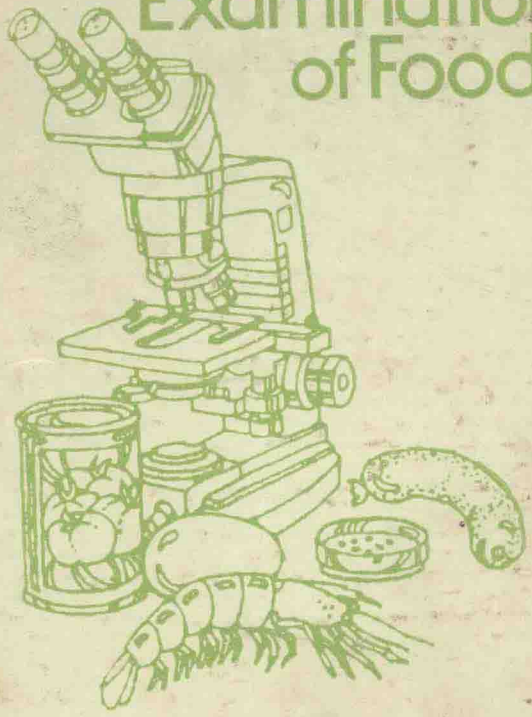
Compendium of Methods for the Microbiological Examination of Foods



Compendium of Methods for the Microbiological Examination of Foods

（内部交流）

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INTERSOCIETY/AGENCY COMMITTEE ON METHODS FOR THE MICROBIOLOGICAL EXAMINATION OF FOODS

MARVIN L. SPECK, Chairman
William Neal Reynolds Professor, Food Science and Microbiology, Department of Food Science, North Carolina State University, Raleigh, NC 27607
Representative: American Public Health Association

CLEVE B. DENNY
Director of Research Services, National Canners Association, 1133 20th Street, N.W., Washington, DC 20036
Representative: National Canners Association

R. PAUL ELLIOTT
Formerly Chief, Microbiology Branch, SS, APHIS, U.S. Department Agriculture; Present address: 1095 Lariat Lane, Pebble Beach, CA 93953. Resigned from IS/A Committee in 1974.

E. M. FOSTER
Director, Professor of Bacteriology, Food Research Institute, The University of Wisconsin, Madison, WI 53706
Representative: American Society of Microbiology

JOHN T. GRAIKOSKI
Supervisory Research Microbiologist, National Marine Fisheries Service, Mid-Atlantic Coastal Fisheries Center, NOAA, Milford, CT 06460
Representative: National Marine Fisheries Service

W. J. HAUSLER, JR.
Director, State Hygienic Laboratory, University of Iowa Iowa City, IA 52240
Representative: Association of State and Territorial Public Health Laboratory Directors, Association of Food and Drug Officials of the United States

GEORGE J. HERMANN
1827 Mason Mill Road, Decatur, GA 30033
Representative: Center for Disease Control

NINO F. INSALATA
Research Manager, Microbiological Research, General Foods Corporation, Central Research, Tarrytown, NY 10591
Representative: National Environmental Health Association, Institute of Food Technologists

RALPH W. JOHNSTON
Chief, Microbiology Staff, Meat and Poultry Inspection Program, U.S.D.A., Animal and Plant Health Inspection Service, Washington, DC 20250
Representative: U.S. Department of Agriculture

EDMUND M. POWERS
Microbiology Division, Food Laboratory, U.S. Army Natick Laboratories, Natick, MA 01760
Representative: U.S. Department of Defense, Food Program

JOHN H. SILLIKER
President, Silliker Laboratories, 1139 E. Dominquez Street, Suite 1, Carson, CA 90746
Representative: American Council of Independent Laboratories

CARL VANDERZANT
Professor of Food Microbiology, Animal Science Department, Texas A & M University, College Station, TX 77840
Representative: International Association of Milk, Food and Environmental Sanitarians

PROJECT DIRECTOR

HOWARD L. BODILY
APHA Staff Associate for Laboratory Programs, P.O. Box 247, Midway, UT 84049

