, fiber content of, 121f aspartame, 124-25, 125t aspartic acid, structure of, 180f aspirin

and gastrointestinal bleeding, 252, 254

interactions with nutrients, 557, 557t asthma

and gastroesophageal reflux disease, 86 obesity and, 546 prevention/reduction *H. pylori* and, 90 microbiome and, 32 phytochemicals and, 35 ATBC. *See* Alpha-Tocopherol

Beta-Carotene (ATBC) Cancer Prevention Study atherosclerosis, 168, 169f athletes

carbohydrate requirements for, 397t, 399-402

dietary guidelines for, 156

endurance, carbohydrate loading for, 402, 402t

energy requirements, 397-99, 398f

fluid requirements, 233

grazing by, 399

health risks and, 399

heat-related deaths in, 245

and protein intake, 195-96

protein requirements, 208, 396, 403

weight concerns of, 399 atom(s), 66, 66f, 275 ATP. *See* adenosine triphosphate (ATP) ATP-CP system, 391-92, 393f atrophic gastritis, 271 atrophy, 386

attachment, mother-infant, breastfeeding

and, 510-11 AUD. *See* alcohol use disorder(s) autoimmune disease, type 1 diabetes

as, 132

autonomic nervous system, 84 avidin, 272

avocado, omega-3 fatty acid content of, 157t

**B**

baby foods, 518

BAC. *See* blood alcohol concentration Bach, Harold, 381 *Bacillus thuringiensis,* 444 bacteria. *See also specific bacteria*

in foodborne illness, 429-30, 430t bagel, size, increased, 52, 52f baked goods

saturated fats in, 158

*trans* fatty acids in, 158 banana, fiber content of, 121f Banting, Frederick, 132 barbecues, food safety for, 438 bariatric surgery, 377-78, 378f Barrett's esophagus, 86 basal metabolic rate (BMR), 351-52, 351f 352f

and body weight, 357

calculation of, 354

in infancy, 513 BDD. *See* body dysmorphic disorder beans

fiber content of, 121f

protein content of, 198t

beef

production, inefficiency of, 469

protein content of, 198t beet extract, 441t*,* 442 Behavioral Risk Factor Surveillance

System (BRFSS), 24 behavior modification, for losing weight and maintaining healthful weight, 364-67 Belviq, 376 benzphetamine, 376 beriberi, 212, 215t, 264-65 berries, phytochemicals in, 34f "best used by" date, 435 beta-alanine, as ergogenic aid, 409 beta-carotene, 34f, 277, 278, 278t, 284

adequate intake of, 282

antioxidant properties of, 281-83

as food coloring, 441f, 442

food sources of, 282, 282f

intake, increasing, 283

physiologic functions of, 282

as provitamin, 281-82

and skin discoloration, 283

supplements, 282, 283, 459 and lung cancer, 35 Beta-Carotene and Retinol Efficacy Trial

(CARET), 289 beta cells, pancreatic, 110, 111f, 132, 133f beta-endorphins, and food intake, 358 beverages, 234-37

added sugars in, 127, 236

caffeinated, 235-36

sugar-sweetened, 115

and cardiovascular disease, 117, 164

consumption, factors affecting, 54-55 and diabetes, 56, 117 and obesity, 26, 56, 117 bias, 21-22 bicarbonate

in small intestine, 78f, 79

in stomach, 76, 77 *Bifidobacterium,* 33 bile, 78f, 79, 83, 141, 150, 151f

synthesis, vitamin C and, 313 bile salts, 150

action of, 152f binge drinking, 253

in pregnancy, 256 binge eating, 418-19

health risks of, 420 binge-eating disorder, 414, 420 bioavailability

of calcium, 319-21

of iron, 304-305 biodiversity, loss of, 444-45 bioelectric impedance analysis, 348f biological disturbances, alcohol and, 253 biomagnification, 446, 446f biopesticides, 448

IN-4

biotin, 212-13, 214, 263f Adequate Intake of, 263t as coenzyme, 272 deficiency, 215t, 272 food sources of, 215t, 272 physiologic functions of, 215t, 272 RDA for, 215t

requirements, of breastfeeding women, 508

sulfur in, 275 birth length, average, 492 birth weight

average, 492

maternal weight gain in pregnancy and, 492-93 bisphenol A, 447

in bottles and cups for infants/ toddlers, 510 bisphosphonates, 339 bitter orange, 457t blackberries, fiber content of, 121f bladder function, cancer and, 296 blastocyst, 489, 489f blindness. *See also* color blindness; night blindness in elderly, 556

vitamin A deficiency and, 287, 482, 483

blood

cellular components of, 302

nutrient transport in, 80-82, 83/ blood alcohol concentration, 250-51

and brain function, 254, 254f blood clotting, 191

vitamin K and, 311 blood donation, and iron status, 305t blood glucose. *See also* glycemic index; hyperglycemia; hypoglycemia

diet and, 175

as energy source for exercise,

148, 148f and food intake, 358 in metabolic syndrome, 374 monitoring, 134f obesity and, 546

regulation of, 69-70, 110-13, 111f

and satiety, 358

in type 2 diabetes, 134 blood health

trace minerals and, 302-309

vitamins and, 310-14 blood pressure. *See also* hypertension

blood volume and, 226

DASH diet and, 175-77, 176f

diastolic, 170

management of, 175-77 medications for, 177

normal, 170

regulation of, 231, 231f

systolic, 170

vegetarianism and, 205 blood volume, 226

regulation of, 231, 231f

BMI. *See* body mass index (BMI) BMR. *See* basal metabolic rate (BMR) bod pod, 348f body composition, 347

in adolescence, 541

age-related changes in, 551

assessment of, 347, 348f body dysmorphic disorder, 415-16

comorbidity with other psychological disorders, 417

genetics and, 416

social factors and, 417 Body Dysmorphic Disorder Foundation,

web link for, 423 body fat, 140, 190. *See also* adipose tissue; obesity; overweight

age-related changes in, 551

distribution patterns, assessment of, 347-49, 349f

energy storage in, 148-49

protective function of, 149

visceral, 373f body fat mass, 347 body fluid, 224-25

age-related changes in, 225

and body temperature regulation, 226-27, 226f

components of, 225

gender differences and, 225

locations of, 224-25, 224f

protective function, 227

and tissue lubrication, 227 body image

in adolescence, 543

anxiety about, 414

definition of, 414

disorders related to, development of, factors affecting, 416-17

and eating behaviors, 414, 415f

and exercise behaviors, 414 body mass index (BMI), 344-47, 345f

age and, 346-47

calculation of, 346

ethnicity and, 347

limitations of, 346-47

and morbid obesity, 373

and obesity, 373

prepregnancy, 488, 493, 493t body temperature. *See also* fever

exercise and, 403-404

regulation of, water and, 226-27, 226f, 403-404 body weight. *See also* obesity;

overweight; underweight; weight gain; weight loss; weight management

alternative sweeteners and, 125-26

athletes' concerns about, 399

and blood pressure, 175

drifty gene hypothesis and, 357

energy balance and, 349-55, 350f

factors affecting, 355-60

FTO gene and, 356

genetics and, 355-57 healthful, definition of, 344 and inflammation, 175 and osteoporosis prevention, 341 physiologic factors and, 357-58 protein leverage hypothesis and, 357 set-point hypothesis and, 356 sociocultural factors affecting, 358-60 thrifty gene hypothesis and, 356 and weight gain in pregnancy, 492-93, 493t

bolus (food), 73

bone(s)

calcium in, 316-17, 318-19 composition of, 315-16 cortical (compact), 316, 316f deterioration, in osteoporosis, 335,

335f. *See also* osteoporosis fluoride in, 324-25 formation (new bone formation),

317, 317f growth, 316 magnesium in, 323 modeling, 316 phosphorus in, 323 physiologic functions of, 315, 315t remodeling, 316-17, 317f

vitamin K and, 330 resorption, 316-17, 317f structure of, 316, 316f trabecular (spongy), 316, 316f

bone density, 316

assessment of, 317-18, 318f gender differences in, 336-37 loss of, 317

low, in female athlete triad,

421-22, 421f peak, 316

vitamin K and, 330 bone health, 315

alcohol use disorder and, 255

calcium and, 318-19

fluoride and, 324-25

magnesium and, 323-24

manganese and, 274

in older adults, 551

phosphorus and, 323

physical activity and, 383, 383f

phytochemicals and, 34f

vitamin A and, 286

vitamin D and, 326-29

vitamin K and, 330 bone loss, 199-200

age and, 336, 337f

age-related, 551

sodium and, 239

vitamin D and, 328-29 bone mass, gender differences in, 336-37 bone mineral density

age-related changes in, 551

genetics and, 337 Bontril, 376 boron, 221

IN-5

botanicals. *See* herb(s) botulism, 432

in infants, 519 bowel habits, cancer and, 296 BPA. *See* bisphenol A brain

alcohol and, 254, 254f

fetal, growth of, 492, 495

growth of, in infancy, 492, 509, 513 bran, 118, 118f, 264 *BRC* gene, 293-94 bread

pumpernickel, fiber content of, 121f white, fiber content of, 121f whole-grain, 119

whole-wheat, fiber content of, 121f breast(s), anatomy of, 505, 505f breast cancer

alcohol and, 251

birth weight and, 526 breastfeeding

advantages of, 505

and alcohol, 257

benefits of, 509-511 for mothers, 510

challenges to, 511-13

convenience of, 511

duration of, 509-10

employment conflicts and, 512

fluid intake in, 508

and fluid loss, 232

and formula feeding, combined, 512

frequency of, 512

and infant bonding with fathers and

siblings, 513 and iron status, 305t low cost of, 511 maternal HIV/AIDS and, 512 maternal obesity and, 512 and mother-infant bonding, 510-11 nutrition and, 506-508 and postpartum weight loss, 493 prevalence of, in U.S., 505 promotion of, initiatives for, 470,

470f, 505 social concerns and, 512-13 supplements and, 508 breast milk alcohol in, 511 caffeine in, 511 calcium in, 508, 509 composition of, 505, 508, 509 contaminants in, 511-12 drugs in, 511 food components in, 512 illegal drugs in, 511 magnesium in, 509 nicotine in, 511 pesticides in, 511 production of, 505-506, 506f sugars in, 116

superior-quality nutrition from, 509-10

brewer's yeast, 4

BRFSS. *See* Behavioral Risk Factor

Surveillance System (BRFSS)

broccoli

fiber content of, 121f

phytochemicals in, 34f brown bread, 119t brown sugar, 116t brush border, 80, 81f Bt gene, 444 buffers, 188 Buffett, Howard, 473 bulimia nervosa, 414

behaviors characteristic of, 418

comorbidity with other psychological disorders, 417

diagnostic criteria for, 419

gender distribution of, 418

signs and symptoms, 419-20 butyrate, 102

B-vitamin(s). *See also specific B-vitamin* as coenzymes, 262, 263f and energy metabolism, 262, 263f,

264-72 requirements

in older adults, 552t, 554 for vigorous exercise, 397t, 405-406 B-vitamins. *See* vitamin(s), B-

**C**

cabbage, phytochemicals in, 34f CAD (coronary artery disease). *See*

coronary heart disease caffeic acid, 34f caffeine

adverse effects of, 408

and bone health, 337-38

in breast milk, 511

and diuresis, 232

in energy drinks, 236

as ergogenic aid, 408

hot beverages containing, 235-36

intake, in pregnancy, 504

in weight-loss supplements, 377 CAFOs. *See* confined animal feeding

operations Calcimar, 339

calcitonin, effect on bone loss, 339 calcitriol, 326

calcium, 12, 12t, 214-16, 216t absorption of, 218, 319-21, 320f bioavailability of, 319-21 blood levels, regulation of, 319,

320f, 326 in body fluids, 225 in bone, 316-17 and bone health, 318-19 in bottled water, 235 deficiency, 216t

in pregnancy, fetal effects of, 526

dietary, and protein, and bone

health, 338 and disease prevention/

treatment, 220 excess, 322

food sources of, 49f, 216t, 321, 321f, 497

lactose intolerance and, 94 intake

calculation of, 322

in childhood, 540

inadequate, 322-23, 540

increasing, 322 and iron absorption, 304 and kidney stones, 322 and muscle contraction, 227-29, 319 and nerve impulse conduction, 319 nonmeat/nondairy food sources of, 206t

physiologic functions of, 206t, 21*6t,*

237-38, 318-19 RDA for, 216t, 302t, 321-22, 321f

for toddlers, 531 requirements

in adolescence, 530t, 542

of breastfeeding women, 508

of children, 530t

in older adults, 552t, 553

in pregnancy, 496t, 497

of toddlers, 530t, 531

for vigorous exercise, 397t, 406 supplements

and bone health, 338, 340-41

and cardiovascular health, 340

for female athletes, 406

lead content of, 340

risks associated with, 322 toxicity, 216t UL for, 21*6t*

vegetarian/vegan diet in pregnancy and, 503 Calorie Control Council, web link

for, 129 Calorie restriction

alternatives to, with similar

benefits, 564 benefits of, 563 challenges of, 564 and life span, 563-64 metabolic effects of, 563 Calories, 8 empty, 10

intake, management of, 365f per serving, on food labels, 43, 44f in sugary drinks, 236 calories, 8

*Campylobacter,* in foodborne illness, 430t cancer

alcohol use disorder and, 255 deaths from, 292 definition of, 293

development of, stages of, 293, 294f diagnosis of, 296-97

IN-6

cancer (*continued)*

free radical production and, 277 in gastrointestinal organs, 89 health claims on food labels

about, 46t herbicide and, 444 infectious agents and, 295 nutrition and, 6, 7f obesity and, 373 prevention/reduction, 297-99

antioxidants and, 289, 292, 298-99

exercise and, 295, 297

phytochemicals and, 34f, 35

Power Plate and, 62

vegetarianism and, 205

vitamin D and, 326 risk factors for, 293-96

modifiable, 295-96

nonmodifiable, 293-95 screening tests for, 296, 297 signs and symptoms of, 296 survival rate for, 293, 297 treatment of, 297 cancer genes, 293-94 cane sugar, 11*6t* canning, 440

canola oil, omega-3 fatty acid content of, 157t

cantaloupe, phytochemicals in, 34f capillary(ies), of intestinal villi, 80, 81f caramel, as food coloring, 441t, 442 carbohydrate(s), 8, *9f,* 100-104 AMDR for, 114, 114t, 399 complex, 100, 102-104 consumption, by atheletes, timing of, 400-401 definition of, 10, 100 digestion of, 107, 108f energy from, 8, 10, 104-105, 190, 391, 393f for brief and long-term exercise,

