



abalone A *shellfish (mollusc), *Haliotis* spp., also known as ormer, paua, or sea ear. A 100-g portion is a rich *source of protein and niacin; a source of iron and vitamin B₁; supplies 130kcal (550kJ).

abboccato Italian; medium sweet wines.

ABC protein ATP-binding cassette proteins; a family of cell membrane transport proteins that bind and hydrolyse ATP, linked to active uptake into, or efflux from, the cell of various compounds. *See also* TRANSPORT, ACTIVE.

abdug Iranian; drink made from *yoghurt with *soda water, and sometimes also vodka.

abetalipoproteinaemia Rare genetic disease involving failure of synthesis or assembly of plasma lipoproteins that contain apo-protein B (*chylomicrons, VLDL and LDL); characterized by severe *vitamin E deficiency, leading to serious neurological damage.

abiu The fruit of *Pouteria caimito*, with caramel flavoured, white translucent flesh. *See also* SAPOTE.

abocada Spanish; medium sweet wines.

absinthe A herb *liqueur flavoured with wormwood (*Artemisia absinthium*). Originally imported from Switzerland (where it was a patent medicine) to France in 1797 by Henri Louis Pernod; sale outlawed in USA in 1912, and in France and other countries in 1915, because of the toxicity of α -thujone. Now available in the EU with an upper limit of 10ppm thujone.

absolute alcohol Pure ethyl *alcohol.

AC Appellation contrôlée. *See* WINE CLASSIFICATION, FRANCE.

acarbose A group of complex *carbohydrates (oligosaccharides) which inhibit the *enzymes of *starch and *disaccharide digestion; used experimentally to reduce the digestion of starch. It has been marketed for use in weight-reducing diets as a 'starch blocker', with little evidence of efficacy.

acaricides Pesticides used to kill mites and ticks (family Acaridae) which cause animal diseases and the spoilage of flour and other foods in storage.

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ACAT Acyl CoA cholesterol acyl transferase, the *enzyme that catalyses esterification of *cholesterol by transfer of fatty acids from fatty acyl CoA. *See also* LCAT.

accelase A mixture of *enzymes that hydrolyse *proteins, used to shorten the maturation time of cheeses and intensify the flavour of processed cheese.

accelerated freeze drying *See* DRYING, FREEZE.

Acceptable Daily Intake (ADI) The amount of a food *additive that could be taken daily for an entire life-span without appreciable risk. Determined by measuring the highest dose of the substance that has no effect on experimental animals, then dividing by a safety factor of 100. Substances that are not given an ADI are regarded as having no adverse effect at any level of intake. *See also* NO EFFECT LEVEL.

accoub Mediterranean edible thistle *Goundelia tournefortii*. The cooked flower buds have a flavour resembling that of *asparagus or globe *artichoke; the shoots can be eaten in the same way as asparagus and the roots as *salsify.

accra Caribbean; heavy batter fritters with salt cod; also known as stamp-and-go, bacalaítos.

accuncciata Corsican; goat, lamb, or mutton stew with potatoes.

ACE Angiotensin converting enzyme, in the blood vessels of the lungs, which activates *angiotensin. Many of the drugs for treatment of *hypertension are ACE inhibitors.

acerola *See* CHERRY, WEST INDIAN.

acesulphames (acesulfames) A group of non-nutritive or intense *sweeteners. The potassium salt acesulphame-K is some 200 times as sweet as *sucrose. It is not metabolized, and is excreted unchanged.

acetanisole A synthetic flavouring agent (*p*-methoxyacetophenone) with a hawthorn-like odour.

acetic acid One of the simplest organic *acids, systematically ethanoic acid, CH₃COOH. The acid of *vinegar, it is formed, together with *lactic acid, in the fermentation of foods. *See* PICKLING.

acetoacetate One of the *ketone bodies formed in *fasting.

