

Food Microbiology Protocols

Edited by

John E. T. Spencer

Alicia L. Ragout de Spencer



HUMANA PRESS

METHODS IN BIOTECHNOLOGY™

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and

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*Planta Piloto de Procesos Industriales Microbiologicos,
San Miguel Tucumán, Argentina*

Humana Press



Totowa, New Jersey

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999 Riverview Drive, Suite 208
Totowa, New Jersey 07512

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ANSI Z39.48-1984 (American Standards Institute) Permanence of Paper for Printed Library Materials.

Cover design by Patricia F. Cleary.

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Printed in the United States of America. 10 9 8 7 6 5 4 3 2 1

Library of Congress Cataloging in Publication Data

Main entry under title: Food microbiology protocols.

Methods in biotechnology™.

Food microbiology protocols./edited by John F. T. Spencer and Alicia L. Ragout de Spencer.
p. cm.—(Methods in biotechnology; 14)

Includes bibliographical references and index.

ISBN 0-89603-867-X (alk. paper)

I. Food—Microbiology. I. Spencer, John F. T. II. Ragout de Spencer, Alicia L. III. Series.

QR115.F658 2001

664'.001'579—dc21

00-021718

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METHODS IN BIOTECHNOLOGY™

John M. Walker, SERIES EDITOR

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Preface

Two of the recent books in the *Methods in Molecular Biology* series, *Yeast Protocols* and *Pichia Protocols*, have been narrowly focused on yeasts and, in the latter case, particular species of yeasts. *Food Microbiology Protocols*, of necessity, covers a very wide range of microorganisms. Our book treats four categories of microorganisms affecting foods: (1) Spoilage organisms; (2) pathogens; (3) microorganisms in fermented foods; and (4) microorganisms producing metabolites that affect the flavor or nutritive value of foods. Detailed information is given on each of these categories.

There are several chapters devoted to the microorganisms associated with fermented foods: these are of increasing importance in food microbiology, and include one bacteriophage that kills the lactic acid bacteria involved in the manufacture of different foods—cottage cheese, yogurt, sauerkraut, and many others. The other nine chapters give procedures for the maintenance of lactic acid bacteria, the isolation of plasmid and genomic DNA from species of *Lactobacillus*, determination of the proteolytic activity of lactic acid bacteria, determination of bacteriocins, and other important topics.

A substantial number of the chapters deal with yeasts, microorganisms which, after all, have also been associated with human foods and beverages for many thousands of years. The emphasis in *Food Microbiology Protocols* is on techniques for the improvement of methods for yeast hybridization and isolation, and for improvement of strains of industrially important yeasts, to be used in food and beverage production. For instance, the chapters by Katsuragi describe techniques for isolation of hybrids obtained by protoplast fusion and conventional mating, by the use of fluorescent staining, and by separation using flow cytometry. Other chapters discuss the identification of strains by analysis of mitochondrial DNA and other techniques. There are chapters on the isolation of strains of starches used in the production of human foods, and an important chapter on obtaining and isolating thermotolerant strains for the high temperature production of beverage and industrial alcohol. Finally, there are methods for the production of polyhydroxy alcohols for low-calorie sweeteners. The material on yeasts overlaps only slightly with that in the excellent book, *Yeast Protocols*, edited by Ivor H. Evans, so investigators interested in industrial yeasts should avail themselves of both volumes.

The chapters on spoilage organisms and pathogens include valuable information on the isolation and identification of most important species in these areas. Several of these are concerned with bacteria, yeasts, and molds, causing spoilage of poultry products, as well as causing disease in humans. Methods for identification by molecular biology techniques and by conventional plate counts are given. There are two reviews on topics of immediate interest.

Finally, the editors and the publishers would like to thank all those authors who gave so freely of their time and energy in preparing these chapters.

The editors wish especially to thank Dr. Faustino Siñeriz, Director of PROIMI, for allowing us to use the facilities at PROIMI in the preparation of this book, and for his kind encouragement in the work at all times. We also thank Dr. María E. Lucca for her able assistance in correcting the final version.

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I

SPOILAGE ORGANISMS