391-94, 393f and exercise, 104-105, 105f exercise intensity and, 395, 395f fiber-rich, 103-104, 114 food sources of, 9f, 10

for athletes, 401, 401t functions of, 104-107 metabolism

chromium and, 274 riboflavin in, 265 thiamin and, 264-65 vitamin B6 in, 267 RDA for, 114, 114f

for adolescents, 530t, 542 for children, 536 for toddlers, 530f, 531 recognizing, in nutrition labels, 120 recommended intake of, 13f requirements

of adolescents, 530f, 542 of breastfeeding women, 508

of children, 530f, 536 in infancy, 515 in older adults, 552 in pregnancy, 495 of toddlers, 530t, 531 for vigorous exercise, 397t, 399-402 simple, 100-101

weight-loss diets focusing on, 362 carbohydrate loading, 109, 402, 402t

adverse effects of, 402 carbon dioxide (CO2), and global

warming, 477 carcinogen(s), 205, 295

detoxification

microbiome and, 32 phytochemicals and, 34f, 35

food residues as, 447-48 cardiometabolic risk, 374 cardiovascular disease, 167-77

blood lipids and, 171-74

deaths from, 168

definition of, 168

prevention/reduction, 174-77, 270

antioxidants and, 289

dietary fiber and, 106-107, 106f

Mediterranean diet and, 61

niacin and, 268

phytochemicals and, 34f, 35

Power Plate and, 62 risk

estimation of, 174 reduction of, 174-77 risk factors for, 164, 170-74, 277 modifiable, 170-71 nonmodifiable, 170 saturated fats and, 157, 164 sugar intake and, 117, 164 *trans* fatty acids and, 158, 164 types of, 168

cardiovascular system, 82, 83f

Care, web link for, 485

CARET. *See* Beta-Carotene and Retinol Efficacy Trial (CARET)

carnitine, 221

as ergogenic aid, 408-409 synthesis, vitamin C and, 313

carnosine, 409

carotenoids, 277, 278

antioxidant properties of, 281-283 food sources of, 282, 282f sources of, 34f

carrageenan, 103

carrier protein(s), 82f, 190

carrots, phytochemicals in, 34f

case control studies, 19

cash crops, 465

catalase, 281

cataract(s), 556, 556f

free radical production and, 277

catechins, 34f

cauliflower, phytochemicals in, 34f

CCK. *See* cholecystokinin (CCK) CDC. *See* Centers for Disease Control

and Prevention (CDC) cecum, 77, 79f celiac disease, 96-97

diagnosis of, 96-97, 96f and vitamin B12 deficiency, 272 celiac sprue. *See* celiac disease Celiac Sprue Association, web link

for, 97 cell(s), 66-67, 66f differentiation definition of, 284 niacin in, 266 vitamin A and, 284-86 vitamin D and, 326 energy sources for, 391, 393f functions of, fats and, 149 repair and maintenance, proteins and, 187 cell membrane, 67, 67f

damage, by free radicals, 276 electrolyte transport across, 227 fats and, 149

water permeability of, 227 cellulose, 103

Celsus, Aulus Cornelius, 283

centenarians, 550

Centers for Disease Control and Prevention (CDC), 24 classification of pediatric obesity, 547 and food safety, 426, 427t Food-Safety Homepage, 453 Healthful Corner Stores initiative, 472 physical activity guidelines for older

adults, 559 web link for, 28, 137, 379, 561

cephalic phase, of digestion, 72

cereals, terminology for, on food labels, 118, 119t

cerebrospinal fluid, 227

cerebrovascular disease, 168

certified (term), 457

ceruloplasmin, 308

CHD. *See* coronary heart disease

chemotherapy, 297

chewing, 72, 72f, 74f

chief cells, gastric, 75

children. *See also* adolescent(s); infant(s); toddler(s) calcium intake, inadequate, 540 carbohydrate requirements, 530t, 536 dental caries in, 539-40 in developing countries,

health-promotion initiatives for, 470 energy requirements, 536 fat requirements, 530t, 536 fiber inatke for, 536 fluid intake for, 536-38 fluid requirements, 530t, 536-38 food choices for, 538 and food insecurity, 540

IN-7

growth and development of, and

nutrient needs, 535-38 growth charts for, 513, 514f, 547 healthful eating patterns for, 547-48 inactivity, sociocultural factors

and, 359 iron requirements, 530f, 531 micronutrient requirements, 530t, 536 nutrient recommendations for, 530t nutrient requirements, 530t, 535-38 nutrition-related concerns for, 539-40 obese, bullying of, 360 physical activity for, 548, 549f protein requirements, 208, 530t, 536 school attendance, and nutrition, 538-39

vitamin A requirements, 482, 530t Chinese ephedra, 457t. *See also*

ephedrine Chipotle's restaurants, and foodborne

illness, 425 chitosan, 163

chloride, 12t, 214-16, 216:

Adequate Intake of, 216t, 237***t*** in body fluids, 225, 242 deficiency, 216t, 242 food sources of, 216t, 242 intake, recommendations for, 23***7t*** physiologic functions of, 216t, 237

chlorine, 242 in water, 234

chlorophyll, 100, 100f

chocolate dark, 236 hot, 236

phytochemicals in, 34f cholecalciferol, 326. *See also* vitamin D cholecystokinin (CCK), 79

actions of, 70

and satiety, 358 cholesterol, 11, 141, 153, 153f, 172, 172f, 173f

absorption of, 159

blood levels, dietary fiber and, 106-107, 106f

of cell membrane, 68

dietary, 158-59

recommended intake of, 174

metabolism of, 159

physiologic functions of, 149

production of, in body, 159

recommended intake of, 159

recycling of, in body, 159

serum

interpretation of, 174t total, 172-74, 174t

structure of, 141, 141f choline

Adequate Intake of, 264t

deficiency, 273

in energy metabolism, 262

food sources of, 273

physiologic functions of, 273

requirements, of breastfeeding women, 508

toxicity, 273 ChooseMyPlate.gov, 494, 523

Daily Food Plan for Moms, 508 chromium, 12t, 216, 217:

deficiency, 274

in energy metabolism, 262

as ergogenic aid, 409

food sources of, 274, 409

physiologic functions of, 274

RDA for, 264f

requirements, of breastfeeding

women, 508 chronic disease(s), 61. *See also* cancer;

cardiovascular disease;

diabetes; hypertension added sugars and, 115 definition of, 4 nutrition and, 6 obesity and, 373 prevention/reduction, 369

physical activity and, 383, 383f risk

alcohol use disorder and, 255 waist circumference and, 349 waist-to-hip ratio and, 349

chylomicron remnants, 152-53, 173f

chylomicrons, 151f, 152-53, 171, 172f, 173f

chyme, 75, 77, 79

ciguatoxins, 432

cirrhosis, of liver, alcohol abuse and, 255, 255f

*cis-,* definition of, 144

citrus fruits, phytochemicals in, 34f

climate change

and global food security, 466 meat consumption and, 469, 477

clinical trials, 19-20, 19f and bias, 22

and conflict of interest, 22, 26

placebo-controlled double-blind randomized, 20

randomized, 20

and transparency, 22 *Clostridium botulinum,* 432, 433, 519 *Clostridium perfringens,* in foodborne

illness, 430: clotting factors, 191 1-C metabolism, 269 cobalamin. *See* vitamin B12 Coca-Cola Company, and health care and

health research, 26 coconut water, 237 coenzyme(s), 262, 262f, 263f, 312

biotin as, 272

B-vitamins as, 262, 263f

vitamin B6 as, 267-68

vitamin C as, 312 cofactors, 277

coffee

benefits of, 235, 289

intake, and bone density, 337-38

and irritable bowel syndrome, 89 coffee beans, phytochemicals in, 34f coffee drinks

healthful, 55f

saturated fat in, 162

serving size, increased, 52, 52f cognitive decline, obesity and, 373 cold/flu, prevention/reduction,

probiotics and, 33 colic, 519-20 collagen, 191

in bone, 315-16

physiologic functions of, 312

structure of, 312

synthesis

copper and, 309 vitamin C and, 312-13, 312f College and University Food Bank

Alliance, 474 College Drinking: Changing the Culture,

web link for, 259 colon, 77. *See also* large intestine

ascending, 77-78, 79f

descending, 78, 79f

sigmoid, 78, 79f

transverse, 78, 79f colon cancer

prevention/reduction, physical activity and, 383, 383f

prevention/reduction of, 105 colonoscopy, 89, 297 color blindness, 284 colorectal cancer, 89

prevention

magnesium and, 323 vegetarianism and, 205 color vision, 284 colostrum, 505 common bile duct, 79 common cold

treatment of, zinc in, 308

vitamin C and, 313 community-supported agriculture, 472-73 compound(s), 275

concentrated fruit juice sweetener, 116t conception, 489f

healthful diet and, 488 condiments, saturated fats in, 158 conditioned taste aversion, 41 cone cells, of eye, 284, 285f confectioner's sugar, 116: confined animal feeding operations, 469 conflict of interest, 21, 22, 26 congeners, 253

Congregate Nutrition Services

Program, 558 connective tissue, 301

IN-8

constipation, 88-89 cancer and, 296

irritable bowel syndrome and, 89

in pregnancy, 498, 500

prevention/reduction, vegetarianism and, 205 container gardening, 451 contingent farm workers

hazardous conditions of, 467

low wages of, 467 Contrave, 376

control group, for experiment, 17 cooking, and food safety, 437 cool-down, for physical activity, 388 copper, 12t, 216, 217t, 281

absorption of, 309

deficiency, 307, 309, 310

food sources of, 309, 310f

physiologic functions of, 308-309

RDA for, 302t***,*** 310f

requirements, of breastfeeding women, 508

corn

fiber content of, 121f

herbicide-tolerant GM crops, 444 corn sweeteners, 11*6t* corn syrup, 116t

inappropriateness for infants, 519 coronary artery disease. *See* coronary

heart disease coronary heart disease, 168

fetal origins of, 525

health claims on food labels about, 46t

protein intake and, 201 Cortisol

and blood glucose, 112

and body weight, 357 cough, cancer and, 296 Coumadin, and dietary supplements,

interactions of, 458-59 CP. *See* creatine phosphate CR. *See* Calorie restriction crab, Alaska King, omega-3 fatty acid

content of, 157t cravings, in pregnancy, 500 C-reactive protein, 171 creatine, supplements, as ergogenic aid, 408

creatine phosphate, 391, 392f, 393f, 408 cretinism, 274, 281

Creutzfeldt-Jakob disease, variant, 431 CRONies, 564

*Cronobacter,* in infant formula, 510 crop rotation, 472 cross-contamination, 434-35 CRP. *See* C-reactive protein cruciferous vegetables, phytochemicals in, 34f

CSA. *See* community-supported

agriculture curcumin, 34f

CVD. *See* cardiovascular disease

CVS. *See* cyclic vomiting syndrome cyclic vomiting syndrome, 87 cysteine, 180, 181, 181t, 268, 268f

sulfur in, 275 cytochromes, 303 cytoplasm, 67f, 68

**D**

dairy foods

calcium in, for children, 540

Mediterranean diet and, 61

protein content of, 198?

saturated fats in, 157

serving sizes, 51f

in USDA Food Patterns, 48, 49f danger zone, 433, 433f, 435 DASH diet, 50, 156, 175-77, 176f, 238, 239, 246, 362

benefits of, 177

web link for, 177 deamination, 190

death(s) and mortality rate(s). *See also* infant mortality; maternal mortality from alcohol-related injury, 256 anorexia nervosa and, 417, 418 caffeine toxicity-related, 377 cancer-related, 292, 293 from farm-labor injuries, 467 foodborne illness and, 426, 429 premature, obesity and, 374 weight-loss supplements and, 377 of young children

malnutrition and, 481 prevention of, 482 deep-fried foods, *trans* fatty acids in, 158 dehydration, 243-44, 244? diarrhea and, 87 exercise and, 403-404 heat illnesses and, 244-45 and hypokalemia, 241-42 in infants, 516, 519 in pregnancy, 499 risk factors for, 243 signs and symptoms in adults, 87t in children, 87f during exercise, 404f vomiting and, 87 dehydroepiandrosterone, 407, 565 dementia, obesity and, 373 denature, definition of, 75 dental caries

in childhood, 539-40 fluoride deficiency and, 325 health claims on food labels

about, 46t in nursing bottle syndrome,

520, 520f obesity and, 546 prevention of, 325 dental health, in older adults, 555-56

deoxyribonucleic acid. *See* DNA (deoxyribonucleic acid) Department of Health and Human Services, web link for, 412 depolarization, 228, 230f depression

and exercise addiction, 414

and muscle dysmorphia, 416

obesity and, 373, 546

treatment of, physical activity and, 383 dermatitis herpetiformis, 96 dessicants, 442

DEWL. *See* Diabetes Excess Weight Loss

(DEWL) trial DEXA. *See* dual-energy x-ray

absorptiometry (DEXA) dextrose, 116t

DHA. *See* docosahexaenoic acid DHEA. *See* dehydroepiandrosterone diabetes, 110, 130-37. *See also* gestational diabetes

alcohol and, 251, 252

and amputations, 131, 131f

complications of, 130 macrovascular, 131 microvascular, 131

definition of, 131

diagnosis of, 134, 134t

dietary guidelines for, 136

epidemiology of, 130, 131

fetal origins of, 526

gestational, 132

maternal, and health problems in adult offspring, 526-27

and neuropathy, 131

nutrition and, 6, 7f

obesity and, 6, 7f

prevention/reduction, Power Plate and, 62

protection against, in breast-fed infants, 510

and protein intake, 200-201

racial/ethnic distribution of, 131, 131f, 135

risk, alcohol use disorder and, 255

sugar intake and, 117

type 1, 132, 132t, 133f

pathophysiology of, 132, 133f

type 2, 132-34, 132t, 133f bariatric surgery and, 378 and cardiovascular disease, 171 dietary fiber and, 107 fetal origins of, 526-27 free radical production and, 277 gestational diabetes and, 501 medications for, 136-37 metabolic syndrome and, 374 microbiome and, 32 obesity and, 373 pathophysiology of, 132, 133f physical activity and, 383, 383f prevention/reduction, 32, 107, 135-36, 171, 383, 383f

IN-9

risk factors for, 134-35, 501, 526-27 risk reduction, 135-36 sugar-sweetened beverages and, 56 Diabetes Excess Weight Loss (DEWL)

trial, 369 diadzein, 34f diarrhea, 87-88 cancer and, 296 and fluid loss, 232 irritable bowel syndrome and, 89 lactose intolerance and, 94 sugar alcohols and, 124 traveler's, 87-88 Didrex, 376

diet. *See also* healthful diet

adequate, 38

balanced, 38-40

and cancer, 295

and cancer prevention, 298

gluten-free, 96-97

moderate intake and, 38

nutrient-dense, 38, 39f, 47, 48, 367-68

nutritious, and wellness, 5

preconception, 488

varied, 40, 47 diet analysis programs, 51-53 Dietary Approaches to Stop Hypertension

(DASH) diet. *See* DASH diet Dietary Guidelines for Americans, 56,

60, 114-15, 114t, 117, 127, 145, 158, 159, 203, 246, 470

definition of, 47

key messages of, 47-48

on moderate drinking, 251

web link for, 58, 63 Dietary Reference Intakes (DRIs), 12-15, 13f

definition of, 12 Dietary Supplement Health and Education Act, 455-56 dietary supplements. *See* supplement(s) diethylpropion, 376 Dietitians of Canada, 23, 25 dietition

licensed, 23

registered, 23 Differin Gel 0.1%, 288 digestion, 70

of carbohydrates, 107, 108f

chemical, 71f, 72-73, 72f, 75, 77f

of fats, 150, 151f

mechanical, 71f, 72, 72f, 75, 77f

in small intestine, 77, 150, 151f digestive disorders, protection against, in

breast-fed infants, 510 digestive system, 71f dioxins, 448

dipeptide(s), 182, 182f, 191-93, 192f disaccharides, 100-101, 107, 108f disease. *See also* chronic disease(s) fetal origins of, 483-84, 524 and malnutrition, 466 nutritional deficiencies and, 4, 5-6, 7f nutrition and, 5-6, 7f disordered eating, 414, 415f family and, 416

person with, talking to/approaching, 422, 423

syndromes of, 420-22 diuretics, 177

and fluid loss, 232

and hypokalemia, 241

interactions with nutrients, 557, 557t diverticulosis, 105, 106f, 205 DNA (deoxyribonucleic acid), 30-31, 30f, 68, 182-84, 264

damage, by free radicals, 276-77

replication, 182, 183f niacin in, 266

synthesis, vitamin C and, 313 docosahexaenoic acid, 146, 147

in breast milk, 509, 515

fish as source of, 160

food sources of, 495

in infant formula, 516, 517

intake, for breastfeeding women, 508

in maternal diet in pregnancy, 495

requirements, of toddlers, 530

vegetarian/vegan diet in pregnancy and, 503 dowager's hump, 335, 336f Dr. Atkins' Diet Revolution, 362 Dr. Atkins' New Revolution Diet, 104 drifty gene hypothesis, 357 drink(s) (alcoholic), definition of,

