

## Obituary



**Arnold Bender**

*(24 July 1918–21 February 1999)*

Arnold Bender has been described as ‘one of the giants who will leave an enormous gap in the field of food science and nutrition’. He made important contributions to these subjects not only in the basic science but also by building bridges between the disciplines of food science and nutrition, academia and the food industry, bench science and its practical application, as well as between scientific research and public understanding.

He was a man of encyclopaedic knowledge, renowned for his rapid recall of an infinite number of facts delivered with humorous anecdotes. His unassuming authority and energy brought him international recognition. He reached the age of 80 years last summer, and although he had been officially retired for 15 years, he did not lie back on his laurels but

remained as active, sprightly and physically unchanged as he was at the age of 40 years, until the last few months when cancer pulled him down. Throughout his career he has been enthusiastically supported in his work by his wife Deborah who was never far from his side. He also collaborated in writing several books with one of their two sons, David, who has followed in his father’s footsteps as a nutritional biochemist at University College London. Their other son, Brian, is also a scientist, with an important position in the Cabinet Office. The family has played a significant part in the scientific enterprise.

Arnold Bender’s final post before retirement in 1983 was as Professor of Nutrition and Dietetics and Head of the Department of Food Science and Nutrition at Queen

Elizabeth College, which merged with King's College 2 years later. He was appointed as Senior Lecturer in 1965 by the then Head of Department, Professor John Yudkin, who had established at the College the first BSc course in Nutrition in Europe and was also asked to establish a degree in Food Science. Professor Yudkin agreed to do so if he could appoint two senior staff. Arnold Bender and Ian Morton were recruited. Arnold was a born teacher, being able to talk fluently and authoritatively 'off the cuff' on a wide variety of topics. Facts were enlivened by amusing snippets, some of which were gleaned from his collection of student exam blunders, the 'June Gems'. Arnold came to the post from a background of academic and food industry research in nutrition, and was therefore in a strong position to link food science with nutrition. His first degrees were in Chemistry and Biochemistry from Liverpool, which he completed both at first class level just before the outbreak of the Second World War. During the war he was a research chemist with British Drug Houses Ltd, working on vitamin A, the stability of fats, and the production of antibiotics. He then moved to Sheffield to do doctoral work as a Nuffield Research Fellow on the biological effects of X-radiation, before being employed as Assistant Lecturer in Biochemistry in the department of the Nobel Laureate Professor Sir Hans Krebs, with whom he collaborated on amino acid metabolism. This work led him into the field of protein nutrition, which was a main topic of Arnold's subsequent research.

Over the 15 years between 1949 and 1964 Arnold Bender worked on protein nutrition research in the food industry. This was the period when it was estimated internationally that an important cause of malnutrition throughout the world was protein deficiency, partly due to a lack of protein supplies to fulfil world needs. It was in this context that he worked first as Head of the Nutrition Team in Crookes Laboratories Ltd studying problems of protein nutrition and protein sources. This work culminated in the development, with his colleague Derek Miller, who was later also appointed at Queen Elizabeth College, of the net protein utilization method of assaying the nutritive value of proteins, which became widely accepted as the Bender-Miller method. It was so widely used and cited in the scientific literature that it became a 'citation classic'. Although Derek Miller responded to this accolade by noting that the premise of a worldwide protein deficiency was later refuted, the method and the associated research was important in the understanding of protein requirements and their relationship to energy or total food requirements. In 1954 Arnold Bender moved to Bovril Ltd where he was head of the Research Department and continued work on protein nutrition partly with United Nations Agencies, and work on the amino acid composition of several proteins, including meat extracts. The next post from 1961 was as Head of the Research and Development Department at Farley's Infant Foods, where he put his knowledge of protein composition into the development of new products for infant feeding. In his positions in the food industry Arnold had the ability to recognize and put into practical application recent scientific developments.

His expertise in protein nutrition and food toxicology led to appointments on many influential national and European committees such as the Agricultural Research Council Committee on the Protein Quality of Feedstuffs and Committee on Protein Evaluation, the Ministry of Health Sub-committee on Protein Requirements, and Committee on Medical Aspects of Food Policy, and the Ministry of Agriculture Fisheries and Food Committees on Dietetic Foods, Composition of Foods, Irradiated and Novel Foods, Naturally Occurring Toxic Substances in Food, and the European Committee for Cooperation in Science and Technology.

He was also influential in the building of professional institutions through membership of the council of several learned bodies, including the British Nutrition Society, Society of Chemical Industry, Royal Society of Health, and the Institute of Food Science and Technology of which he was a founding member in 1962. The Institute was established to provide a professional body for graduates in these subjects and has been effective in reinforcing the application of science to food. He later became President, and Vice President of the International Union of Food Science and Technology (IUFST).

Arnold Bender published many academic papers and books, including the classic *Food Processing and Nutrition*; *Food Labelling*; *Dictionary of Food and Nutrition*; *Meat and Meat Products in Developing Countries*, *Nutrition, a Reference Handbook*; amongst others. However, a skill rare amongst academics was his ability to popularize sound science, in a topic that is bedevilled by emotive beliefs, through books such as *Health or Hoax?: The Truth about Health Food and Diet*. Through the book written with his son David, *Nutrition for Medical Students*, he also attempted to address the vexing problem that exists in many developed countries of the small place that nutrition occupies in medical curricula in contrast to the fact that the majority of the population consider the medical profession to be a reliable source of nutrition information.

Despite his active professional life which creates an entry in *Who's Who* that is longer than that of Lady Thatcher, Arnold still found time for recreations, one of which was his garden. Awards included an Honorary DSc at the University in Madrid in 1983 and more recently his election as one of the first Fellows of the International Academy of Food Science and Technology, newly established by the IUFST in 1995, and as Honorary Fellow of the Institute of Food Science and Technology in 1998 in recognition of his contribution to the profession.

Following Arnold's wishes there will be no funeral. He will continue to teach, as he did through most of his life, by donating his body to science.

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