Glossary

Terms here are defined in the context of this Report. Some terms may have other meanings in other contexts.

Absorption
The movement of nutrients and other food constituents from the gut into the blood.

Acid-base balance
The appropriate acidity of the blood and tissues. Abnormal acid-base balance may indicate a change in respiratory or metabolic status.

Adduct (see DNA adduct)
An organic compound containing an amino group and a carboxylic acid group. The basic building blocks of proteins such as enzymes.

Adipose tissue
Body fat. Tissue comprising mainly cells (adipocytes) containing triglyceride. It acts as an energy reserve, provides insulation and protection, and secretes metabolically active hormones.

Adiposity rebound
The age at which body mass index (BMI) increases after reaching a nadir at around 4–6 years of age. Earlier age of adiposity rebound has been linked to later development of obesity.

Adjustment
A statistical tool for taking into account the effect of known confounders (see box 3.1).

Adrenarche
The period, typically between age 6 and 10 years, characterised by an increase in secretion of androgens from the adrenal cortex.

Aerobic metabolism
The normal process of producing ATP as a source of energy using oxygen.

Aflatoxins
Naturally-occurring mycotoxins that are produced by many species of Aspergillus, a fungus, most notably Aspergillus flavus and Aspergillus parasiticus. Aflatoxins are toxic and carcinogenic to animals, including humans (see box 4.1.4).

Age-adjusted incidence
The number of events in a population, usually expressed per 100,000 people, over a defined period of time, adjusted for the varying proportion of people in each age group between populations and over time. It allows for comparisons between countries with different age structures (see box 7.1.1).

Alpha-linolenic acid
An essential n-3 polyunsaturated fatty acid (C18:3 n3).

Amenorrhoea
The absence of menstruation.

Amino acid
An organic compound containing an amino group and a carboxylic acid group. The basic building blocks of proteins such as enzymes.

Anaerobic metabolism
The process of producing ATP as a source of energy without oxygen, resulting in lactic acid accumulation.

Androgen
Any masculinising sex hormone, such as testosterone.

Angiogenesis
The process of generating new blood vessels.

Antioxidants
Any substance that inhibits oxidation or traps reactive oxygen species generated during metabolism.

Bowel
A greenish-yellow fluid secreted by the liver and stored in the gallbladder. Bile plays an important role in the intestinal absorption of fats. Bile contains cholesterol, bile salts, and waste products such as bilirubin.

Biliary tract
The biliary tract includes the bile ducts within the liver, the common bile duct, which connects the liver and gallbladder to the small intestine, and the cystic duct, which connects the gallbladder to the common bile duct.

Bioavailability
The degree to which a nutrient (or other substance) can be absorbed and used by the body.

BMI (see body mass index)

BMR (see basal metabolic rate)

Body mass index (BMI)
Body weight expressed in kilograms divided by the square of height expressed in metres (BMI = kg/m²). It provides an indirect measure of body fatness. Also called Quetelet's Index.

Caffeine
An alkaloid found in coffee, tea, kola nuts, chocolate, and other foods that acts as a stimulant and a diuretic.

Cancer survivor
Any person who has received a diagnosis of cancer.
Cantonese-style salted fish
Fish that has been treated with varying amounts of salt and dried in natural conditions outdoors. It is characterised by treatment with less salt than typically used and is also subject to fermentation during the drying process due to relatively high outdoor temperature and moisture levels (see box 4.3.5).

Carcinogen
Any substance or agent capable of causing cancer.

Carcinoma
Malignant tumour derived from epithelial cells, usually with the ability to spread into the surrounding tissue (invasion) and produce secondary tumours (metastases).

Carcinoma in situ
The first stage of carcinoma in which the malignant tumour has not spread beyond the epithelium.

Cardiovascular disease
A group of diseases that involve the heart and/or blood vessels (arteries and veins). While the term technically refers to any disease that affects the cardiovascular system, it is usually used to refer to those related to atherosclerosis.

Case-control study
An epidemiological study in which the participants are chosen based on their disease or condition (cases) or lack of it (controls) to test whether past or recent history of an exposure such as smoking, genetic profile, alcohol consumption, or dietary intake is associated with the risk of disease (see box 3.4).

CE
Common Era — the period of measured time beginning with the year one on the Gregorian calendar. The notations CE and BCE (Before Common Era) are alternative notations for AD and BC, respectively.

Cell cycle
The sequence of stages that a cell passes through between one cell division and the next.