250, 250f drug(s). *See also* medication(s)

in breast milk, 511

interactions with alcohol, 252

weight-loss, 376-77 drug abuse. *See also* illegal drugs

in pregnancy, 504 drug-drug interactions, in older

adults, 557 drug-nutrient interactions, 557, 557f dry mouth, in older adults, 550 DSHEA. *See* Dietary Supplement Health

and Education Act dual-energy x-ray absorptiometry

(DEXA), 317-18, 318f, 348f duodenum, 77, 78f dwindles, 555 DXA. *See* dual-energy x-ray

absorptiometry (DEXA) dysgeusia, 550

dyslipidemia, obesity and, 373 dysmorphia, 415 dysphagia, 550

**E**

EAR (Estimated Average Requirement), 13f, 14

Eat Better, Eat Together, 538, 538f

web link for, 561 eating disorder(s), 417-20

in adolescence, 543

comorbidity with other psychological disorders, 417

cultural factors and, 417

definition of, 414

development of, factors affecting, 416-17

family environment and, 416 gender distribution of, 417 genetics and, 416 media and, 417

person with, talking to/approaching, 422, 423

social factors and, 417

treatment of, 422 Eating Issues and Body Image Continuum, 414, 415f eating out

and avoiding foodborne illness, 438-39

and food choices, 53-55

selecting healthful fats in, 162 eclampsia, 501 Economic Research Service

on food deserts, 484-85

web link for, 485 eczema, prevention/reduction,

microbiome and, 32 edema, 188, 189f

Hypernatremia and, 240

in kwashiorkor, 202 EFAs. *See* essential fatty acids eggs

Eggland's Best, omega-3 fatty acid content of, 157t

and *Salmonella,* 438

saturated fats in, 157 eicosanoids, 147 eicosapentaenoic acid, 146

fish as source of, 160

vegetarian/vegan diet in pregnancy and, 503 Eijkman, C., 212

elastin, synthesis, copper and, 309 electrolyte(s), 188, 225. *See also* fluid

and electrolyte balance; *specific* electrolyte

and fluid balance, 227-28

and muscle contraction, 227-29

and nerve impulse conduction, 227, 229f

physiologic functions of, 227-30 electrolyte imbalance

anorexia nervosa and, 418

bulimia nervosa and, 420 electron(s), 275, 275f

loss of, in oxidation, 275-76, 276f

unpaired, 276, 276f elimination, 70, 71f, 78 ellagic acid, 34f

IN-10

embryonic development, 489-90, 489f healthful maternal diet and, 488-90, 491f eMedicine: Pediatrics, web link for, 523 empty Calories, 10, 60 emulsifiers, 441t***,*** 442 endocrine disruptors, 447, 448 endocytosis, 80, 82f endoplasmic reticulum, 67f, 68 endosperm, 118, 118f energy

availability, low, in female athlete

triad, 421-22, 421f in carbohydrates, 104 cellular sources of, 391, 393f DRIs related to, 13f, 14 intake, in pregnancy,

recommendations for, 494-95 metabolism

manganese and, 274

nutrients involved in, 262, 263t-64t

regulation of, 262-63 nutrient sources of, 8 for physical activity, 391 requirements

of adolescents, 541

of breastfeeding women, 506-508, 507f

of children, 536

in infancy, 514-15

in older adults, 552

physical activity and, 396-403

in pregnancy, 494-95

of toddlers, 530

for vigorous exercise, 397-99, 398f

total daily needs, calculation of, 354 energy balance, and body weight,

349-55, 350f energy balance equation, 349-51, 350f

limitations of, 355 energy cost of physical activity, 351f,

352-53, 353t energy density, of foods/meals

financial considerations and, 484

lower, 363-65

and obesity, 483 energy drinks, 223, 377, 408

harmful effects of, 236 energy expenditure, 349, 351-53 energy intake, 349

estimation of, 351 enriched foods, definition of, 119, 119t ENS. *See* enteric nervous system enteric nervous system, 84 enterocytes, 67, 67f, 80, 81f enterotoxins, 431-32 environment, and fluid loss, 232 Environmental Protection Agency, U.S. (EPA)

and food safety, 426, 427t information on drinking water, web link for, 248

Pesticides, web link for, 453

and pesticides, 448

Sustainability Tips, web link for, 479

water safety standards, 234 enzyme(s), 73, 73f, 80, 188

pancreatic, 79, 150, 151f enzyme systems, antioxidant, 277 EPA. *See* eicosapentaenoic acid EPA (U.S.). *See* Environmental Protection

Agency, U.S. (EPA) ephedra, 457t

in weight-loss supplements, 377 ephedrine

adverse effects of, 408

as ergogenic aid, 408 epidemiological studies, 18, 19f epigenetic factors, 30-31, 30f epiglottis, 73-74, 74f epinephrine, 191

for allergic reactions, 94-95

and blood glucose, 112

synthesis, vitamin C and, 313 EpiPen, 94-95 epiphyseal plates, 541, 541f epitonin, 457t equity, 461

ER. *See* endoplasmic reticulum ergocalciferol. *See* vitamin D ergogenic aids, 407-409

anabolic, 407-408 erythrocytes, 302, 303f. *See also* red blood

cells *Escherichia coli*

in foodborne illness, 425, 430t, 432

Shiga toxin-producing, 432 esophageal cancer, prevention/reduction,

*H. pylori* and, 90 esophagus, 71f, 74, 75f essential fatty acids, 145-47

Dietary Reference Intake for, 156-57

functions of, 147 Estimated Energy Requirement (EER), 13f, 14

estrogen

and bone density, 336

and lactation, 505 ethanol, 250. *See also* alcohol evaporation, water loss in, 232 every-other-day feeding, 564 Evista, 339

excessive polypharmacy, 557 exchange reaction, 275-76 exchange system, 62 exercise, 48. *See also* physical activity aerobic, 382

barriers to, overcoming, 366 benefits of, 63, 171, 172, 175,

295, 364 and cancer prevention, 295, 297 and colorectal cancer, 89 to combat increased serving sizes, 52f definition of, 382 and dehydration, 403-404

and diabetes risk reduction, 135-36 disorders related to, development of,

factors affecting, 416-17 energy sources for, 104-105, 105f excessive, body image and, 414 fat as energy source for, 148, 148f and fluid and electrolyte balance,

227, 228f fluid loss in, 232 guidelines for, 63 *Healthy People 2020* and, 5, *6t* and heart disease risk reduction, 171 and heat-related illnesses, 403-404 and iron status, 305t and osteoporosis prevention,

338-39, 341 in pregnancy, 493, 500, 503 resistance training and, 382 stretching and, 382 and stroke risk reduction, 171 and type 2 diabetes risk

reduction, 171 vigorous

B-vitamin requirements for, 397t,

405-406 calcium requirements for,

397t, 406 carbohydrate requirements for,

397t, 399-402 energy requirements for, 397-99,

397t, 398f fat requirements for, 397t, 402-403 iron requirements for, 397t, 406 micronutrient requirements for,

405-406 nutrient intake to support,

397, 397t protein requirements for, 397t, 403 water requirements for, 397t, 404-405 and weight gain, 368 and weight loss, 364, 376 exercise addiction, 414 exercise dependence, 414 exhalation, water loss in, 232 experiment(s), 17 double-blind, 20 repeatability of, 17 single-blind, 20 extracellular fluid, 224f, 225

electrolytes in, 225 extrusion reflex, 518 eye(s), fetal, development of, 495 eye disease, age-related, 556, 556f prevention of, phytochemicals and, 34f

eyesight, vitamin A and, 284, 285f

**F**

facilitated diffusion, 80, 82f

FAD. *See* flavin adenine dinucleotide

fad diets, 361

IN-11

FAE. *See* fetal alcohol effects fair trade, 474

Fair Trade Certified logo, 474, 474f Fair Trade USA, 474

web link for, 479 family farms, 472 famine, 464

fetal adaptation to, 525-26, 525f

food supply in, 470 farm(s)

family, 472

number of, in U.S., 472 small, 472 farmers markets, 473 farm labor

dangers of, 467 low wages for, 467 FAS. *See* fetal alcohol syndrome fashion models, underweight in, 413 fast food, 53-54, 54t, 358-59 health risks of, 162 *trans* fatty acids in, 158 fast-food industry, advertising by, 470 fasting

alternate-day, 564 intermittent, 564 fasting plasma glucose, 134, 134t fat(s)

body. *See* body fat in breast milk, 509 definition of, 140 dietary, 8, *9f*

absorption of, 150-53, 151f, 152f AMDR for, 156 beneficial, 160 and cell function, 149 definition of, 10 digestion of, 150, 151f, 152f emulsification, 79, 150, 152f energy content of, 147 and flavor of foods, 149 in foods, recognizing, 154 food sources of, 144f and food texture, 149 functions of, 147-50 Mediterranean diet and, 61 replacement by added sugars, 156 as energy source, 8, 10, 11, 147-48, 190, 391, 393f and exercise, 104-105, 105f,

148, 148f exercise intensity and,

395, 395f for exercise of low intensity and

long duration, 393f, 394-96 in high-intensity interval

training, 396 at rest, 147 hidden, 154 intake of, 154-62

recommendations for, 13f, 174 liquid, 11

metabolism, riboflavin in, 265

requirements

in adolescence, 530t, 542 of children, 530t, 536 in infancy, 515 in older adults, 552 in pregnancy, 495 for vigorous exercise, 397t, 402-403 and satiety of foods, 149 saturated, 47-48

and cardiovascular disease,

157, 164 and cholesterol, 159 dietary sources of, 157-58 foods low in, 159 health risks of, 157 recommended intake of, 164, 172-74 reducing, in meals, 161f solid, 11 storage

in adipose tissue, 153-54 in muscle, 153-54 transport of, 150 and transport of fat-soluble

vitamins, 149 visible, 154 fat blockers, 163 fat free, definition of, 154 fatigue, cancer and, 296 fat replacers, 163

protein-based, 163 fatty acids, 140, 140f, 141, 394. *See also* essential fatty acids chain length, 142 *cis,* 144, 145f free, 152, 152f

levels of saturation, 142-43, 142f, 143f omega-3, 146-47, 171, 172

food sources of, 156-57, 157t, 174 omega-6, 146

physiologic functions of, 149 saturated, 142-44, 142f, 143f

food sources of, 144f

maternal intake, and health risks to offspring, 527 shape, carbon bonding and, 143-44 *trans,* 144-45, 145f

avoiding, 158

dietary sources of, 157-58

foods low in, 159

food sources of, 158

health risks of, 158

intake of, recommendations for, 174

maternal intake, and health risks

to offspring, 527 recommended intake of, 158 transport of, 153 unsaturated, 142-44, 142f, 143f fatty liver

alcohol abuse and, 255 obesity and, 546 fatty streaks, 168, 169f

FDA. *See* Food and Drug Administration

(FDA) feces, 78, 79f

water loss in, 232 Federal Trade Commission, web link for, 371

Feeding America, web link for, 485 feeding center, 69

female athlete triad, 339, 406, 421-22,

421f fermentation, 101 ferritin, 190 ferulic acid, 34f

fetal adaptation, to undernutrition,

525-26, 525f fetal alcohol effects, 257 fetal alcohol syndrome, 256-57, 257f, 504 fetal death, maternal obesity and, 373 fetal development, 490-92, 491f fetal origins of adult disease, 483-84, 524 fetus, 490, 490f fever

cancer and, 296

and fluid loss, 232 fiber

Adequate Intake of, 118, 121f

for children, 536

for toddlers, 531 dietary, 38, 102, 102f

benefits of, 289

and diabetes risk reduction, 135

excess, 121-23

health benefits of, 105-107

sources of, 119-23 excretion from large intestine,

108f, 109 functional, 103 insoluble, 103 intake

maximizing, 122f, 123, 174

in pregnancy, 500 requirements, in older adults,

552, 552t soluble, 103, 103f total, 103 viscous, 103

in whole grains, 118-19, 118f fiber-rich carbohydrate(s), 103-104, 114 fibrin, 191 fibrinogen, 191 fight-or-flight reaction, 112 fish

contaminants in, 160 cooking, 438 intake

benefits of, 160

for breastfeeding women, 508

in pregnancy, 495, 502

recommendations for, 174

safety of, 160 Mediterranean diet and, 61 mercury in, 447, 495, 502

IN-12

fish (*continued)* raw, 438 semi-raw, 438

spoiled, illness caused by, 432 fitness. *See* physical fitness FITT principle, 386-88, 386f flavanols, 34f, 236 flavin adenine dinucleotide, 262, 263f, 265

flavin mononucleotide, 262, 263f, 265

flavones, 34f

flavonoids

benefits of, 289

and cancer prevention, 299

sources of, 34f flavor enhancers, 442 flaxseed

omega-3 fatty acid content of, 157t phytochemicals in, 34f flaxseed oil, omega-3 fatty acid content of, 157t

Flint, Michigan, water problems, 233-34, 447, 520

flour

terminology for, on food labels,

118, 119t unbleached, 119t wheat, 118, 119t white, 119, 119t whole-grain, 119, 119t whole-wheat, 118, 119t fluid(s)

definition of, 224 extracellular, 224f, 225 intake, 231

for breastfeeding women, 508

with high-fiber diet, 121

by infant, breast milk and, 509

for infants, 516

in pregnancy, 498-99, 500 interstitial, 224f, 225 intracellular, 224-25, 224f intravascular, 224f, 225 loss, 232, 243-44, 244t

in infants, 516 replacement, 244

guidelines for, 404-405, 405t requirements

in adolescence, 530t*,* 542-43

for children, 530t, 536-38

for older adults, 555

of toddlers, 530t*,* 531-33 tissue, 224f, 225 fluid and electrolyte balance, 188, 189f, 190f, 227 alcohol and, 253 disorders related to, 227, 243-45 exercise and, 227, 228f regulation of, 229-32 fluid balance, electrolytes and, 227-28 flukes, 430-31

fluoride, 12t, 216, 217t in bones, 324-25 deficiency, 325

and dental health, 324-25, 540 RDA for, 302t

requirements, in infancy, 515 supplements, 458, 458t in teeth, 324-25 for toddlers, 531 toxicity, in infants, 516 fluorohydroxyapatite, 324 fluorosis, 325, 325f FMN. *See* flavin mononucleotide foam cells, 168, 169f folate (folic acid), 11t, 174, 212-13, 263f benefits of, 289 deficiency, 215t, 269, 270, 307, 310, 311f fetal effects of, 526 in pregnancy, 496, 526 as food additive, 442 food sources of, 215t, 269, 270f, 496 intake, in pregnancy, 269,

495-96, 496t and neural tube development,

496, 496f physiologic functions of, 215t*,* 264,

268, 268f, 269 RDA for, 215t***,*** 263t, 270f, 302t requirements

of breastfeeding women, 508 in older adults, 554 of reproductive-age women, 269, 488, 495-96, 496t toxicity, 215*t,* 269 UL for, 215t folic acid. *See* folate (folic acid) food(s). *See also* fast food; good food allergenic, and nutrition label, 95 complementary, 186, 187f contamination of, 438, 439f bacterial, 429-30, 430t barriers to, 433 environmental factors

affecting, 433 sources of, 427, 428f, 468 viral, 429 definition of, 4 fiber-rich, and diabetes risk

reduction, 135 functional, 32

genetically modified, labeling of, 445

gluten-free, 96-97

interactions with genes, 31

locally grown, 473

low in energy density, 363-64

maternal consumption, and breast

milk, 512 microorganisms in, 433, 433f nutrient-dense, 38, 39f, 60 organic, 449-51

perishable, shopping for, 435 processed, 33

reduced-fat, labeling of, 154, 155 satiety value of, 70 slow, 473

solid, for infants, 518

unsafe for infants, 519

water content of, 231, 231f

whole, 33

and cancer prevention, 299 food additives

definition of, 441

examples of, 441t

safety of, 442 food allergy, 94-95

diagnosis of, 95

in infants, 519

pediatric

incidence of, 521 triggers, 521

prevention of, 518, 519, 521 Food Allergy and Anaphylaxis Network,

web link for, 97 Food and Drug Administration (FDA)

Center for Food Safety and Applied Nutrition, web link for, 459

definition of dietary supplement, 455

and food labels, 42

and food safety, 426, 427t

regulation of claims on food labels, 45-46, 46t

and regulation of dietary supplements, 456

on supplement use, web link for, 221

web link for, 58 Food and Nutrition Information Center,

web link for, 221, 412 food banks, 474 foodborne illness, 468

Chipotle's restaurants and, 425

deaths caused by, 426

definition of, 426

food sources of, 427

infectious, 429

pathogens causing, 425

in pregnancy, 501-502

prevalence of, 426

prevention of, 426-27, 434-39

toxic, 429

toxins and, 429, 431-33, 438-39 food choices

for adolescents, 543 for children, 538 eating out and, 53-55 emotions and, 40f, 41 environmental impact of, 475-76 ethnic variations and, 50 finances and, 475, 484 learned factors and, 40f, 41 nutritious, 475 sensory data and, 40-41, 40f

