

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 Dairy 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

begins with a review of the composition and structure of cow's milk, specifically milk fat globules, casein micelles, whey proteins, and lactose, and includes the latest features and approaches towards a more detailed understanding of the molecular structures influencing milk colloidal behaviour (Chapter 3). Chapter 4 deals with the microstructure of dairy fat products, such as cream and butter, whilst Chapters 5 and 6 are concerned with concentrated and dried milk products, and fermented milks, respectively. Evaporated and condensed milks, and whole and skimmed milk powders, buttermilk powder, whey powder, whey protein concentrates and isolates, lactose, and caseinates are presented (Chapter 5), and lactic acid, lactic acid–yeast, and lactic acid–mould fermented products are covered (Chapter 6). These three chapters provide some interesting information about the processing methods that are used commercially to manufacture these kinds of products, and there is discussion of the changes that may occur in the microstructures of the components during such processing. The next two chapters (7 and 8) are concerned with natural cheese and processed cheese and cheese analogues, respectively. The microstructural elements of cheese, such as fat and proteins, and the physicochemical mechanisms involved in their interactions are described, along with the impact of additives and processing conditions on cheese micro-

structure. The penultimate chapter (9) details the microstructure of frozen and dairy-based confectionery products, such as ice cream, chocolate, caramel, and toffee, whilst the final chapter (10) discusses microscopic troubleshooting, such as the identification of extraneous/foreign matter.

In conclusion, '*Structure of Dairy Products*' is an excellent volume that provides a comprehensive investigation of the microstructures of a wide range of different types of dairy products, including detailed micrographs throughout. It is therefore highly recommended to all researchers and students with interests in any aspects of dairy product processing, manufacture, composition, and detailed structural characterisation.

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