

# Real-Time PCR in Food Science

## Current Technology and Applications



Edited by: **David Rodríguez-Lázaro**  
University of Burgos, Burgos, Spain

**Published:** January 2013 (book); October 2013 (ebook). **Pages:** x + 286  
**Book:** ISBN 978-1-908230-15-7 £159, \$319. **Ebook:** ISBN 978-1-908230-80-5 £159, \$319  
**Published by:** Caister Academic Press [www.caister.com](http://www.caister.com)

The promotion of a high level of food safety and quality is of major importance world-wide. Aspects of food quality such as genetically modified organisms (GMOs), food allergens and food authentication have become increasingly important while food-borne diseases caused by bacteria, viruses and parasites continue to be a significant problem. The application of real-time PCR is one of the most promising advances in food safety and quality providing rapid, reliable and quantitative results. In recent years real-time PCR has become a valuable alternative to traditional detection methods in the agricultural and food industries. The advantages of quantitative real-time PCR include speed, an excellent detection limit, selectivity, specificity, sensitivity and the potential for automation.

Written by experts in the field, this book is an indispensable manual for scientists in the food industry. The first section, *Real-Time PCR Basics*, provides an introduction to real-time PCR, discusses the use of PCR diagnostics in food science, describes the principles and methods of sample preparation, and covers the verification and control of PCR procedures. The eleven chapters in the second section, *Food Microbiology*, cover the use of real-time PCR to detect various pathogens including *Salmonella*, *Listeria*, *E. coli*, *Campylobacter*, *Yersinia*, *Staphylococcus*, *Clostridium*, viruses and parasites. Also included is a chapter on the standardisation of real-time PCR methods in food microbiology. The final section, *Food Quality*, covers the use of real-time PCR for the analysis of GMOs, food allergens and for the identification of animal or plant species.

An invaluable book for anyone involved in food science or the detection of foodborne pathogens and a recommended volume for all microbiology laboratories.

- Chapter 1.** Introduction to the Real-time PCR. *David Rodríguez-Lázaro and Marta Hernández*
- Chapter 2.** Current Challenges in Real-time PCR Diagnostics in Food Science. *David Rodríguez-Lázaro, Nigel Cook and Marta Hernández*
- Chapter 3.** Sample Preparation for Real-time PCR in Food Science. *Tomás Kuchta*
- Chapter 4.** Internal Amplification Controls in Real-time Polymerase Chain Reaction-Based Methods for Pathogen Detection. *Nigel Cook, Gabriel A de Ridder, Martin D'Agostino and Maureen B Taylor*
- Chapter 5.** Standardization of Real-time PCR Methods in Food Microbiology. *Kornelia Berghof-Jäger*
- Chapter 6.** Real-time PCR Detection of Foodborne Pathogenic *Salmonella* spp.. *Burkhard Malorny, Dietrich Mäde and Charlotta Löfström*
- Chapter 7.** Real-time PCR Methods for the Detection of *Listeria monocytogenes* in Foods. *David Rodríguez-Lázaro and Marta Hernández*
- Chapter 8.** Real-time PCR Detection of Foodborne Pathogenic *Escherichia coli*. *Patricia Elízaquível, Gloria Sánchez and Rosa Aznar*
- Chapter 9.** Detection of Pathogenic Thermotolerant *Campylobacter* species by Real-time PCR. *L. Jesús Garcia-Gil*
- Chapter 10.** Detection of Pathogenic *Yersinia enterocolitica* by Real-time PCR in Foods. *Dietrich Mäde*
- Chapter 11.** Real-time PCR Detection of Foodborne Pathogenic *Vibrio*. *Luciana Croci and Elisabetta Suffredini*
- Chapter 12.** Real-time PCR Detection of Foodborne Pathogenic *Staphylococcus aureus*. *B. Stessl and M. Wagner*
- Chapter 13.** Real-time PCR Detection of Foodborne Pathogenic *Clostridia*. *Kathie Grant and Corinne Amar*
- Chapter 14.** Real-Time PCR and other Molecular Detection Methods for Foodborne Pathogenic Viruses. *Doris Helen D'Souza, Marta Hernández, Nigel Cook and David Rodríguez-Lázaro*
- Chapter 15.** Real-Time PCR Detection of Foodborne and Waterborne Parasites. *George D. Di Giovanni, Gregory D. Sturbaum, and Huw V. Smith*
- Chapter 16.** Real-time PCR Analysis of Genetically Modified Organisms. *Arne Holst-Jensen*
- Chapter 17.** Real-time PCR Analysis of Food Allergens and Gluten. *Carmen Diaz-Amigo and Bert Popping*
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