IN-13

sociocultural cues and, 40f, 41, 358-60 for toddlers, 533-34 food colorings, 441t*,* 442 Food Democracy Now, web link for, 479 food deserts, 484-85 food diversity, loss of, 469-70 food industry

effect on American diet, 470 lobbying by, 470 food insecurity childhood, 540 in older adulthood, 558 prevalence of, 462-63, 462f, 463f risk factors for, 463-67 in U.S., 463, 463f

prevalence of, 463, 463f risk factors for, 463 Food Insight—International Food Information Council Foundation, web link for, 129 food intolerance, 94 food label(s)

claims on, 43-46, 46t

FDA-approved, 45-46, 46t terms approved for use in, 45, 45t genetically modified foods and, 445 information required on, 42-43, 42f for reduced-fat products, 154, 155 structure-function claims on, 46t terminology for added sugars, 115, 116f

terminology for grains and cereals, 118, 119t food miles, 473

food poisoning. *See* foodborne illness

food residues, 446-50

food retail workers, low wages of,

467-68 food safety

for barbecues, 438

chilling and, 435-36

cleaning and, 434

for packed lunch, 436

regulation of, government agencies and, 426-27, 427t

rules for, 434-37, 434f

separating and, 434-35 Foodsafety.gov, 434, 453

food-safety logo, 434f Food Safety Modernization Act, 427 Food Safety Working Group, 426-27 food security

provision of, initiatives for, 470-73

supporting, 474 food service workers, low wages of, 467-68 food shortages

agricultural practices and, 465

food distribution and, 464-65

food supply in, 470

lack of infrastructure and, 466

overpopulation and, 465

wars and, 464

weather events and, 464 food spoilage, prevention of, 440 food supply, unequal distribution of, 464-65 foremilk, 509

fortified foods, definition of, 119, 119t

Fosamax, 339

four Ds, of pellagra, 266

FPG. *See* fasting plasma glucose

fracture(s)

age-related, 316

hip, 335, 335f

osteoporotic, 335, 335f

risk

in female athletes, 422 osteoporosis and, 335 spinal, 335 free radicals

antioxidants and, 277 cell damage caused by, 276, 277f destabilizing power of, 276 formation of, 276, 276f prooxidants and, 303 reduction of, Calorie restriction and, 563 freezing, of food, 436 fructans, 103

fructose, 100-101, 100f, 116t

metabolism of, 110-12 fruit juice, recommendations for, for

toddlers, 531 fruits, 114

and bone health, 338

fiber content of, 119-23, 121, 121f

pesticides in, 451, 451t

phytochemicals in, 34f

Power Plate and, 62, 62f

red/orange, phytochemicals in, 34f

serving sizes, 51*f*

in USDA Food Patterns, 48, 49f fruit sugar. *See* fructose FTO gene, 356 fuel economy, 476

fungi, in foodborne illness, 431, *431f* fungicides, 448 Funk, Casimir, 264

**G**

galactose, 100-101, 100f, 116t gallbladder, *71f,* 72, 79

and fat digestion, 150 gallbladder disease, obesity and, 373 gallstones, prevention/reduction, vegetarianism and, 206 garlic, phytochemicals in, *34f* gastric banding, 377-78, 378f gastric bypass, 377-78, 378f

gastric juice, 75, *77f*

reflux of, 85-86, 86f gastrin, 75, 191 gastritis, 75

alcohol and, 253 gastroesophageal reflux, in

pregnancy, 500 gastroesophageal reflux disease, 85-86, 86f management of, 86 prevention/reduction, *H. pylori* and, 90

gastroesophageal sphincter, 74, *77f,* 85 gastrointestinal disorders, 85-89 gastrointestinal system, 67

age-related changes in, 550-51

cancer in, 89

nerve cells in, and hunger/satiety, 69 gastrointestinal tract, 72 muscles of, 84

neuromuscular system and, 83-84

organs of, *71f* Gates, Bill, 473 G cells, 75

GEBN. *See* Global Energy Balance

Network (GEBN) gene(s), 30, 30f, 182

food interactions with, 31 gene expression, 182, 184

zinc and, 308 gene library, 443

Generally Recognized as Safe, 442 genetically modified organism(s), 443-44 genetic code, 182 genetic engineering. *See* genetic

modification genetic modification

benefits of, 444

definition of, 443

and economic instability, 445

and environmental risks, 444-45

and health risks, 444

types of, 443-44 genetics

and body dysmorphic disorder, 416

and body weight, 355-57

and bone mineral density, 337

and eating disorders, 416

and obesity and overweight, 355-56

and osteoporosis, 337 genistein, 34f genome, 30

GERD. *See* gastroesophageal reflux disease

geriatric failure to thrive, 555 germ, of grain kernel, 118, 118f gestation, healthful diet and, 488-92 gestational diabetes, 500-501

obesity and, 373

risk factors for, 501 gestational hypertension, 501

IN-14

ghrelin, 358

actions of, 70

*H. pylori* and, 90 *Giardia,* 431

GI flora, 83. *See also* microbiome gingko biloba, 565 GI tract. *See* gastrointestinal tract gliadin, 96

Global Energy Balance Network (GEBN), 26

global warming, and global food security, 466

GLP-1 receptor agonists, 137

glucagon, 79

actions of, 69-70, 110, 111f

and blood glucose regulation, 110

secretion of, 110, 111f

gluconeogenesis, 105, 110, 111f, 112

glucose, 100-101, 100f, *See also* blood glucose

aerobic metabolism of, 392-94

energy from, 391-94, 393f, 394f

as energy source, 101

production of, in liver, 107-109, 108f

requirement for, 104

synthesis, by plants, 100, 100f

glucose transporters, 110, 111f, 133f

glucosinolates, 299

glutamine, 181

glutathione peroxidase, 265

gluten

and celiac disease, 96-97

definition of, 96 gluten sensitivity, nonceliac, 97 glycemic index, 112-13, 113f glycemic load, 112-13 glycerol, 140, 140f, 141, 141f glycine

production of, 181, 181f

structure of, 180f glycogen, 102, 102f, 109, 109f, 190

body stores of, 394

low-carbohydrate diet and, 399-400, 400f

as energy source for exercise, 148, 148f

metabolism of, 391-92 glycogenosis, 109, 109f, 111f glycogen loading. *See* carbohydrate loading

glycogenolysis, 109, 109f, 111f glycolysis, 391-92, 394f glycosylated hemoglobin test, 134, 134t glyphosate, 445

as carcinogen, 444 GMO. *See* genetically modified

organism(s) goiter, 274, 274f Goldberger, Joseph, 4 good food

access to, 461

corporate and philanthropic support for, 473

definition of, 461 promotion of, 474-76 provision of, initiatives for, 470-73 grains

ancient, 198

fiber content of, 121f

high-yield varieties of, 469

kernels of, 118, 118f

milling of, 119

Power Plate and, 62, 62f

serving sizes, 51f

terminology for, on food labels,

118, 119t in USDA Food Patterns, 48, 49f whole, 49f, 119

and diabetes risk reduction, 135 fiber in, 118-19, 118f phytochemicals in, 34f grapefruit juice, interactions with

drugs, 557 grapes, phytochemicals in, 34f GRAS. *See* Generally Recognized as Safe grazing, 399

greenhouse gases, 466, 469, 477 Green Revolution, 469 growth hormone

and blood glucose, 112

human, 565

use in animals, 449 growth spurts, adolescent, 541 gum disease, sugar and, 116, 117f gums, 103

**H**

HACCP. *See* Hazard Analysis Critical

Control Point system halibut, omega-3 fatty acid content

of, 157t

handwashing, and food safety, 425, 434 Harvard School of Public Health

Healthy Eating Plate, 62

web link for, 63 HAV. *See* hepatitis A virus Hazard Analysis Critical Control Point

system, 426 HbAlc. *See* glycosylated hemoglobin test HC1. *See* hydrochloric acid HDL. *See* high-density lipoproteins head circumference, in infancy, 513 healthful diet

characteristics of, 38-40

definition of, 38

USDA Food Patterns and, 48-53

variety in, 469-70 healthful eating pattern(s), 47-48. *See* also Mediterranean diet

for children and adolescents, 547-48

components of, 60-61

exchange system and, 62

principles of, 60-61 Healthy, Hunger-Free Kids Act, 127, 539 Healthy Eating Plate, 62

*Healthy People 2020,* 5, *6t* heart attack, 168 heartburn, 85, 86f heart disease

fetal origins of, 525-27

metabolic syndrome and, 374

nutrition and, 6, 7f

obesity and, 6, 7f, 373

prevention/reduction, 171

physical activity and, 383, 383f vegetarianism and, 205 heart rate, training range, 387-89 Heart Truth, web link for, 177 heat cramps, 244-245, 404 heat exhaustion, 245, 404 heat-related illnesses, exercise and,

403-404 heat stroke, 245, 404 heat syncope, 404 heavy metals, 447

in breast milk, 511 *Helicobacter pylori,* 90

and atrophic gastritis, 271

and gastric cancer, 295

and peptic ulcer, 86

and stomach cancer, 87 helminths, in foodborne illness, 430-31 heme, 303, 304f

synthesis of, 310 vitamin B6 in, 267 hemicellulose, 103 hemochromatosis, 306, 314 hemoglobin, 303, 304f

synthesis of, 310, 311f hepatitis, alcoholic, 255 hepatitis A virus, 429 herb(s), 456-57

anti-aging, 565 herbicides, 448

herbicide-tolerant GM crops, 443-44 herring, omega-3 fatty acid content of, ***157t***

HFCS. *See* high-fructose corn syrup hiatal hernia, 85 hiatus, 85 hidden fats, 154

high-density lipoproteins, 172, 172f, 173f blood levels, interpretation of, 174t decreased levels, in metabolic

syndrome, 374 increased levels, physical activity

and, 383

high-fructose corn syrup, 101, 114-15, 116t, 127, 236

and diabetes, 117 high-intensity interval training, 396 high-pressure processing, of food, 440 high-yield varieties, of grains, 469 HIIT. *See* high-intensity interval training hindmilk, 509 hip bone

fracture of, 335, 335f

osteoporotic, 335, 335f

IN-15

histories, 30, 30f HIV/AIDS, 466 and cancer, 295

drug treatment of, interactions with nutrients, 557?

maternal, and breastfeeding, 512 hoarseness, cancer and, 296 Hodgkin, Dorothy Crowfoot, 270 homocysteine, 174, 268, 268f, 289

metabolism, 273 vitamin B12 in, 270 honey, 116f

inappropriateness for infants, 519

and sugar, comparison of, 115 Hopkins, F. G., 212 hormone(s), 188

definition of, 69

energy-regulating, 358

and hunger/satiety, 69-70

pancreatic, 79 hormone replacement therapy

and bone health, 339

and iron status, 305? horseradish, phytochemicals in, 34f HTN. *See* hypertension Human Microbiome Project, 35 human papillomavirus (HPV), and

cancer, 295, 295f humectants, 441t, 442 humidity

low, and fluid loss, 232

and microorganism survival, 433 hunger, 68

hormones and, 69-70

hypothalamic regulation of, 68-69

worldwide, statistics for, 462-63, 462f hunger-obesity paradox, 484 husk, of grain kernel, 119 hydrated, definition of, 100 hydrochloric acid, 75

decreased, in older adults, 551

protein denaturation by, 191, 192f hydrogenation, 144-45 hydroxyapatite, 315, 317, 318-19, 323 hypercalcemia, 322, 328 hyperglycemia, 131 hyperkalemia, 240 hyperkeratosis, 287 hypermagnesemia, 324 hypernatremia, 240 hypertension, 170, 226

definition of, 170

fetal origins of, 525-527

health claims on food labels about, 46t

management of, 175-177 medications for, 177

in metabolic syndrome, 374

obesity and, 373, 546

in pregnancy, 501

prevention/reduction, physical activity and, 383, 383f

primary (essential), 170

risk factors for, 170

sodium and, 239, 246

sodium-potassium imbalance and, 240

systolic, 168 hypertensive disorders of pregnancy, 501

management of, 501

risk factors for, 501

types of, 501 hypertrophy, 386 hypocalcemia, 323 hypoglycemia, 110

diabetes and, 136 hypokalemia, 240-42 hypomagnesemia, 324 hyponatremia, 240 hypothalamus, 68-69, 69f

and body weight, 357-58

and thirst regulation, 229-30, 230f hypothesis

alternative, 17

definition of, 17

testing, scientific method for, 15-17, 16f hypothyroidism, 274 HYVs. *See* high-yield varieties

**I**

IBS. *See* irritable bowel syndrome

ibuprofen

and alcohol, interactions of, 252, 254 and gastrointestinal bleeding, 252, 254

ideal body weight, standards for, 344 ileocecal valve, 77 ileum, 77, 78f illegal drugs

in breast milk, 511

use in adolescence, 545

use in pregnancy, 504 immune function

physical activity and, 383, 383f

vitamin B5 in, 267-68

vitamin C and, 313 immunity

definition of, 189

proteins and, 189 impaired fasting glucose, 134 implantation, of blastocyst, 489f inactivity

and cardiovascular disease, 171

rate of, in U.S. population, 384, 384f

sociocultural factors and, 359 incidence, definition of, 18 indicator amino acid technique, 208 indoles, 34f inequities

in food production, 467

in food retail, 467-68

in food service industry, 467-68 infant(s)

anemia in, 520

bonding with fathers and siblings, 513

choking by, prevention of, 519

colic in, 519-20

dehydration in, 516, 519

energy requirements, 514-15

extrusion reflex in, 518

food allergies in, 519 prevention of, 521

foods unsafe for, 519

growth charts for, 513, 514f

growth of, 513

lead poisoning in, 520

macronutrient requirements, 514-15

nutrient requirements, 513-18

nutrition-related concerns for, 518-20

physical activity of, 513

solid foods for, 518

supplements for, 515-16 infant formula(s)

and breastfeeding, combined, 512

and breast milk, comparison of, 509

composition of, 516, 517

*Cronobacter* in, 510

nutritional value of, 516, 517 infant mortality, 462, 481, 482f

protection against, in breast-fed infants, 510

in U.S., 487 infection(s)

malnutrition and, 481, 482f

prevention/reduction microbiome and, 32 phytochemicals and, 35 probiotics and, 33

protection against, in breast-fed infants, 510

vitamin A deficiency and, 482 infertility

body weight and, 488

obesity and, 373 inflammation

alcohol and, 253

in atherosclerosis, 168, 169f

and cardiometabolic risk, 374

and cardiovascular disease, 171

prevention/reduction microbiome and, 32 phytochemicals and, 35 probiotics and, 33 ingestion, 71f

initiation stage, of cancer development,

293, 294f inorganic, definition of, 8 inorganic phosphate (Pi), 391, 391f insecticides, 448 insensible water loss, 232 insomnia, night-eating syndrome and, 420-21

Institute of Medicine, recommendations for physical activity, 410

insulin, 79, 107

actions of, 69-70, 110, 111f, 133f and blood glucose regulation, 110

IN-16

insulin (*continued)*

deficiency, and type 1 diabetes,

132, 133f secretion of, 110, 111f, 133f, 148 therapy with

alcohol and, 252 for type 1 diabetes, 132 for type 2 diabetes, 137 insulin insensitivity, 132-34, 133f insulin resistance, 132-34, 133f and cardiometabolic risk, 374 intermittent fasting, 564 International Bottled Water Association,

web link for, 248 International Osteoporosis Foundation,

web link for, 341 International Scientific Association for Probiotics and Prebiotics, web link for, 35 interstitial fluid, 224f, 225 intracellular fluid, 224-25, 224f

electrolytes in, 225 intravascular fluid, 224f, 225 intrinsic factor, 75, 270, 271-72, 551 inulin, 33, 103 invert sugar, 116t iodine, 12t, 216, 21*7t* deficiency, 274, 481-82 in energy metabolism, 262 food sources of, 273-74 physiologic functions of, 273 prenatal intake of, 481-82 RDA for, 264t requirements

of breastfeeding women, 508 in infancy, 515 in pregnancy, 496t, 498 in salt, 274, 441-42 toxicity, 274 iodopsin, 284, 285f IOM. *See* Institute of Medicine ions, 225

iron, 12, 12t, 216, 21*7t,* 281

absorption of, 218, 304-305, 313, 314, 498

breast milk and, 509

factors affecting, 498 bioavailability of, 304-305 deficiency, 306-307, 310

in female athletes, 406

prevalence of, 481 as food additive, 442 food sources of, 305-306, 306f, 498 heme, 218, 304, 498 intake

calculation of, 305

increasing, 307

recommendations for, 305

for women, 14, 498 in molasses, 115 non-heme, 218, 304

and zinc absorption, 308

nonmeat/nondairy food sources

of, 206t overdose, 306

physiologic functions of, 206t,

303, 406 RDA for, 302t, 306f, 498

for toddlers, 531 recycling, in body, 303-304 requirements

in adolescence, 530t, 542

of breastfeeding women, 508

of children, 530t, 531

in infancy, 515, 518

in older adults, 553-54

in pregnancy, 496t, 497-98

of toddlers, 530t, 531

for vigorous exercise, 397t, 406 storage, in body, 303 supplements, 406

adverse effects of, 306

for infants, 515

in pregnancy, 498 toxicity, 306

in infants, 516 transport, copper and, 308 vegetarian/vegan diet in pregnancy and, 503

iron-deficiency anemia, 301, 305t*,* 307, 481, 483 in infants, 520 in pregnancy, 497-98 in young children, 531 iron status, factors affecting, 304-305, 305t

irradiation, of food, 440

irritable bowel syndrome, 89

Irritable Bowel Syndrome Self-Help and

Support Group, web link for, 92 isletin, 132

islets of Langerhans, 132 isoflavonoids, 34f isoleucine, metabolism of, 264 isomalt, 124 isothiocyanates, 34f isotretinoin

for acne treatment, 288

adverse effects of, 288

**J**

jejunum, 77, 78f Jenny Craig, 362

Joslin Diabetes Center, web link for, 137

**K**

kale, phytochemicals in, 34f kava, 457t Kay, Mary, 381 kcal. *See* kilocalories kefir, 33, 234 Keshan disease, 280

ketoacidosis, 105

diabetic, 131, 132 ketones, 105 ketosis, 105, 362 kidney disease, 200-201

fetal origins of, 525 kidney stones

calcium and, 322

prevention/reduction, vegetarianism and, 206

vitamin C and, 314 kilocalories, 8 kilocalories per day, 351 kwashiorkor, 201f, 202 kyphosis, 335, 336f