Acetobacter A genus of bacteria that oxidize ethyl *alcohol to *acetic acid, used in the manufacture of *vinegar. They also grow as a film on the surface of beer wort, pickle brine, and fruit juices, when they are commonly known as 'mother of vinegar'.

aceto dolce Italian; pickles eaten as an appetizer.

acetoin A precursor of the compound *diacetyl, one of the constituents of the flavour of *butter, produced by bacteria during ripening.

acetomel Sweet-sour syrup of vinegar and honey used to preserve fruit; also known as agrodolce.

acetomenaphthone Synthetic compound with *vitamin K activity; vitamin K₃, or menaquinone-0.

acetone One of the *ketone bodies formed in *fasting, dimethyl ketone (propan-2-one). It is formed by non-enzymic decarboxylation of acetoacetate and is poorly metabolized; detection of acetone in blood, urine, or breath may be clinically useful in cases of *diabetes, as a means of detecting ketosis. Also used as a solvent, e.g. in varnishes and lacquer.

acetylated monoglyceride An emulsifier manufactured by *interesterification of fats with glyceryl triacetate (triacetin) or by acetylation of monoacylglycerols with acetic anhydride. Characterized by sharp melting point and stability to oxidative rancidity.

acetylcholine The acetyl derivative of *choline, produced at cholinergic nerve endings both in the brain, where it acts as a chemical transmitter, and at the junctions between nerves and muscles, where it stimulates muscle contraction.

acetylene Hydrocarbon gas that acts as a plant growth regulator and can be used to control ripening of fruits; systematic name ethyne. *See also* CLIMACTERIC.

acha Alternative name for hungry rice. *See* RICE, HUNGERY.

achalasia Difficulty in swallowing due to disturbance of the normal muscle activity of the *oesophagus. Also known as cardiospasm.

achene Botanical term for small, dry, one-seeded fruit that does not open to liberate the seed, e.g. a nut.

ACH index Arm, chest, hip index. A method of assessing nutritional status by measuring the arm circumference, chest diameter, and hip width. *See also* ANTHROPOMETRY.

achira The edible canna, *Canna edulis*, related to the ornamental *C. indica*. The starchy rhizome is eaten as a vegetable in South America; it is grown in Vietnam to make transparent noodles, and in Australia as a commercial starch crop (Queensland arrowroot).

achlorhydria Failure to secrete hydrochloric acid in gastric juice. *See also* ANAEMIA; GASTRIC ACIDITY.

acholia (acholic) Absence or deficiency of *bile secretion.

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achromotricia Loss of hair colour. One of the signs of *pantothenic acid deficiency in animals, but there is no evidence that pantothenic acid affects hair colour in human beings.

acid Compounds that dissociate (ionize) in water to give rise to hydrogen ions (H^+); they taste sour. *See also* ALKALI; AMINO ACIDS; BUFFERS; ESTERS; FATTY ACIDS; ORGANIC ACIDS; pH; SALT.

acid, gastric The acid in the *gastric secretion is hydrochloric acid; *see also* ACHLORHYDRIA; GASTRIC ACIDITY.

acid drops Boiled sweets with sharp flavour from tartaric acid (originally called acidulated drops); known as sourballs in the USA.

acid foods (basic foods) These terms refer to the residue of the *metabolism of foods. The *mineral salts of *sodium, *potassium, *magnesium, and *calcium are base-forming, while *phosphorus, *sulphur, and *chlorine are acid-forming. Which of these predominates in foods determines whether the residue is acidic or basic (alkaline); meat, cheese, eggs, and cereals leave an acidic residue, while milk, vegetables, and some fruits leave a basic residue. Fats and sugars have no mineral content and so leave a neutral residue. Although fruits have an acid taste due to organic acids and their salts, the acids are completely oxidized and the sodium and potassium salts form an alkaline residue.

acidity *See* pH.

acidity regulators *See* BUFFERS.

acid number (acid value (of a fat)) A measure of *rancidity due to *hydrolysis, releasing free *fatty acids; it serves as an index of the efficiency of refining since the fatty acids are removed during refining and increase with deterioration during storage.

acidophilin *See* ACIDOPHILUS THERAPY; MILK, ACIDOPHILUS.

acidophilus therapy A treatment for *constipation based on the consumption of milk containing a high concentration of viable *Lactobacillus acidophilus*, although the milk itself is unfermented. The effect is believed to be due to the implantation of the organisms in the intestine. *See also* MILK, ACIDOPHILUS; PROBIOTICS.

acidosis An increase in the acidity of *blood plasma to below the normal range of *pH 7.35–7.45. Respiratory acidosis is due to impaired exhalation of carbon dioxide; metabolic acidosis is due to overproduction of acids. *See also* ALKALOSIS; KETOACIDOSIS; LACTIC ACIDOSIS.

acids, fruit *Organic acids such as citric, malic, tartaric, etc., which give the sharp or sour flavour to fruits; often added to processed foods for taste.

acidulants Organic acids used as flavouring agents, preservatives, chelating agents, buffers, gelling, and coagulating agents. Citric, fumaric, malic, and tartaric acids are general purpose acidulants, other acids have more specialist uses.

