Dictionary of Nutrition and Food Technology

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Third Edition

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FOREWORD

With the number of disciplines involved in the study of food it is difficult to decide which terms should be included in a dictionary such as this. Second thoughts have given rise to a second edition which includes many more terms, both by extending the coverage and adding newly-devised terms. In addition many definitions have been revised and lengthened to provide more useful information.

FOREWORD TO THIRD EDITION

Further thought together with criticism and suggestions from readers of previous editions have led to revision of some of the entries. In addition there are several newer trade names that have passed into common usage that have therefore been included in this dictionary.

INTRODUCTION

Workers in many different fields have a professional interest in food, apart from their immediate personal interests. Medical practitioners, public health workers, home economists, teachers, chemists and chemical engineers, all, from time to time, step into the food field. The study of food covers a wide range embracing many disciplines, from cooking and chemistry to physics and pharmacology, and a specialist in one subject might be unfamiliar with some of the terms used in another. Hence this dictionary. It is a compilation of many of the terms commonly met with in discussions of the numerous facets of food.

It is hoped that when the domestic scientist wonders at the significance of butylated hydroxyanisole, and when the chemical engineer seeks an explanation of the term ATP so familiarly used by the biochemist, and the doctor boggles at a riffle flume, they will each be enlightened by this book. The publishers would be happy to learn of any sins of omission that would, if rectified, help to fulfil the declared aim.

As an additional aid to those without library facilities at hand, many of the entries include a reference to a publication where the full detailed information may be found; the following is the code to the references:—

Abrams	*Linton's Animal Nutrition and Veterinary Dietetics*, J. T. Abrams. Edinburgh: W. Green & Son Ltd.
AEB	*Dietetic Foods*, A. E. Bender. London: Leonard Hill Books.
Ayl	*Food Technology, Processing and Laboratory Control*, F. Aylward. London: George Newnes Ltd.
Bailey	*Industrial Oil and Fat Products*, A. E. Bailey. New York: Interscience Publishers Inc.
B & R	*The Nation's Food*, A. L. Bacharach and T. Rendle. London: Society of Chemical Industry.
Baum	*Canned Foods, an introduction to their microbiology*, J. G. Baumgartner. London: J. & A. Churchill Ltd.
BDS	*Textbook of Physiology and Biochemistry*, G. H. Bell, J. N. Davidson and H. Scarborough. London: E. & S. Livingstone Ltd.

Bell	*Bell's Sale of Food and Drugs*, J. A. O'Keefe. London: Butterworth & Co. (Publishers) Ltd.
Brav	*Citrus Products*, J. B. S. Braverman. New York: Interscience Publishers Inc.
Clark	*Clark's Applied Pharmacology*, revised by A. Wilson and H. O. Schild. London: J. & A. Churchill Ltd.
Cohen	*Theoretical Organic Chemistry*, Julius B. Cohen. London: Macmillan & Co. Ltd.
Cruess	*The Principles and Practice of Wine Making*, W. V. Cruess. New York: The Avi Publishing Co. Ltd.
Davis	*A Dictionary of Dairying*, J. G. Davis. London: Leonard Hill Ltd.
Davis & Mac	*Richmond's Dairy Chemistry* revised by J. G. Davis and F. J. Macdonald. London: Charles Griffin & Co. Ltd.
DP	*Human Nutrition and Dietetics*, Sir Stanley Davidson and R. Passmore. Edinburgh: E. & S. Livingstone Ltd.
FAO	*Food Composition Tables—Minerals and Vitamins*, Food and Agriculture Organisation, United Nations.
FB	*Value of Food*, Patty Fisher and Arnold E. Bender. London: Oxford University Press.
GH	*Good Housekeeping's Home Encyclopaedia.*
Gil	*Mineral Nutrition and the Balance of Life*, F. A. Gilbert. University of Oklahoma Press.
GMW	*Trace Elements in Food*, G. W. Monier-Williams. London: Chapman & Hall.
Griswold	*The Experimental Study of Foods*, Ruth M. Griswold. Boston: Houghton, Mifflin Co.
Hawk	*Practical Physiological Chemistry*, B. L. Oser. London: J. & A. Churchill Ltd.
Hilditch	*Industrial Fats and Waxes*, T. P. Hilditch. London: Baillière, Tindall & Cox.
Hutch	*Hutchinson's Food and the Principles of Dietetics*, revised by V. H. Mottram and G. Graham. London: Edward Arnold (Publishers) Ltd.
Jacobs	*Food and Food Products*, M. B. Jacobs. New York: Interscience Publishers Inc.
Johnson	*Laboratory Manual in Cookery*. Doris B. Johnson. London: Putnam.