**L**

label(s). *See* food label(s); nutrition

labeling lactalbumin, 509 lactase, 80, 94, 107, 108f lactation

nutrition and, 506-508

physiology of, 505-506 lacteal, 80, 81f, 152 lactic acid

energy from, 392

production of, 392, 394f *Lactobacillus,* 33 lactose, 94, 101, 101f

in breast milk, 509, 515

in infant formula, 516, 517

metabolism of, 80 lactose intolerance, 94 La Leche League, web link for, 523 Lappe, Francis Moore, 476 large intestine, 71f, 77-78, 78f, 79f. *See* also colon

fiber excretion from, 108f, 109 laxatives, interactions with nutrients,

557, 557t LDL. *See* low-density lipoproteins lead, 447

lead poisoning, in infancy, 520 lean body mass, 347

age-related changes in, 551 lecithins, 141

leeks, phytochemicals in, 34f leftovers, refrigerated, shelf life of, 436f legumes

adding, to diet, 200

fiber content of, 121, 121f

Power Plate and, 62, 62f

protein content of, 196

resistant starch in, 102 leisure-time physical activity, 382

absence of, in U.S. population, 384, 384f lentils, fiber content of, 121f leptin, 358

actions of, 70

IN-17

lettuce, fiber content of, 121f leucine

metabolism of, 264

structure of, 180f leukocytes, 302, 303, 303f levulose, 101, 11*6t* licorice root, 457t life expectancy

in Namibia, 462

poverty and, 462

in U.S., 462 life span. *See also* longevity

Calorie restriction and, 563-564 light (reduced fat), definition of, 154 lignans, 34f lignins, 103 Lind, James, 312 linoleic acid, 146-47

Dietary Reference Intake for, 156-57 Linus Pauling Institute, 35

web link for, 221 lipase

gastric, 75, 77f, 151f

lingual, 72f, 151f

pancreatic, 78f, 79, 150, 152f lipid(s), 10, 140, 141

abnormalities

fetal origins of, 525 obesity and, 546

blood

and cardiovascular disease, 171-74

improving, steps for, 174-75 management of, medications

for, 177 sugars and, 117 dietary, 8

digestion of, 150, 151f distribution of, 173f physiologic functions of, 149 transport of, 173f lipogenesis, 111f

lipoprotein(s), 147, 152-53, 153f 171, 190

distribution of, 173f

transport of, 173f lipoprotein lipase, 152, 171, 173f liposuction, 378 liraglutide, 376

*Listeria monocytogenes,* 501-502, 502f

in foodborne illness, 427, 430, 430t listeriosis, 501-502, 502f liver, 71f, 72, 82-83

cirrhosis, alcohol abuse and, 255, 255f

damage, supplement-related, 456

and fat digestion, 150

functions of, 82-83, 192f, 193 alcohol and, 255

and glucose production, 107-109, 108f livestock production

environmental impact of, 477

and global warming, 477 industrial techniques and, 469

long-chain fatty acids, 142, 153

longevity

Calorie restriction and, 563-64 promotion of, health-related

behaviors and, 566 supplements and, 565

lorcaserin, 376

low-birth-weight infant(s), 487, 492, 492f

low-density lipoproteins, 171-72, 172f, 173f and atherosclerosis, 168, 169f blood levels, interpretation of, 174t damage, by free radicals, 276 elevated levels, and cardiometabolic

risk, 374 reduction of, 106-107, 113

low fat, definition of, 154

LPL. *See* lipoprotein lipase

lung(s)

capacity, physical activity and, 383, 383f

efficiency, physical activity and, 383, 383f lutein, 34f, 282, 556 lycopene, 34f, 282 lymph, 80

nutrient transport in, 80-82, 83f lymphatic system, 82, 83f lymph nodes, 82

**M**

macronutrient(s) definition of, 8 requirements

of breastfeeding women, 506-508

of children, 536

in infancy, 514-15

in older adults, 552

physical activity and, 396-403

in pregnancy, 494-95

of toddlers, 530-31 macula, 285f

macular degeneration, 556, 556f magnesium, 12t, 214-16, 216t

absorption of, 324

in body fluids, 225

in bone, 323

in bottled water, 235

deficiency, 216t, 324

and disease prevention/treatment, 220, 323

food sources of, 216t, 323, 324f

physiologic functions of, 216t, 237-38, 323

RDA for, 216t, 302t, 324f

UL for, 216t ma huang, 377, 408, 457f malabsorption, 96

and vitamin B12 deficiency, 272

malnutrition, 480-85

alcohol-related, 255-56, 256f disease and, 466

maternal, fetal adaptation to, 483-84 in pregnancy, fetal effects of, 483-84 prenatal, lifelong effects of, 483-84 worldwide, statistics for, 462-63, 462f

maltase, 107, 108f

maltose, 101, 101f, 107, 108f

malt sugar. *See* maltose

mammography, 296

manganese, 12t, 216, 217t, 281 Adequate Intake of, 264t deficiency, 275 food sources of, 274 physiologic functions of, 274 requirements, of breastfeeding

women, 508 toxicity, 275

mannitol, 116t, 124

maple sugar, 116t

marasmus, 201-202, 201f

March of Dimes, web link for, 523, 527

Marshall, Barry, 86

maternal age, and pregnancy, 502

maternal mortality, 481, 482f

matrix, of connective tissues, 301

maximal heart rate, 387-88, 387f, 389

Mayo Clinic, web link for, 248, 379

McGwire, Mark, 407

meat

consumption of and cancer, 295

and climate change, 469, 476, 477 and resource depletion, 469, 477 processed

and colorectal cancer, 89 consumption, guidelines for, 470 consumption of, 56 and diabetes risk, 135

red

and colorectal cancer, 89 consumption, guidelines for, 470 consumption of, 56 and diabetes risk, 135 Mediterranean diet and, 61 saturated fats in, 157 meat factor, 304

Meatless Monday Campaign, 476

web link for, 210, 479 meconium, 505 media

and body image problems, 416-17

and eating disorders, 417

reports of research findings, 18 media hype, detection of, 21 medication(s). *See also* drug(s)

and body weight, 357

weight-loss, 376-77 Mediterranean diet, 50, 61, 61f, 246, 368, 369, 545

medium-chain fatty acids, 142, 153

IN-18

MEDLINE Plus Health Information, web

link for, 97, 166, 333 megadosing, of vitamins, 212, 313 megaloblasts, 310 meglitinides, 136-37 melanin, 328 melanoma, 296, 296f melatonin, 188, 565 men, muscle dysmorphia in, 416 menaquinone. *See* vitamin K menstrual dysfunction, in female athlete

triad, 421-22, 421f menstrual irregularity, obesity and, 373 mercury, 447, 495

messenger RNA (mRNA), 182, 183f metabolic disturbances, alcohol and, 253 metabolic syndrome, 135, 149, 170, 369

abdominal obesity and, 373f, 374

fetal origins of, 524, 525-526

health risks of, 374

obesity and, 546

risk factors for, 374 metabolic water, 232 metabolism

definition of, 11

niacin in, 266 metastasis, 293 Metchnikoff, Elie, 32-33 metformin, 136

methane, and global warming, 477 methicillin-resistant *Staphylococcus*

*aureus* (MRSA), 449 methionine, 180, 181t

metabolism of, 268, 268f, 269, 270

sulfur in, 275 methyl donors, 30-31 metric system, 17 MI. *See* myocardial infarction Miacalcin, 339

micelles, 150, 151f, 152, 152f microbiome. *See also* GI flora of breast-fed infants, 510 human, 32 and health, 32 web link for, 35 microcephaly, Zika virus and, 490 micron filtration, of water, 235 micronutrient(s). *See also* mineral(s); vitamin(s) deficiencies of

and disease, 481-82 in pregnancy, fetal effects of, 526 definition of, 11 discovery of, 212 and disease prevention/

treatment, 220 essential, 221 intake

maximizing, 219f *vs.* absorption, 218 requirements

in adolescence, 530t, 542 of breastfeeding women, 508 of children, 530t, 536 in infancy, 515 in older adults, 552t, 553-54 in pregnancy, 495-98 of toddlers, 530t, 531 vigorous exercise and, 405-406 research on, controversies in, 218-21 supplements as sources of, 220 Micronutrient Initiative, 471 microorganisms, of human body, 32, 32f microvilli, 80, 81f milk, 234 cow's

allergy to, 521

inappropriateness for infants < 1 year old, 517, 519 evaporated, inappropriateness for

infants, 519 goat's, inappropriateness for infants

< 1 year old, 517, 519 intake, in childhood, 540 plant-based alternatives,

inappropriateness for infants

< 1 year old, 517, 519 riboflavin in, 265 sweetened condensed,

inappropriateness for

infants, 519 milk allergy, 94 milk alternatives, 234 milk anemia, 518 milk sugar. *See* lactose Millenium Development Goals, 462 millet, 198

mindful eating, 364-66 mineral(s), 8, 9f, 212. *See also specific* mineral absorption of, 80, 218 antioxidant, 277 in body fluids, 225 in bone, 315-16 in bone health, 318-25 classification of, 214-18 definition of, 12 and disease

prevention/treatment, 220 in energy metabolism, 262 major, 12, 12t, 214-16, 216t modifications of, 218 requirements, of breastfeeding

women, 508 trace, 12, 12t, 216, 217t, 221

and blood health, 302-309 ultra-trace, 216-18, 217t mineral salts, 218, 225. *See also*

electrolyte(s) minimum wage, 468, 473 MiPlato, 53f

miscarriage. *See* spontaneous abortion mitochondrion (pl., mitochondria), 67f, 68

modified atmosphere packaging, 440 molasses, 115, 11*6t* molds

and foodborne illness, 431, 431f

in refrigerated foods, 437 molecule(s), 66, 66f, 275 molybdenum, 12t, 216, 21*7t* monarch butterflies, 445 monoacylglyceride, 150, 152, 152f monocultures, 469 monosaccharides, 100-101, 100f,

107, 108f monosodium glutamate, 442 monounsaturated fatty acids, 142-43, 143f

food sources of, 144f Monsanto, 445

mood disorder, night-eating syndrome

and, 420-21 morbid obesity, 345, 346, 373

surgery for, 377-78, 378f morning sickness, 499-500 mortality rate(s). *See* death(s) and

mortality rate(s) mother-infant bonding, breastfeeding

and, 510-11 mouth, 71f, 72f mouthfeel, 41

mRNA. *See* messenger RNA (mRNA) MRSA, 449

MSG. *See* monosodium glutamate mucilages, 103

MUFA. *See* monounsaturated fatty acids multifactorial disease, obesity as,

374, 375f muscle(s)

fatigue, 392-94

glycogen in, 394

lactic acid in, 392

soreness, 392 muscle contraction

calcium and, 227-29, 319

electrolytes and, 227-29 muscle dysmorphia, 416 muscle mass

age-related changes in, 551

increasing, 368 mushrooms, poisonous, 432, 432f mustard, phytochemicals in, 34f mustard greens, phytochemicals in, 34f mutation(s), 277, 293 mutual supplementation, 186 MVM. *See* supplement(s), multivitamin

and mineral (MVM) mycotoxins, 432 myelin sheath, 270 myocardial infarction, 168

risk, calcium supplements and, 340 myoglobin, 303, 304f MyPlate, 48-49, 50f, 56

Spanish-language version, 50, 53f

and vegetarianism, 207

for vegetarians, web link for, 210

web link for, 58, 129 MyPlate Supertracker, 51-53

IN-19

**N**

National Academies of Sciences,

Engineering and Medicine- Health and Medical Division dietary recommendations, 114, 114t web link for, 28

National Association of Anorexia Nervosa and Associated Disorders, web link for, 423

National Cancer Institute, web link for, 92, 299

National Center for Complementary and

Integrative Health, 457 web link for, 459, 566 National Center for Health Statistics,

web link for, 28 National Cholesterol Education Program,

web link for, 177 National Eating Disorders Association,

web link for, 423 National Health and Nutrition

Examination Survey

(NHANES), 24, 321 National Heart, Lung, and Blood

Institute

Heart Attack Risk Calculator, web link

for, 177 web link for, 166, 248

National Institute of Diabetes and

Digestive and Kidney Diseases, web link for, 92, 137, 371

National Institute of Mental

Health (NIMH), Office of Communications and Public Liaison, web link for, 423

National Institute on Aging, web link for, 566

National Institute on Alcohol Abuse and Alcoholism, 252 approaches to person with alcohol

use disorder, 258 signs of alcohol use disorder, 258 web link for, 259 National Institutes of Health (NIH), 24 National Institute of Arthritis and Musculoskeletal and Skin Diseases, web link for, 341 Office of Dietary Supplements, web

link for, 333, 412 Senior Health, web link for, 566 web link for, 28, 166 National Organization on Fetal Alcohol

Syndrome, web link for, 523 National Osteoporosis Foundation, web

link for, 341 National Partnership for Smoke-Free Families, web link for, 523 National School Lunch Program, 539 National Student Campaign Against

Hunger and Homelessness, 474 National Weight Control Registry, 364, 376

natrexone and bupropion extended

release, 376 natural (term), 450, 457 natural sweeteners, 116t naturopathic physician(s), 24 nausea and vomiting of pregnancy, 499-500 NCCIH. *See* National Center for

Complementary and Integrative

Health

NCGS. *See* nonceliac gluten sensitivity NEAT. *See* non-exercise activity

thermogenesis necrotizing enterocolitis, protection against, in breast-fed infants, 510 neotame, 125 nerve impulse conduction calcium and, 319 electrolytes and, 227, 229f Nestle, Marion, 470 neural tube, 496 neural tube defects, 496, 496f folate deficiency and, 269, 526 health claims on food labels

about, 46t obesity and, 373, 526 neuropathy, diabetic, 131 neuropeptide Y, and food intake, 358 neurotoxins, 431-32, 447 neurotransmitter(s), 191, 319 synthesis, vitamin C and, 313 synthesis of, 264 vitamin B6 in, 267 NHANES. *See* National Health and

Nutrition Examination Survey (NHANES) NIAAA. *See* National Institute on Alcohol

Abuse and Alcoholism niacin, 11t, 212-13, 214, 263f deficiency, 215*t,* 266 deficiency of, 4, *7f,* 18 food sources of, 215t, 266, *267f* physiologic functions of, 215t, 266 RDA for, 215t, 263t, 267f toxicity, 215t, 266, 459 UL for, 215t nickel, 218, 221 nicotine, in breast milk, 511 NIDDK. *See* National Institute of

Diabetes and Digestive and Kidney Diseases night blindness, 283, 284, 286f night-eating syndrome, 420-21 NIH. *See* National Institutes of Health (NIH)

nitrites, as food additives, 441t, 442

nitrogen, in protein, 11

nitrogen balance, 193-95, 194f, 208

negative, 194-95, 194f

positive, 194, 194f nitrosamines, 280, 442 nonceliac gluten sensitivity, 97

non-exercise activity thermogenesis,

352-53 noni, 457t

nonnutritive sweeteners, 124

nonsteroidal anti-inflammatory drugs (NSAIDs), and peptic ulcer, 86-87

norepinephrine, 191 and blood glucose, 112 synthesis, vitamin C and, 313

normal weight, 344, 345

norovirus, 87, 425, 429, 429f

NSAIDs. *See* nonsteroidal anti- inflammatory drugs (NSAIDs)

NSLP. *See* National School Lunch Program

nucleotide(s), synthesis of, folate in, 269

nucleus

atomic, 275, 275f

cell, 67f, 68 nursing bottle syndrome, 520, 520f nut milk, inappropriateness for infants

