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## Acronyms, Abbreviations, and Glossary

### ACRONYMS AND ABBREVIATIONS

#### **25-hydroxyvitamin D**

In this report, 25OHD (also referred to as calcidiol or calcifediol); indicates no distinction between D<sub>2</sub> and D<sub>3</sub> forms. When relevant, forms distinguished as 25OHD<sub>2</sub> and 25OHD<sub>3</sub>.

#### **1,25-dihydroxyvitamin D**

In this report, calcitriol. Ercalcitriol refers to 1,25-dihydroxyvitamin D<sub>2</sub>, but in this report, the term “calcitriol” will be used for both.

#### **24,25-dihydroxyvitamin D**

In this report, 24,25(OH)<sub>2</sub>D.

<b>AHRQ</b>	Agency for Healthcare Research and Quality
<b>AI</b>	Adequate Intake
<b>ALTM</b>	All-laboratory trimmed mean
<b>AMDR</b>	Acceptable Macronutrient Distribution Range
<b>ATBC</b>	Alpha-Tocopherol Beta-Carotene Cancer Prevention Study
<b>BDI</b>	Beck Depression Inventory
<b>BMAD</b>	Bone mineral apparent density
<b>BMC</b>	Bone mineral content
<b>BMD</b>	Bone mineral density
<b>BMI</b>	Body mass index
<b>BV</b>	Bone volume

<b>CCHS</b>	Canadian Community Health Survey
<b>CDC</b>	Centers for Disease Control and Prevention
<b>CG</b>	Control group
<b>CHMS</b>	Canadian Health Measures Survey
<b>CI</b>	Confidence interval
<b>CNF</b>	Canadian Nutrient File
<b>CPBA</b>	Competitive protein binding assay
<b>CVD</b>	Cardiovascular disease
<b>CYP</b>	Cytochrome P450
<b>DBP</b>	Vitamin D binding protein
<b>DEQAS</b>	Vitamin D External Quality Assurance Scheme
<b>DNA</b>	Deoxyribonucleic acid
<b>DRI</b>	Dietary Reference Intake
<b>DXA</b>	Dual-energy X-ray absorptiometry
<b>EAR</b>	Estimated Average Requirement
<b>EPIC</b>	European Prospective Investigation into Cancer and Nutrition
<b>EPIDOS</b>	Epidémiologie de l'Ostéoporose study
<b>FGF23</b>	Fibroblast-like growth factor-23
<b>FN</b>	Femoral neck
<b>GC</b>	Gas chromatography
<b>GFR</b>	Glomerular filtration rate
<b>HPFS</b>	Health Professionals Follow-up Study
<b>HR</b>	Hazard ratio
<b>IBD</b>	Inflammatory bowel disease
<b>IFN</b>	Interferon
<b>Ig</b>	Immunoglobulin
<b>IG</b>	Intervention group
<b>IHD</b>	Ischemic heart disease
<b>IL</b>	Interleukin
<b>IOM</b>	Institute of Medicine
<b>iPTH</b>	Intact parathyroid hormone
<b>IU</b>	International Unit
<b>K-MMSE</b>	Mini-Mental State Examination for Koreans

<b>LC</b>	Liquid chromatography
<b>LOAEL</b>	Lowest-observed-adverse-effect level
<b>LS</b>	Lumbar spine
<b>LSM</b>	Least squares mean
<b>MAS</b>	Milk-alkali syndrome
<b>MMSE</b>	Mini-Mental State Examination
<b>mo</b>	Month(s)
<b>mRNA</b>	Messenger ribonucleic acid
<b>MrOS</b>	Osteoporotic Fractures in Men Study
<b>MS</b>	Mass spectrometry; Multiple sclerosis
<b>MS/MS</b>	Tandem mass spectrometry
<b>NA</b>	Not applicable
<b>NCa</b>	Normocalcemic
<b>NCHS</b>	National Center for Health Statistics
<b>NCI</b>	National Cancer Institute
<b>ND</b>	Not determined
<b>NHANES</b>	National Health and Nutrition Examination Survey
<b>NHS</b>	Nurses' Health Study
<b>NIH</b>	National Institutes of Health
<b>NIST</b>	National Institute of Standards and Technology
<b>NOAEL</b>	No-observed-adverse-effect level
<b>NOD</b>	Nonobese diabetic
<b>NR</b>	Not reported
<b>NS</b>	Not significant
<b>OA</b>	Osteoarthritis
<b>OC</b>	Oral contraceptive
<b>OP</b>	Osteoporosis
<b>OR</b>	Odds ratio
<b>OV</b>	Osteoid volume
<b>PLCO</b>	Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial
<b>PM</b>	Postmenopausal
<b>POMS</b>	Profile of Mood States
<b>PTH</b>	Parathyroid hormone
<b>PTHrP</b>	Parathyroid hormone-related protein
<b>RA</b>	Rheumatoid arthritis
<b>RANK</b>	Receptor activator for nuclear factor $\kappa$ B