Cell signalling
Mechanisms whereby cells send messages to, or respond to external stimuli from, other cells.

Cerebrovascular disease
A group of diseases of the brain due to damage to the blood vessels, in which an area of the brain is transiently or permanently affected by ischaemia or bleeding.

Cholesterol
The principal sterol in animal tissues, a component of cell membranes and the precursor of the steroid hormones and vitamin D.

Chromatin
Mass of genetic material in the nucleus of a cell, composed of DNA and proteins that condense to form chromosomes.

Chronic disease
A disease that develops or persists over a long period of time. Includes noncommunicable diseases such as cancer, cardiovascular disease, and diabetes, and some infectious diseases such as tuberculosis.

CI (see confidence interval)

Coeliac disease
Intolerance to the gliadin fraction of the protein gluten from wheat, rye, and barley. The villi of the small intestine atrophy and nutrient absorption from food is poor. Stools are often bulky and contain a large amount of unabsorbed fat.

Cohort study
A study of a (usually large) group of people whose characteristics are recorded at recruitment (and sometimes later), followed up for a period of time during which outcomes of interest are noted. Differences in the frequency of outcomes (such as disease) within the cohort are calculated in relation to different levels of exposure to factors of interest, for example smoking, alcohol consumption, diet, and exercise. Differences in the likelihood of a particular outcome are presented as the relative risk comparing one level of exposure to another (see box 3.4).

Compliance
The extent to which people such as study participants follow an allocated treatment programme.

Computed tomography (CT)
A form of X-ray that produces cross-sectional or other images of the body.

Confidence interval (CI)
A measure of the uncertainty in an estimate, usually reported as 95% confidence interval (CI), which is the range of values within which there is a 95% chance that the true value lies. For example the effect of smoking on the relative risk of lung cancer in one study may be expressed as 10 (95% CI 5–15). This means that in this particular analysis, the estimate of the relative risk was calculated as 10, and that there is a 95% chance that the true value lies between 5 and 15.

Confounder
A variable, within a specific epidemiological study, that is associated with an exposure, is also a risk factor for the disease, and is not in the causal pathway from the exposure to the disease. If not adjusted for, this factor may distort the apparent exposure–disease relationship. An example is that smoking is related both to coffee drinking and to risk of lung cancer and thus, unless accounted for (controlled) in studies, might make coffee drinking appear falsely as a possible cause of lung cancer (see box 3.1).

Confounding factor (see confounder)

Confounding variable (see confounder)

Cretinism
Underactivity of the thyroid gland (hypothyroidism) in infancy, resulting in poor growth, severe mental retardation, and deafness.

CT (see computed tomography)

Curing
Various preservation andavouring processes, especially of meat or fish, by the addition of a combination of salt, sugar, and either nitrate or nitrite. Curing processes often involve smoking. The addition of saltpetre (sodium nitrate) gives a pinkish colour to meat. Bacteria convert the nitrates in cured meats to nitrites and nitrosoamines, which are potentially carcinogenic to humans (see box 4.3.2).

Cytotoxic
Poisonous to living cells.

Deoxyribonucleic acid (DNA)
The double-stranded, helical molecular chain found within the nucleus of each cell that carries the genetic information.
DNA adducts
DNA adducts are compounds formed by the reaction of a chemical with DNA, which may damage the DNA. If repaired, some adducts can be excrated and measured in the urine as a marker of DNA damage. If not repaired, DNA may function abnormally and may therefore be a stage in carcinogenesis.

Docosahexaenoic acid (DHA)
A long-chain n-3 polyunsaturated fatty acid (C22:6 n3).

Dose response
A term derived from pharmacology that describes the degree to which an effect changes with the level of an exposure, for instance the intake of a drug or food (see box 3.2).

Double bond
A covalent bond between two carbon atoms each with one hydrogen atom, for instance in fatty acids.

Dual energy X-ray absorptiometry (DEXA)
A means of measuring the density of different body tissues such as bone or fat, using two X-ray beams with differing energy levels.

Dyslipidaemia
Any disorder of lipoprotein metabolism resulting in abnormal plasma concentrations of lipoprotein, such as high total or low-density lipoprotein (LDL) cholesterol or triglyceride, and low high-density lipoprotein (HDL) cholesterol concentrations.

Dysplasia
Abnormal development of the cells of a tissue.

Ecological study
A study in which differences in patterns of exposure, for instance in consumption of a particular nutrient or food, are compared at aggregate level, with populations (rather than individuals) as the unit of analysis (see box 3.4).