KJ	*Modern Cereal Chemistry*, D. W. Kent Jones and A. J. Amos. Liverpool: The Northern Publishing Co. Ltd.
Loes	*Outlines of Food Technology*, H. W. von Loesecke. New York: Reinhold Publishing Corp.
M & W	*Chemical Composition of Foods*, R. A. McCance and E. M. Widdowson. M.R.C. Special Report Series No. 297. London: H.M.S.O.
Matz	*Food Texture*, S. A. Matz. Westport: The Avi Publishing Co. Inc.
Matz 2	*The Chemistry and Technology of Cereals as Food and Feed*, S. A. Matz. Westport: The Avi Publishing Co. Inc.
Meat	*The Science of Meat and Meat Products*, American Meat Institute Foundation. San Francisco & London: W. M. Freeman & Co.
Merory	*Food Flavorings, Composition, Manufacture and Use*, J. Merory. Westport: The Avi Publishing Co. Inc.
Platt	*Tables of Representative Values of Foods Commonly used in Tropical Countries*, B. S. Platt. Medical Research Council Special Report, Series No. 302, 1962.
RJC	*Process Engineering in the Food Industries*, R. J. Clarke. London: Heywood & Company Ltd.
Sebrell	*The Vitamins*, W. H. Sebrell, Jr. and R. S. Harris. New York: Academic Press Inc.
Tanner	*The Microbiology of Foods*, F. W. Tanner. Illinois: Garrard Press.
TND	*Tropical Nutrition and Dietetics*, L. Nicholls, H. M. Sinclair, and D. B. Jelliffe. London: Baillière, Tindall & Cox.
Tressler	*Marine Products of Commerce*, D. K. Tressler and J. McW. Lemon. New York: Reinhold Publishing Corp.
WHSS	*Principles of Biochemistry*, A. White, P. Handler, E. L. Smith, D. Stetten. New York: McGraw-Hill Book Co. Inc.

Abalone. A shellfish, gastropod mollusc of the genus *Haliotis*; found in the water round Japan, California, Channel Islands and France.

Also called Ormer.

Abbé Refractometer. *See* Refractometer.

Abernethy. Hard biscuit flavoured with carraway seed.

Abomasum. *See* Rumen.

Absinthe. Green liqueur prepared from oils of wormwood, angelica, anise and marjoram. It is toxic and the manufacture has been banned in many countries. The toxic principle is oil of thujol, which is cumulative, and is a cerebral convulsant. (Clark.)

Absorptiometer. Instrument used to measure the absorption of light, and therefore used as a quantitative measure of coloured solutions. Frequently (incorrectly) called colorimeters. Many substances, minerals, vitamins, amino acids, will react with a particular reagent to form a coloured complex. The colour developed is proportional to the amount present and is measured in an absorptiometer or a true colorimeter. (Hawk.)

Acaricide. Chemical that kills acarids, i.e. ticks and mites, e.g. tetraethylpyrophosphate.

Accelerated Freeze-drying. A method of drying by first freezing, then applying a high vacuum; the ice sublimes off and the substance dries without thawing. The process is accelerated by applying heat from plates above and below the frozen substance and in this respect differs from ordinary freeze-drying.

When the process is applied to foods the minimum structural and flavour damage are caused.

Ac'cent. Trade name (International Mineral & Chemical Corpn., U.S.A.) for mono sodium glutamate.

Acerola. West Indian Cherry, *see* Cherry, West Indian.

Acetate. Salt of acetic acid, *which see.*

Acetate, Active. The form in which the acetyl radical CH_3CO-, is transferred from one compound to another, as the acetyl-Coenzyme A complex (*see* Coenzyme A).

The metabolism both of glucose and of fats involves the formation of active acetate. (WHSS.)

Acetate Replacement Factor. *See* Lipoic acid.

Acetic Acid. One of the simplest of the organic acids,—formula CH_3COOH. (Cohen.)

Acetobacter. Genus of bacteria of family *Acetobacteriaceae*, which oxidizes alcohol to acetic acid. *Acetobacter pasteurianus* (also known as *Mycoderma aceti* and *Bacterium aceti* or *pasteurianum*) is one of this type and is used in the manufacture of vinegar. Also grow in film on beer wort, pickle brine and fruit juices. *See also* Vinegar. (Tanner.)

Aceto-glycerides. Differ from the triglycerides in that either one or two of the long chain fatty acids attached to the glycerol molecule are replaced by acetic acid. There are three types, diaceto-triglycerides (e.g. diaceto-monostearin),

monoaceto-triglycerides (e.g. monoaceto-distearin) and monoaceto-diglycerides (e.g. monoaceto-monostearin) in which one hydroxyl group of the glycerol is free.

Also known as "partial glyceride esters."

They are non-greasy and have lower melting points than the corresponding triglycerides and are used in shortenings and spreads, as films for coating foods, and as plasticisers for hard fats.