< 1 year old, 517 nutrient(s). *See also* macronutrient(s); micronutrient(s)

definition of, 8

energy-yielding, 8

as food additives, 441-42

inorganic, 8, 12

organic, 8

recommended intake values for,

12-15, 13f six groups of, 8, *9f* Nutrient Data Laboratory Home Page,

web link for, 291, 333 nutrient density, 38, 39f, 47, 48, 60 definition of, 38 of foods, in pregnancy, 494-95 nutrigenomics, 4, 31 nutrition

definition of, 4

and disease, 5-6, *7f*

and health, 5-6, *7f*

*Healthy People 2020* and, 5, 6t

professionals with advanced degrees

in, 23-24 as science, evolution of, 4 Nutrition Debate

added sugars and obesity, 127 antioxidants: from food or

supplements?, 289 conflict of interest, 26 government advice on nutrition, 56 *Helicobacter pylori,* 90 high-carbohydrate, moderate-fat

diets, 369 low-sodium diets, 246 meat consumption and climate

change, 477 organic foods, 451 physical activity in older adulthood, 559

IN-20

Nutrition Debate *(continued)* physical activity

recommendations, 410 prevention of food allergies, 521 protein recommendations, 208 saturated fats: bad or benign?, 164 vitamin D deficiency, 331

Nutrition Facts panel, 42f, 44f definition of, 43 sugars on, 115 use of, 43

Nutrition.gov, 371, 561

nutrition information

from government agencies, 24-25 from professional organizations, 25 trustworthy sources for, 23-25

nutritionist, 24

Nutrition Label activity allergens in foods, 95 bottled water, 235 fat content of food, 155 infant food labels, 517 protein consumption, 199 recognizing carbohydrates, 120

nutrition labeling, in chain

restaurants and retail food outlets, 54-55, 54f

Nutrition Labeling and Education Act, 42

nutrition paradox, 483-84

Nutrition Services Incentive Program, 558

nutritive sweeteners, 123-24

nuts

beneficial fats in, 160

energy content of, 160

fiber content of, 119-23

protein content of, 198, 198?

sterols in, 141 NuVal system, 38 NVP. *See* nausea and vomiting of pregnancy

**O**

oatmeal, fiber content of, 121f oats, phytochemicals in, 34f obesity, 372-379. *See also* obesity and overweight abdominal, 373-74, 373f

fetal origins of, 525, 526 causes of, 374, 375f and chronic disease, 373 complications of, 373 definition of, 345, 373 fetal origins of, 483-84, 524, 525 and infertility, 488 limited access to good food and,

483-85 maternal

and breastfeeding, 512 and health problems in adult offspring, 526

morbid, 345, 346, 373

surgery for, 377-78, 378f as multifactorial disease, 374, 375f and nutrient deficiencies, co- occurrence, 481, 483, 484 in older adults, 555 paternal, and reproductive

health, 488 pediatric, 546-48

CDC definition of, 547 health risks of, 546-47 poverty and, 484 prevalence of, 373

in children and adolescents,

529, 546 in low-income populations, 484 worldwide, 483 treatment of, 376-78 Obesity Action Coalition, web link

for, 379 obesity and overweight, 61

added sugars and, 115, 117, 127 alcohol and, 252 binge-eating disorder and, 420 and cancer, 295

and cardiovascular disease, 170-71

childhood antibiotic therapy and, 90

in college students, 135

and colorectal cancer, 89

and diabetes, 132, 135

drifty gene hypothesis and, 357

and gastroesophageal reflux disease, 85-86 genetics and, 355-356 health risks of, 6, 483 *Healthy People 2020* and, 5, *6t* night-eating syndrome and, 420-21 poverty and, 359 prevalence of, 6, 7f

worldwide, 483 prevention/reduction

*H. pylori* and, 90

microbiome and, 32

physical activity and, 383, 383f

Power Plate and, 62

vegetarianism and, 205 protection against, in breast-fed

infants, 510 sociocultural factors and, 359, 360 sugar intake and, 117 sugar-sweetened beverages and, 26, 56, 117

and vitamin D status, 328, 331 and weight gain in pregnancy, 492-93, 493? observational studies, 18-19 obsessive-compulsive disorder, and body

dysmorphic disorder, 417 OCD. *See* obsessive-compulsive disorder Office of Dietary Supplements, 377

web link for, 221, 459 Office on Women's Health Anemia Fact Sheet, web link for, 333

OGT. *See* oral glucose tolerance test

oil(s), dietary, 8, 9f, 11, 140 partially hydrogenated, 145 plant-based, benefits of, 160

older adults

bone health in, 551 bone loss in, 336, 337f B-vitamin requirements, 552t, 554 calcium requirements, 552t, 553 carbohydrate requirements, 552 demographics of, 549-50 dental health issues of, 555-56 drug-drug interactions in, 557 and drug-nutrient interactions,

557, 557t drug-nutrient interactions in,

557, 557t energy requirements, 552 eye diseases of, 556, 556f fat requirements, 552 fiber requirements, 552, 552t financial problems of, 558 fluid requirements, 555 folate requirements, 554 and food insecurity, 558 iron requirements, 553-54 micronutrient requirements, 552t, 553-54

nutrient recommendations for,

551-55, 552t nutrition-related concerns for, 555-58 obesity in, 555 osteoporosis in, 336 physical activity if, 559 physiologic changes in, 550-51 polypharmacy in, 557 in population of U.S., 549 protein requirements, 208, 552 supplements for, 554-55 underweight in, 555 vitamin A requirements, 554 vitamin D requirements, 552t, 553 weight loss in, nine Ds of, 555, 556f

Olean. *See* olestra

olestra, 163

olfaction, definition of, 41 oligopeptide(s), 182 olive oil, Mediterranean diet and, 61 olives, phytochemicals in, 34f omega fatty acids, 145-47

physiologic functions of, 149 oncologist, 297

onions, phytochemicals in, 34f opsin, 284

oral cancer, signs and symptoms of, 296 oral contraceptives, and iron status, 305? oral glucose tolerance test, 134, 134? organ(s), 66f, 67 organelle(s), 67f, 68 organic, definition of, 8 organic (term), 449-50 organic farming, 449-50, 472 organosulfur compounds, sources of, 34f

IN-21

organ system(s), 66f, 67 orlistat, 163, 377 osmosis, 226-27, 227f osteoarthritis, obesity and, 373 osteoblasts, 317, 317f osteoclasts, 316-17, 31*7f* osteomalacia, 329, 331 osteopathic physician(s), 24 osteoporosis, 6, *7f,* 317, 318, 323, 329, 331, 334-41 age and, 336

alcohol use disorder and, 255 bone deterioration in, 335, 335f definition of, 335 epidemiology of, 335 in female athletes, 421f, 422 fractures caused by, 335, 335f gender differences in, 336-37 genetics and, 337

health claims on food labels about, 46t prevention, 340-41

exercise and, 338-39 prevention/reduction, physical

activity and, 383, 383f risk factors for, 335-38, 336t smoking and, 337 of spine, 335 treatment of, 339 ostocalcin, 330

ounce-equivalent (oz-equivalent),

definition of, 50 Overeaters Anonymous, 376

web link for, 379 overeating

food industry and, 470

sociocultural factors and, 358-59 overhydration, 244 overload principle, 386 overpopulation

definition of, 465

and food shortages, 465 overweight. *See also* obesity and overweight

definition of, 345

fetal origins of, 526

pediatric, CDC definition of, 547 ovulation, 489, 489f

breastfeeding and, 510 oxalates, and calcium absorption, 319-21 oxidation, 275, 276f

antioxidants and, 277

and free radical formation, 276, 276f oxygen

and microorganism survival, 433 transport, in blood, 303 oxytocin, 506, 506f

**P**

packaging of food

environmental impact of, 476 plastic, environmental impact of, 476 to prevent spoilage, 440

pain, cancer and, 296 paleo diet, 104, 362, 369 palmitic acid, 394 pancreas, *71f, 72,* 79

and fat digestion, 150

injury to, alcohol use disorder and, 255 pantothenic acid, 11t, 212-13, 214, 263f

Adequate Intake of, 263t

deficiency, 215t

food sources of, 215t, 272

physiologic functions of, 215t, 272

RDA for, 215t Pap smear, 297

paralytic shellfish poisoning, 432

parasites

in foodborne illness, 430-31 intestinal, and iron status, 305t

parathyroid hormone, 319, 320f, 326

parietal cells, gastric, 75

Parkinson's disease, free radical production and, 277

partially hydrogenated oil, 145, 158, 159, 442

passive diffusion, 80, 82f

pasteurization, 440

PCOS. *See* polycystic ovary syndrome

peanut allergy, 521 prevention of, 521

pear, fiber content of, 121f

pear-shaped fat patterning, 347, 349f

pectins, 103

pellagra, 4, *7f,* 18, 215t, 266 pepsin, 75, *77f,* 191, 192f pepsinogen, 75, 191 peptic ulcer, 86-87, 86f

*Helicobacter pylori* and, 90 peptidase(s), 193 peptide bond(s), 182, 182f peptide YY, 358

Percent Daily Values (%DV), 43, 44f peristalsis, 74, 75f, 78, 84, 84f pernicious anemia, 270, 271-72 persistent organic pollutants, 446-48, 446f

biomagnification of, 446, 446f

health risks of, 447 personalized nutrition, 31 pesticides, 448

in breast milk, 511

in produce, 451, 451t

use on organic farms, 450 PFASs, 448

PFK. *See* phosphofructokinase pH, and microorganism survival, 433 pharynx, 71f, 73 phendimetrazine, 376 phenolic acids, sources of, 34f phentermine, 376 phentermine-topiramate, 377 phenylalanine, 125, 181 phenylketonuria, 125, 181 phenylpropanolamine, in weight-loss supplements, 377

PHO. *See* partially hydrogenated oil phosphate, 141, 141f, 242, 323 phosphocreatine. *See* creatine

phosphate phosphofructokinase, 188 phospholipids, 141, 153, 153f, 172f

of cell membrane, 67f, 68, 141, 141f

physiologic functions of, 149

structure of, 141, 141f phosphoric acid, 323 phosphorus, 12t, 141, 214-16, 216t

in body fluids, 225, 242

in bone, 323

deficiency, 216t, 242, 323 food sources of, 216t, 242, 243f, 323

intake

excessive, 323 recommendations for, 237t

physiologic functions of, 216t, 237, 242, 323

RDA for, 216t, 237t, 302t

toxicity, 216t, 242, 323 photosynthesis, 100, 100f pH scale, 76, 76f phthalates, 447 phylloquinone. *See* vitamin K physical activity. *See also* exercise

for adolescents, 541, 548, 549t

benefits of, 382-84

for children, 548, 549t

cool-down for, 388

daily, duration of, 384-85, 410

decreased, global trend toward, 483

definition of, 382

and energy needs, 396-403

enjoyment of, 385

FITT principle and, 386-88, 386f

and fluid requirements, 403-405

frequency of, 386-87, 386f

fuels for, 391-96

guidelines for, 384-85, 410

health benefits of, 383, 383f, 410

increasing, 384-90, 389

in infancy, 513

insufficient, rate of, in U.S. population, 384, 384f

intensity of, 386f 387-88, 387f and health benefits, 410

leisure-time, 382

and macronutrient needs, 396-403 and maximal heart rate, 387-88,

387f, 389 motivators for

extrinsic, 385

intrinsic, 385 in older adulthood, 559 overload principle and, 386 time of, 386f, 388

and health benefits, 410 type of, 386f, 388 variety in, 385 warm-up for, 388

IN-22

Physical Activity Guidelines for Americans, 63, 384-85, 410, 548 physical fitness

components of, 382, 382t current level of, assessment, 384 improvement of, 384-90 personal goals for, identification of, 384-85

physical activity and, 382, 382t physician(s), 24

Physicians Committee for Responsible Medicine

Power Plate, 62, 62f

web link for, 63 phytates

and calcium absorption, 319-21

and iron absorption, 304

and zinc absorption, 308 phytochemicals, 33, 205

antioxidant, 277

benefits of, 34f, 35

and cancer prevention, 299

in chocolate, 236

in coffee, 235

Mediterranean diet and, 61

sources of, 33, 34f

supplements, harmful effects of, 35

in tea, 235-36 phytoestrogens, sources of, 34f Pi. *See* inorganic phosphate (Pi) pica, 500

PKU. *See* phenylketonuria placebo, definition of, 20 placebo effect, 20

placenta, development of, 490, 490f plant(s)

sterols in, 141

toxins produced by, 432-33 plant-based diet, 203 plant-based foods, advantages of, 33, 35, 477

plaque, atherosclerotic, 168, 169f plasma, 191, 224f, 225, 303, 303f plasma protein(s), 191 plasma volume, exercise and, 406 plasticizers, 447 platelets, 302, 303, 303f

in atherosclerosis, 168, 169f pleural fluid, 227

poly- and perfluoroalkyl substances, 448 polycystic ovary syndrome, 488 polyp(s), colorectal, 89 polypeptide(s), 182

from protein digestion, 191-93, 192f polypharmacy, 557

polyphenols, and iron absorption, 304 polysaccharides, 102, 102f

viscous, 103 polyunsaturated fatty acids, 143, 143f

*cis-* and *trans-,* 144-45, 145f

food sources of, 144f

physiologic functions of, 149

POPs. *See* persistent organic pollutants pork, protein content of, 198f portal vein, 82

portion size. *See* serving size(s) potassium, 12t, 214-16, 216t

Adequate Intake of, 216t, 237t, 240, 241f

in body fluids, 225, 240

deficiency, 216t, 240-41

and disease prevention/ treatment, 220

food sources of, 216f, 240, 241f

intake

increasing, 241 recommendations for, 237*t*

and nerve impulse conduction, 227, 229f

physiologic functions of, 216t, 237, 240

toxicity, 21*6t,* 240

transport proteins and, 188, 190f potatoes

green, toxin in, 432-33

phytochemicals in, 34f poultry, protein content of, 198t POUNDS LOST trial, 369 poverty

and food insecurity, 463

and obesity, 359

undernourishment and, 482 poverty-obesity paradox, 484 Power Plate, 62, 62f PPA. *See* phenylpropanolamine prebiotics, 33, 35

Mediterranean diet and, 61 prediabetes, 134

diagnosis of, 134, 134t preeclampsia, 501 pregnancy

adolescent, 502

alcohol consumption in, 504

and alcohol intake, 256

anemia in, 307

caffeine intake in, 504

carbohydrate intake in,

recommendations for, 495

constipation in, 498, 500

cravings in, 500

dehydration in, 499

drug abuse in, 504

energy intake in, recommendations for, 494-95

exercise in, 493, 500, 503

fat intake in, recommendations for, 495

first trimester, 489-90

fish intake in, 495, 502

and fluid loss, 232

fluid retention in, 498

folate intake in, 269

foodborne illness in, 501-502

gastroesophageal reflux in, 500

hypertension in, 501

illegal drug use in, 504 iodine deficiency in, 274 listeriosis in, 501-502, 502f maternal age and, 502 morning sickness in, 499-500 nutrient imbalances in, and health

risks to offspring, 525-27 nutrient requirements in, 494-99 nutrition-related concerns in, 499-505

protein intake in, recommendations for, 495

second trimester, 490-92, 491f

smoking in, 504

supplements in, 498

trimesters of, 489

urinary tract infections in, 498-99

vegetarian diet in, 502-503

vomiting in, 499 prehypertension, 170

management of, 175-77 preschoolers, MyPlate Healthy Eating for,

536, 537f preservatives, as food additives,

441-42, 441t President's Challenge Adult Fitness test,

web link for, 412 preterm infant(s), 492 prevalence, definition of, 18 prions, 431

probiotics, 32-33, 35, 83

Mediterranean diet and, 61 procoagulants, 311 progesterone, and lactation, 505 prognosis, 293 progression stage, of cancer

development, 293, 294f prolactin, 505-506, 506f promotion stage, of cancer development,

293, 294f proof (akcohol content), 250 prooxidant(s), 303 propulsion, in digestive tract, 71f protease(s), 78f, 79, 192f, 193 protein(s)

absorption of, 192f, 193 and acid-base balance, 188 body, 11

energy from, 105 and bone health, 338 in breast milk, 509 cellular, damage, by free

radicals, 276 complementary, 186, 187f complete (high-quality), 186

food sources of, 186 definition of, 180 denaturation of, 185-86 dietary, 8, 9f

deficiency of, 201-202 definition of, 10 denaturation, 75 energy provided by, 8, 10