Egger's test
A statistical test for small study effects such as publication bias.

Eicosapentaenoic acid (EPA)
A long-chain n-3 polyunsaturated fatty acid (C20:5 n3).

Effect modifier/effect modification
Effect modification (or effect-measure modification) occurs when a measure of effect for an exposure changes over levels of another variable (the modifier) (see box 3.6).

Emulsifier
A substance that promotes the formation of a stable mixture, or emulsion, of two substances that do not normally mix well (for example oil and water).

Endocrine
Referring to organs or glands that secrete hormones into the blood.

Energy
Energy, measured as calories or joules, is required for all metabolic processes. Fats, carbohydrates, proteins, and alcohol from foods and drinks release energy when they are metabolised in the body.

Energy adjustment
The use of statistical methods to ‘adjust’ intakes of a dietary factor under study for total energy intake (see box 3.7).

Energy balance
The state in which the total energy absorbed from foods and drinks equals total energy expended. Also the degree to which intake exceeds expenditure (positive energy balance) or expenditure exceeds intake (negative energy balance).

Enzyme
A protein that acts as a catalyst in living organisms, promoting chemical reactions and regulating the rate at which they proceed.

Epidemic
A widespread or rapidly spreading disease that affects many individuals in a population at the same time, markedly in excess of the number normally expected.

Epigenetic
Relating to the control of gene expression through mechanisms that do not depend on changes in the nucleotide sequence of DNA, for example through methylation of DNA or acetylation of histone.

Epithelial (see epithelium)

Epithelial-mesenchymal transition (EMT)
A disorder of cell differentiation where cells assume a mesenchymal rather than an epithelial phenotype. Cancer cells may have phenotypic similarities to EMT.

Epithelium
The layer of cells covering internal and external surfaces of the body, including the skin and mucous membranes lining body cavities such as the lung, gut, and urinary tract.

Essential amino acid
An amino acid that is required for normal cellular structure and metabolic function but which humans cannot synthesise and so must obtain from food.

Evidence
Information that helps to determine whether a proposal or belief is true or valid, or false or invalid.

Exercise
A type of physical activity, often deliberate such as sport, which improves fitness or health.
Exposure
A factor to which an individual may be exposed to varying degrees, such as intake of a food, level or type of physical activity, or aspect of body composition.

Extracellular fluid
All body fluid not contained within cells. Includes the fluid in blood vessels (plasma) and between cells (interstitial fluid).

Factor analysis
A statistical technique used to examine the structure underlying the interactions between several variables.

Fat-free mass
The mass of all body tissue excluding the lipid components.

Fatty acid
A carboxylic acid with a carbon chain of varying length, which may be either saturated (no double bonds) or unsaturated (one or more double bonds). Three fatty acids attached to a glycerol backbone make up a triglyceride, the usual form of fat in foods and adipose tissue.

Fermentation
The anaerobic metabolic breakdown of molecules such as glucose. Fermentation yields energy in the form of lactate, acetate, ethanol, or other simple product.

Fetal programming (see programming)

Food systems
The interconnected agricultural, ecological, economic, social, cultural, and technological systems involved in food production, distribution, and consumption.

Forest plot
A simple visual representation of the amount of variation between the results of the individual studies in a meta-analysis. Their construction begins with plotting the observed exposure effect of each individual study, which is represented as the centre of a square. Horizontal lines run through this to show the 95% confidence interval. Different sized squares may be plotted for each of the individual studies, the size of the box increasing with the size of the study and the weight that it takes in the analysis. The overall summary estimate of effect and its confidence interval can also be added to the bottom of this plot, if appropriate, and this is represented as a diamond. The centre of the diamond is the pooled summary estimate and the horizontal tips are the confidence intervals (see box 3.3).

Fortification
The deliberate addition of nutrients to foods or drinks as a means of increasing the level of intake in a population (see box 4.10.1).

Functional food
Any food, similar in appearance to conventional food, claiming to have specific physiological effects that benefit health and/or reduce the risk of disease. Products are sometimes sold in medicinal forms (see box 4.10.2).

Gene expression
The active production of the RNA and protein that are coded for by a particular gene. In any cell, not all genes are expressed (see epigenetic).

Genetic modification
The manipulation of a living organism’s genetic material by eliminating, modifying, or adding copies of specific genes, often from other organisms. Also known as ‘genetic engineering’.

Genotype
The genetic makeup of a cell or organism.