PROJECT OFFICER

JOSEPH C. OLSON, JR.
Division of Microbiology, Bureau of Foods, Food and Drug Administration, 200 C. Street, S.W., Washington, DC 20204
Representative: Association of Official Analytical Chemists, Food and Drug Administration

AUTHORS AND CONTRIBUTORS

JOHN A. ALFORD
Laboratory Chief, Dairy Foods Nutrition Laboratory, Nutrition Institute, USDA, Bldg 157, ARC East, Beltsville, MD 20705

R. E. ARENDS
Contech Laboratory, Pet Inc., Greenville, IL 62246

DAVID H. ASHTON
Hunt-Wesson Foods, 1645 W. Valencia Drive, Fullerton, CA 92634

EDWARD F. BAER*
Microbiologist, FB, 05, Division of Microbiology BF-124, Food and Drug Administration, 200 C Street, S.W., Washington, DC 20204

JOHN A. BAROSS
Research Associate, Department of Microbiology, Bioscience Bldg, Oregon State University, Corvallis, OR 97330

T. A. BELL
U.S. Department of Agriculture, Box 5578, Raleigh, NC 27607

REGINALD W. BENNETT
Research Microbiologist, Division of Microbiology, Food and Drug Administration, 200 C Street, S.W., Washington, DC 20204

MERLIN S. BERGDOLL
Professor-Enterotoxin, University of Wisconsin, Food Research Institute, 2115 Herrick Drive, Madison, WI 53706

A. RICHARD BRAZIS
Chief, Laboratory Development Section, Division of Microbiology, Food and Drug Administration, 1090 Tusculum Avenue, Cincinnati, OH 45226

JAMES J. BRINDA
Director, Bureau of Environmental Hygiene, City of Minneapolis, Division of Public Health, 250 S. 4th Street, Minneapolis, MN 55402

FRANK L. BRYAN
Chief, Food Borne Diseases Activity, Health Agencies, Branch Training Program, Center for Disease Control, Atlanta, GA 30333

FRANCIS F. BUSTA
Department of Food Science and Nutrition, 238 FSI Building, University of Minnesota, St. Paul, MN 55101

JEPTHA E. CAMPBELL
Chief, Microbial Biochemistry, Division of Microbiology, FDA, 1090 Tusculum Avenue, Cincinnati, OH 45226

JAMES C. CANADA
Quality Control Manager, Chemical and Microbiological Services, Gerber Products Company, 445 State Street, Fremont, MI 49412

RICHARD T. CAREY
National Supervisor, Food Technologist, Granding Branch, USDA, AMS, Poultry Division Grading Branch, Washington, DC 20250

THOMAS C. CHENG
Institute for Pathology, Lehigh University, Bethlehem, PA 18015

*Deceased

LEE R. CHUGG
General Foods Corporation, Technical Center, 250 North Street, White Plains, NY 10625
D. O. CLIVER
Associate Professor, University of Wisconsin, Food Research Institute, Madison, WI 53706
D. A. CORLETT, JR.
Manager, Microbiology, Del Monte Research Center, 205 N. Wiget Lane, Walnut Creek, CA 94598
ROBERT H. DEIBEL
Professor, Department of Bacteriology, 1550 Linden Drive, University of Wisconsin, Madison, WI 53706
WALLIS E. DEWITT
Chief, Enteric Investigation Unit, Bacterial Diseases Branch, Center For Disease Control, Altanta, GA 30333
JOHN M. DRYER
Manager, Microbiology, H. J. Heinz Company, P.O. Box 57, Pittsburgh, PA 15230
CHARLES LEE DUNCAN
Associate Professor, University of Wisconsin, Food Research Institute, 1925 Willow Drive, Madison, WI 53706
WILLIAM V. EISENBERG
Microanalytical Branch, Division of Microbiology, HFF-127, Food and Drug Administration, 200 C Street, S.W., Washington, DC 20204
J. L. ETCHELLS
U.S. Department of Agriculture, Box 5578, Raleigh, NC 27607
MARTIN S. FAVERO
Deputy Chief, Phoenix Laboratories, U.S. Public Health Service, CDC-Phoenix Field Station, 4402 N. Seventh Street, Phoenix, AZ 85014
JAMES C. FEELEY
Chief, Special Pathogens Unit, Epidemiology Program, Bacterial Diseases Branch, Center for Disease Control, Atlanta, GA 30333
MORRIS FISHBEIN*
Microbiologist, Food and Drug Administration, Division of Microbiology-HFF-124, 200 C Street, S.W., Washington, DC 20204
DAMIEN GABIS
Vice-President, Silliker Laboratories, 1304 Halsted Street, Chicago Heights, IL 60411
STANLEY E. GILLILAND
Associate Professor, Department of Food Science, North Carolina State University, Raleigh, NC 27607
J. M. GOEPFERT
Associate Professor, University of Wisconsin, Food Research Institute, 2115 Herrick Drive, Madison, WI 53706
JAMES M. GORMAN
Technical Director, Food Division, Seymour Foods, Inc., P.O. Box 1220, Topeka, KS 66601

