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Book reviews

S. Gordon, Y.-L. Hsieh (Eds.), Cotton: Science and Technology, Woodhead Publishing Ltd., Cambridge, 2007 (xx + 548 pp., £150.00, ISBN: 1-84569-026-5)

Natural cotton fibre is the purest source of cellulose. Despite the increased variety of man-made fibres available to the textile industry, demand for cotton remains high because of its suitability on the basis of price, quality and comfort across a wide range of textile products. Cotton-producing nations are also embracing sustainable production practices to meet growing consumer demand for sustainable resource production, thereby ensuring that cotton remains a key fibre in the textiles industry. Both the market value and the quality of cotton products are directly related to fibre quality. A fundamental understanding of the fibres, in terms of structural formation during development, and structure–function relationships with respect to physicochemical characteristics, are necessary to ensure that improvements in fibre quality, process innovation and product differentiation help to maintain/improve its competitiveness and global market share with respect to significant man-made fibre developments, such as microdeniers (e.g. polyesters and nylons) and elastomeric properties (e.g. spandex).

This important volume summarises the key scientific and technological issues in ensuring cotton quality, and is divided into three parts. The first part (Chapters 1–3) reviews the chemical and physical properties of cotton and how they determine cotton fibre quality. The most essential cotton fibre qualities related to mechanical processing, i.e. traditional yarn spinning, weaving, and knitting, are length, strength, fineness and their distributions, and they determine yarn strength, regularity, handle and lustre of fabrics. For chemical processing such as scouring, dyeing and finishing, fibre structure plays a major role, largely due to the impact of non-cellulosic cell wall components and secondary cell wall cellulose on such processes. The second part of the volume (Chapters 4–11) discusses the key stages in cotton production from cultivation and harvesting to spinning, knitting and weaving. Genetic modification or transformation of cotton plants has resulted in the introduction of pest-tolerant, and herbicide-resistant traits. Around a third of all cotton grown in the world is genetically modified. Like genetically modified cotton, organic cotton generates much debate on its worth to society. There continues to be worldwide interest in organic cotton on the basis that it is an environmentally friendly and cost-effective production method.

Textile market survival relies on knowledge of raw material costs, product quality maintenance, health and safety issues and recycling (cradle-to-grave) processes associated with cotton product manufacturing. Building on these foundations developed in the first two parts, the third part of the volume (Chapters 12–16) reviews quality and other issues such as testing yarn and fabric quality, cost control in the industry and recycling. '*Cotton: Science and Technology*' can most definitely be described as an essential reference source for all those concerned with the manufacture, quality control, and development of cotton and cotton-based products throughout the world.

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J. W. van der Kamp, N.-G. Asp, J. Miller Jones, G. Schaafsma (Eds.), Dietary fibre: Bio-active carbohydrates for food and feed. Wageningen Academic Publishers, Wageningen, The Netherlands, 2004 (357 pp., €75.00, ISBN: 90-76998-32-9)

The growing attention by consumers for healthy eating, intestinal health, combating major disorders such as obesity and diabetes and prevention of cardio-vascular diseases and cancer, has resulted in an increased output of research and development on dietary fibre and related carbohydrates. In recent years, hundreds of new products have been launched annually with claims regarding their fibre content. Existing and new fibres are also increasingly incorporated in products for specific target groups, such as babies, farm animals, pets, and for clinical nutrition. New

analytical methods, model systems to measure the impact of fibre on processes in the gastro-intestinal tract, intervention studies, epidemiological research, and the identification and measurement of new biomarkers (e.g. those related to satiety), have all contributed to obtaining a better understanding of the mechanisms of action of bio-active carbohydrates.

This volume contains articles based on oral and selected poster presentations from a dietary fibre conference, and aims to provide a state-of-the-art overview of this topic. The first chapter covers definitions, health claims and new challenges, initially discussing the definition and analysis of dietary fibre in the context of food carbohydrates. Information on whole grain health claims in the USA, UK and Sweden, and on functional food development, target populations, synbiotics, and nutrigenomics is also provided. The second chapter is concerned with analytical tools, technological aspects and applications, beginning with new developments in rapid bio-analytical methods for the analysis of fructans and fructo-oligosaccharides, cyclodextrins, and native and partially hydrolysed galactomannan and glucomannan. This is followed by the characterisation of polysaccharides, and non-starch polysaccharide-derived oligosaccharides, with particular focus on the use of HPAEC-PAD for the analysis of inulin. Other topics presented include advanced *in vitro* models of the gastro-intestinal tract for studying the functionality of dietary fibres, the importance of food structure on glycaemic responses of carbohydrate-rich foods, the use of dietary fibres in dairy based applications, and the importance of phytosterols, folates, and other bioactive compounds in cereals.

The health benefits of dietary fibre with particular focus on epidemiological evidence, specifically intake, disease prevention, health promotion, colon cancer, colorectal cancer, lipid metabolism and cardiovascular disease, and intestinal flora and health, are detailed in chapter 3. This is followed by a chapter covering the health benefits of specific types of dietary fibre, such as the cholesterol-lowering ability of carob fibre, effects of resistant maltodextrin on glucose and lipid metabolism, effects of extra-cellular polysaccharides on satiety, effects of inulin and *Clostridium difficile* on the metabolic activity and composition of *in vitro* human colonic microbiota, and the role of probiotic fibres in calcium absorption. The fifth chapter shifts the focus to specific target groups, including topics such as the effect of inulin/fructo-oligosaccharides as a baby formulae probiotic, the role of fibre in clinical nutrition, and in companion and animal nutrition, and the effect of xylo-oligosaccharides on gut microbe metabolism and blood xylose levels in chicks. An overview of the dietary fibre conference on which this volume is based is provided in the final chapter.

In summary, this informative volume provides a detailed overview of the scientific evidence supporting the beneficial health claims of dietary fibre materials in a wide range of food and feed application areas. It is therefore recommended as an indispensable tool for scientists involved in research and development in this constantly expanding field, especially new product development.

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A.Y. Tamime (Ed.), Structure of Dairy Products, Blackwell Publishing Ltd., Oxford, UK, 2007 (xvi + 288 pp., £105.00, ISBN 1-4051-2975-6)

Dairy products are thought to be the most complex natural foods available to humanity. Foodstuffs such as milk, yoghurt, butter and ice-cream are a regular part of our everyday life. There have been significant advances in our understanding of milk systems, which have been the focus of researchers' attention in recent times. A better understanding of the microstructure environment and the influence of processing conditions on the physicochemical properties of these kinds of products leads to possible improvements in the industrial processes involved in their production.

'*Structure of Diary Products*' is divided into 10 chapters, the first of which introduces the reader to various microscopic techniques, for the investigation of food products in order to obtain a greater understanding of their behaviour, thereby assisting the reader in the selection of a suitable methodology for their own analytical requirements. Techniques specifically covered in this chapter include light microscopy and electron microscopy. In the next chapter sample preparation methods with respect to particular instrumental techniques are introduced, covering the more traditional aspects of light microscopy techniques, including fluorescence light microscopy, confocal scanning laser microscopy (CSLM), sectioning, scanning electron microscopy (SEM), environmental scanning electron microscopy (ESEM), transmission electron microscopy (TEM), and staining. Non-microscopic topics covered in this chapter include X-ray microanalysis, rheology, laser light scattering, NMR spectroscopy, and future techniques for dairy product structure determination, such as diffusing wave and ultrasonic spectroscopy, and microwave techniques.

The next eight chapters (3–10) focus upon the microstructure of particular classes of dairy products. This