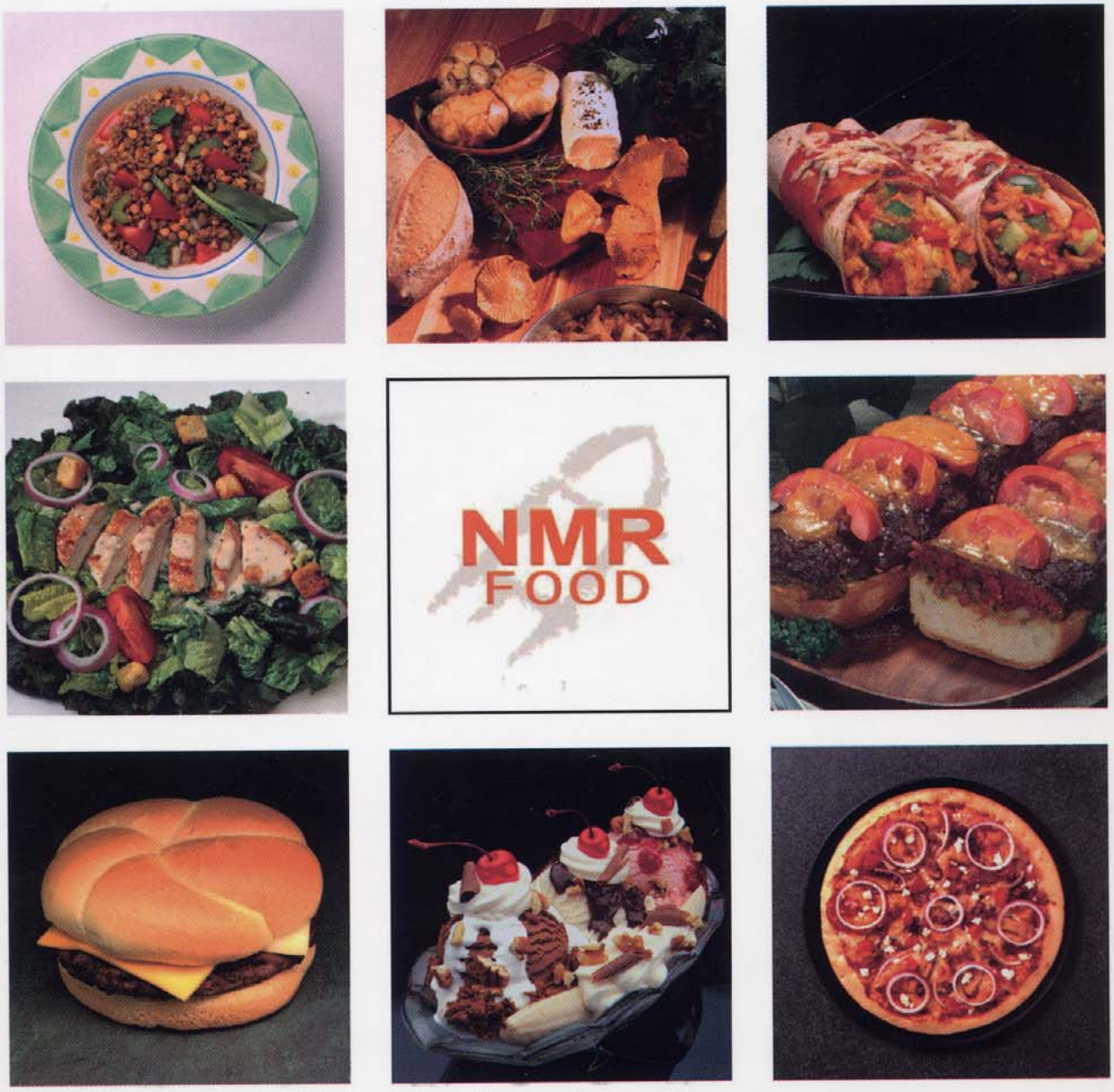
S B Engelsen, P S Belton, H J Jakobsen

MAGNETIC RESONANCE IN FOOD SCIENCE

The Multivariate Challenge



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Magnetic Resonance in Food Science
The Multivariate Challenge

Magnetic Resonance in Food Science
The Multivariate Challenge

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Preface

This book consists of 26 papers based on lectures presented at the 7th International Conference on Applications of Magnetic Resonance in Food Science. The three-day conference, which was held for the first time in Denmark at The Royal Veterinary and Agricultural University in Copenhagen, attracted over one hundred participants from 20 different countries. The meeting continued the tradition of a friendly gathering with as much, or more, interchange of information during the social events as during the formal sessions. The conference was divided into 5 symposia covering (i) Sensory science, aroma and flavour, (ii) Authenticity and quantification of food, (iii) Functionality, structure and ingredients, (iv) Applications of solid-state NMR methods and (v) New NMR methods and instrumentation. The book follows the form of the conference, although some of the chapters do not necessarily suit the categories.

This year's meeting was subtitled *The Multivariate Challenge* in order to focus on the way in which the interpretation and quantification of magnetic resonance data of complex food systems increasingly requires the application of multivariate data analytical protocols. Since the discovery of the phenomenon of MR spectroscopy in the mid-1940's this technique has developed into one of the most versatile and information-rich analytical techniques. The possible applications range from probing free radicals to studies of dynamic processes in solution, from routine structure elucidation of small molecules to conformational analysis of macromolecules and from quantitative screening of authenticity to MR images of the human brain being impressed by flavours etc. Inspired by the rapidly expanding research field of *metabonomics,* which combines high throughput MR systems with *chemometrics,* it would appear as if the MR food application area is undergoing a transformation towards screening of bioactive components and exploration of functional factors in food. New high throughput instruments are now working intensively on measuring detailed fingerprints of raw materials, food components and final food systems. On-line systems are even being devised for rapid, non-invasive and total quality control. It would appear that hardware technology has evolved to an extent that data technology is becoming the limiting factor.

This collection of papers shows that MR in food science is at a highly sophisticated level and gives good indications of the continuing development towards analysis of larger and more complex food systems, the functionality of which can only be optimally extracted by advanced pattern recognition techniques. Before we know it, we may have developed *bromatonomics*.

We would like to express our deepest thanks to all the active participants, to the staff at Food Technology for hosting the conference, to the conference speakers whose work is documented by this book and to the RSC for making this book a reality. Special thanks are given to Associate Professor Frans van den Berg and Gilda Kischinovsky for help in editing the book.

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1992: Surrey
1994: Aveiro
1996: Nantes
1998: Norwich
2000: Aveiro
2002: Paris
2004: Copenhagen

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