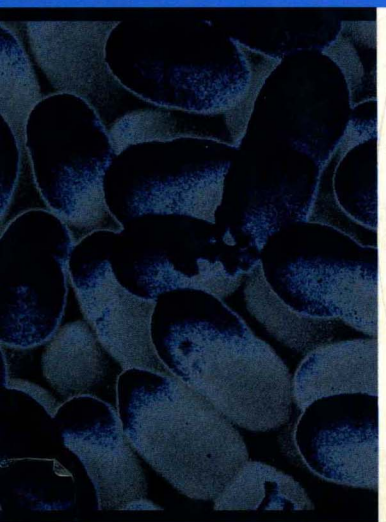


Lactic Acid

Bacteria

Microbiology and Functional Aspects
Second Edition, Revised and Expanded



edited by

Seppo Salminen
Atte von Wright

Lactic Acid Bacteria

Microbiology and Functional Aspects

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Preface to the Second Edition

The first edition of *Lactic Acid Bacteria* was a profound success and well received. This, together with the very rapid progress in the field of research on lactic acid bacteria, has created a need for the second edition of the volume sooner than we had thought. Most of the material has been completely rewritten, and some totally new chapters have been included, although few changes have been made in some technical chapters.

Understanding of the scientific basis of probiotic research, which was anticipated in the previous edition, has advanced in great strides. Consequently, new data on immunology, animal probiotics, and the role of propionic acid bacteria have been added. The importance of bacteriophages, both as a practical problem and as a molecular biological tool, has merited a special chapter. Other chapters have been updated for the most recent research findings and regulatory developments.

We feel that this book provides the reader with a concise overview of a rapidly progressing field. Thus, it is an invaluable aid in guiding the reader through the web of accumulating new research data and in summarizing the fragmentary information available in specialist publications. Also, recent rapid developments in the area of functional foods should make the present edition valuable to an even wider audience.

*Seppo Salminen
Atte von Wright*

Preface to the First Edition

Lactic acid-producing fermentation is an old invention. Many different cultures in various parts of the world have used it to improve the storage qualities, palatability, and nutritive value of perishable foods such as milk, vegetables, meat, fish, legumes, and cereals. The organisms that produce this type of fermentation, lactic acid bacteria, have had an important role in preserving foods, preventing food poisoning, and indirectly feeding the hungry on every continent.

In the developed world, lactic acid bacteria are mainly associated with fermented dairy products such as cheese, buttermilk, and yogurt. The use of dairy starter cultures has become an industry during this century. Because of this, the technological aspects of lactic acid fermentation have been well covered in both research and training in food sciences.

Since the days of the Russian scientist Metchnikoff, lactic acid bacteria have also been associated with beneficial health effects. Today an increasing number of health foods and so-called functional foods as well as pharmaceutical preparations are promoted with health claims based on the characteristics of certain strains of lactic acid bacteria. Most of these strains, however, have not been thoroughly studied, and consequently the claims are not well substantiated. Moreover, the accepted standards of clinical protocols, including double-blind randomized study designs, have not been applied in most “health-claim” studies—health benefits are judged mainly using subjective criteria. Additionally, the specific bacterial strains used in the studies are often poorly identified. Most information about the

health effects of lactic acid bacteria is thus anecdotal. There is a clear need for critical study of the effects on health of strain selection and the quality of fermented foods and their ingredients. Clinical studies should be properly conducted as double-blind, placebo-controlled randomized trials. Both the defined bacterial strains and the proposed products should be studied to verify results. Only such studies produce the solid data that can back up health claims.

This book reviews current developments in the study of lactic acid bacteria using the above-mentioned criteria. An overview of the taxonomy and general physiology of lactic acid bacteria is given. A discussion of the genetics of lactic acid bacteria as a future area of interest is included as well as a chapter on the technological aspects of manufacturing functional lactic acid bacteria starters. Many chapters consider our present knowledge of the effects of lactic acid bacteria in human health and disease and as animal probiotics.

One chapter of particular interest describes the development of individual lactic acid microflora. It was written by an Estonian research group that worked in association with the former Soviet space program. These results have not been previously published in the West.

Thus, this book attempts to shed light on little-known and controversial aspects of lactic acid bacteria and their applications. As new techniques as well as new interest in these organisms develop, the anecdotal evidence on the health benefits of specific strains of lactic acid bacteria is slowly being replaced by a more scientific outlook. This book should serve as an important introduction to any student or scientist interested in these developments.

In particular, those working with lactic acid bacteria and fermented foods or feed products within universities and the food industry should find this book most interesting. It will also be helpful to dairy scientists and technologists, both as a textbook and as a handbook for product development. It will be useful to government organizations developing regulatory policies for products based on lactic acid fermentation and bacteria, especially when health claims are concerned. Finally, consumer groups interested in the effects of lactic acid bacteria may benefit from the comprehensive reviews in this volume.

Readers are referred to most of the recent literature in the area, covering the subject well from various aspects. Our aim has been to give an overview of a rapidly changing and extremely important area of food and nutrition research.

*Seppo Salminen
Atte von Wright*

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