IN-23

food sources of, 9f, 11, 196-98, 197f, 198t, 403

intake, 199-201

nutrient-dense, 197f

RDA for, for adolescents, 530t, 542

recommended intake of, 13f

in vegetarian diet, 203-207

and zinc absorption, 308 digestibility, and protein quality, 193 digestion of, 191-93, 1*92f* energy from, in exercise, 396 as energy source, 190 fibrous, 185

and fluid and electrolyte balance, 188,

189f, 190f functions of, in body, 187-91 globular, 185

and immune function, 189 incomplete (low-quality), 186 intake, deficient, 188 in lipoproteins, 171-72, 172f organization of, 184-85 oxygen-carrying, 303 plant, sources of, 186 primary structure of, 184, 185f quality of, 193

in legumes, 196 quaternary structure of, 185, 185f RDA for, 195-96, 208

for toddlers, 530 requirements, 193-95, 208, 396

of adolescents, 530t, 542

of athletes, 396

of breastfeeding women, 508

calculation of, 195

of children, 208, 530t, 536

in infancy, 515

in older adults, 208, 552

in pregnancy, 495

of toddlers, 530, 530t

for vigorous exercise, 397t, 403 secondary structure of, 184-85, 185f

shape, and function, 185, 185f structure-function relationship, 185, 185f structure of, 180 zinc and, 308 supplements, 368, 396 synthesis of, 181-84, 183f factors affecting, 186 limiting amino acid and, 186 mutual supplementation and, 186 tertiary structure of, 185, 185f protein-energy malnutrition, 201-202, 201f

protein foods

Mediterranean diet and, 61

serving sizes, 51*f*

in USDA Food Patterns, 48, 49f protein leverage hypothesis, 357

protein turnover, 184, 184f prothrombin, 311

protozoa, in foodborne illness, 431 provitamin, 281-82 psyllium, 103 puberty, 541

PubMed Central, web link for, 28 PUFA. *See* polyunsaturated fatty acids pumpkin, phytochemicals in, 34f purging, 418-19 pyloric sphincter, 77, 77f pyridoxal, 267. *See also* vitamin B6 pyridoxamine, 267. *See also* vitamin B6 pyridoxine, 267. *See also* vitamin B6 pyruvic acid, 391-92, 394f PYY. *See* peptide YY

**Q**

Qsymia, 377 quackery, 22, 23

Quetelet's index. *See* body mass index (BMI)

Quick Tips

adding legumes to diet, 200 calcium intake, 322 cancer risk reduction, 298 controlling alcohol intake, 257 controlling portion sizes, 363 decreasing sugar intake, 118 detecting media hype, 21 eating more vitamin E, 279 eating right when eating out, 55 fiber intake, 123 food safety for barbecues, 438 food safety strategies for packed

lunch, 436 healthful eating pattern, 62 increasing beta-carotene intake, 283

increasing iron intake, 307 increasing physical activity, 390 increasing potassium intake, 241 increasing vitamin C intake, 315 modifying food-related

behaviors, 367 overcoming barriers to physical

activity, 366 promoting longevity, 566 reducing saturated fats in

cooking, 158 reducing sodium in diet, 239 retaining vitamins in foods, 214 selecting healthful fats in eating

out, 162

shopping for foods low in *trans* and

saturated fats, 159 spending less to eat right, 475 staying safe with supplements, 456 stocking a first kitchen, 544 talking to loved one about disordered

eating, 423 traveler's diarrhea, 88

quinoa, 198

fiber content of, 121 quorn, 198

**R**

radiation therapy, 297

Radura symbol, 440, 440f

RAE. *See* Retinal Activity Equivalents

raloxifene, 339

randomized trials, 20

raw sugar, 116t

and table sugar, comparison of, 115 rBGH. *See* recombinant bovine growth

hormone RDA. *See* Recommended Dietary

Allowance (RDA) RD/Nutritionist, 23 recombinant bovine growth hormone, 449

recombinant DNA technology, 443, 443f

Recommended Dietary Allowance

(RDA), 13*f,* 14. *See also specific* nutrient rectum, *7lf,* 78, *79f* red blood cells. *See also* erythrocytes development of, vitamins required

for, 310, 311f formation of folate in, 269 vitamin B12 and, 270 lysis of, 280

structure-function relationship, 185, 185f

Red Bull, 408

RED-S. *See* relative energy deficiency in

sport red tide, 432

reduced fat, definition of, 154 reduction, 275, 275f refined, definition of, 119t refrigeration, 435-36, 436f

and molds in foods, 437 registered dietatian (RD), 23 relative energy deficiency in sport,

339, 421 repolarization, 227, 229f reproductive health

body weight and, 488

nutrition and, 488

vitamin A and, 286 research

in nutrigenomics, 31

nutrition-related, 4

repetition of, 17-18 research question, 17. *See also*

hypothesis research study(ies)

and bias, 21-22

and conflict of interest, 21-22, 26 evaluation of, 20-23 resistance training, 382

IN-24

respiratory illness, in infants, smoking

and, 504 resveratrol, 34f, 251, 565 retina, 284, 285f Retin-A, for acne treatment, 288 retinal, 284, 285f. *See also* vitamin A Retinal Activity Equivalents, 282, 284, 286

retinoic acid, 284. *See also* vitamin A retinoids, for acne treatment, 288 retinol, 282, 284, 285f. *See also*

vitamin A reverse osmosis, of water, 235 Reye's syndrome, 457t rhodopsin, 284, 285f riboflavin, 11t, 212-13, 262, 263f deficiency, 215t, 265-66 food sources of, 215t, 265, 266f nonmeat/nondairy food sources

of, 206t physiologic functions of, 206t,

215t, 265 RDA for, 215t, 263t, 266f requirements

of breastfeeding women, 508 vigorous exercise and, 405-406 vegetarian/vegan diet in pregnancy and, 503

ribosomal RNA (rRNA), 182, 183f ribosomes, 67f, 68, 182, 183f rice milk, 234

inappropriateness for infants < 1 year old, 517 rickets, 329, 329f, 331 RNA, 264 rod cells

bleaching of, 284, 285f

of eye, 284, 285f roid rage, 407

Roundup, as carcinogen, 444 roundworms, 430-31 rRNA. *See* ribosomal RNA (rRNA) rugae, gastric, 74-75

**S**

saccharin, 124

salad dressings, saturated fats in, 158 saliva, 73, 107, 227

production of, age-related changes in, 550, 555

secretion of, 84 salivary glands, 71f, 72, 73 salmon

omega-3 fatty acid content of, 157t omega-3 fatty acids in, 146, 149

*Salmonella* eggs and, 438 and foodborne illness, 425 in foodborne illness, 429, 430f, 430t

salmon oil, omega-3 fatty acid content of, 157t

salt, 242

iodized, 274, 441-42, 482, 498 salt(s), avoidance of, in baby

food, 519 SAM. *See* severe acute malnutrition sample size, for experiment, 17 Santa Gertrudis cattle, 443 sardine oil, omega-3 fatty acid content

of, 157?

sardines, omega-3 fatty acid content of, 157t

satiety

definition of, 69

food characteristics and, 70

hormones and, 69-70 satiety center, 69, 357-58 Saxenda, 376

SBP. *See* School Breakfast Program scallops, omega-3 fatty acid content of, 157?

School Breakfast Program, 539 school gardens, 473 scientific method

definition of, 15

steps in, 15, 16f scombrotoxic fish poisoning, 432 scratch test, for food allergy, 95 screening test(s), 296, 297 scurvy, 4, 312-13, 313f, 314 seafood

availability, climate change and, 466

protein content of, 198t safety of, 160 sedentary lifestyle and cancer, 295

and cardiovascular disease, 171 sociocultural factors and, 359 seeds

beneficial fats in, 160

fiber content of, 119-23 segmentation, 84, 84f selective breeding, 443 selective estrogen receptor modulators, 339 selenium, 12t, 216, 217t

as antioxidant, 280-81

deficiency, 280-81

food sources of, 281, 281f

RDA for, 278?

requirements, of breastfeeding

women, 508 toxicity, 281, 459 selenocysteine, 280 selenomethionine, 280 "sell by" date, 435 Senior Farmers' Market Nutrition

Program, 558 sensory neuropathy, excess vitamin B6

and, 268-69 sensory perception, age-related changes

in, 550

serotonin, 191

copper and, 309

and satiety, 358

synthesis, vitamin C and, 313 serving size(s), 50

controlling, 363

eating out and, 53-54

fast food and, 358-59

on food labels, 43, 44f

increased, exercise needed to combat, 52f

oz-equivalents and, 50, 51f

for preschoolers, 533, 533f

supersizing and, 50

in USDA Food Patterns, 50 servings per container, on food labels,

43, 44f set-point hypothesis, 356 severe acute malnutrition, 481, 482f SGLT2 inhibitors, 137 shellfish, allergy to, 521 Shiga toxin, 432

short-chain fatty acids, 106, 109, 142, 153

shrimp, omega-3 fatty acid content

of, 157? sickle cell anemia, 307 silicon, 221

skeletal disorders, obesity and, 546 skin, changes in, cancer and, 296 skin cancer, 295-96, 296f

screening for, 297 skinfold measurement, 348f sleep apnea, obesity and, 373, 421, 546 sleeve gastrectomy, 377-78, 378f slow food, 473

Slow Food USA, web link for, 479 small-for-gestational-age infant, 492 small intestine, 71f, 77, 78f

absorption in, 77, 80, 82f, 150

function of, 81f

lining of, 80, 81f

mucosal membrane, 80, 81f

protein digestion in, 191-93, 192f

segmentation in, 84, 84f

structure of, 81f Smart Balance Omega-3 Buttery

Spread, omega-3 fatty acid content of, 157t smell, sense of, age-related changes in, 550

smoking

in adolescence, 545

and breastfeeding, 511

and cancer, 295, 295f

and cardiometabolic risk, 374

and cardiovascular disease, 171, 175

and colorectal cancer, 89

and diabetes risk, 136

and gastroesophageal reflux disease, 85-86 and osteoporosis, 337

IN-25

in pregnancy, 504 quitting, 297

and vitamin C requirements, 313 snack foods

fat replacers in, 163 saturated fats in, 158 *trans* fatty acids in, 158 SNAP benefits, 468, 470-71, 540, 558 social physique anxiety, 414 Society for Nutrition Education and Behavior, web link for, 371 sodium, 12, 12t, 214-16, 216t Adequate Intake of, 216t, 237t in body fluids, 225, 238 and bone loss, 239 in bottled water, 235 deficiency, 216t dietary, limiting, 175 food sources of, 216t, 238, 238t, 239 and hypertension, 239 intake, 48

and bone health, 338 recommendations for, 175, 237t,

238, 246 reducing, 238, 239, 246 and nerve impulse conduction,

227, 229f physiologic functions of, 216t, 237, 238

requirements, in pregnancy, 496t, 498

toxicity, 216t, 239

transport proteins and, 188, 190f soft drinks. *See* beverages solanine, 432-33 solutes, 225 solvent, 226 sorbitol, 116t, 124 sorghum, 198 soybeans

herbicide-tolerant GM crops, 444 pesticide residue in, 451

phytochemicals in, 34f

protein, and iron absorption, 304

protein content of, 196 soy flour, phytochemicals in, 34f soy milk, 234

inappropriateness for infants < 1 year old, 517

phytochemicals in, 34f soy products

phytochemicals in, 34f

protein content of, 198t Special Supplemental Nutrition Program for Women, Infants, and Children. *See* WIC specialty waters, 237 specificity principle, 384 sphincter, definition of, 72 spina bifida, 496, 496f spinach

omega-3 fatty acid content of, 157t phytochemicals in, 34f

spine, osteoporosis of, 335 spontaneous abortion, 490 sports anemia, 406 sports beverages, 237, 405 SSB. *See* beverages, sugar-sweetened stabilizers, 441t, 442 standardized (term), 457 *Staphylococcus aureus*

in foodborne illness, 430t, 432, 438, 439f

methicillin-resistant (MRSA), 449 starch, 100, 100f, 102, 102f

digestion of, 107, 108f

food sources of, 102, 102f

resistant, 102 statins, 177

STEC. *See Escherichia coli,* Shiga toxin- producing steroid hormone(s)

anabolic, 407, 416

synthesis, vitamin C and, 313 sterols, structure of, 141, 141f stevia, 125 stilbenes, 34f

stimulant(s), in weight-loss supplements, 377

stomach, 71f, 74-77

bicarbonate in, protective effect, 76, 77

cancer, *Helicobacter pylori* and, 90

mucus in, protective effect, 75, 76

protein digestion in, 191, 192f stone ground, definition of, 119t storage protein, 190 strawberries, fiber content of, 121f stress, of poverty, and obesity, 484 stress management

physical activity and, 383, 383f

sugars and, 484 stretching, 382 stroke, 168

deaths from, 168

health claims on food labels about, 46t

hemorrhagic

alcohol and, 251 vitamin E and, 280

nutrition and, 6, *7f*

obesity and, 6, *7f,* 373

prevention/reduction, 171

physical activity and, 383, 383f

risk factors for, 171 stunting, 481, 482, 483

and overweight/obesity, 483 subclavian vein, left, 152 sucralose, 125 sucrase, 107, 108f sucrose, 101, 101f sudden infant death syndrome, 510

smoking and, 504 sugar(s), 100. *See also* added sugars

avoidance of, in baby food, 519

and blood lipids, 117

and diabetes, 117

and health problems, 115-17

intake, lowering, 118

and obesity, 117

and stress management, 484

and tooth decay, 116, 117f sugar alcohols, 124 Sugar Busters!, 362 sugar-sweetened beverages. *See*

beverages, sugar-sweetened sugary drinks, 236 sulfites, as food additives, 441t*,* 442 sulfonylureas, 136-37 sulfur, 12t, 214-16, 216t, 264t

dietary sources of, 275

food sources of, 216t

physiologic functions of, 216t, 275 sun exposure, for vitamin D synthesis,

328, 331 superbugs, 449 super centenarians, 550 supermarket, nutritional guidance in, 38 superoxide dismutase, 281, 309 supersizing, 50 superweeds, 445 supplement(s)

anti-aging, 565

adverse effects of, 565

for breastfeeding women, 508

for children in developing countries, 470

dangerous, 454, 456

drug interactions with, 458-59

evaluation of, 456

herbal, 456-57 anti-aging, 565

potentially harmful, 457, 457t

precautions with, 457 hormone-based, anti-aging, 565 individuals who might benefit from,

457-58, 458t for infants, 515-16 labeling of, 455, 455f and liver damage, 456 and longevity, 565 micronutrients from, 220 multivitamin and mineral (MVM), 455, 458t

for children, 536

popularity of, 457

for toddlers, 531 non-nutrient, anti-aging, 565 for older adults, 554-55 precautions with, 458-59 prenatal, 498

for vegan woman, 503 regulation of, 455-56 sales of, 454 single-nutrient, 459

anti-aging, 565 stimulant, 459

IN-26

supplement(s) *(continued)* use of, in U.S., 457 vision-enhancing, 556 weight-loss

health risks of, 377 stimulants in, 377 Supplemental Nutrition Assistance

Program. *See* SNAP benefits Suprenza, 376

Surgeon General, recommendations for

physical activity, 410 surgery, for cancer, 297 sushi, and food safety, 438 sustainability, 468 sustainable agriculture, 472-73 swallowing, 73-74, 74f sweat

and body temperature regulation, 227

water loss in, 232 sweet potatoes, phytochemicals in, 34f sweets, saturated fats in, 158 sympathetic nervous system, and body

weight, 357 syndrome, definition of, 420

**T**

tapeworms, 430-31, 431f tartrazine, 441t*,* 442 taste, sense of, age-related changes in, 550