Acetoin. Acetyl methyl carbinol, $CH_3.CO.CHOH.CH_3$, precursor of diacetyl, the butter flavour. Produced by bacteria during butter ripening and by yeast during fermentation.

Acetone Bodies. *See* Ketone bodies.

Acetylcholine. Acetyl derivative of choline (*which see*) which is liberated at certain nerve endings (cholinergic nerves) to stimulate the muscle. (BDS.)

ACH Index. Arm, chest, hip index. The arm girth, chest diameter and hip width used as a method of assessing the state of nutrition. (DP.)

Achlorhydria. Deficiency of hydrochloric acid in the gastric secretion.

Achrodextrin. A product formed during the enzymic breakdown of starch to maltose; it is a dextrin that gives no colour with iodine (hence achro).

Achromotrichia. Loss of hair pigment. *See* Para-amino benzoic acid *and* Pantothenic acid.

Acid-base Balance. Body fluids are maintained just on the alkaline side of neutrality, pH 7·3 to 7·45, by buffers in the blood and tissues. Buffers include proteins, and sodium and potassium phosphate and bi-carbonate.

Acidic products of the body's metabolism are excreted in the urine in combination with bases such as sodium and potassium. These bases are thereby lost to the body and the acid-base balance is maintained by replacing them from the diet.

Buffer materials in the blood and tissues are termed the alkaline reserve. (BDS.)

Acid Calcium Phosphate. *See* Calcium acid phosphate.

Acid Foods and Basic Foods. Minerals sodium, potassium, magnesium and calcium are base-forming, and phosphorus, sulphur and chlorine are acid-forming. Which of these predominates in the food determines whether the food itself leaves an acid or alkaline residue. An acid residue is left by meat, fish, eggs, cheese, cereals. An alkaline residue is left by milk, vegetables, some fruits. Fats and sugars are neutral as they contain no minerals at all.

Acid-tasting citrus fruits are actually alkali formers, as, although they contain a mixture of citric acid and sodium citrate, the citric acid and the citrate radical are oxidized to carbon dioxide and water, and the sodium remains as the alkaline residue. *See also* Acid-base balance. (Hutch.)

Acid Number. With reference to fats is a measure of hydrolytic rancidity. Defined as milligrams of caustic potash required to neutralise the free fatty acids in 1 g of the fat.

The acid number, also known as the **acid value,** is an index of the efficiency of refining, during which process the free fatty acids are removed and the acid number

falls to very low values; it is also an index of the deterioration in storage. (Bailey.)

Acidophilus Therapy. The consumption of milk containing a high concentration of viable *Lactobacillus acidophilus* (the milk itself being unfermented) as a treatment for constipation. The effect is said to be due to the implantation of these organisms in the intestine. (Tanner.)

Acidosis. Increase in the ratio of acid to base in the blood plasma, or a reduction in its buffering power. Causes may be alteration in carbon dioxide excretion, metabolic overproduction of acid or excessive loss of base. *See also* Acid-base balance. (BDS.)

Acid Rebound. Term used in reference to the secretion of gastric acid to signify the increase in acidity of the stomach that results from the administration of alkalies. There is conflicting evidence as to whether this really occurs.

Acid value. *See* Acid Number.

Aconitase. Enzyme that catalyses the interconversion of citric cis-aconite and isocitric acids. The reaction is in equilibrium and any one of these acids results in a mixture of all three when aconitase is present. It is involved in the Krebs tricarboxylic acid cycle. (WHSS.)

Aconitine. Toxic alkaloid of Monkshood (*Aconitum*), slows the pulse and reduces blood pressure, fatal in small doses.

Acorn Sugar. Quercitol, extracted from acorns; pentahydroxycyclohexane.

A.C.P. Acid calcium phosphate. *See* Calcium acid phosphate.

Acraldehyde. *See* Acrolein.

Acrodynia. A specific type of dermatitis seen on diets deficient in vitamin B_6. (WHSS.)

Acrolein. Acraldehyde, CH_2: CHCHO. Formed when glycerol is heated to a high temperature, and is responsible for the acrid odour and lachrymatory vapour produced when fats are overheated. (Cohen.)

Acronize. Trade name (Cyanamide Co., U.S.A.) for the antibiotic chlortetracycline (used, for example, as "acronized ice").

ACTH. Abbreviation for adrenocorticotropic hormone, *which see.*

Actin. One of the proteins of muscle, about 13% of total, combines with myosin to form the contractile protein, actomyosin.

Activators. With reference to enzymes, substances that increase the activity of the enzyme in a non-specific manner. Those substances that are part of the activating system, and are required before the enzyme can activate its substrate, are activators. Substances that are part of the reaction system but play no part in the activation of the substrate are coenzymes. Many inorganic radicals are activators; thus salivary amylase requires the presence of chloride; others are potassium, calcium, magnesium, phosphate. (WHSS.)