<b>RCT</b>	Randomized controlled trial
<b>RDA</b>	Recommended Dietary Allowance
<b>RECORD</b>	Randomised Evaluation of Calcium and/Or vitamin D trial
<b>RIA</b>	Radioimmunoassay
<b>RNI</b>	Recommended Nutrient Intake
<b>RR</b>	Relative risk
<b>SD</b>	Standard deviation
<b>SE</b>	Standard error
<b>SEM</b>	Standard error of the mean
<b>SLE</b>	Systemic lupus erythematosus
<b>SPA</b>	Single-photon absorptiometry
<b>SPF</b>	Sun protection factor
<b>SRM</b>	Standard Reference Material
<b>TB</b>	Tuberculosis; Total body
<b>Th</b>	T helper
<b>TH</b>	Total hip
<b>Tr</b>	Trochanter
<b>TRPV6</b>	Transient receptor potential cation channel, vanilloid family member 6
<b>Tx</b>	Treatment
<b>UK</b>	United Kingdom
<b>UL</b>	Tolerable Upper Intake Level
<b>U.S.</b>	United States
<b>USDA</b>	U.S. Department of Agriculture
<b>UV</b>	Ultraviolet
<b>UVB</b>	Ultraviolet B
<b>VDDR</b>	Vitamin D–dependent rickets
<b>VDR</b>	Vitamin D receptor
<b>VDRE</b>	Vitamin D–responsive element
<b>VEGF</b>	Vascular endothelial growth factor
<b>WHI</b>	Women’s Health Initiative
<b>WWEIA</b>	What We Eat in America
<b>wk</b>	Week(s)
<b>y</b>	Year(s)

## GLOSSARY

**Achlorhydria**

A lack of hydrochloric acid in the digestive juices in the stomach.

**Adenoma**

A benign epithelial tumor of glandular origin.

**Adequate Intake**

The recommended average daily intake level of a nutrient based on observed or experimentally determined approximations or estimates of intakes that are assumed to be adequate for a group (or groups) of apparently healthy people; used when the Recommended Dietary Allowance cannot be determined.

**Adipokines**

Cytokines, growth factors, and other proteins produced and secreted by adipose tissue.

**Adipose tissue**

A connective tissue consisting chiefly of fat cells surrounded by reticular fibers and arranged in lobular groups or along the course of one of the smaller blood vessels.

**Amenorrhea**

Abnormal suppression or absence of menstruation.

**Anorexia**

The symptom of poor appetite whatever the cause.

**Anorexia nervosa**

A psychophysiological disorder usually occurring in teenage women that is characterized by fear of becoming obese, a distorted self-image, a persistent aversion to food, and severe weight loss, and that is often marked by hyperactivity, self-induced vomiting, amenorrhea, and other physiological changes.

**Antigen**

Any substance that stimulates an immune response in the body.

**Antirachitic**

Cures or prevents rickets.

**Asthma**

A chronic inflammatory disease of the airways.

**Autism**

A complex developmental disability that typically appears during the first few years of life; is the result of a neurological disorder that affects the normal functioning of the brain, impacting development in the areas of social interaction and communication skills.

**Biomarker**

A biochemical, physiological, behavioral, or other alteration that can be measured in the body or its products that influences, predicts, or is associated with an established or possible outcome, health impairment, or disease.

**Body mass index**

An indirect measure of body fat calculated as the ratio of a person's body weight to the square of a person's height:

$$\text{BMI (kg/m}^2\text{)} = \text{weight (kilograms)}/\text{height (meters)}^2$$

$$\text{BMI (lb/in}^2\text{)} = \text{weight (pounds)}/\text{height (inches)}^2 \times 703$$

**Bone mineral content**

The hardness of bone results from its mineral content in the organic matrix.