*Deceased

RODNEY J. H. GRAY
University of Delaware, Department of Foods and Nutrition, 206 Allison Hall, Newark, DE 19711
V. W. GREENE
School of Public Health, University of Minnesota, Minneapolis, MN 55455
PHILIP A. GUARINO
Manager, Corporate Analytical Services, 414 Light Street, Baltimore, MD 21202
LESTER HANKIN
Biochemist, Connecticut Agricultural Experimentation Station, New Haven, CT 06504
STANLEY M. HARMON
Research Microbiologist, Division of Microbiology BF-124, Food and Drug Administration, 200 C Street, S.W., Washington, DC 20204
PAUL A. HARTMAN
Distinguished Professor, Department of Bacteriology, Iowa State University, Ames, IA 50010
GLEN L. HAYES
Senior Bacteriologist, American Can Company, 433 North Northwest Highway, Barrington, IL 60010
GEORGE R. HEALY
Chief, Parasitology Section, Parasitology Branch, Center for Disease Control, Atlanta, GA 30333
JOHN S. HILKER
Microbiological Manager, M & M / Mars, High Street, Hackettstown, NJ 07840
W. MIKE HILL
Armour Foods Company, Armour Research Center, Scottsdale, AZ 85260
W. E. HOBBS
Head, Microbiological Regulatory Services, General Mills, Inc., 9000 Plymouth Avenue North, Minneapolis, MN 55427
GLEN L. HOFFMAN
Fish Farming Experimental Station, U.S.S.W.S., P.O. Box 860, Stuttgart, AK 72160
DANIEL A. HUNT
Assistant Chief, Shellfish Sanitation Branch, Division of Shellfish Sanitation, BF-230, Food and Drug Administration, 200 C Street, S.W., Washington, DC 20204
MARGARET HUSTON
Scientific Director, Poultry and Egg Institute of America, 67 East Madison Street, Chicago, IL 60603
JOHN J. IANDOLA
Associate Professor, Microbiology, Division of Biology, Kansas State University, Manhattan, KS 66506
KEITH A. ITO
Head, Microbiology Section, National Canners Association, 1950-6th Street, Berkeley, CA 94710