T cells (T lymphocytes), 286 tea, 235-36

benefits of, 289

black, 34f, 235-36

fluoride in, 325

green, 34f, 235-36

oolong, 235-36

phytochemicals in, 34f

white, 235-36 teeth

bulimia nervosa and, 420

fluoride and, 324-25

in nursing bottle syndrome, 520, 520f

in older adults, 555-56 teff, 198 temperature

body. *See* body temperature

of cooked foods, 437

danger zone, 433, 433f, 435

and microorganism survival, 433, 433f Tenuate, 376 teratogen(s), 488

alcohol as, 256-57, 504

definition of, 256

embryonic vulnerability to, 489-90, 489f teriparatide, 339

testosterone, and bone density, 336 textured vegetable protein,

phytochemicals in, 34f

texturizers, 441t, 442

thalassemia, 307

thawing, of frozen food, 437

The Obesity Society (TOS), 25 web link for, 28

theory, definition of, 18

thermic effect of food (TEF), 351f, 352

thiamin, 11t, 212-13, 262, 263f deficiency, 215t, 264-65 deficiency of, 212 and energy metabolism, 264-65 food sources of, 215t, 264, 265f physiologic functions of, 215t RDA for, 215t, 263t, 265f requirements, vigorous exercise

and, 405-406 sulfur in, 275

thiamin pyrophosphate, 262, 263f, 264

thirst mechanism, regulation of,

hypothalamus and, 229-30, 230f

thrifty gene hypothesis, 356 thunder god vine, 457? thyroid hormone(s)

and body weight, 357

selenium and, 280

synthesis, vitamin C and, 313

synthesis of, iodine and, 273

vitamin C and, 280 time-restricted feeding, 564 tissue, 66f, 67

healthy, nutrients essential to, 302? tissue fluid, 224f, 225 tobacco use

and body weight, 368

and cancer, 295, 297, 368 tocopherol. *See* vitamin E toddler(s)

carbohydrate requirements, 530t, 531

energy requirements, 530

fat requirements, 530

fiber intake for, 531

fluid requirements, 530t, 531-33

food choices for, 533-34

growth of, 530

micronutrient requirements, 530t, 531

nutrient recommendations for, 530? nutrient requirements, 530-33 obesity in, 546

protein requirements, 530, 530?

serving sizes for, 533, 533f

and vegan diet, 534-35

vegetarian diet and, 534

vitamin D requirements, 531 tofu, phytochemicals in, 34f Tolerable Upper Intake Level (UL), 13f, 14 tomatoes, phytochemicals in, 34f tooth decay

prevention of, 116

sugar and, 116, 117f TOS. *See* The Obesity Society (TOS)

toxin(s)

algae producing, 432 bacterial, 432 in food, 438-39

and foodborne illness, 429, 431-33, 438-39

fungal, 432

plant, 432-33 *Toxoplasma gondii,* 431 training, 384 *trans-,* definition of, 144 transamination, 181, 181f transcription, 182, 183f transferrin, 190

transfer RNA (tRNA), 182, 183f translation, 182, 183f transparency, of research findings, 22 transport protein(s), 188, 190-91, 190f trauma

from alcohol-related injury, 256

and fluid loss, 232 traveler's diarrhea, 87-88 traveling, and avoiding foodborne

illness, 439 tretinoin, for acne treatment, 288 triglyceride(s), 140, 140f, 141, 152, 153f, 171, 172f, 190

classification of, 142

elevated, in metabolic syndrome, 374

energy from, for exercise of low intensity and long duration, 393f, 394-96

increased, fetal origins of, 526

in muscle, 148f, 149

types of, 142 trimester(s), of pregnancy, 489 tripeptide(s), 182, 191-93, 192f tRNA. *See* transfer RNA (tRNA) trout, omega-3 fatty acid content of, 157? tryptophan, 266 T-score, 317 tumor(s), 293

benign, 293

malignant, 293 tuna

line-caught, 160

mercury in, 495, 502

omega-3 fatty acid content of, 157t turbinado sugar, 116t tyrosine, 181

**U**

ulcer(s). *See also* peptic ulcer duodenal, 86 gastric, 86 ultrafiltration (reverse osmosis), of

water, 235 ultraviolet radiation, and skin cancer, 295-96 umbilical cord, 490, 490f umbilicus, 490

IN-27

undernourishment. *See also* malnutrition health problems caused by, 481-82 socioeconomic problems caused by, 482-83

undernutrition, fetal adaptation to,

525-26, 525f underwater weighing, 348f underweight, 344, 345, 367 in older adults, 555 sociocultural factors and, 360 and weight gain in pregnancy, 492-93, 493t

United Nations Children's Fund, web

link for, 485 United Nations World Food

Programme, 470 upper esophageal sphincter, 74 urban agriculture, 472 urea, 184f, 190, 274 urinary tract infection(s), in pregnancy, 498-99

urine, color, hydration level and,

244, 244f urine output, water loss in, 232 U.S. Department of Agriculture (USDA).

*See* USDA

USDA

ChooseMyPlate, web link for, 494, 523 Commodity Supplemental Food

Program, 472 Daily Food Plan for preschoolers,

536, 537f Food and Nutrition Service, 539

web link for, 561 Food Guide, 362

Food Safety and Inspection Service,

426, 427t web link for, 453 National Nutrient Database for

Standard Reference, web link

for, 210

National Nutrient Databases, 58

National Organic Program, web link for, 453

organic seal, 450, 450f

programs to provide food to low- income citizens, 470-71 USDA Food Patterns

definition of, 48

food groups in, 48, 49f

and healthful diet, 48-53

**V**

validity, 17

valine, metabolism of, 264 vanadium, 218

vCJD. *See* Creutzfeldt-Jakob disease,

variant vegan diet, 204, 301

benefits of, 564

and breastfeeding, 508

definition of, 203t

energy and macronutrients in, 204f

nutrition concerns in, 206t, 207

and pregnancy, 503

and supplements, 458

and toddlers, 534-35

and vitamin B12, 271, 406 vegetables

and bone health, 338

deep green, phytochemicals in, 34f

fiber content of, 119-23, 121, 121f

pesticides in, 451, 451t

Power Plate and, 62, 62f

prepared, saturated fats in, 158

red/orange, phytochemicals in, 34f

serving sizes, 51f

in USDA Food Patterns, 48, 49f vegetarianism, 203-207

and breastfeeding, 508

definition of, 203

ecological considerations and, 205 ethical considerations and, 204 food-safety considerations and,

204-205 health benefits of, 205-206 and iron status, 305t nutrition concerns in, 206, 206t, 207 and pregnancy, 502-503 religious considerations and, 204 and toddlers, 534 types of, 203, 203t Vegetarian Resource Group, web link for,

210, 561

vertebrae, osteoporosis of, 335, 335f very-low-birth-weight infant(s), 492 very-low-density lipoproteins, 171,

172f, 173f villi, intestinal, 80, 81f virus(es), in foodborne illness, 429 viscous, definition of, 103 visible fat, 154 vision

age-related changes in, 550 vitamin A and, 284, 285f vitamin(s), 8, *9f,* 212. *See also* B-vitamin(s) absorption of, 75, 80 activation of, 218 antioxidant, 277, 277f and blood health, 310-14 chemical names for, 213-14 classification of, 212-14 definition of, 11 and disease prevention/

treatment, 220 fat-soluble, 11, 11t, 12f, 80, 212, 213f

and bone health, 326-30

deficiency, 212, 213t

toxicity, 212, 213t

transport of, 149 in foods, retaining, 214 Mediterranean diet and, 61

megadosing of, 212 nomenclature for, 213-14 requirements, of breastfeeding

women, 508 water-soluble, 11, 11t, 80, 212-13, 215t

deficiency, 213, 215t

food sources of, 213, 215t

toxicity, 213, 215t vitamin A, 11t, 149, 212, 213-14, 213t, 282, 283 as antioxidant, 286 and bone health, 286 and cell differentiation, 284-86 deficiency, 213t, 283, 287, 482, 483 derivatives of, for acne treatment,

287-88, 545 excess, and birth defects, 497 and eyesight, 284, 285f food sources of, 213t, 286, 287f forms of, 284 intake

calculation of, 286

excessive, 286

recommendations for, 286 physiologic functions of, 213: RDA for, 213t, 278f, 287f and reproduction, 286 requirements

in adolescence, 530t, 542

of breastfeeding women, 508

of children, 482, 530:

in older adults, 554

in pregnancy, 496t, 497 supplementation

for children, 482

risks of, 287 toxicity, 212, 213t, 286-87, 459 UL for, 213f, 286 vitamin B1. *See* thiamin vitamin B2. *See* riboflavin vitamin B5, 11t, 174, 212-13, 214, 263f as coenzyme, 267-68 deficiency, 215t, 267, 269, 307, 310 excess, from supplements, 268-69 food sources of, 215t, 268, 268f and heme synthesis, 310 physiologic functions of, 215t, 264, 267-68

RDA for, 215t, 263t, 268f, 302: requirements

in older adults, 554

vigorous exercise and, 405-406 toxicity, 215t, 268-69, 459 UL for, 215t

vegetarian/vegan diet in pregnancy and, 503

vitamin B12, 11t, 174, 212-13, 214, 263f absorption of, 75

deficiency, 215t, 270, 271-72, 307, 310, 311f folate toxicity and, 269 in older adults, 551

IN-28

vitamin B12 (*continued)*

food sources of, 2151, 271, 271f intake, insufficient, 271 malabsorption of, 271 nonmeat/nondairy food sources of, 206t

physiologic functions of, 206t, 215t,

264, 268, 268f, 270 RDA for, 215t*,* 263t, 271f, 302t, 497 requirements

of breastfeeding women, 508 in older adults, 554 in pregnancy, 496t, 497 vigorous exercise and, 406 supplements, for infants of vegan

mothers, 515 vegetarian/vegan diet in pregnancy and, 503 vitamin C (ascorbic acid), 11t, 212-13, 214 as antioxidant, 280, 313 as coenzyme, 312

and collagen synthesis, 312-13, 312f and common cold, 313 deficiency, 4, 215t, 312, 314

in pregnancy, 497 as food preservative, 440, 441, 441t food sources of, 215t, 313, 314f, 315, 497

and iron absorption, 304, 306, 313,

314, 498 megadose of, 313 physiologic functions of, 215t,

280, 313 RDA for, 215t, 278f, 302t, 313,

314f, 497 requirements

of breastfeeding women, 508 of children and adolescents, 530t factors affecting, 313 in older adults, 554 in pregnancy, 496t, 497 toxicity, 21*5t,* 314 UL for, 215t vitamin D, 11t, 149, 212, 213t, 214 and bone health, 326-29 and calcium absorption, 319,

320f, 321 deficiency, 213t, 328-29, 331

in pregnancy, fetal effects of, 526 and disease prevention/treatment,

220, 331 drug interactions with, 329 excess, fetal effects of, 497 as food additive, 442 food sources of, 213t, 328, 329f in fortified foods, 328, 329f, 331 as hormone, 326 nonmeat/nondairy food sources

of, 206t physiologic functions of, 206t, 213t, 326

RDA for, 213t, 302t, 328, 329f requirements

in adolescence, 542

in infancy, 515

in older adults, 552f, 553

in pregnancy, 496t, 497

of toddlers, 531 supplements, 331, 341

and bone health, 338

for children, 531

for infants, 509, 515

in pregnancy, 497 synthesis

age and, 328

factors affecting, 326-28

latitude and, 326-28, 327f

in skin, 326-27, 327f

skin color and, 328

time of day and, 328

time of year and, 326-27, 327f toxicity, 212, 213t, 328, 331

in infants, 516 UL for, 213t, 341

vegetarian/vegan diet in pregnancy

and, 503 vitamin E, 11t, 149, 212, 213f, 214 as anticoagulant, 280 as antioxidant, 277f, 278-80 deficiency, 213t, 280, 328-29 and disease prevention/treatment,

220, 326 as food preservative, 440, 441, 441t

food sources of, 213t, 279, 279f physiologic functions of, 213t, 278 RDA for, 213t, 278t, 279, 279f regeneration of, 280 requirements

of breastfeeding women, 508 of children and adolescents, 530t in older adults, 554 supplementation, adverse effects of,

280, 289 UL for, 213t units for, 278 vitamin K, 11t, 149, 212, 213t, 214 Adequate Intake of, 213t, 302? and blood clotting, 311 and bone remodeling, 330 deficiency, 213t, 311, 330 and disease prevention/

treatment, 220 food sources of, 213t, 311, 330 injection, for newborn, 515 interactions with drugs, 557 nondietary source of, 311 physiologic functions of, 213? VLDL. *See* very-low-density

lipoproteins vomiting, 87

and fluid loss, 232 in pregnancy, 499

**W**

waist circumference, and abdominal

obesity, 374 waist-to-hip ratio, 347-49, 349f Walmart, 473

walnuts, omega-3 fatty acid content of, 157t

warm-up, for physical activity, 388 Warren, J. Robin, 86 wasting, 481, 482f water, 8, 9f

absorption of, 80

and body temperature regulation,

226-27, 226f bottled, 233-34

label information, 235 nutrient content of, 235 source of, 235 sweeteners in, 235 treatment methods, 235 carbonated, 234 distilled, 234 DRI for, 233 fluoridated, 325 food sources of, 231, 231f intake, 233-37, 233f metabolic, 232 micron filtration of, 235 mineral, 234

physiologic functions of, 12, 226-27

requirements

factors affecting, 233 for vigorous exercise, 397t, 404-405

seltzer, 234

as solvent, 226

specialty, 237

tap *vs.* bottled, 233-34

ultrafiltration (reverse osmosis), 235 water intoxication, 244 water loss

insensible, 232

sensible, 232 water supply, livestock production

and, 477 Web Links

alcohol use disorders, 259

body image disorders, 423

cancer, 299

carbohydrates, 129

cardiovascular disease, 177

diabetes, 137

dietary supplements, 459

eating disorders, 423

essential nutrients, 291

fats, 166

fetal environment, 527 fluid and electrolyte balance, 248 food-related disorders, 97 food safety and technology, 453 food security, 479

IN-29

healthful body weight, 371 healthful diet, 58 healthful eating patterns, 63 health information for older

adults, 566 human body, 92 malnutrition, 485 micronutrients, 221 new frontiers in nutrition and

health, 35 nutirents essential to healthy

tissue, 333 nutrition and health, 28 nutrition in pregnancy and first year

of life, 523 nutrition through the life cycle, 561 obesity, 379 osteoporosis, 341 physical activity, 412 proteins, 210 Website(s), credibility of, evaluation, 22-23

Weight-Control Information Network,

web link for, 412 weight gain

in adolescence, 541 healthful, 367-68 metabolic factors and, 357 in pregnancy

distribution between mother and pregnancy-specific tissues, 493, 494f and healthy birth weight of infant, 492-93

recommendations for, 492, 493: weight loss

and blood pressure, 175 cancer and, 296

and diabetes risk reduction, 136 diets for, 376

high-carbohydrate, with moderate

fat and protein, 362, 369 low-carbohydrate, with high fat

and protein, 362 macronutrient composition of, 362, 369 exercise and, 364, 376 fat blockers and, 163 geriatric, nine Ds of, 555, 556f healthful, 360-66, 369 low-energy-density foods and, 363-65 metabolic factors and, 357 postpartum, 493 realistic goals for, 362-63 three strategies for, 360, 362 weight management fiber and, 106

physical activity and, 383, 383f products for, advertised in spam e-mails, 22

Weight Watchers, 362

wellness, definition of, 5

Wernicke-Korsakoff syndrome, 265

whey protein concentrate, in infant formula, 516, 517

white blood cells. *See* leukocytes

white sugar, 116t

whole wheat, phytochemicals in, 34f WIC, 472

Willett, Walter, 346

willow bark, 457t

Wilson's disease, 309

wine, Mediterranean diet and, 61

women

alcohol absorption in, 250

bone mineral density in, age-related changes in, 336, 337f

iron intake for, 14

osteoporosis in, 336 Women's Health initiative (WHL),

Dietary Modification Trial, 369 World Health Organization

Nutrition, web link for, 210, 485

web link for, 291 wound healing, 191

**X**

Xenical, 377 xylitol, 116t, 124

**Y**

yogurt

added sugars in, 115 probiotics in, 33

yohimbe, 457t You Do the Math

BMI calculation, 346 calculating protein needs, 195 calculation of BMR and total daily

energy needs, 354 energy contribution of carbohydrates,

fats and proteins, 10 iron intake, 305

macronutrients in toddler's diet, 532 maximal and training heart rate

calculation, 389 negative logarithms, 76 pH scale, 76

portion size and exercise levels, 52

**Z**

zeaxanthin, 34f, 556

Zika virus, 490

zinc, 12t, 216, *21ft,* 281

absorption of, 218, 308, 309f, 498 and copper absorption, 309 deficiency, 308, 550 enxymatic functions of, 307-308 food sources of, 308, 309f

nonmeat/nondairy, 206t and immune function, 308 physiologic functions of, 206t,

307-308, 498 RDA for, 302t, 309f regulatory functions of, 308 requirements

of breastfeeding women, 508 of children and adolescents, 530t in infancy, 515 in older adults, 554 in pregnancy, 496t, 498 structural functions of, 308 supplements

therapy with, 309 toxicity caused by, 308 vegetarian/vegan diet in pregnancy and, 503 zygote, 488f, 489, 489f

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IN30

CR-1

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CR-2

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CR-3

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CR-4

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CR-9

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