**Bone mineral density**

A measure of bone density that reflects the strength of bones as represented by calcium content.

**Calcification**

Impregnation with calcium or calcium salts; hardening, as of tissue, by such impregnation.

**Calcinosis**

The abnormal deposition of calcium salts in a part or tissue of the body.

**Calcitonin**

A peptide hormone, produced by the thyroid gland in humans, that acts to lower plasma calcium and phosphate levels without augmenting calcium accretion.

**Calcitriol**

Another name for 1,25-dihydroxyvitamin D.

**Calcium**

A mineral found mainly in the hard part of bones, where it is stored; it is essential for healthy bones and is important for muscle contraction, heart action, nervous system maintenance, and normal blood clotting.

**Calciuria**

The presence of calcium in the urine.

**Cancer**

A malignant and invasive growth or tumor.

**Cardiovascular disease**

Any abnormal condition characterized by dysfunction of the heart and blood vessels; includes atherosclerosis (especially coronary heart disease), cerebrovascular disease, and hypertension.

**Chondrocyte**

A connective tissue cell that occupies a lacuna within the cartilage matrix.

**Chylomicron**

One of the microscopic particles of fat occurring in chyle (a digestive fluid) and in the blood, especially after a meal high in fat.

**Computed tomography**

Tomography used in diagnostic studies of internal bodily structures, in which computer analysis of a series of cross-sectional scans made along a single axis of a bodily structure or tissue is used to construct a three-dimensional image of that structure.

**Creatinine**

One of the nonprotein constituents of blood, a breakdown product of creatinine (protein used to make adenosine triphosphate). Increased quantities of serum creatinine are found in advanced stages of renal disease.

**Crohn's disease**

A chronic inflammatory disease of the intestines that primarily causes ulcerations (breaks in the lining) of the small and large intestines, but can affect the digestive system anywhere from the mouth to the anus.

**Cut-point**

A specified quantitative measure used to demarcate the presence or absence of a health-related condition; often used in interpreting measures obtained from analysis of blood (example: blood measures below "x" ng/mL indicate a deficiency state for Nutrient Y).

**Cytochrome**

Any of a class of iron-containing proteins important to cell respiration as catalysts of oxidation–reduction reactions.

**Depression**

A condition of general emotional dejection and withdrawal; sadness greater and more prolonged than that warranted by any objective reason.

**Dermis**

The sensitive connective tissue layer of the skin located below the epidermis, containing nerve endings, sweat and sebaceous glands, and blood and lymph vessels.

**Diabetes mellitus**

A group of metabolic diseases characterized by high blood sugar (glucose) levels that result from defects in insulin secretion or action, or both.

**Diabetes, type 1**

An autoimmune disease that occurs when T cells attack and decimate the  $\beta$ -cells in the pancreas that are needed to produce insulin, so that the pancreas makes too little insulin (or no insulin); there is a genetic predisposition to type 1 diabetes, and the disease tends to occur in childhood, adolescence, or early adulthood (before age 30), but it may have its clinical onset at any age.

**Diabetes, type 2**

Disease in which the  $\beta$ -cells of the pancreas produce insulin but the body is unable to use it effectively because the cells of the body are resistant to the action of insulin; also known as insulin-resistant diabetes, non-insulin-dependent diabetes, and adult-onset diabetes.

**Dietary Reference Intake**

A set of four distinct nutrient-based reference values that replaced the former Recommended Dietary Allowance in the United States. These include Estimated Average Requirement (EAR), Recommended Dietary Allowance (RDA), Adequate Intake (AI), and Tolerable Upper Intake Level (UL).

**Dose–response assessment**

Determination of the relationship between nutrient intake (dose) and some criterion of either adequacy or adverse effect.

**Dual-energy X-ray absorptiometry**

Means of measuring bone density with two X-ray beams with differing energy levels aimed at an individual's bones.

**Emesis**

The act or process of vomiting.

**Endocrine**

Pertaining to hormones and the glands that make and secrete them into the bloodstream through which they travel to affect distant organs.

**Epidermis**

The nonvascular outer protective layer of the skin, covering the dermis.

**Ergosterol**

A plant sterol that is converted into vitamin D by ultraviolet radiation.

**Estimated Average Requirement**

The average daily nutrient intake level that is estimated to meet the requirements of half of the healthy individuals in a particular life stage and gender group.