GEORGE J. JACKSON
Chief, Parasitology Laboratory, Division of Microbiology, Food and Drug Administration, 200 C Street, S.W., Washington, DC 20204
DONALD A. KAUTTER
Assistant Chief, Division of Microbiology (BF-124), Food and Drug Administration, 200 C Street, S.W., Washington, DC 20204
JOHN A. KOBURGER
Associate Professor, Department of Food Science, University of Florida, Gainsville, FL 32611
HARRY E. KORAB
Technical, National Soft Drinks Association, 1101 16th Street, N.W., Washington, DC 20036
ALLEN A. KRAFT
Professor, Food Research Laboratory, Iowa State University, Ames, IA 50010
C. P. KURTZMAN
Zymologist, Northern Regional Research Laboratory, Agricultural Research Service, U.S. Department of Agriculture, 1815 North University Street, Peoria, IL 61604
LOUIS C. LAMOTTE, JR.
Licensure and Proficiency Testing Division, Bureau of Laboratories, Center for Disease Control, Atlanta, GA 30333
J. S. LEE
Department of Food Science, Oregon State University, Corvallis, OR 97331
W. H. LEE
Research Microbiologist, Division of Microbiology, Food and Drug Administration, 200 C Street, S.W., Washington, DC 20204
HAROLD V. LEININGER
Director, Minneapolis Microbiological Facility, DHEW, PHS, Food and Drug Administration, 240 Hennepin Avenue, Minneapolis, MN 55401
J. RALPH LICHTENFELS
Parasite Classification and Distribution Unit, Animal Parasitology Institute, U.S.D.A., A.R.S., B.A.R.C., East 120 Beltsville, MD 20705
JOHN LISTON
Institute for Food Science and Technology, College of Fisheries, University of Washington, Seattle, WA 98195
JOSEPH LOVETT
Food and Drug Administration, 1090 Tusculum Avenue, Cincinnati, OH 45226
RICHARD K. LYNT
Division of Microbiology BF 124, Food and Drug Administration, 200 C Street, S.W., Washington, DC 20204
J. R. MATCHES
College of Fisheries, University of Washington, Seattle, WA 98195
DUANE T. MAUNDER
Continental Can Company, Inc., 1350 W 76 Street, Chicago, IL 60620

J. L. MAYOU
Microbiology, R & D Laboratories, The Pillsbury Company, 311 Second Street, S.E., Minneapolis, MN 55414
IRA J. MEHLMAN
Food and Drug Administration-HFF-125, 200 C Street, S.W., Washington, DC 20204
JAMES W. MESSER
Food Microbiology Branch, Division of Microbiology, Food and Drug Administration, 1090 Tusculum Avenue, Cincinnati, OH 45226
H. DAVID MICHENER
Microbiology Research Unit, Western Regional Laboratory, U.S. Department of Agriculture, Berkeley, CA 94710
THADDEUS F. MIDURA
California State Department of Health, 2151 Berkeley Way, Berkeley, CA 94704
JOHN J. MIESCIER
N. E. Technical Service Unit, Food and Drug Administration, CBC Building S-26, Davisville, RI 02852
WILLIAM A. MOATS
Dairy Quality Investigations, Market Quality Research Division, Bldg 309, ARC East, U.S. Department of Agriculture, Beltsville, MD 20705
GEORGE K. MORRIS
Chief, Epidemiologic Services Laboratory Section Center for Disease Control, Atlanta, GA 30333
J. ORVIN MUNDT
Department of Microbiology, University of Tennessee, Knoxville, TN 37916
D. I. MURDOCK
The Coca-Cola Company, Foods Division, P.O. Box 368, Plymouth, FL 32768
M. J. NAKAMURA
Professor and Chairman, Department of Microbiology, University of Montana, Missaula, MT 59801
F. E. NELSON
Professor, 225 Agricultural Sciences, University of Arizona, Tucson, AZ 85721
Z. JOHN ORDAL
Professor, Department of Food Science, 580 Bevier Hall, University of Illinois, Urbana, IL 61801
DONALD S. ORTH
Proctor and Gamble Company, Technical Center, 6071 Center Hill Road, Winton Hill, Cincinnati, OH 45224
HENRY J. PEPPLER
Scientific Director, Universal Foods Corporation, Milwaukee, WI 53201
PAUL L. POELMA
Division of Microbiology, Bureau of Foods, No 135, Food and Drug Administration, Washington, DC 20204
DONALD J. PUSCH
Manager, Technical Section, Corporate Quality Assurance Laboratory, The Pillsbury Company, 311 Second Street, S.E., Minneapolis, MN 55414
BIBEK RAY
Visiting Assistant Professor, Food Science Department, North Carolina State University, Raleigh, NC 27607