Active Oxygen Method. A method of measuring the stability of fats and oils by bubbling air through the heated material and following the formation of peroxides.

Also known as the Swift Stability Test.

Actomyosin. The contractile protein of muscle formed from actin plus myosin. It also appears

to be identical with the enzyme that catalyses the decomposition of adenosine triphosphate ("ATP-ase") and liberate its energy. This procedure provides the energy for the work of the muscle. (WHSS.)

Addison's Disease. Destruction of the cortex of the suprarenal glands; symptoms are low blood pressure, anaemia, muscular weakness, fall in metabolic rate. Treatment partly successful by taking sodium chloride, or by implantation of pellets of deoxycorticosterone acetate. (BDS.)

Additives. Include all materials deliberately added to food to help manufacture and preserve food, improve palatability and eye-appeal; such as emulsifiers, flavours, thickeners, curing agents, humectants, colours, vitamins, minerals, and mould, yeast and bacterial inhibitors. Most of these are controlled by law in all countries.

Additives, Baking. *See* Baking additives.

Adenine. *See* Purines *and* Nucleic acids.

Adenosine. Combination of the base, adenine, with the sugar, ribose. Of special importance, as adenosine triphosphate plays a central part in the energy release in muscle.

See also Adenosine diphosphate, Adenosine triphosphate, Phosphate bond, energy-rich *and* Phosphokinase. (WHSS.)

Adenosine Diphosphate (or ADP). Adenine + ribose + phosphate + phosphate. Involved in energy exchange in muscle metabolism as the addition and subtraction of the third phosphate (to form adenosine triphosphate) is the means of trapping and releasing energy respectively.

See also Adenosine triphosphate, Phosphate bond, energy-rich *and* Phosphokinase. (WHSS.)

Adenosine Monophosphate. *See* Adenylic acid.

Adenosine Triphosphate (ATP or adenyl pyrophosphate). A compound of central importance in the liberation of energy from foodstuffs, consisting of adenine linked to ribose and three phosphate molecules. The last two phosphates are linked by what is called "the energy-rich phosphate bonds". On hydrolysis they liberate energy for muscular work, etc. The energy obtained by the oxidation of carbohydrates, fats and amino acids is trapped as ATP. *See* Phosphate bond, energy-rich *and* Phosphokinase. (WHSS.)

Adenylic Acid. Combination of the base, adenine, with the sugar, ribose, and phosphoric acid. Also known as adenosine monophosphate or AMP; of importance in muscle metabolism. (BDS.)

Adenyl Pyrophosphate. *See* Adenosine triphosphate.

Adermin. *See* Vitamin B_6.

Adipose Tissue. Groups of cells that store and mobilize fat; constitutes a fifth to a quarter of the total body mass—more in fat people. Composed of 82–88% fat, 2–2·6% protein and 10–14% water and contains 8–9 kcal per gram or 3,600–4,000 per lb. (DP.)

Adlay. A tall grass that grows wild in parts of Asia and Africa. Latin name *Coix lachryma-jobi*,—Job's tears. Used as a cereal to eke out rice supplies in parts of India, China, Siam and Philippines.

Belongs to the same tribe (*Tripsaceae*) as maize.

Protein 14%, fat 4%; Calories 363, Ca 20 mg, Fe 4 mg, vitamin B_1 0·3 mg, B_2 0·2 mg, nicotinic acid 3 mg,—per 100 g (TND, Platt.)

ADP. *See* Adenosine diphosphate.

Adrenal Glands. Also called suprarenal glands; situated just above each kidney. Comprise the inner part, or medulla, which secretes adrenaline and noradrenaline (*which see*), and the outer cortex, which secretes steroid hormones.

Steroid hormones include steroid sex hormones, corticosterone (affects carbohydrate metabolism and is anti-inflammatory) and aldosterone (controls excretion of salt and water through the kidneys.) (BDS.)

Adrenaline. Hormone secreted by the medulla of the adrenal glands; the first hormone to be discovered. It is secreted under conditions of emotional stress and causes an increase in blood pressure, blood sugar levels and metabolic rate, thus mobilising the body's reserves of energy.

Also known as epinephrine, chemically hydroxy, dihydroxyphenyl-ethylmethylamine. (BDS).

Adrenocorticotropic Hormone. Hormone extracted from the anterior part of the pituitary gland of animals and used in the treatment of rheumatoid arthritis. Acts by stimulating the adrenal gland to secrete corticosteroids.

Aequum. Amount of food necessary to maintain body weight under normal or specified conditions of activity.

