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BOOK REVIEWS

Instrumental assessment of food sensory quality: A practical guide

D. Kilcast (Ed.)

Woodhead Publishing, Cambridge, 2013, Series in Food Science, Technology and Nutrition No. 253,
ISBN 978-0-85709-439-1 (print), ISBN-978-0-85709-885-6 (online), 627 pages

The current food analysis is unthinkable without modern instrumental methods that can objectively describe the properties of the food. The instrumental methods are becoming more and more accepted even in those areas where the judgements of the human panels are the standards. A typical example for this is the examination of organoleptic properties. Subjectivity of human sensory tests is known, so wherever possible it is useful to replace or support the activity of sensory assessors with instrumental methods. For decades now, food laboratories and scientists could use reliable instrumental analytical techniques for measurement of some particular organoleptic properties of foods (eg., analysis of colour and texture of food). However, this area can not be considered to be completely explored. It is enough to think of computer vision system for analysing the appearance of foods or non-destructive testing of texture of foods. These methods spread nowadays, since electro technique had to reach its today's developmental level in order to be an effective tool in the field of food analysis. Thus, the newer and newer possible measurement principles and their realizations in practical life generate more and more information that requires the extension and systematization of knowledge. The book titled „Instrumental assessment of food sensory quality" attempts to solve this very difficult task. The team of authors tries to present the theoretical foundations of the subjects discussed in an understandable way, as well as tries to give useful information to the professional experts working in the field of sensory analysis. In the first part of the book the description of instrumental measurement principles of sensory properties can be found. The reader can get to know the most important theoretical background of the measurement of appearance, flavour and texture. Then, the advanced measurement techniques are presented in the second part of the book. In this section, such special topics are discussed like application of "chemosensor arrays" (electronic nose and tongue), analysis of flavours of food, or the in-mouth measurement of food quality. A separate chapter deals with the possibilities of processing techniques of data collected during the instrumental analysis. The third, and the biggest, part of the book focuses on the instrumental measurement techniques of organoleptic properties of all food groups. Thus, the reader gets a detailed picture about the potential measurement techniques of meat products, dairy products, fruit and vegetables as well as alcoholic beverages. This useful book, containing extensive knowledge, is heartily recommended to all working as industrial research and development practitioners, or those who work in the field of food science education.

I. Dalmadi

Functionalizing carbohydrates for food applications Texturizing and bioactive/flavour delivery systems

M.E. Embuscado (Ed.)

DEStech Publications, Inc., Lancaster, Pennsylvania, U.S.A., 2014, ISBN 978-1-60595-038-9, 477 pages

This book, written by leading food chemists, systematically explains the chemistry and engineering of new starch-based polymers and carbohydrates and shows how they are used to improve food texture and also to function as carriers for flavours and bioactive compounds. The book contains original investigations of strategies to modify food carbohydrates for refining product formulations and improving processing. Also included are detailed treatments of how such delivery systems are manufactured and tested.

The editor, Dr. Milda E. Embuscado, is currently a Principal Scientist at the Materials and Process Technology group, McCormick and Company, Hunt Valley, MD. Her areas of research include ingredient characterization and functionality, new product innovation, process improvement, and flavour/bioactive microencapsulation including optimization of formulations and processes through the employment of design of experiment and response surface methodology to optimize ingredient functionality in food systems such as food emulsion and flavour/bioactive encapsulated products. She is also working on bioactives and antioxidants from spices and herbs and the effects of processing and cooking on these bioactive components. The contributors are BeMiller, J.N., Lal Dar, Y., Nieto, M.B., Reineccius, G.A., and the editor, Embuscado, M.E. (chapters 5–7).

Chapter 1 gives essentials of carbohydrate chemistry, chapter 2 covers starches as food texturizing systems. Gum polysaccharides as texturizing systems are the topic of chapter 3. Carbohydrates are functioning as flavour and bioactive delivery systems (chapters 4 and 5). Chapter 6 describes processing methods in the manufacture of flavour and bioactive delivery systems (both liquid and solid ones). The last part contains analytical methods for carbohydrate texturizing and delivery systems, with chemical characterization of carbohydrates, emulsion characterization, and stability determination. The emulsion stability as well as powder properties of encapsulated flavour compounds and bioactives are also covered.

M. Tóth-Markus

Food microstructures
Microscopy, measurement and modelling

V.J. Morris and K. Groves (Eds)

Woodhead Publishing, Cambridge, October 2013, Series in Food Science, Technology and Nutrition No. 254,
ISBN 978-0-85709-525-1 (print), ISBN-978-0-85709-889-4 (online), 438 pages

The development of high-quality foods with desirable properties for both consumers and the food industry requires a comprehensive understanding of food systems and the control and rational design of food microstructures. This book reviews practice and developments in the determination of food microstructure.