**Estradiol**

The most potent naturally occurring estrogen.

**Etiology**

Causes and origins of disease.

**Fibroblast**

A cell ubiquitous in connective tissue that makes and secretes collagen.

**Glucocorticoid**

Any of a group of steroid-like compounds, such as hydrocortisone, that are produced by the adrenal cortex, are involved in carbohydrate, protein, and fat metabolism, and are used as anti-inflammatory agents.

**Hematocrit**

The percentage by volume of packed red blood cells in a given sample of blood after centrifugation.

**Homeostasis**

A property of cells, tissues, and organisms that allows the maintenance and regulation of the stability and constancy needed to function properly.

**Hormone**

A substance, usually a peptide or a steroid, produced by one tissue and conveyed in the bloodstream to another to effect physiological activity, such as growth or metabolism.

**Hydroxyapatite**

The principal bone salt that provides the compressional strength of vertebrate bone.

**Hypercalcemia**

A higher than normal level of calcium in the blood.

**Hypercalciuria**

Excess calcium in the urine.

**Hyperglycemia**

A high blood sugar; an elevated level specifically of the sugar glucose in the blood.

**Hypertension/hypertensive**

Systolic blood pressure  $\geq 140$  mmHg or diastolic blood pressure  $\geq 90$  mmHg.

**Hypophosphatemia**

Abnormally low concentrations of phosphates in the blood.

**Inflammatory bowel disease**

Any of several incurable and debilitating diseases of the gastrointestinal tract characterized by inflammation and obstruction of parts of the intestine.

**Influenza**

An acute, commonly epidemic disease occurring in several forms, caused by numerous rapidly mutating viral strains and characterized by respiratory symptoms and general prostration.

**Ligand**

An ion, a molecule, or a molecular group that binds to another chemical entity to form a larger complex.

**LOAEL**

The lowest intake (or experimental dose) of a nutrient at which an adverse effect has been identified.

**Lumisterol**

A naturally occurring compound that is part of the vitamin D family of steroid compounds.

**Macrophage**

A type of white blood cell that ingests foreign material.

**Menopause**

The state of an absence of menstrual periods for 12 months.

**Metabolic syndrome**

Also called insulin resistance syndrome and Metabolic Syndrome X. A group of conditions that increase risk of heart disease, diabetes, and stroke. The five conditions are high blood pressure, high blood sugar levels, high levels of circulating triglycerides, low levels of circulating high-density lipoprotein, and excess fat in the abdominal area.

**Microsome**

A small particle in the cytoplasm of a cell, typically consisting of fragmented endoplasmic reticulum to which ribosomes are attached.

**Milk-alkali syndrome**

Caused by the ingestion of large amounts of calcium and absorbable alkali with resulting hypercalcemia; if untreated, can lead to metastatic calcification and renal failure.

**Morbidity**

Illness or disease.

**Mortality**

A fatal outcome; death.

**Multiple sclerosis**

A disease in which the nerves of the central nervous system (brain and spinal cord) degenerate.

**Natriuresis**

Excretion of excessive amounts of sodium in the urine.

**Neoplasm**

A new, often uncontrolled growth of abnormal tissue; tumor.

**Nephrocalcinosis**

Renal lithiasis characterized by diffusely scattered foci of calcification in the kidneys.

**Nephrolithiasis**

Calculi in the kidneys.

**NOAEL**

The highest intake (or experimental dose) of a nutrient at which no adverse effect has been observed.

**Nutrient**

A substance (such as a chemical element or inorganic compound) that an organism needs to live and grow; a substance used in an organism's metabolism that must be taken in from its environment.

**Nutriture**

A state of nutrition in the body.

**Osteoblast**

A cell from which bone develops.

**Osteoclast**

A large multinucleate cell found in growing bone that resorbs bony tissue, as in the formation of canals and cavities.

**Osteocyte**

A branched cell imbedded in the matrix of bone tissue.

**Osteogenesis**

Formation and development of bony tissue.

**Osteoid**

Resembling bone; the bone matrix, especially before calcification.

**Osteomalacia**

The softening of bone, the depletion of calcium from bone; may be caused by poor dietary intake or poor absorption of calcium and other minerals needed to harden bones and can be a characteristic feature of vitamin D deficiency in adults.

**Osteopenia**

A condition of bone in which decreased calcification, decreased density, or reduced mass occurs.