James Redman
N.Y. State Department Environmental Conservation, SUNY, Bldg 40, Stoneybrooke, NY 11790
Joseph V. Rodricks
Chief, Biochemistry Branch, Bureau of Foods, BF-146, Food and Drug Administration, 200 C Street, S.W., Washington, DC 20204
Arnold C. Salinger
Laboratories Research Administration, Maryland Department of Health and Mental Hygiene, 201 W. Preston, Baltimore, MD 21201
Arvey C. Sanders
Food Microbiology Branch, Division of Microbiology, Bureau of Foods, Food and Drug Administration, 200 C Street, S.W., Washington, DC 20204
William E. Sandine
Professor, Department of Microbiology, Oregon State University, Corvallis, OR 97331
David C. Sands
Department Plant Pathology and Botany, Connecticut Agricultural Experiment Station, New Haven, CT 06504
Arnold E. Schulze
Division of Microbiology (HFF-127), Food and Drug Administration, 200 C Street, S.W., Washington, DC 20204
Anthony J. Sinskey
Department of Nutrition and Food Science, Massachusetts Institute of Technology, Cambridge, MA 02139
F. R. Smith
910 East Oak Street, Greenville, IL 62246
R. V. Speck
Process Microbiology, Campbell Institute for Food Research, Campbell Place, Camden, NJ 08101
D. F. Splittstoesser
Professor, Cornell University, NYS Agriculture Experimental Station, Geneva, NY 14456
Berenice M. Thomason
Analytical Bacteriology Section, Bacteriology Branch, Center for Disease Control, Atlanta, GA 30333
H. Thompson
Del Monte Corporation Research Center, 205 N. Wigot Lane, Walnut Creek, CA 94598
Paul J. Thompson
Microbiology, Gerber Products Company, 445 State Street, Fremont, MI 49412
Donald Vesley
Assistant Professor, School of Public Health, University of Minnesota, 1325 Maye, Minneapolis, MN 55455
Joy G. Wells
Chief, Salmonella-Shigella Unit, Center for Disease Control, Atlanta, GA 30333
Edmund A. Zottola
Professor, Department of Food Science and Nutrition, University of Minnesota, St. Paul, MN 55101

PREFACE

Many factors have contributed to the prevalent intensive microbiological examination of foods. Food safety has become an important responsibility of various regulatory agencies charged with maintaining food safety. The food industry also is concerned with the production of safe foods; and also must cope with problems of preventing food spoilage.

The increased dependence of consumers on food processing industries has contributed to the growth and centralization of food processing. While this situation is conducive to the specialized and expert performance of various processing operations, any lapses in the supervision and care during the processing of foods potentially may affect large quantities of food and a large number of consumers. This situation has contributed to the importance of microbiological testing of foods.

The increased microbiological surveillance of the quality of foods has resulted in the development of many useful analytical procedures. Those which allow the most accurate evaluation of food quality are the ones that should be used. At the same time, it is important that procedures used in different laboratories not be adopted indiscriminately. This is particularly important since multiple laboratories in varying geographical locations may be responsible for the examination of a given food supply. Therefore, the use of the same or equivalent procedures by analysts is essential. Otherwise, health agencies, food processors, as well as the consumer, cannot have the assurance needed for evaluating the data obtained in testing food supplies.

Following the 1971 National Conference on Food Protection sponsored by the American Public Health Association in Denver, Colorado, the need for a *Compendium of Methods for the Microbiological Examination of Foods* became evident. Different government agencies and many industries already had adopted methods for use in their laboratories. Additional publications presented methods useful in the examination of foods for foodborne pathogens. In order to consolidate useful methods in one publication, the American Public Health Association, through its Committee on Laboratory Standards and Practices, developed a proposal that a compendium of methods be developed which would include methods for the evaluation of food safety, as well as for the microbiological spoilage of foods. Subsequently, the Food and Drug Administration contracted with the American Public Health Association to develop such a compendium of methods.