GH (see growth hormone)

Gleason score
A quantitative measure of the degree of differentiation of prostate cancers. High Gleason scores, representing aggressive disease, are associated with poor prognoses.

Whitemore and Jewett scales are used to assess prostate cancer stage.

Glycaemic index
A system for ranking foods containing carbohydrates according to the effect of a standard amount on blood glucose levels. Foods that raise the blood sugar the most have the highest glycaemic index (see box 4.1.3). The glycaemic load of the glycaemic index of a food multiplied by the number of grams of carbohydrate in the serving of food (see box 4.1.3).

Glycerol
A three-carbon molecule that forms the backbone of triglyceride in fats (see fatty acid).

Growth hormone (GH)
Also known as somatotropin, a hormone secreted by the pituitary gland that stimulates secretion of growth factors from the liver and so also protein synthesis and growth of the long bones in the legs and arms. It also promotes the breakdown and use of fatty acids, rather than glucose, as an energy source.

Haem
The part of the organic molecule haemoglobin in red blood cells containing iron to which oxygen binds for transport around the body.

Herbicide
A pesticide used to kill or control the growth of unwanted plants. Selective herbicides kill certain targets while leaving a desired crop relatively unharmed. Non-selective herbicides kill every plant with which they come into contact.

Heterocyclic amines
A family of compounds formed from protein and sugars in meat, chicken, and fish cooked at very high temperatures by grilling (broiling) or frying that have potential carcinogenic effects (see box 4.3.4).

Heterogeneity
A measure of difference between the results of different studies addressing a similar question. In meta-analysis, the degree of heterogeneity may be calculated statistically using the I² test.

High fructose corn syrup (HFCS)
A form of corn syrup that has undergone enzymatic processing in order to increase its fructose content. Used to sweeten soft drinks, juices, ice cream, and many other processed foods, especially in the USA (see box 4.6.1).

High-income countries
Countries with a gross average annual national product of more than an agreed figure per head (in 2006 this was more than $US 10,726). This term is less judgemental and more descriptive than ‘economically developed’ countries.

Homeostasis
The maintenance of biological conditions in a stable state.

Hormone
A substance secreted by specialised cells that affects the structure and/or function of other cells or tissues in another part of the body.

Hydrogenation
The process by which unsaturated fatty acids in vegetable oils are made more saturated by the addition of hydrogen. This makes liquid oils more solid at room temperature and more resistant to oxidation, for instance in the manufacture of margarines. Incomplete hydrogenation can lead to the formation of trans-fatty acids (see box 4.5.1).
Hyperkeratosis
Excessive thickening of the outer horny layer of the skin, affecting the palms and soles.

Hyperplasia
An increase in the number of cells in a tissue.

Hypertension
High blood pressure; a risk factor for cardiovascular and kidney disease.

Hypoxia
Abnormally low levels of oxygen in blood or tissues.

IARC
International Agency for Research on Cancer (www.iarc.fr).

IGF binding proteins
Proteins that bind to insulin-like growth factors (which are implicated in the cancer process, see Chapter 2) in the bloodstream.

Immune response
The production of antibodies or specialised cells in response to foreign proteins or other substances.

Incidence rates
The number of new cases of a condition appearing during a specified period of time expressed relative to the size of the population, for example 60 new cases of breast cancer per 100 000 women per year.

Inflammation
The immunologic response of tissues to injury or infection. Inflammation is characterised by accumulation of white blood cells that produce several bioactive chemicals, causing redness, pain, and swelling.

Inflammatory bowel disease
A term used to describe Crohn’s disease and ulcerative colitis; both are characterised by chronic inflammation of the gut.

Insulin
A protein hormone secreted by the pancreas that promotes the uptake and utilisation of glucose, particularly in the liver and muscles. Inadequate secretion of, or tissue response to, insulin leads to diabetes mellitus.

Intrinsic sugars
Sugars naturally integrated into the cellular structure of foods, for example those present in unprocessed fruits and vegetables.

Intra-abdominal fat
Also known as visceral fat. Fat stored within the abdomen surrounding the internal organs (see adipose tissue).

In utero
In the uterus; refers to events that occur before birth.

Invasive cancer
Tumours that spread into surrounding healthy tissue.

Iron-deficiency anaemia
A low blood concentration of haemoglobin due to a deficiency of iron, due either to unusually high demands or low intake or impaired absorption.

Irradiation
Exposure to ionising radiation. Food irradiation is used to disinfest, sterilise, or preserve food.

