Sweet review

Sugars in Nutrition. (The Nutrition Foundation: A Monograph Series.) Edited by H. L. Sipple and Kristen W. McNutt. Pp. xx+768. (Academic: New York and London, November 1974.) $45.00; £21.60.

THIS powerful and informative book is based on a number of papers presented at the International Conference on sugars held at the Vanderbilt University School of Medicine in 1972, at which world authorities within the field were very well represented.

The book commences with an historical account and general synopsis of sugars and nutrition, along with psychological and biochemical descriptions of their sweetness. A useful account of their occurrence and incorporation in foods is followed by some statistics of their use and recent technological advances. An entire section on the metabolism of sugars includes also some effects attributable to polyols, especially sorbitol and xylitol which are now so important as food additives and which are still, of course, items of modern therapy. This section includes a valuable paper from Macdonald on the metabolic effects of maltose and higher oligosaccharides, which are now being increasingly used by food manufacturers as a substitute for sucrose. A large section on disorders of sugar metabolism includes papers on inborn errors, sugar cataract, intolerance, hypertriglyceridaemia, cardiovascular disease and diabetes, and a section on therapy naturally includes some special emphasis on the uses and dangers of xylitol and mannitol in different forms of treatment. Finally, a section on the oral cavity deals with sugars, dental plaque and oral streptococci.

It is inevitable that a book of this magnitude should possess one or two puzzling features. Some contributors, for example, could have been expected to cover areas which have in fact been covered by different authors. Shallenberger, who has made one of the most radical contributions to the theory of sweetness in the last decade does not write either of the two papers on that subject. Nor is the major part of his work alluded to by the other two authors. It is, however, evident that some speakers at this symposium presented more than one work and that not all of these were selected by the editors.

Some of the newest and less well known research into sugars and nutrition does not seem to have been included in the book. Examples include the research by the National Aeronautics and Space Administration into the conversion of human waste products to formose sugars and their metabolic fate after re-feeding, and the work at MIT on carbohydrates and brain metabolism. The effects of sugars on human work performance and fuel reserves seem also to have been excluded from discussion.

Any multidisciplinary scientific volume is liable to have its share of editorial mistakes and omissions, but of particular gravity are those on pages 153 and 155; the pyranose sugar structures depicted there are not the sugars they are claimed to be. Furthermore, the diagram of transport across a biological membrane gives the completely erroneous impression that D-glucose enantiomerises in the process. In spite of these faults, however, the book remains the best work to date for coordination and summary of the status of sugars in modern nutrition and physiology.

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Sizing it up

Particle Size Analysis. (Series in Analytical Chemistry) By Z. K. Jelinek. Pp. 178. (Ellis Horwood: Chichester, 1974.) £5.00.

THE quantitative determination of the size, shape and distribution of particles in disperse systems is of considerable importance to the study of fogs and smokes, foams and emulsions, suspensions, porous solids and catalysts, and in general to systems consisting of a disperse and a continuous phase.

Particle sizes may vary from those found in polymer and colloidal solutions to those found in coarse dispersions, and as a consequence, a range of methods is necessary for the analysis of the different systems. This book gives a comprehensive account of the practical aspects of size analysis in these systems, and describes in detail the methods of measurement of size, shapes and pores in disperse systems, the measurement of surface areas by adsorption methods, and molecular weight measurements in polymer and colloidal solutions.

The coverage of the various methods is thorough, and the volume includes separate chapters on optical procedures (electron microscopy and ultramicroscopy, light scattering and X-ray diffraction), mechanical methods, gravitational and osmotic methods, viscosity and permeation, pore size analysis, and adsorption and conductiometric measurements. The apparatus, technique and procedure is given in detail for each method, followed by a valuable selection of worked out examples. The references cover literature up to 1972.

This is a valuable reference work for chemists who desire a survey of the practical laboratory method of particle size analysis of dispersions.

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