ackee (akee) The fruit of the Caribbean tree *Blighia sapida*. The fruit is toxic when unripe because it contains the toxin hypoglycin.

acne Inflammatory pustular skin eruption occurring around sebaceous glands, especially around the time of puberty. Not known to be caused or exacerbated by diet, although a low-fat diet is sometimes recommended. Severe persistent acne may be treated by topical application of synthetic *retinoids.

acorn Fruit of the oak tree (*Quercus* spp.), used both for animal feed and (especially in Spain) to make a flour for baking. Roasted acorns have been used as a coffee substitute. Used in Korea to produce an edible starch gel known as mook. *See also* SUGAR, ACORN.

ACP 1. Acid calcium phosphate; *see* PHOSPHATES. **2.** Acyl carrier protein, part of the fatty acid synthetase multi-enzyme complex.

acrodermatitis enteropathica Skin lesions associated with *zinc deficiency, due either to failure to absorb zinc (probably as a result of genetic defect of an intestinal transport protein) or to inadequate intake.

acrodynia Dermatitis seen in *vitamin B₆ deficient animals. There is no evidence for a similar dermatitis in deficient human beings.

acrolein (acraldehyde) An aldehyde formed when *glycerol is heated to a high temperature. It is responsible for the acrid odour and lachrymatory (tear-causing) vapour produced when fats are overheated.

ACTH *See* ADRENOCORTICOTROPIC HORMONE.

actin *See* MUSCLE.

actinidain (actinidin) Proteolytic *enzyme in *kiwi fruit with specificity similar to that of *papain.

activators Compounds that increase the activity of *enzymes.

actometer An instrument for measuring movement in three dimensions, so as to provide an indication of physical activity and hence energy expenditure.

acute phase proteins A variety of serum proteins synthesized in increased (or sometimes decreased) amounts in response to trauma and infection, so confounding their use as indices of nutritional status.

acyl CoA Fatty acid esterified to *coenzyme A by a thioester linkage.

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acylglycerol One or more fatty acids esterified to glycerol; hence monoacylglycerol (also known as monoglyceride), diacylglycerol (diglyceride), and triacylglycerol (triglyceride). Triacylglycerols are the major constituent of fats and oils; mono- and diacylglycerols are used as *emulsifying agents.

ADA American Dietetic Association, founded Cleveland, Ohio, 1917.



- ADA's homepage.

adaï Indian; pancakes made from ground rice and legumes; the dough is left to undergo lactic acid bacterial fermentation before frying.

adaptogens Name coined for the active ingredients of *ginseng and other herbs that are reputed to be anti-stress compounds.

additive Any compound not commonly regarded or used as a food, which is added to foods as an aid in manufacturing or processing, or to improve the keeping properties, flavour, colour, texture, appearance, or stability of the food, or as a convenience to the consumer. The term excludes *vitamins, *minerals, and other nutrients added to enrich or restore nutritional value. Herbs, spices, hops, salt, yeast, or protein hydrolysates, air, and water are usually excluded from this definition. Additives may be extracted from natural sources, may be synthesized in the laboratory to be chemically the same as the natural materials (and hence known as nature-identical), or may be synthetic compounds that do not occur in nature.

In most countries only additives from a permitted list of compounds that have been extensively tested for safety may legally be added to foods. The additives used must be declared on food labels, using either their chemical names or their numbers in the EU list of permitted additives (*E-numbers). See APPENDIX VIII.

See also ACCEPTABLE DAILY INTAKE.

adenine A *nucleotide, one of the purine bases of the *nucleic acids (DNA and RNA). The compound formed between adenine and *ribose is the nucleoside adenosine, and can form four phosphorylated derivatives important in metabolism: adenosine monophosphate (AMP, also known as adenylic acid); adenosine diphosphate (ADP); adenosine triphosphate (ATP); and cyclic adenosine monophosphate (cAMP). See also ATP; ENERGY METABOLISM.

adenosine See ADENINE.

adequate intake Where there is inadequate scientific evidence to establish requirements and *reference intakes for a nutrient for which deficiency is rarely, if ever, seen, the observed levels of intake are assumed to be greater than requirements, and thus provide an estimate of intakes that are (more than) adequate to meet needs.

ADHD Attention deficit hyperactivity disorder, a behavioural problem of children, sometimes associated with food intolerance. *See* FOOD, ADVERSE REACTIONS.