Jewett scale (see Whitemore and Jewett scales)

K-ras
One of a class of genes (proto-oncogenes) which when mutated can malfunction to become an oncogene, promoting the transformation of normal cells into cancer cells (see box 2.2).

Lactation
The production and secretion of milk by the mammary glands.

Lacto-ovo-vegetarian diet
A vegetarian diet characterised by the inclusion of eggs and dairy products, but no other animal products.

Latency
The period of time between the onset of a disease process and its detection or clinical appearance.

Lean body mass
The mass of those parts of the body that are not adipose tissue. Lean body mass includes some lipid and is not synonymous with fat-free mass.

Lesion
A general term for any abnormality of cells or tissues, including those due to cancerous change.

Linoleic acid
An essential n-6 polyunsaturated fatty acid (C18:2 n6).

Lipids
Naturally occurring organic molecules that are insoluble in water, including triglycerides; fatty acids; phospholipids; lipoproteins; carotenoids; cholesterol, which is a precursor of steroid hormones and vitamin D; and the other fat-soluble vitamins A, E, and K. Lipids are an essential component of cell membranes and many metabolic processes.

Low-density lipoprotein (LDL) cholesterol
A class of lipoproteins that is the major carrier of cholesterol in the blood in humans. A high blood LDL cholesterol concentration is a cause of coronary artery disease.

Low-income countries
Countries with a gross average annual national product of less than an agreed figure per head (in 2006 this was US$875). This term is less judgemental and more descriptive than ‘economically developing’ countries.

Lymphocyte
Several types of white blood cell, part of the immune system, found in the blood and lymph glands.

Macronutrient
Those nutrient components of the diet that provide energy: carbohydrate, fat, and protein; ethanol also provides energy but is not a nutrient.

Magnetic resonance imaging (MRI)
A technique that produces images of parts of the body using analysis of the behaviour of water molecules within body tissues when placed in a strong magnetic field.

Malignant
A tumour with the capacity to spread to surrounding tissue or to other sites in the body.

Melanoma
Malignant tumour of the skin derived from the pigment-producing cells (melanocytes).

Membrane potential
The difference in electrical charge across the cell membrane.

Menarche
The beginning of menstruation (see boxes 6.1 and 6.2).

MET (see metabolic equivalent)

Meta-analysis
The process of using statistical methods to combine the results of different studies.

Metabolic equivalent (MET)
One MET equals the resting metabolic rate, measured as the rate of oxygen consumption, which is approximately 3.5 millilitres of oxygen per kilogram body weight per minute. Equivalent to physical activity ratio (see box 5.1).

Metabolic syndrome
A common cluster of a variety of several risk factors for cardiovascular disease including insulin resistance, abdominal obesity, high blood pressure, and abnormal blood lipids.

Metastasis
The spread of malignant cancer cells to distant locations around the body from the original site.

Micronutrients
Vitamins and minerals present in foods and required in the diet for normal body function in small quantities, conventionally of less than 1 g/day (see box 4.2.3).

Migrant study
A study of people who migrate from one country to other countries with different environments and cultural backgrounds. The experience, such as mortality or disease incidence, of the migrant group is compared with that of people in their current country of residence and in their country of origin.
**Glossary**

**Mineral**
An inorganic compound in food required by the body for normal function, such as calcium, magnesium, and iron.

**Monosaccharide**
Simple sugar consisting of a single sugar molecule, such as glucose, fructose, and galactose. They form the basis of disaccharides such as sucrose, and of oligosaccharides, starch, and non-starch polysaccharides.

**MRI** (see magnetic resonance imaging)

**Mucosal**
Relating to mucous membranes.

**Mutagens**
Chemical compounds or physical agents capable of inducing genetic mutations.

**Mycotoxins**
Toxins produced by fungi (moulds), especially Aspergillus flavus under tropical conditions and Penicillium and Fusarium species under temperate conditions (see box 4.1.4).

**Neoplasm**
A benign or malignant tumour.

**Nested case-control study**
A case-control study in which cases and controls are drawn from the population of a cohort study; often used for studies of prospectively collected information or biological samples.

**Neurotransmitter**
A chemical secreted by one nerve cell that stimulates a response in a neighbouring nerve cell.

**Night blindness**
A condition in which a person has impaired vision in the dark, characteristic of vitamin A deficiency.

**Nitrate**
A salt containing the nitrate ion, which contains nitrogen and oxygen in proportion 1:3 (NO$_3^-$). Derived from decomposing organic material such as manure, plants, and human waste, and a component of chemical fertilisers (see box 4.3.2).

