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ublishing Series in Food Science, Technology and Nutrition:
Number 186

Chemical deterioration and physical instability of food and beverages

Edited by
Leif H. Skibsted, Jens Risbo and
Mogens L. Andersen

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CRC Press
Boca Raton Boston New York Washington, DC

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Introduction

The primary process in all food production is photosynthesis. The energy of solar light is converted by chlorophylls to chemical energy by algae and plants and initially stored in electron-rich carbohydrates, which are further converted to other organic material including energy-dense lipids. All calculations show that the Earth can produce food sufficient for its current and growing population. By the year 2050, the world population is expected to have increased from the current almost 7 billion to more than 9 billion (FAO, 2009). Still, even today people are starving as approximately 1/6 of the world's population do not have access to enough food and even more are short of essential vitamins and minerals leading to retarded development and apathy. The number of food-insecure individuals is still increasing although the percentage seems to have started to decline (Pinstrup-Andersen & Herforth, 2008). The gap between the world's potential for food production and the food available to mankind is the result of both insufficient or ineffective agricultural systems and the enormous amount of waste resulting from ineffective preservation, storage, processing, packaging, transportation and distribution.

Food science is essential to secure the world's population enough to eat for fully productive working lives today and in the future. Food science also deals with food safety, and both food security and food safety depend on the microbiology and on the chemistry and physics of food raw materials and manufactured food. Food science is complex: to convert raw materials to safe, palatable and nutritious food with acceptable shelf life in an environmentally friendly way, very many scientific disciplines need to be combined. Food science has developed rapidly recently as evidenced by the impressive growth in the number of published reports, often of high quality

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and utilizing methods and results from the more fundamental sciences (McGorrin, 2009).

It may be argued that food security and food safety should be the prime concern for food scientists. However, other aspects are also on the agenda for the food sector today. A correct and balanced diet is mandatory for a good life. Food needs to be designed and manufactured to meet new specifications based on the ever increasing knowledge of optimal function of the human body in order to prevent lifestyle diseases and the obesity epidemic. Food for different segments of the population with special nutritional needs is also a challenge for the food industry in relation to human wellbeing. The controlled release of nutrients and delivery of functionality for increased eating pleasure depend to a large degree on material science (Palzer, 2009).

Food should also be a pleasure, and it is essential in many social activities. Over the past decade, gastronomy has increasingly become recognized internationally as a scientific discipline. The time is now ripe to strengthen the connection between the classical food science disciplines and gastronomy. Food chemistry and food physics lie at the heart of investigations into why one dish is delicious and another is not (This, 2009).

This book deals with the physical and chemical aspects of food quality and stability. The editors were so fortunate that a number of leading experts in various fields of food physics and food chemistry, and based both in academia and industry, agreed to write up-to-date reviews of their individual fields of expertise. Some chapters are commodity oriented whereas others deal with more generic aspects of food stability. The editors trust that this combination has provided material valuable for university teaching and for product development and decision making in the food sector in the years to come.

The Editors

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Part I

Understanding and measuring chemical deterioration of food and beverages

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Published by Woodhead Publishing Limited, Abington Hall, Granta Park,
Great Abington, Cambridge CB21 6AH, UK
www.woodheadpublishing.com

Woodhead Publishing India Private Limited, G-2, Vardaan House, 7/28 Ansari Road,
Daryaganj, New Delhi – 110002, India
www.woodheadpublishingindia.com

Published in North America by CRC Press LLC, 6000 Broken Sound Parkway, NW,
Suite 300, Boca Raton, FL 33487, USA

First published 2010, Woodhead Publishing Limited and CRC Press LLC
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British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library.

Library of Congress Cataloging in Publication Data
A catalog record for this book is available from the Library of Congress.

Woodhead Publishing ISBN 978-1-84569-495-1 (book)
Woodhead Publishing ISBN 978-1-84569-926-0 (e-book)
CRC Press ISBN 978-1-4398-2772-7
CRC Press order number: N10155

The publishers' policy is to use permanent paper from mills that operate a sustainable forestry policy, and which has been manufactured from pulp which is processed using acid-free and elemental chlorine-free practices. Furthermore, the publishers ensure that the text paper and cover board used have met acceptable environmental accreditation standards.

Typeset by Toppan Best-set Premedia Limited, Hong Kong
Printed by TJ International Limited, Padstow, Cornwall, UK

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Contents

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