ADI *See* ACCEPTABLE DAILY INTAKE.

adipectomy Surgical removal of subcutaneous fat.

adipocyte A fat-containing cell in *adipose tissue.

adipocytokines (adipokines) *Cytokines secreted by *adipose tissue.

adiponectin A small protein, secreted by *adipocytes, that enhances insulin action, stimulates glucose and fatty acid metabolism, and increases energy expenditure by induction of *uncoupling proteins. Its secretion is inversely proportional to adipose tissue mass, so circulating levels are low in *obesity.

adiponutrin Intracellular *lipase in *adipose tissue; unlike *desnutrin, its activity increases on refeeding after a period of fasting, suggesting that its main role is in esterification to form triacylglycerol rather than lipolysis.

adipophilin One of the proteins that coats lipid droplets in *adipose tissue; in macrophages it increases storage of *triacylglycerol by stimulation of biosynthesis and inhibition of β -oxidation.) *See also* PERILIPIN.

adipose tissue Body fat—the cells that synthesize and store *fat, releasing it for *metabolism in *fasting. Also known as white adipose tissue, to distinguish it from the metabolically more active brown adipose tissue (*see* ADIPOSE TISSUE, BROWN). Much of the body fat reserve is subcutaneous; in addition there is essential (as opposed to storage) adipose tissue around the organs, which serves to protect them from physical damage. In lean people, 15–25% of body weight is adipose tissue, increasing with age; the proportion is greater in people who are *overweight or *obese. Adipose tissue contains 82–88% fat, 2–2.6% protein, and 10–14% water. The energy yield of adipose tissue is 34–38MJ (8000–9000kcal) per kg or 15–17MJ (3600–4000kcal) per pound.

adipose tissue, brown Metabolically highly active adipose tissue, which is involved in heat production to maintain body temperature, as opposed to white *adipose tissue, which is storage fat and has a low rate of metabolic activity. *See also* THERMOGENESIS.

adiposis Presence of an abnormally large accumulation of fat in the body—also known as liposis. *See also* OBESITY.

adiposity The proportion of fat in the body, and hence more useful as an indicator of *obesity than weight or *body mass index.

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adipostat Control of body *adiposity, and hence body weight, by signals from *adipose tissue to control appetite and energy expenditure (especially *leptin).

adipsia Absence of thirst.

adipsin A *protease secreted by adipose tissue, and also expressed in macrophages, that is involved in the activation of complement; secretion is reduced in *obesity.

adjunct culture Bacterial culture used in cheese and yoghurt making, together with the *starter culture, to produce a specific benefit, e.g. texture, flavour, or nutrient content.

adlay The seeds of a wild grass (Job's tears, *Coix lachryma-jobi*), botanically related to *maize, growing wild in parts of Africa and Asia and eaten especially in the south-east Pacific region.

ad libitum Feeding as much food as the subject or experimental animal will eat, as opposed to restricting intake, e.g. by *pair feeding.

adoucir French; to reduce the bitterness of food by prolonged cooking, or to dilute a dish with milk, stock, or water to make it less salty.

ADP Adenosine diphosphate. See ADENINE; ATP.

adrenaline Also known as epinephrine. A *hormone secreted by the medulla of the adrenal gland, especially in times of stress or in response to fright or shock, and in response to *hypoglycaemia. Its main actions are to increase blood pressure and to mobilize tissue reserves of *glycogen (leading to an increase in the blood glucose concentration) and fat, in preparation for flight or fighting. Derived from the *amino acid *tyrosine.

adsorbent Compounds used to adsorb, and hence remove, unwanted materials in foods and beverages that affect food safety or quality. See also ADSORPTION.

adsorption (adsorb) The binding of compounds to the surface of a solid.

adulteration The addition of substances to foods etc. in order to increase the bulk and reduce the cost, with intent to defraud the purchaser. Common adulterants are starch in spices, water in milk and beer, etc. The British Food and Drugs Act (1860) was the first legislation to prevent such practices.

advocaat Dutch; liqueur made from brandy and eggs.

aerobic **1.** Aerobic micro-organisms (aerobes) are those that require oxygen for growth; obligate aerobes cannot survive in the absence of oxygen. The opposite are anaerobic organisms, which do not require oxygen for growth; obligate anaerobes cannot survive in the presence of oxygen. **2.** Aerobic exercise is physical activity which requires an increase in heart rate and

respiration to meet the increased demand of muscle for oxygen, as contrasted with maximum exertion or sprinting, when muscle can metabolize anaerobically, producing *lactic acid, which is metabolized later, creating a need for increased respiration after the exercise has ceased (so-called oxygen debt).