Part I reviews microstructure and microscopy in 9 chapters. These deal with environmental scanning electron microscopy (ESEM), probe microscopy and photonic force microscopy, light and confocal microscopy, optical coherence tomography (OCT), space-resolved reflectance spectroscopy (SRS) and time-resolved reflectance spectroscopy (TRS), Fourier transform infrared (FTIR) and Raman microscopy, ultrasonic and acoustic microscopy, and X-ray micro-computed tomography; in each technique the principles and applications to food microstructure are discussed.

Part II covers measurements, analysis, and modelling of food microstructures, it has 5 chapters and an appendix. Chapters describe food microstructure and rheology; tribology measurement and analysis: applications to food microstructures; methods for modelling food cellular structures and the relationship between microstructure and mechanical and rheological properties. Chapter 13 reviews granular and jammed food materials, chapter 14 describes modelling and computer simulation of food structures, including food bio-molecular structure and function of proteins and carbohydrates, adsorption of food biomolecules, as well as the simulation of food colloid systems.

The appendix introduces us to electron microscopy, its principles and applications to food microstructures; a useful case study.

Written by leading professionals and academics in the field, Food Microstructures is a reference work for professionals in processes of food and nutraceutical industries and food science as well.

M. Tóth-Markus

Minerals in food
Nutrition, metabolism, bioactivity

E.D. Harris

DEStech Publications, Inc., Lancaster, Pennsylvania, U.S.A., 2014, ISBN 978-1-932078-97-8, 368 pages

This book provides a fundamental study of the functions of food minerals in humans; investigates chemistry, biological effects, and nutrition, while covers macrominerals and microminerals from arsenic and boron through vanadium and zinc. The author, Edward D. Harris, is the professor emeritus of the Department of Nutrition and Food Science, Texas A&M University.

The book gives a technical introduction to all major and trace minerals in foods, including their chemistry, transport, absorption, bioavailability, and physiological roles. It explains the *in vivo* functions of food minerals and demonstrates why and how macrominerals and microminerals are necessary for proper metabolic functioning in humans. Also presented is the etiology of diseases resulting from mineral deficiencies. Important information is revealed on the roles of minerals in the brain, as well as on ways minerals interact with one another in the body. Detailed biochemistry and nutritive information for twenty minerals are provided in separate chapters. This text represents the only comprehensive summary of the science of inorganic elements in foods and their biological effects, with implications for food scientists, food engineers, and clinical nutritionists.

The first seven chapters give an introduction to the minerals, their chemical and biochemical properties, their bioavailability in foods, nutritional approaches to minerals, their intestinal absorption and post-absorption metabolism. A separate chapter is devoted to mineral-mineral interactions (microminerals and macrominerals as well). Chapter 9 treats minerals in the brain, their functions; focussing mainly on Zn, Cu, Fe, and Mn; and also discusses specific diseases with mineral connections.

Chapter 10-22 delivers history, chemical, biochemical, nutritional properties, and intestinal absorption of individual mineral groups.

Each chapter gives a summary, references, and questions to be answered by the readers, who can easily check their newly acquired knowledge in a very amusing way. At the end of the book one can find the right answers as well.

M. Tóth-Markus

Trends in packaging of food, beverages and other fast-moving consumer goods (FMCG) Markets, materials and technologies

N. Farmer (Ed.)

Woodhead Publishing, Cambridge, 2013, Series in Food Science, Technology and Nutrition No. 244,
ISBN 978-0-85709-503-9 (print), ISBN-978-0-85709-897-9 (online), 322 pages

Packaging plays an important role in protecting and extending the shelf-life of foods, beverages, and other fast-moving consumer goods. This book provides a review at the latest developments and international market trends. Contributors are acknowledged experts from the UK and USA.

The book consists of eleven chapters. First one, written by the editor, describes the present status and trends in innovations for food, beverages, and other fast-moving consumer goods, including among others light-weighting, recycling, active and intelligent packaging, bioplastics, recycled PET market developments, high performance barrier additives, materials and coatings; market of glass, plastic and metal containers; innovations in paper and paperboard packaging, nanotechnology, etc. The second chapter is devoted to modified atmosphere packaging and other active packaging systems of the goods above. The third chapter is about augmenting and securing the consumer brand experience trough smart and intelligent packaging. The next one shows the developments in plastic materials and recycling systems, including major types of petrochemical-based plastic materials, barrier polymers, scavenger systems, nucleating and clarifying agents, antimicrobial additives and coatings, active, intelligent, rigid, flexible, sustainable packaging, and recycling of plastic packaging. Chapter 5 describes the developments in bioplastic materials, their definition, rationale, classification, biodegradability, major packaging uses; other subsections are devoted to biobased plastics.

Chapter 6 treats innovations and trends in metal, chapter 7 in paper and paperboard packaging. Chapter 8 describes international environmental and sustainability and legislative frameworks, chapter 9 is on nanotechnology and the packaging of food. Chapter 10 shows the smart and interactive packaging development for enhanced communication with users. The last chapter summarizes the future, global trends and analysis for the international market considering the impact of innovations and likely material changes.

This book is an important source for professionals in the food and packaging industries and academics working in this area.

M. Tóth-Markus