**Nitrite**
A salt containing the nitrite ion, which contains nitrogen and oxygen in proportion 1:2 (NO$_2^-$). Sodium nitrite is added to many processed meats. Nitrites are also formed in the body from nitrates in plant foods that are eaten. When consumed, nitrites can lead to the generation of N-nitroso compounds, some of which are known carcinogens (see box 4.3.2).

**Nitrosamines**
A group of chemicals formed by the reaction of nitrates with amines; some nitrosamines are carcinogens (see box 4.3.2).

**N-nitroso compound** (see nitrosamines)

**Non-caloric sweetener**
A food additive that replicates the sweetness of sugar but with negligible food energy (see box 4.6.2).

**Non-exercise activity thermogenesis (NEAT)**
The energy used in non-conscious or spontaneous physical activity, such as fidgeting and posture maintenance.

**Non-milk extrinsic sugars**
Sugars not present within the cellular structure of foods, apart from those in milk or milk products. For example, those added to foods or in juices, syrups, or honey.

**Non-starch polysaccharide**
A carbohydrate comprising at least 10 simple sugar molecules; a major component of plant cell walls and the principal analytic fraction characterising dietary fibre (see box 4.1.2).

**Nucleic acid**
The four building blocks of DNA – guanine, thymine, cytosine, and adenine.

**Nutrient**
A substance present in food and required by the body for maintenance of normal structure and function, and for growth and development. Nutrients include macronutrients (fat, protein, and carbohydrate), which provide energy as well as performing metabolic and structural functions, and micronutrients (vitamins and minerals), which do not provide energy but are necessary for normal metabolic function.

**Obesity**
Excess body fat to a degree that increases the risk of various diseases. Conventionally defined as a BMI of 30 kg/m$^2$ or more. Different cut-off points have been proposed for specific populations.

**Odds ratio**
A measure of the risk of an outcome such as cancer, associated with an exposure of interest, used in case-control studies, approximately equivalent to the relative risk.

**Oligosaccharide**
A compound comprising between 2 and 10 simple sugar molecules (monosaccharides).

**Oncogene**
A gene whose protein product contributes to the transformation of normal cells into cancer cells. Oncogenes result from the mutation of normal genes called proto-oncogenes (see box 2.2).

**Organic compounds**
Any member of a large class of chemical compounds whose molecules contain carbon (and other elements), with exception of carbides, carbonates, and carbon oxides. Most occur naturally only in the bodies and products of living organisms.

**Organic farming**
Agricultural production system without or with only limited use of pesticides, synthetic fertilisers, growth regulators, and livestock feed additives (see box 4.9.2).

**Osteomalacia**
A disease due to vitamin D deficiency characterised by inadequate bone mineralisation, pain, and increased bone fragility.

**Osteoporosis**
Loss of the tissues of bone (bone cells, mineral, and protein) to an extent that increases the risk of fracture.

**Oxidative damage**
Damage to cells or structures in cells caused by oxidation, either by chemicals or by radiation. Some oxidants are generated in the normal course of metabolism. Oxidation of DNA is one cause of mutation.

**p53**
A protein central to regulation of cell growth. Mutations of the p53 gene are important causes of cancer (see oncogene and box 2.2).

**Pasteurisation**
Partial sterilisation of foods at a temperature that destroys microorganisms such as bacteria, viruses, moulds, yeasts, and protozoa without major changes in the chemistry of the food.

**Pathogenesis**
The origin and development of disease. The mechanisms by which causal factors increase the risk of disease.

**Pedometer**
An instrument that records the number of steps taken.

**Peer review**
The scrutiny of scientific papers by one or more suitably qualified scientists.

**Pentosan**
A polysaccharide composed of pentose sugars (with a ring comprising 5 carbon atoms), for example arabans or xylans.

**Phenotype**
The characteristics displayed by an organism; this depends on both the genotype and environmental factors.

**Phosphorylation**
Addition of phosphate groups to hydroxyl groups on proteins, catalysed by a protein kinase with ATP as phosphate donor. A key process in cell signalling and energy transfer.

**Physical activity**
Any movement using skeletal muscles.

**Physical activity level** (PAL)
Energy expenditure per day as a multiple of basal metabolic rate (BMR) (see box 5.2).
**Physical activity ratio (PAR)**
The energy cost of an activity per minute divided by the energy cost of basal metabolic rate per minute. Thus, the energy cost of sitting at rest is about 1.2; for walking at a normal pace, 4; and for jogging, 7.

