Trevor H. Grenby, PhD, FRSC, CChem (1934–2013)

Trevor Grenby passed away in July 2013 at the age of 79, after a long and disabling illness. He was, until his retirement, Reader in Nutrition in Relation to Dentistry in the Department of Oral Medicine at the GKT (Guy's, King's and St Thomas's) Dental Institute in London, UK.

A Londoner by birth, he was educated in Somerset, Scotland and London, before studying for his first degree at the University College of Wales, Aberystwyth, where he gained a BSc in Chemistry with Agricultural Chemistry in 1955.

After service in the army in one of the last groups of National Service conscripts, he returned to London, where he secured a post at St Thomas's Hospital, London, as a chemical biochemist. His employment in the Department of Biochemistry, under Professor Leslie Young, between 1957 and 1961 enabled him to study for his PhD, on the properties and occurrence of mercapturic acids.

It was during his subsequent appointment in 1961 as a research biochemist with the Association of British Flour Millers' Cereals Research Station that he embarked on what became his lifetime's work: the effect of various foodstuffs on dental health, particularly in regard to caries (dental decay), progressing up the ranks to Senior Lecturer and ultimately becoming Reader in Nutrition in Relation to Dentistry at the GKT Dental Institute.

The highlights of his dental studies included in vitro studies on oral bacteria and in vivo studies on laboratory animals and human volunteers. He developed a method in demineralisation experiments conducted on hydroxyapatite, the basic component of dental enamel, by determining calcium dissolving by atomic absorption spectroscopy and phosphate concentration by UV-visible spectrophotometry. Titration of the acid content, he found, was superior to pH measurement in determining the potential dental erosiveness of the formed acids. To determine the caries score in rat molar teeth, by assessing corrosive changes on the tooth surface, he developed a digital imaging analysis (DIA). He used enamel- or hydroxyapatite-demineralization tests to study potential protective action of minor milk protein or protein-associated components in milk against acid attack; removal of lactose from milk had little protective effect. In another related study, he found that the mean caries score in plain chocolate was 30% higher than in a milk chocolate regime. In a food (rusks) cariogenicity study with various concentrations of sucrose (i) in rats, (ii) during acid production by oral micro-organisms, and (iii) adhesion to enamel surface, he found that the cariogenicity of sucrose in the food ranged from high (31% sucrose) to low (0% sucrose). He also studied the cariogenicity of lactitol as a bulk sweetener to replace dietary sugar. Results showed that acidogenic and polysaccharide-forming oral bacteria did not easily metabolize lactitol; the enamel-demineralizing potential in vitro, intra-oral acid production and dental plaque formation from lactitol in human volunteers were substantially lower than from sucrose. These results were also confirmed in an in vivo study using caries-active Osborne–Menôdel rats. Lactitol produced 60% fewer caries lesions than the sugar regimen. The sugar alcohols sorbitol and mannitol did not work as well as lactitol or xylitol compared with sucrose.

In rat experiments, there was no confirmation of an active caries-reversing effect of xylitol when xylitol-containing diets were alternated with the basic high-sucrose cariogenic ration.

With a particular interest in the dental aspects of the use of artificial sweeteners, he soon became one of the world’s foremost experts on the topic. Consulted by the leading international manufacturers, he was labelled in a Daily Mail report on the results of his research as “one of the world’s top tooth experts”. Trevor studied ways in which potentially erosive products, such as soft drinks, might be modified by supplementing various levels of calcium, phosphate and calcium citrate malate; applications of fluoride, bicarbonates and certain constituents of milk products were also included. The potential dental effects of new types of sugar-free sweets formulated with lycasin or isomalt as bulk sweeteners instead of sugars were also evaluated, leading to an improvement in their potential dental effects. He also studied the efficacy of mouthwashes compared with toothpaste to control oral bacteria formulated with chlorhexidine, fluoride and sanguinarine, the last being a natural therapeutic product, affecting somewhat even subgingival plaque.

During his career, he published some 90 scientific papers, as well as presenting his work to a great number of national and international scientific and biomedical societies. During the 1980s and 1990s, he also edited a series of books which have remained among the definitive volumes on the subject: Developments in Sweeteners II and III, Progress in Sweeteners and Advances in Sweeteners, which was reprinted in 2011.

Trevor was a member of the Biochemical Society, the Royal Society of Chemistry, the Society of Chemical Industry, the Nutrition Society, the International Association for Dental Research, the European Organisation for Caries Research and the Bone and Tooth Society, among others. From 1988 to 1990, he was chairman of the Food Chemistry Group of the Royal Society of Chemistry.

His many qualities, appreciated by a wide circle of friends and colleagues across the globe, included wit, good humour, uprightness, equality, courtesy and consideration for others. As a scientist, he gave generously of his time to advise students or younger colleagues, and he was always fair in peer review. He is survived by his wife, Jeanette, his two sons, Matthew and Edmund, and four grandsons, the latest born just 4 days after he passed away.

Harald A.B. Linke
(New York University Dental Center)