# DICTIONARY OF NUTRITION AND FOOD TECHNOLOGY

*Should this book become sufficiently familiar through usage to earn the title 'Bender's dictionary', it would probably be more correct to call it 'Benders' dictionary', in view of the invaluable assistance of D., D.A., and B.G., guided, if not driven, by A.E.*

# Dictionary of Nutrition and Food Technology

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# PREFACE

The study of food as included in the combined subjects of nutrition and food science and technology involves a wide variety of basic sciences ranging from chemistry and biochemistry to microbiology and engineering. Consequently many technical terms and abbreviations are involved.

At the same time the rapidly growing interest in the subject is shared by specialists from many fields such as sociology, medicine, agriculture and commerce. The purpose of this dictionary is to assist the specialist from one field to understand the technical terms used by the variety of specialists in the food fields.

Successive editions have become larger with the broadening scope of the subject matter, changes in policy such as the inclusion of proprietary names, the updating of information, and the introduction by official bodies of defined terminology. In the present edition the energy content of foods is expressed in both joules and calories, and vitamins are expressed, where appropriate, in both micrograms and international units.

ARNOLD E. BENDER

# INTRODUCTION

Definitions have been kept simple and brief but in many instances they are followed by a reference indicating where the reader can find further information. The codes refer to the following books.

It should be noted that where the composition of foods is stated, these are average values taken from standard works of reference. It must be borne in mind that different samples of the same food can vary considerably in composition, especially in vitamin content.

| | |
|---|---|
| Abrams | *Linton's Animal Nutrition and Veterinary Dietetics*, J. T. Abrams. Edinburgh: W. Green & Son Ltd. |
| AEB | *Nutrition and Dietetic Foods*, A. E. Bender. London: Leonard Hill Books. |
| 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 Emslie Smith. 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. |

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| 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. |
| FM | *Food Industries Manual, 21st ed.*, A. H. Woollen, ed. London: Leonard Hill. |
| 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 | *Hutchison'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 | *Composition of Foods*, R. A. McCance and E. M. Widdowson. M.R.C. Special Report Series No. 297. London: H.M.S.O. |
| MP | *Food Science and Technology*, Magnus Pyke. London: John Murray. |
| Matz | *Food Texture*, S. A. Matz. Westport: The Avi Publishing Co. Inc. |

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| 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. |
| OF | *The Oxford Book of Food Plants*, S. G. Harrison, G. B. Masefield and M. Wallis. London: Oxford University Press. |
| 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.

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

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

**Acetate.** Salt or 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 $CH_3COOH$. *See* Vinegar. (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, 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.

**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 in animals fed on diets deficient in vitamin $B_6$. (Sebrell.)

**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-