**Phytochemicals**
Compounds found in plants not required for normal structure or function, which may modify physiological functions and influence health (see box 4.2.1).

**Point estimate**
An estimate that is reported as a single value. The precision of a point estimate is indicated by the width of the confidence interval that surrounds it.

**Point mutation**
Mutation of a single DNA base in a gene often leading to a single peptide change in a protein, which can influence its function.

**Polycyclic aromatic hydrocarbons**
A family of chemical compounds, including several known carcinogens, formed by incomplete combustion of organic substances such as wood, coal, diesel, fat, or tobacco (see box 4.3.4).

**Polymorphisms**
Common variations (more than 1 per cent of the population) in the DNA sequence of a gene.

**Polyphenol**
Any of a group of chemical substances found in plants that have more than one phenol group per molecule; includes tannins, lignins, and flavonoids.

**Polysaccharide**
A polymer composed of multiple subunits of monosaccharides (simple sugars) linked together.

**Polyunsaturated fatty acids**
Fatty acids containing two or more double bonds.

**Pooled analysis** (see pooling)

**Pooling**
In epidemiology, a type of study where original individual-level data from two or more original studies are obtained, combined, and re-analysed.

**Positive energy balance** (see energy balance)

**Prebiotic**
Dietary carbohydrate that reaches the colon, where it promotes growth of beneficial bacterial flora (see box 4.10.2).

**Precursor**
A chemical compound from which another compound is formed.

**Processed meat**
Meat (usually red meat) preserved by smoking, curing, or salting, or by the addition of preservatives. Definitions vary between countries and studies as to what precisely is included (see box 4.3.1).

**Programming**
The process whereby events happening during fetal life (fetal programming), such as growth restriction, or in infancy can permanently affect the structure and function of particular organs, and so also metabolic processes. Combined with other factors, this can in turn alter the response to environmental exposures and so susceptibility to disease.

**Promoter region**
The region of DNA in a gene which initiates the transcription of DNA to RNA when the enzyme RNA polymerase binds to it.

**Prostaglandins**
A range of hormones derived from essential fatty acids. Among many other processes, they influence blood pressure and inflammation.

**Publication bias**
A bias in the overall balance of evidence in the published literature due to selective publication. Not all studies carried out are published, and those that are may differ from those that are not. Publication bias can be tested for with either Begg’s or Egger’s tests.

**Randomised controlled trial (RCT)**
A study in which a comparison is made between one intervention (often a treatment or prevention strategy) and another (control). Sometimes the control group receives an inactive agent (a placebo). Groups are randomised to one intervention or the other, so that any difference in outcome between the two groups can be ascribed with confidence to the intervention. Neither investigators nor subjects usually know to which condition they have been randomised; this is called ‘double-blind’ (see box 3.4).

**RCT** (see randomised controlled trial)

**Reactive oxygen species**
Oxygen-containing radical or reactive ion that oxidises DNA (removes electrons); can be hydroxyl radical (OH-), hydrogen peroxide (H₂O₂) or superoxide radical (O₂⁻).

**Red meat**
Meat from domesticated cattle, pigs, sheep, and goats; not poultry or fish or meat from wild animals.

**Refined sugars**
Sugars obtained by purification from plants which contain it, principally sugar cane or beet.

**Relative risk (RR)**
The ratio of the rate of disease or death among people exposed to a factor, compared to the rate among the unexposed, usually used in cohort studies (see odds ratio).

**Resting metabolic rate**
Metabolic rate in a fasting subject sitting quietly (also see basal metabolic rate).

**Reverse causation**
The situation when an abnormal level of an exposure is caused by the cancer or its treatment, rather than the other way round. For example if cancer causes weight loss, then the finding that low BMI is associated with increased risk may reflect weight loss due to cancer rather than low weight causing cancer.

**Ribonucleic acid (RNA)**
The molecule created by RNA polymerase from DNA (transcription) which carries the genetic message to ribosomes (translation), where proteins are made.

**Ricketts**
Malformation of the bones in growing children due to deficiency of vitamin D. In adults the equivalent is osteomalacia.

**RNA** (see ribonucleic acid)

**Salt iodisation**
The practice of fortifying salt with iodide as a means of ensuring adequate iodine intake.

**Satiation**
The development of fullness during eating that limits the size of a meal consumed (see satiety).

**Satiety**
The suppression of appetite after eating that inhibits the starting of eating (see satiation).

**Saturated fatty acids**
Fatty acids that do not contain any double bonds.

**Selection bias**
Bias arising from the procedures used to select study participants and from factors influencing participation.

