Rapid Detection,
Characterization, and
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Foodborne
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PREFACE

The current increase in public attention to food safety, especially foodborne microbes, has increased research into new, rapid methods of detection of foodborne pathogens. Faster and better detection and characterization of pathogens are the cornerstones of the fight against foodborne pathogens.

The food industry and control authorities are putting substantial efforts into testing in order to ensure and document safer foods, prevent product recalls, and limit economic losses. But how are the current rapid methods validated, what is the cost-benefit of using rapid methods, and which rapid method is the appropriate one to choose? These are some of the questions that this book attempts to answer.

A group of 85 experts from 50 research centers provides readers with the latest developments in this field. One of the book’s unique aspects is that it focuses on commodities rather than pathogens. Thus, it is organized according to food production lines rather than types of pathogens. For each production line, rapid methods are described for a number of important target pathogens.

Another unique aspect of the book is the presentation of open-formula, noncommercial protocols. There are many commercial kits available, and new ones are frequently introduced while others are withdrawn. Some kits are better validated than others, and some perform better on certain types of samples. It is not the intention of this book to promote specific commercial kits, but rather to discuss the scientific basis for new methods. For this reason, and to avoid bias toward certain products, we have done our best to limit mention of commercial kits.

The book is organized into seven sections and contains a total of 28 chapters. Section I is a state-of-the-art review of the latest laboratory technologies that can accelerate test results. Section II, entitled “Critical Considerations before Setting Up Rapid Methods,” serves as an introduction to the field of rapid methods and provides an overview of the critical issues.

Section III deals with the sample types, testing considerations, and main foodborne pathogens in the meat production chain. In Section IV, the latest
rapid methods concerned with the dairy production chain are reviewed, along with practical implications for sampling schemes and pathogens of concern to the public health. Section V provides the reader with the latest developments in the testing of fresh produce, water, and seafood, which is considered as an emerging public health issue due to the increasing international trade of fresh produce.

In the sixth section, the latest testing issues in the food service and catering industry are discussed and guidelines for rapid testing are given. In the last section, “Conclusions,” the final chapter of this book looks to the future of rapid methods by explaining research needs and discussing emerging areas.

I hope those readers who work in the food industry and end-use laboratories will find these protocols useful and implement them for actual testing. For those scientists developing new methods and adopting new protocols, the discussions especially in Section II will be helpful with the less elucidated aspects, such as statistics, sampling plans, validation, and so on. For those students who are involved in test development both at the undergraduate and postgraduate levels, this book will help them to understand important aspects of laboratory work. Finally, by consulting this book, quality control managers will become more familiar with the principles of testing when they are deciding to use a new test or detecting a different pathogen. This book is written in the hope that it makes the food your company produces safer.

J. Hoorfar
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In today’s demanding work culture, it is not easy to find time for extracurricular work such as book contributions; in particular, writing updated reviews can be quite time-consuming. That is why I express my heartfelt gratitude to the large panel of my colleagues who contributed to the chapters. Their enthusiasm to share expertise and knowledge has made this book possible.

Coordinating the European project BIOTRACER project (FOOD-2006-CT-036272), one of the world’s largest food microbiology research projects, provided me with the opportunity to collaborate closely with many excellent scientists from different disciplines of microbial food safety. One of the outcomes of this collaboration is this book. The European project BIOTRACER supported a large number of scientists and much of the work that is described in different chapters of this book.

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