



ELSEVIER

Food Chemistry 65 (1999) 277–278

Food Chemistry

Book Reviews

PII: S0308-8146(98)00241-6

***Magnetic Resonance Imaging in Food Science*; Brian Hills; John Wiley and Sons, New York, 1998, vi + 342 pages, hardcover, ISBN 0-471-17087-9, £70.00**

This book is a coherent, up-to-date account of the applications of magnetic resonance imaging in its subject area. It is written by one of our leading practitioners in the field, and can justly be described as authoritative. The book is intended “to be of value to all food scientists and technologists who seek a better understanding of the present and future role of MRI in their discipline...” I do not doubt that it will perform this function fully, provided the reader has the necessary background, or possibly is prepared to acquire it—though this may not be a trivial task. As in the text, the author has chosen his words carefully; nowhere does he claim this as an introduction, and indeed specifically warns that he assumes the reader will be familiar with the basic ideas of n.m.r. and MRI. One useful feature that this review might perform would be to give an idea of what is meant by “basic ideas”. As an illustration, the first section [1.2] (following a single introductory paragraph) is entitled *Phase Coherence and Fourier Conjugate Variables in NMR*, within which we find the n.m.r. signal described as “the ensemble average of the phase of the transverse magnetisation arising from all the spins in the sample, which can be written

$$S(t) = \langle \exp(i\phi) \rangle = \int d\omega P(\omega) \exp(i\omega t)$$

The author then goes on to explain that $S(t)$ is a complex function, and that it is usual to observe both its real and imaginary components by quadrature detection. While all of this is perfectly standard to n.m.r. aficionados, potential readers may like to consider whether, with no explanations, and the briefest of definitions for some of these terms, the book is likely to suit them. Furthermore, Dr. Hills is far from those irritating writers who spend their first chapter on a quantitative introduction, only to abandon all equations for the remainder of the text. The book is presented at a sophisticated spectroscopic level throughout.

In order to classify the material over this highly diverse field, it is presented in three parts, concerning the macroscopic, microscopic, and molecular distance fields, and is essentially method-based, rather than

substrate-based. An intriguing feature, and a valuable one, is that the author has not only included techniques which are currently undergoing development, but has been prepared to suggest, in some cases, the likely outcomes. These speculations frequently take the form of suggesting that this method will give useful results or that that technique is capable of much higher resolution. It will be interesting to see how far these prognostications are borne out in future but, whatever the outcome, it seems unlikely that we will be provided with a better guide for some time to come. The book is nicely produced (without gimmicks), and I noted only a very few (and trivial) typographical errors. References are collected at the end (avoiding much time-wasting searching for the end of each chapter!) and, with many references in 1996, and some 1997, up-to-date though without the exclusion of significant earlier citations. Clearly no laboratory involved in this area can afford to be without this volume, and it is an invaluable source of information and insight for any food science library.

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PII: S0308-8146(98)00226-X

***Milk and Dairy Product Technology*, Edgar Spreer (1998). Marcel Dekker, New York. ISBN 0-8247-0094-5. VII + 483pp. \$135-00**

This book sets out to convey basic knowledge of milk processing in a concise form to a broad spectrum of readers. The 16 chapters vary considerably in length and fall into three sections.

The first three chapters cover a brief introduction, the composition and both physico-chemical and biological characteristics of milk and aspects of its collection and delivery to the dairy. The fourth chapter provides a good review of the processes and processing equipment common to many dairy plants, though it was odd that the term “decreaming” was invented where the terms skimming and separating already exist and are in common usage.

The subsequent chapters devoted to product groups form the largest section. Chapter 5 covers market milk, milk drinks and cream products and, with the heat treatment processes already covered in the previous

chapter, gives a good coverage to packaging technology that is often poorly covered in general texts. Chapter 6 reviews batch and continuous butter manufacture, touching on mixed fat and reduced fat spreads plus the production of anhydrous milk fats. In the case of milk fat fractionation, the more widely used dry fractionation process would have been more appropriate than the centrifugation route described.

The following chapter on cheese concentrates on a 'continental' rather than UK approach to cheese making and as such will be of particular interest to those interested in widening their repertoire of cheese-making processes. In the first section the fat content is omitted from the table of nutrients and in many places the term "fungus" has been used instead of "mould". The summary table 7./16 has part of the third column displaced by two lines.

Chapter 8 covers the technology for the manufacture and packaging of acidified products including, yoghurt, kefir, acidophilus and soured milks. Chapter 9 covers long-life concentrated milks, bringing in evaporation, drying and retorting technologies. The sections on drying cover the full range from roller drying to multi-stage spray dryers. The commodity-related chapters are concluded by a review of whey processing.

Short chapters covering generic areas in dairy technology, the critical area of cleaning and disinfection, water supply and wastewater treatment, refrigeration, energy supply, electricity and finally hygiene and occupational safety form a third section. However, the latter chapters were unfortunately too brief to be really useful.

Overall, the book has left mixed feelings. There were some very good sections and the approach complements that of others in this field. The general standard of presentation, including the wide use of diagrams, was good. However there are very few references to sources of either original or further information to guide the reader. Furthermore, there are a large number of typographical errors that have crept in and escaped the proof reading; some are minor but others could mislead the unwary. These criticisms apart, this book will find a useful place in a dairy library.

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PII: S0308-9146(98)00187-3

Analytical Methods of Food Authentication., Ed. by P.R. Ashurst and M.J. Dennis. 1998. London: Blackie Academic and Professional. xiii + 350 pp. ISBN 07514 04268. £79.00.

This book is the successor to the earlier volume 'Food Authentication' by the same editors. It surveys the analytical methods currently used to investigate authenticity or adulteration of food and it comprises 12 chapters, each contributed by eminent scientists. The first chapter is introductory and discusses the aims of food authentication, sampling, interpreting databases, data evaluation, new technology, and methods of analysis. Each of the next ten chapters discusses the application of a particular technique, or analysis of a type of component, to food authentication. The format is not entirely uniform but each chapter gives the principles, practical considerations and many examples of application. In most cases, limitations and the future of the technique are also considered. These ten chapters are entitled: Stable isotope analysis by mass spectrometry, Nuclear magnetic resonance spectroscopy, Infrared spectroscopy, Oligosaccharide analysis, Enzymic methods of food analysis, DNA/PCR techniques, Electrophoretic methods, Antibody techniques, Trace element analysis for food authenticity studies, Pyrolysis mass spectrometry in food analysis and related fields: principles and application. The final chapter deals with the principles and application of multivariate data analysis to food authentication. It is inevitable that there will be some overlap between chapters in a book of this type, but this has been kept to a minimum by the editors while each chapter is self-contained. Each chapter ends with a reference section which, in most cases, is extensive. The index is good and runs to 14 pages. On the whole, the book is very well produced, although a few diagrams are rather faint. Overall, this is an excellent book which will be of great value to food analysts and other professionals concerned with food authenticity.

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