**Single bond**
A covalent bond between two carbon atoms, each with two hydrogen atoms, for instance in saturated fatty acids.

**Single nucleotide polymorphism (SNP)**
DNA sequence variation where a single nucleotide in the DNA is altered. SNPs account for 90% of all human genetic variation (see polymorphism and point mutation).

**SLR** (see systematic literature review)
**Glossary**

**Smoking (foods)**
Smoking is the process of curing, cooking, or seasoning food by exposing it for long periods of time to the smoke from a wood fire. ‘Hot smoking’ is a process that can be used to fully cook raw meats or fish, while ‘cold smoking’ is an hours- or days-long process that is generally used to preserve or flavour foods (usually meats or fish, but sometimes cheeses, vegetables, fruits).

**SNP** (see single nucleotide polymorphism)

**Socioeconomic status**
A combined product of social and economic status reflecting education level, personal wealth, class, and associated factors.

**Solvent**
Substances (usually liquid) capable of dissolving or dispersing one or more other substances.

**Spontaneous physical activity** (see non-exercise activity thermogenesis)

**Squamous cell carcinoma**
A malignant cancer derived from squamous epithelial cells.

**Stabiliser**
One of a number of food additives, such as agar or pectin (used in jam, for example), that give foods a firmer texture. While they are not true emulsifiers, they help to stabilise emulsions.

**Statistical significance**
The probability that any observed result might not have occurred by chance. In most epidemiologic work, a study result whose probability is less than 5% (p < 0.05) is considered sufficiently unlikely to have occurred by chance to justify the designation ‘statistically significant’ (see confidence interval).

**Stem cell**
A cell that can self-renew or give rise to a lineage of more differentiated cells.

**Sterilisation**
The destruction of bacteria or other microorganisms by heat, radiation, or chemical means.

**Steroid hormone**
One of several hormones derived from cholesterol and having a central effect on growth and metabolism.

**Supplement** (see dietary supplement)

**Systematic literature review (SLR)**
A means of compiling and assessing published evidence that addresses a scientific question with a predefined protocol and transparent methods (see box 3.5).

**Testosterone**
An androgenic steroid hormone and the principal male sex hormone.

**Thermodynamics**
The branch of physics concerned with the study of energy and its conversion between different forms.

**Thermogenesis**
The process of heat production. In adults, arising from the metabolic processes during the digestion and assimilation of food and during shivering.

**Tocotrienol**
A form of vitamin E.

**Total energy expenditure**
The energy expended in a 24-hour period by an individual or a group of individuals. It reflects the average amount of energy spent in a typical day, but may not be the exact amount of energy spent each and every day.

**Transcription**
Synthesis of RNA from DNA by the enzyme RNA polymerase.

**Transition cultures**
Countries in the process of changing from one predominant social/cultural structure to another, for instance moving from lower-income to higher-income status with the accompanying changes that this implies.

**Translation**
The process by which RNA carries the genetic message from DNA to generate proteins in the ribosome.

**Tumour suppressor gene**
A gene whose protein product inhibits tumour formation (see also oncogene and box 2.2).

**UICC**
International Union Against Cancer (www.uicc.org).

**Ulcerative colitis**
A disease causing chronic inflammation of the large intestine (colon). Together with another disease of inflammation of the intestines called Crohn’s disease, referred to as inflammatory bowel disease.

**Underwater weighing**
A method for estimating the proportions of body fat and lean mass. By comparing weight underwater with weight on land, and taking account of the different densities of fat and lean tissue, the proportions of fat and lean can be calculated.

**UVA/UVB**
Ultraviolet light of different wavelengths. UVA has relatively long wave lengths, UVB relatively short.

**Visceral fat** (see intra-abdominal fat)

**Waist to hip circumference ratio (WHR)**
A measure of body shape indicating fat distribution.

**Weight cycling**
Repeated abnormal losses and regains of weight, often the result of repeated diet regimes.

**Whitemore and Jewett scales**
A scale used to describe the stage of prostate cancer.

**WHO**
World Health Organization (www.who.int).

**Wholegrain**
Cereal grain that retains the bran and germ as well as the endosperm, in contrast to refined grains that retain only the endosperm. All components of the grain are retained in their usual proportions, though the term ‘wholegrain’ may apply to products that include other constituents, so that the complete product comprises less than 100% wholegrain (see box 4.1.1).

**WHR** (see waist to hip circumference ratio)