Aerobes. Micro-organisms that need oxygen for growth. Obligate aerobes cannot survive in the absence of oxygen. (Tanner.)

Aesculin. A glycoside (dihydroxycoumarin glycoside) found in chestnuts, with "vitamin P" activity. (WHSS.)

A.F.D. See Accelerated Freeze-drying. Used in the context "A.F.D. foods".

Agar. Dried, purified stems of a seaweed, *Gelidium algae*, *Gracilaria* and other genera. Partly soluble and swells with water to form a gel. It has a wide temperature range between gelling and melting points.

Used in soups, jellies, ice-cream, meat and fish pastes, in bacteriological media, for sizing silk, as adhesive and as a stabiliser for emulsions. Also called agar-agar, Macassar gum and vegetable gelatine. (Jacobs.)

Agar is a galactan, i.e. a complex of galactose units but it is not digested by man.

Agene. *See* Aging.

Ageusia. Lack or impairment of sensitivity to taste stimuli.

Aging. (1) Term applied to treatment of flour with oxidising agents, i.e. aging agents.

When freshly milled flour is stored for several weeks it undergoes an aging effect and produces a stronger and more resilient dough and a bolder loaf, and the flour slowly bleaches. Chemical agents can produce these effects immediately.

Oxidising agents, such as ammonium persulphate (used at 160 ppm) and potassium bromate (20 ppm), are "improvers" but do not bleach. Nitrogen peroxide (5 ppm) and benzoyl peroxide (Novadelox, 20–40 ppm) bleach but do not "improve". Nitrogen

trichloride (agene) (60 ppm) and chlorine dioxide (Dyox, 30 ppm) bleach and "improve".

The Bread and Flour Report 1960 recommends the use of only one bleaching agent, benzoyl peroxide at not more than 50 ppm. No specific limit is set on maturing agents such as ascorbic acid, potassium bromate, ammonium and potassium persulphate, chlorine dioxide, chlorine (cake flour only) sulphur dioxide (brown flour only). (KJ.)

(2) In reference to wine "aging" refers to the development of bouquet and smooth mellow flavour, and disappearance of harsh and yeasty taste—due to slow oxidation and formation of esters.

With reference to meat see Rigor mortis. (Cruess.)

Aginomoto. *See* Glutamate, sodium.

Aglycon. The non-sugar part of a glycoside.

Agnelloto. Envelope of pasta stuffed with minced meat or vegetables; cut in half-moon shape, so differing from ravioli, which is cut in squares.

A/G Ratio. *See* Albumin/Globulin ratio.

Ala. Bulgur, *which see.*

Alanine. A non-essential amino acid, amino propionic acid. The alpha amino acid is found in all proteins; there is also beta-alanine (the amino group attached to the second carbon atom) which is part of the molecule of pantothenic acid, of carnosine and of anserine. (BDS.)

Albedo. White pith of the inner peel of citrus fruits, also known as the mesocarp; 20–60% of the whole fruit. Consists of sugars, cellulose and pectins; used as a source of pectin for commercial manufacture. (Brav.)

Albumen. *Oxford Dictionary* spelling of albumin.

Albumin. Often used as a non-specific name for protein, strictly should refer to one of the albumins, *which see. See also* Egg white, Lactalbumin, *and* Albumin/Globulin ratio.

Albumin/Globulin Ratio. Ratio of the blood albumin to the globulins; in normal human serum 1·82. Change in the A/G ratio is of diagnostic value.

Albumin Index. A measure of the quality of an egg; the ratio of height of the albumin to the width when broken on to a flat surface. As the egg deteriorates the albumin index decreases, i.e. the egg white spreads. (Griswold.)

Albumin milk. *See* Protein milk.

Albuminoids (or scleroproteins). Fibrous proteins that have supporting or protective function in the animal (in plants cellulose fulfils this function). Three types: (1) collagens in skin, tendons and bones, resistant to pepsin and trypsin, converted to water-soluble gelatin by boiling with water; (2) elastins in tendons and arteries, not converted to gelatin; (3) keratins, proteins insoluble in dilute acids and alkalies, not attacked by any animal digestive enzymes, comprise horns, hoofs, feathers, scales, nails. (Hawk.)

Albumins. Simple proteins (i.e. free from other subtances) soluble in water and coagulated by heat, e.g. ovalbumin in egg-white, serum albumin in blood serum, lactalbumin in milk.

The name albumin is often used for any protein, e.g. albuminuria is the presence of protein in the urine, and although this protein is often largely serum albumin it is not necessarily so. (Hawk.)

Albumoses. Old name for proteoses, *which see.*

Alcaptonuria. A rare inborn error of metabolism of the two amino acids phenylalanine and tyrosine. Their metabolism ceases at homogentisic acid, which is excreted in the urine. Homogentisic acid oxidizes to black melanoid pigments, hence the urine of aloaptonurics slowly turns black. The defect appears to be harmless. (BDS.)

