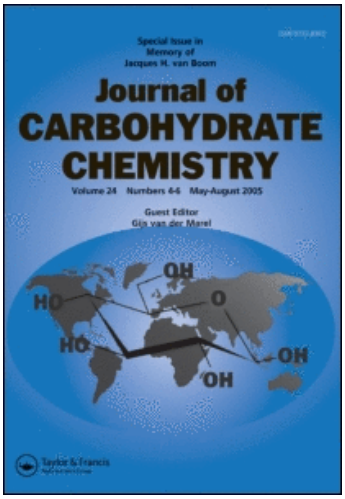

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Carbohydrates in Food. Edited by Ann-Charlotte Eliasson (University of Lund, Sweden), Marcel Dekker, Inc.: New York, 1996, viii 561 pp. $. 185.00. ISBN 08247-9542-3.

James R. Daniel[a]
[a] Dept. of Foods and Nutrition, Purdue University, West Lafayette, IN, USA

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BOOK REVIEW

Carbohydrates in Food. Edited by Ann-Charlotte Eliasson (University of Lund, Sweden), Marcel Dekker, Inc.: New York, 1996, viii + 561 pp. $. 185.00. ISBN 08247-9542-3.

This book is the latest in a long line of texts from Marcel Dekker in the area of Food Science and Technology and continues the excellent reputation of high quality that this series of monographs enjoys. The editor is to be commended for assembling such a strong field of authors and an equally strong compilation of well written chapters. The book is roughly divided into chapters dealing with mono- and disaccharides, cell wall polysaccharides and food gums, and starch.

The first chapter by Folkes and Jordan deals with the analytical aspects of mono- and disaccharides including chemical, biochemical, and chromatographic methods of analysis. GLC and HPLC methods are reviewed and actual experimental procedures are given for derivatization and analysis of these low molecular weight carbohydrates. Representative chromatograms are presented to illustrate the types of separation and extent of resolution that may be attained. The next chapter, by Slade and Levine, describes physical and functional aspects of mono- and disaccharides. This chapter, a tour de force running to 116 pages and 520 references, essentially is a review of the "food polymer science" approach to mono and disaccharides in foods, that is, how they interact with each other and also with their environment. Readers and workers in the field should find the extensive tabulation of T_g values quite useful. The authors also discuss the plasticization effect of water in food systems and compare WLF behavior and kinetics with Arrhenius behavior and kinetics. The third chapter in the book by Astrup and Raben reviews the relationship between consumption of low molecular weight carbohydrates and several pathologies, including obesity, biliary disease, diabetes (non-insulin dependent), and artherosclerosis.

Chapters 4 through 8 are devoted to cell wall polysaccharides and food gums. Chapter 4 by Aman and Westerlund contains a general review of cell wall polysaccharide extraction, purification, and methods for structural analysis. Later in the chapter, cell wall polysaccharides specific to cereals and fruits and vegetables are discussed. Chapter 5 by Autio examines cell wall polysaccharide functionality, mainly in barley, oats, rye, and wheat. The author examines their solubility, water holding capacity, and dispersion rheological properties. The functional significance of these polysaccharides in baking, malting, and brewing is also discussed. Chapter 6 by BeMiller is a concise but well referenced review of analytical methods of use in investigating gums and hydrocolloids. Areas discussed in this chapter include gum isolation, purification, and fractionation, as well as polysaccharide hydrolysis and resultant monosaccharide identification. The offering in Chapter 7 by Doublier and Cuvelier examines the functional aspects of aqueous food gum dispersions. Special emphasis is placed on

dispersion rheology, viscosity building properties of gums, and strong and weak gels. Chapter 8 by Edwards and Parrett concludes the cell wall polysaccharide/gum chapters and is a review of the nutritional effects of these large non-starch polysaccharides. Among those areas discussed are the effect of gums on starch digestion, fat digestion, absorption of vitamins and minerals, colonic fermentation, and serum cholesterol and lipid levels.

The last three chapters comprise the starch section of the book. Chapter 9 on analytical aspects of starch by Hizukuri is an excellent review of the area and abundantly referenced (324 references). The author begins with a thorough review of starch degrading enzymes and follows on with a discussion of methods for separating amylose and amylopectin, methods for structural analysis of the component starch polymers, structure of "intermediate" starch molecules and overall starch granule structure. Chapter 10 by Eliasson and Gudmundsson examines the physical and functional aspects of starch in foods. A general discussion of granule structure (including granule surface characteristics) is followed by thorough discussion of gelatinization, retrogradation, and general starch gel rheology. Sections are also included on chemically modified starches and the interaction of starch with other food components. Chapter 11 by Bjorck reviews the nutritional aspects of starch including digestion and absorption in the small intestine and the concept of glycemic index of foods (starchy foods in particular). A discussion of resistant starch, an increasingly important component of starch containing foods, is also included.

The book concludes with a very serviceable subject index. As noted earlier this monograph is the latest in an excellent series of books, and this book continues that tradition of excellence. This text will be a highly valuable addition to the food science and technology collections of institutional libraries, and is a must for any individual working with carbohydrates in food systems.

James R. Daniel
Dept. of Foods and Nutrition
Purdue University
West Lafayette, IN 47907, USA