**Osteoporosis**

A condition characterized by a decrease in bone density (a decrease in bone strength that results in fragile bones); leads to abnormally porous bone that is compressible, like a sponge.

**Parathyroid gland**

A gland that regulates calcium, located behind the thyroid gland in the neck, which secretes parathyroid hormone.

**Parathyroid hormone**

A hormone that is made by the parathyroid gland and that is critical to calcium and phosphorus balance.

**Perimenopause**

The interval in which a women's body begins its transition into menopause.

**Periosteal**

Pertaining to the periosteum, the membrane covering the bones.

**Phosphate**

A form of phosphoric acid; calcium phosphate makes bones and teeth hard.

**Polyuria**

The excessive passage of urine, resulting in profuse urination and urinary frequency.

**Preeclampsia**

A toxic condition developing in late pregnancy characterized by a sudden rise in blood pressure, generalized edema, proteinuria, severe headache, and visual disturbances that may result in eclampsia (convulsive or coma state) if untreated.

**Previtamin D<sub>3</sub>**

A short-lived intermediate form arising from exposure of provitamin D<sub>3</sub> (7-dehydrocholesterol) in the skin to UVB irradiation. Body heat quickly changes previtamin D<sub>3</sub> into vitamin D<sub>3</sub>.

**Prohormone**

An intraglandular precursor of a hormone.

**Provitamin D<sub>3</sub> (7-dehydrocholesterol)**

A provitamin present in the skin of humans as well as the milk of mammals that becomes vitamin D<sub>3</sub> when exposed to ultraviolet light.

**Recommended Dietary Allowance**

The average daily dietary intake level that is sufficient to meet the nutrient requirements of nearly all (97.5 percent) healthy individuals in a particular life stage and gender group.

**Rheumatoid arthritis**

An autoimmune disease that causes chronic inflammation of the joints.

**Rickets**

A disorder caused by a deficiency of vitamin D, calcium, or phosphate, which leads to softening and weakening of the bones and is seen most commonly in children 6 to 24 months of age.

**Sarcoidosis**

A disease that results from a specific type of inflammation of tissues of the body that can appear in almost any body organ, often starting in the lungs or lymph nodes.

**Scleroderma**

A pathological thickening and hardening of the skin caused by swelling and thickening of fibrous tissue.

**Systemic lupus erythematosus**

A chronic, autoimmune, inflammatory disease of connective tissue that causes fever, weakness, fatigue, joint pains, and skin lesions on the face, neck, or arms.

**Tachysterol**

An isomer of ergosterol that forms vitamin D<sub>2</sub> when irradiated with ultraviolet light.

**Tolerable Upper Intake Level**

The highest average daily nutrient intake level that is likely to pose no risk of adverse effects to almost all individuals in the general population. As intake increases above the Tolerable Upper Intake Level, the potential risk of adverse effects may increase.

**Transgenic**

Having genetic material (deoxyribonucleic acid) from another species.

**Tuberculosis**

A highly contagious infection caused by the bacterium called *Mycobacterium tuberculosis*.

**Ultraviolet**

Pertaining to electromagnetic radiation having wavelengths in the range of approximately 5 to 400 nm; shorter than visible light, but longer than X-rays.

**Ultraviolet B**

Medium wavelength (280 to 320 nm) ultraviolet rays from the sun; help synthesis of vitamin D<sub>3</sub>; the “burning” rays in the ultraviolet spectrum.

**Vasodilatation**

Relaxation or widening of the blood vessels; leads to a lowered blood pressure.

**Vitamin D**

Also referred to as calciferol; comprises a group of fat-soluble secosterols. The two major forms are vitamin D<sub>2</sub> and vitamin D<sub>3</sub> (both vitamin D<sub>2</sub> and vitamin D<sub>3</sub> can be synthesized commercially and may be found in dietary supplements or fortified foods; they differ only in their side chain structure).

**Vitamin D<sub>2</sub>**

Also referred to as ergocalciferol; originates from plants and is found in the human diet.

**Vitamin D<sub>3</sub>**

Also referred to as cholecalciferol; is synthesized in the skin of humans from 7-dehydrocholesterol and is also consumed in the diet via the intake of animal-based foods.

**Vitamin D-resistant rickets**

An inherited form of rickets characterized by high concentrations of phosphate in the blood due to defective renal tubular reabsorption of phosphate and subnormal absorption of dietary calcium.