Alcohol. The name without further description refers to ethyl alcohol, chemical formula C_2H_5OH. This is the second member of a series of alcohols of the general formula $C_nH_{2n}OH$, the first member being methyl alcohol CH_3OH, and rising to long molecules such as cetyl alcohol, *which see.*

Alcohol is produced by yeast fermentation of carbohydrates and is the basis of a large number of beverages. It has an energy value of 7 kcal per gram; the quantity of alcohol contained in various drinks is shown under Alcoholic Beverages. (Cohen.)

Alcohol, denatured. Alcohol to which unpleasant materials have been added to prevent it being drunk, e.g. methylated spirits contains 10% methyl alcohol, a blue dye and unpleasant-smelling pyridine. Denatured alcohol is used for industrial purposes and not subject to Excise Duty.

Alcoholic Beverages. Yeast fermentation of sugar or starchy materials yields a solution of approximately 15% alcohol, (wine) at which strength the alcohol kills off the yeast. If sweet wines are wanted the fermentation is stopped at an earlier stage when there is still some sugar left. If stronger wines are required, such as port, they are fortified by the addition of brandy.

The strong spirits are made by distilling the alcohol from wine.

Alcohol content (per cent by volume):—spirits—gin, whisky, brandy, rum—25 under proof, 43% alcohol; 35 under proof, 37%. Wines,—port, sherry, madeira 20%; burgundy, 14%; champagne, claret, hock, 10%; cider, 4·3%; ale 3·1 to 6·6%; stout, 3·9 to 5·3%; porter 4·0%. Liqueurs; curacao, 55%; benedictine, 52%; absinthe, 59%; anisette, 42%; chartreuse, 43%; kummel, 34%. *See also* Proof spirit. (Hutch.)

Aldehyde. One of a large class of organic substances derived from primary alcohols by oxidation, and containing the grouping —CHO. E.g. formaldehyde, acetaldehyde, benzaldehyde. (Cohen.)

Aldosterone. Hormone secreted by the adrenal cortex which controls the excretion of salt and water through the kidneys. (BDS.)

Ale. *See* Beer.

Aleurone Layer. Single layer of large cells under the bran coat and outside the endosperm of cereal grains; about 3% by weight of the grain, rich in protein. Botanically is part of the endosperm but during milling remains attached to the inner layer of bran.

Contains about 20% of the thiamine, 30% of the riboflavine and 50% of the nicotinic acid of the grain. (KJ.)

Alewives. River herrings, mostly used for canning after salting. (Tressler.)

Algae. The interest in algae from the food point of view lies mainly in the potential large-scale cultivation of the organism *Chlorella*. If sufficient heat, light, mineral salts and carbon dioxide are provided, these organisms will multiply at a rapid rate and serve as a large-scale source of fat, protein and carbohydrate.

Seaweeds such as Irish Moss and Dulse, which are algae, have long been eaten in various countries. *See also* Seaweed.

Alginates. Salts of alginic acid found as the free acid and calcium salt in many seaweeds. Alginic acid is a polysaccharide complex built from mannuronic acid units.

Salts such as iron, magnesium and ammonium alginates form viscous solutions and can hold large amounts of water and so are useful as thickeners, stabilisers and gelling, binding and emulsifying agents in ice-cream, synthetic cream, artificial cherries.

The propyl glycol ester is used under the trade name of "mannucol ester". (Tressler.)

Alginic Acid. *See* Alginates.

Alimentary Canal. The digestive tract, comprising, in man, mouth, oesophagus, stomach, duodenum, small and large intestine. (BDS.)

Alimentary Pastes. Shaped dried doughs made from semolina or wheat flour with water, and sometimes egg and milk. The dough is partly dried in hot air, then more slowly.

Macaroni — tubular-shaped, about $\frac{1}{4}$ inch diameter; at $\frac{1}{8}$ inch it is called fovantini or maccaroncelli; at $\frac{1}{2}$ inch, zitoni.

Spaghetti is solid rod about $\frac{1}{32}$ inch diameter; vermicelli is a third of this thickness.

Noodles are shaped into sheets or ribbons.

Farfals are ground, granulated or shredded. *See* Macaroni, Spaghetti *and* Noodles. (Loes, Matz 2.)

Aliment de Sevrage. Protein-rich baby food, 20% protein. Algerian version made from wheat, chick peas, lentils, skim milk powder and sugar with added vitamin D.

Senegal version made from millet flour, peanut flour, skim milk powder and sugar with vitamins A and D and calcium.

Aliphatic. Name given to those organic chemicals that have open-chain structure in distinction to the alicyclic compounds, which contain rings of carbon compounds. (Cohen.)

