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Book reviews

Nutritive Sweeteners: edited by G. G. BIRCH AND K. J. PARKER, Applied Science Publishers, London, 1982, ix + 310 pages + Subject Index, £ 29.00.

This book is based on the proceedings of an Industry–University symposium held at the National College of Food Technology, University of Reading, April 1981.

In the three main groups of chapters of this book, group I is concerned mostly with the sweet-taste perception, group II concentrates on the nutritional aspects of sugars and sugar derivatives, and group III is mostly about the production, properties, and uses of sugars. There is some overlap of these groups of subject matter among the chapters.

In group I, the sweet taste, chapter 1 by R. S. Shallenberger, is a discussion of the relationship between the molecular structure of sugars and the sweet taste. The procedures used to specify the multiple chirality of sugar structures are very well presented. In chapter 14, A. Faurion and P. MacLeod present an interesting history of the development of ideas about the molecular interactions involved in the sweet-taste perception. They advance the idea that single cells may be sensitive to several taste qualities and that several structurally different receptors should be sought in order to account for the great variety of sweet-taste stimuli. G. G. Birch, G. Ogunmoyela, and S. L. Munton describe experiments with various mixtures of sugars and non-sugar sweeteners to enhance or suppress sweet taste as a means of defining some aspects of the sweetener–receptor interactions. Interactions of sweeteners with surfactants are also discussed. S. S. Schiffman, in chapter 16, shows how multiple-dimension scaling can be used to make distinct classifications of sweeteners of various structures according to taste similarities. The results are presented on three-dimensional graphs. Cross-adaptation experiments and their use in study of receptor qualities are also described.

The group II chapters, nutritional aspects, contain a report of studies by P. J. Sicard in which reduced mono- and oligo-saccharides are described in terms of their manufacture and properties, and by extensive descriptions of the metabolism patterns of D-glucitol (sorbitol), D-mannitol, and xylitol. The roles of sugars and alditols ("hydrogenated sugars") in caries development are discussed. In chapter 9, M. Naim and M. R. Kare describe the sweet-taste perception as an innate response. The significance to nutrition of the stimulation of various secretions through the sweet taste is discussed. The relationship between palatability and food consumption is presented in an interesting manner. M. W. Kearsley and R. H. P. Lian-Loh present comparisons of D-glucose, corn syrup, maltitol, and hydrogenated corn syrup on the basis of short-term and long-term physiological-response tests. In chapter 11, W. M. Edgar presents an outline of the techniques used in evaluation of pH in dental

plaque, and provides comparisons of various sugars, reduced sugars, and starch as evaluated by this method. I. MacDonald's discussion of body weight response to nutritional sweeteners reveals small differences between caloric energy and metabolic energy in various mono- and di-saccharides. M. J. Stock and N. J. Rothwell point out that variation in "diet-induced thermogenesis" among individuals may contribute to the obesity problem. The metabolic basis of this concept is also discussed.

Papers of group III, on the manufacture, properties, and uses of carbohydrates are represented by W. M. Nicol in chapter 2, in which sucrose is surveyed from those standpoints. The use of sugars in confectionery is discussed by P. H. Wiggall, with specific examples of how the physical state of sugars in candies is controlled in order to attain desired texture, appearance, and stability. Chapter 4, by P. D. Fullbrook, describes the production, composition, properties, and uses of malt syrups made by extraction of malted grains, and how addition of enzymes improves manufacturing efficiency. Similar products made by enzymically catalyzed hydrolysis of starch are also discussed. T. J. Palmer presents an outline of the production, functional properties, and uses of D-glucose, corn syrups, and high-D-fructose corn-syrups. Lactose and lactitol are discussed by P. Linko, who points out that the low sweetness and unique crystallization characteristics of lactose make it especially good for certain food applications. The enhanced solubility and sweetness of lactitol also provide advantages for certain uses. In chapter 7, L. H. Hyvönen and P. Koivistoinen show that the taste properties and reactivity of D-fructose call for modified baking-procedures when this sugar is used. Advantages of using D-fructose in a variety of food products are also discussed.

In general, this book should be of value to practising food technologists and to students, because it brings together a lot of pertinent information and ideas in a convenient way. All the chapters are well written and interesting.

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Carbohydrate Chemistry (*A Specialist Periodical Report*): Volume 12, edited by J. F. KENNEDY AND N. R. WILLIAMS (Senior Reporters), The Royal Society of Chemistry, London, 1981, xv + 591 pages + Author Index, £70.00; $143.00.

Since the inception of the series in 1968, the *Specialist Periodical Reports on Carbohydrate Chemistry* have provided detailed summaries of the successive annual increments of literature in the field. Volume 12 reviews research reported in 1978. Comprised, like its predecessors, of two independently edited parts, this volume contains over 3400 literature citations. Although many articles are cited more than