Aeromonas hydrophila A food-borne pathogen associated with seafood, snails, and drinking water, causing diarrhoea, vomiting, mild fever, and abdominal cramps.

aerosporin See POLYMYXINS.

aeruginosin *Mycotoxin produced by *Microcystis aeruginosa*.

AFD Accelerated freeze drying; see DRYING, FREEZE.

aflata West African; part of a fermented dough that is boiled, then mixed with the remaining dough to make *akpiti or *kenkey.

aflatoxins A group of *mycotoxins produced by **Aspergillus* spp. (*A. flavus*, *A. parasiticus*, *A. nomius*, *A. ochraceoroseus*), which can grow on *peanuts and cereal grains when they are stored under damp and warm conditions. In addition to being acutely toxic, many, especially aflatoxin B₁, are potent *carcinogens. Fungal spoilage of foods with *A. flavus* is a common problem in many tropical areas, and aflatoxin is believed to be the cause of much primary liver cancer in parts of Africa. Aflatoxins can be secreted in milk, so there is strict control of the level in cattle feed.

aftertaste A flavour, often unpleasant, that lingers in the mouth after a food has been swallowed.

agalactia Failure of the mother to secrete enough milk to feed a suckling infant.

agar Dried extracts from various seaweeds, including *Gelidium* and *Gracilaria* spp.; a partially soluble *non-starch polysaccharide composed of *galactose units. It swells with water to form a *gel, and is used in soups, jellies, ice cream, and meat products. It is also used as the basis of bacteriological culture media, as an adhesive, for sizing silk, and as a stabilizer for emulsions. Also called agar-agar, Macassar gum, vegetable gelatine. Danish agar is *furcellaran.

agave nectar A bulk *sweetener from the blue agave (*Agave tequilana*). Mainly *fructose, 30% sweeter than *sucrose.

ageing **1.** As wines age, they develop bouquet and a smooth mellow flavour, associated with slow oxidation and the formation of *esters, as well as losing the harsh yeasty flavour of young wine. **2.** The ageing of meat by hanging in a cool place for several days results in softening of the muscle tissue, which stiffens after death (*rigor mortis). This stiffening is due to

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anaerobic metabolism leading to the formation of lactic acid when the blood flow ceases. **3.** Ageing of wheat flour for bread making is due to oxidation, either by storage for some weeks after milling or by chemical action. Freshly milled flour produces a weaker and less resilient dough, and hence a less 'bold' loaf, than flour which has been aged.

ageusia Loss or impairment of the sense of *taste.

agglomeration The process of producing a free-flowing, dust-free powder from substances such as dried milk powder and wheat flour, by moistening the powder with droplets of water and then redrying in a stream of air. The resulting agglomerates can readily be wetted.

agglutination The clumping together of cells, such as bacteria or red blood cells, due to cross-linking by proteins such as antibodies or *lectins found in *legumes. The basis of immunological techniques for detecting and identifying bacteria.

agglutinins *See* LECTINS.

agidi West African; thick gruel prepared by soaking maize, then grinding and leaving to undergo lactic acid bacterial fermentation before the paste (koko) is cooked.

aglycone The non-sugar moiety of a *glycoside.

agnolotti Italian; envelopes of *pasta, stuffed with minced meat, cheese, or vegetables, cut into a half-moon shape, unlike *ravioli, which are cut into squares.

agneshka chorba Bulgarian; whole spring lamb stuffed with rice, offal, and raisins, then roasted. A traditional Easter dish.

AGORA Access to Global Online Research in Agriculture.



- AGORA's homepage.

agouti mouse A genetically obese mouse; the agouti gene is normally expressed only in hair follicles, and only during hair growth, when it antagonizes melanocortin receptors. In the obese yellow mutant the gene is expressed in all tissues, and at all times; it antagonizes the melanocortin receptors in the hypothalamus that normally inhibit feeding. Expression of the agouti gene is variable, depending on maternal nutrition; this is an *epigenetic event, linked to failure of methylation of *CpG islands in *DNA.

Agrobacterium tumefaciens A bacterium that transforms plant cells into tumorous crown galls by introducing bacterial *DNA into the host cell. Widely exploited as a means of creating transgenic plants. *See also* GENETIC MODIFICATION.