Alkali Formers. *See* Acid Foods and Basic Foods.

Alkaline Reserve. *See* Acid-base balance.

Alkaloids. Group of organic compounds containing nitrogen, occurring in plants and having powerful effects on animals. Many drugs and poisons are alkaloids, such as strychnine, codeine, morphine, atropine, nicotine, quinine. (Cohen.)

Alkalosis. Decrease in the acid–base ratio in the blood plasma, or an increase in its buffering power. Causes may be excessive loss of carbon dioxide, excessive intake of base as in antacid drugs, loss of gastric secretion by vomiting, high intake of sodium or potassium salts of weak organic acids. *See also* Acid-base balance. (BDS.)

Alkannet (Alkanet, Alkannin, Alkanna). Colouring obtained from root of *Anchusa tinctoria* (*Al-*

kanna tinctoria); legally permitted in food in most countries; colouring principle is alkannin. Insoluble in water but soluble in alcohol and ether. Blue in alkalies, blue with lead, crimson with tin, violet with iron. Used for colouring fats, cheese, essences (and inferior port wine). Also known as orcanella. (Jacobs.)

All-Bran. Trade name (Kellogg's Ltd.) for a breakfast cereal high in bran content, claimed as a laxative.

Protein 12·6%, fat 4·5%, carbohydrate 58%; Ca 82 mg, Fe 10·8 mg, Calories 311—per 100 g.

Phytic acid phosphorus 76% of total P (815 mg/100 g). (M&W.)

Allantoin. Excretion product of purines in most mammals except man and the anthropoid apes (where it is uric acid). Other mammals possess the enzyme uricase which converts uric acid to allantoin, but this enzyme is lacking in man. (BDS.)

Allergen. *See* Allergy.

Allergy. An altered or abnormal tissue reaction which may be caused by contact between a foreign protein, the allergen, and sensitive body tissues.

Food allergies are more common in infants and the usual causes are eggs, milk and wheat, together with fish and various fruits. The reactions may include nettle-rash, hay fever, asthma, and dyspepsia. (DP.)

Allicin. Sulphur compound responsible for the flavour of garlic. (Griswold.)

Alligator Pears. *See* Avocados.

Allinson Bread. A whole wheat bread named after Allinson who advocated its use in England at the end of the nineteenth century, as did Graham in the United States (thus Graham bread).

Allolactose. A sugar, which may be a modification of lactose, which, together with **gynolactose,** has been claimed to be found in human milk. (Davis & Mac.)

Allotriophagy. Unnatural desire for foods, alternative words cissa, cittosis and pica.

Alloxan. Pyrimidine derivative that can induce diabetes when given orally or by injection, by damaging the Islets of Langerhans (that part of the pancreas which secretes insulin). (BDS.)

Alloxan Diabetes. Experimental diabetes caused by alloxan.

Alloxazine. Three-ring structure, the central part of riboflavine. The latter is dimethyl ribityl isoalloxazine. (BDS.)

Allspice. (Or Jamaica pepper.) Dried fruits of the evergreen *Pimenta officinalis,* also known as pimento or Jamaican pepper (differs from pimiento). The name allspice derives from the volatile oil, which has an aroma similar to a mixture of cloves, cinnamon and nutmeg. Used to flavour meat products. (Jacobs.)

Almond, Sweet. Ripe seeds of *Prunus amygdalus* var. *dulcis;* yields sweet almond oil.

Almond Oil, Bitter. Essential oil from seeds of almond tree (*Prunus amygdalus*) or apricot tree (*Prunus armeniaca*); mostly manufactured from the apricot. Contains 95% benzaldehyde, with hydrocyanic acid and benzaldehyde cyanhydrin. When freed from hydrocyanic acid is used as flavour, in perfumes and in cosmetics.

Aloe. Dried juice of leaves of *Aloe perryi*; used in medicine. Contains a glycoside, aloe-emodin or rhabarberone, aloe oil, and aloin or barbaloin.

Alpha-Laval Centrifuge. Continuous bowl centrifuge for separating liquids of different densities for clarifying. Widely used for cream separation.

Aluminium. One of the most abundant elements in Nature, as it occurs in rocks and clay. It is found in animal and plant tissues in traces but has not been shown to be essential to either.

There is a popular misconception that aluminium cooking vessels are in some way harmful but the fact that relatively large doses of aluminium hydroxide are often consumed as an antidote to gastric hyperacidity demonstrates the harmlessness of aluminium.

"Alum" baking powders, in which sodium aluminium sulphate was the acid constituent, used to be used. (GMW.)

"Silver" beads used to decorate confectionery may be coated either with silver foil or an aluminium copper alloy.

