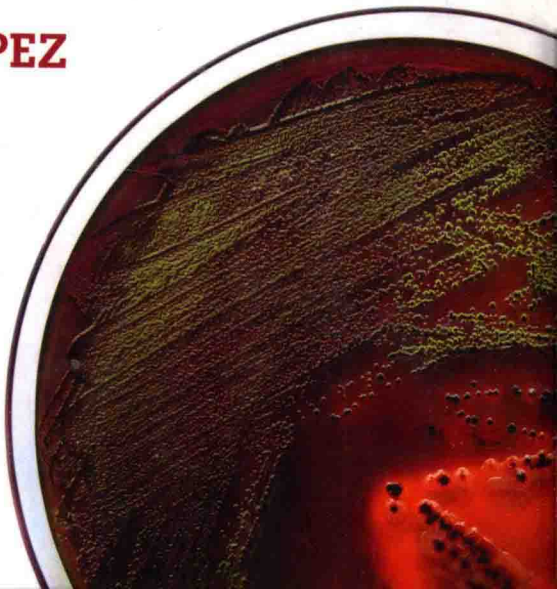
Decontamination of Fresh and Minimally Processed Produce

EDITED BY
VICENTE M. GÓMEZ-LÓPEZ



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Preface

This text has the goal of being the first book providing a systematic view of the different types of decontaminants for fresh and minimally processed produce, and describing the different effects of decontamination treatments well beyond food safety.

There are a growing number of valuable books on emerging technologies. There are also high-quality texts on minimal processing; however, there is a lack of books that cover extensively and in detail the different aspects of the use of decontaminants, and especially detailing their effects on spoilage microflora, sensory quality, nutrient and phytochemical content, and toxicological and legal concerns.

This book is organized into six sections. In Section I, the preharvest and harvest contamination of produce is described in detail. This is followed by three chapters about factors impairing decontamination efficacy such as attachment and surface topography, biofilms, resistance, and sublethal damage.

Sections II, III, and IV cover different decontamination strategies based on six transversal axes:

1. Inactivation of human pathogens present in produce in order to reduce the risk of foodborne infections and intoxications.
2. Inactivation of indigenous microflora and microbial contaminants acquired during processing, together with controlling survival and growth during storage, in order to decrease microbial spoilage.
3. Preservation of sensory quality, immediately after processing and during storage.
4. Nutritional quality and phytochemical composition.
5. Potential presence of toxic residues or formation of unacceptable levels of toxic by-products.
6. Regulatory status.

More specifically, Section II starts with a chapter describing produce washers, followed by others explaining the special characteristics of minimally processed fruits and vegetables. The chapter then describes, based on the six transversal axes, different decontaminants: chlorine, electrolyzed oxidizing water, chlorine dioxide, ozone, hydrogen peroxide, peroxyacetic acid, essential oils, edible films and coatings, and miscellaneous.

Section III is devoted to biological decontamination strategies such as viruses, protective cultures, bacteriocins, and quorum sensing. Section IV addresses physical methods such as mild heat, continuous UV light, ionizing radiation, and miscellaneous, and finishes with a discussion of a combination of decontamination methods in the frame of the hurdle technology concept.

Section V refers to preservation strategies after decontamination, where the principles of modified atmosphere packaging and cold chain are revised and discussed. Section VI covers modeling tools, which are not widely used in decontamination experiments, and should serve as a way to promote their use. These chapters focus on two perspectives: from

the point of view of microbial inactivation and from the point of view of microbial growth during shelf life.

I am very grateful to each of the contributors for their commitment to this book. Since the start of this project, I was sure that this book's success would rely on the strong team of authors that assured from the beginning its top quality. I also want to thank the editorial staff of Wiley-Blackwell, especially Mark Barrett, Susan Engelken, Carys Williams, David McDade, and Samantha Thompson for their guidance in all the aspects that made possible the publication of this book.

Finally, I would like to thank my parents, my wife M. Stella, and my children Vicente and Juan Manuel for their patience in allowing me to use our family time to write chapters and edit this book.

Vicente M. Gómez-López

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