Alveograph. Measures stretching quality of dough as index of protein quality for baking. A standard disc of dough is blown into a bubble and the pressure curve and bursting pressure measured; gives the stability, extensibility and strength. (Ayl.)

Amama. Trade name (Glaxo Laboratories) for a protein-rich baby food based on casein (1 part) and groundnut flour (10 parts).

Amaranth. Burgundy red colour, fast to light; trisodium salt of 1-(4-sulpho-1-naphthylazo)-2-naphthol-3:6-disulphonic acid.

Permitted food colour in most countries but not West Germany.

Ambergris. Morbid concretion obtained from the intestine of the sperm whale. Contains cholesterol, ambrein, benzoic acid. Appears as a mottled or striped grey-brown or black wax. Used in drugs and perfume. (Tressler.)

Amberlite. Group of polystyrene resins used to absorb specific radicals from solutions. The sulphonic acid derivative, strongly acidic (IR 120), and the carboxylic acid, weakly acidic (IRC 150), are used for cation exchange; basic types used for anion exchange (IR 4B, IR 45, IRA 400). Used for water softening, metal recovery, purification of chemicals, chemical analysis, particularly amino acids. *See also* Ion-exchange resins.

Amino Acid. Characterized by an amino group and an acid group attached to the same carbon atom. Proteins are made of combinations of large numbers of amino acids of twenty different kinds.

Eight of these amino acids must be provided in the diet, i.e. the essential amino acids—namely, lysine, methionine, valine, tryptophan, threonine, leucine, isoleucine and phenylalanine. Possibly arginine and histidine are essential for infants.

The remaining twelve can be synthesized in the body so long as a source of nitrogen is available in the diet. These are the non-essential amino acids—histidine, glycine, arginine, alanine, aspartic acid, glutamic acid, proline, hydroxyproline, serine, cystine, cysteine and tyrosine. (BDS, DP.)

Amino Acid, Limiting. That essential amino acid present in the protein in question in least amount (relative to the dietary needs). The ratio of the amount of the limiting amino acid to the requirements serves as a chemical estimation of the nutritive value of the protein. *See* Chemical score.

Most cereal proteins are limited by lysine and most animal and vegetable proteins by the sulphur amino acids (methionine plus cystine).

In complete diets it is the sulphur amino acids that are usually limiting. *See also* Lysine *and* Methionine. (DP, AEB.)

Amino Acid Oxidase. *See* Flavoproteins.

Amino Acids, Antiketogenic. Those which are metabolized to glucose. They are glycine, alanine, serine, cystine, aspartic acid, glutamic acid, arginine, proline and hydroxyproline. (WHSS.)

Amino Acids, Ketogenic. Those which are metabolized to acetoacetic acid (ketone bodies). They are leucine, isoleucine, phenylalanine and tyrosine. (WHSS.)

Aminopeptidase. Enzyme of the pancreatic juice that splits polypeptides to dipeptides. Removes the terminal unit of the polypeptide chain at the end at which the amino radical is free, hence is an exopeptidase. (WHSS.)

Aminopterin. Aminopteroylglutamic acid, specific antagonist to folic acid.

Ammonotelic. Animals that excrete their waste nitrogen as ammonia, e.g. various worms, leeches, molluscs, sea urchins, fish.

AMP. Adenosine monophosphate or adenylic acid, *which see.*

Amphetamine. *See* Anorectic drugs.

Amphoteric. *See* Iso-electric point.

Amydon. Starchy material made by steeping wheat flour in water and drying the starch sediment in the sun; used for many centuries for thickening broths.

Amygdalin. Glucoside in almonds, apricot and cherry stones, hydrolysed by the enzyme, emulsin, to glucose, hydrocyanic acid and benzaldehyde. The benzaldehyde gives the characteristic odour. (Merory.)

Amylases. Enzymes that hydrolyse starch and glycogen to maltose.

Alpha-amylase, or dextrinogenic amylase, breaks starch down to small dextrin-like molecules and does not proceed to maltose.

Beta-amylase, or maltogenic amylase, is specific for the 1:4-alpha-glucosidic linkages of starch and liberates maltose. Complete degradation of starch requires the attack of both these enzymes.

Salivary amylase and pancreatic amylase in animals behave like the alpha-amylase. Also known as diastase. *See also* Z-enzyme. (WHSS.)

Amyloamylose. Old name for amylose, as distinct from erythroamylose, old name for amylopectin.

Amylodyspepsia. Inability to digest starch.

Amylograph. Measures the viscosity of flour paste as it is heated from 25°C to 90°C (the same temperature rise as in baking) and serves as a measure of the diastatic activity of the flour. (KJ.)

Amyloins. Carbohydrates that are complexes of dextrins with varying proportions of maltose. (KJ.)