The *Compendium* is to a degree a continuation of two previous publications in this field. The first edition of *Recommended Methods for the Microbiological Examination of Foods* was published in June 1958 by the Coordinating Committee on Laboratory Methods of the American Public Health Association. The committee involved in this work was chaired by Dr. Harry E. Goresline. A second edition of this manual was published in 1966 by the same organization with Dr. John M. Sharf, chairman

of the subcommittee charged with the preparation of the manual. Furthermore, the APHA Committee on Laboratory Standards and Practices suggested that the procedures for shellfish examination contained in *Recommended Procedures for the Examination of Sea Water and Shellfish*, 4th Edition, 1970, be incorporated in this *Compendium*. This has been accomplished and, therefore, effectively terminates the above mentioned procedural manual. Those individuals interested in methods for the examination of sea water are referred to the 14th Edition of *Standard Methods for the Examination of Water and Wastewater*, 1975.

Some of the methods included in this compendium differ only in formats from those given in the Official Methods of Analytical Chemists (12th ed.) and in *Standard Methods for the Examination of Dairy Products* (13th ed.). These methods are used by various federal, state, and municipal regulatory agencies as official methods of analysis. Other methods were selected which have been used in the monitoring of foods for pathogens or for food spoilage types of microorganisms.

In an effort to assist analysts not familiar with different types of foods, a section has been developed in the *Compendium* for a brief description of different foods and processing operations involved in their manufacture. Emphasis in these chapters is given to the types of microorganisms likely to occur in specific foods or food commodity groups, as well as their significance in these foods. This information will allow analysts a more judicious selection of methods for the examination of certain foods.

Shortcomings in different methods are recognized widely by food microbiologists and, hopefully, research will eliminate these from current analytical methodology. While much attention is now given to correct procedures for securing representative food samples for analysis, relatively little is known about the insults to contained microorganisms in the samples during transportation to laboratories. This is particularly important where split samples must be shipped to different laboratories for comparative analyses. The development of cryoprotective additives for samples would be very helpful here. Current procedures generally ignore the stressed or injured condition that may exist in many microorganisms resulting from sublethal treatments during processing and storage of foods. Methods need to be developed that allow injury to be repaired, especially before selective cultural procedures are applied. The enterotoxigenic staphylococci present challenges in the detection of cells by cultural procedures or by the use of indicators such as thermostable nuclease; and procedures for measuring the enterotoxins in food still are adaptable to only a few specialized laboratories. Fluorescent antibody techniques for detecting salmonellae are not as adaptable as had been expected for routine examinations of foods. Procedures for the more certain identification of *Bacillus cereus*, and isolates of *Clostridium perfringens* are needed, as are selective media for detecting *Yersinia* and *Shigella* in foods. A sequel to this *Compendium* is being planned as research provides means for the updating of current methodology.

Many persons have contributed most unselfishly to the development of the Compendium. The project was conceived and developed by Dr. Howard L. Bodily. Collaboration in its implementation and development was supported by a contract from the Food and Drug Administration, U. S. Department of Health, Education, and Welfare, through the encouragement of Dr. J. C. Olson, Jr. Government agencies involved in the microbiological surveillance of foods and professional societies with a competence and interest in food microbiology were asked to appoint

representatives to an Intersociety/Agency Committee to study current analytical methods for the microbiological examination of foods. Authors and contributors were solicited from microbiologists who had established competence in the different subject areas selected for the *Compendium*. The Intersociety/Agency Committee spent many hours in planning the general format and overseeing the content of the *Compendium*. The authors and contributors were especially generous and prompt in the writing, reviewing, and correcting of the materials for which they accepted responsibility. Deliberations of the Intersociety/Agency Committee during its work on the *Compendium* were facilitated and assisted by the attentive care of Mrs. H. L. Bodily to committee proceedings. Dr. Nell Hirschberg furnished exceptional dual competence as copy editor and technical reviewer. Dr. Elizabeth Robinton constructed the index for the *Compendium*. For all of the study and contributions provided by colleagues, the editor expresses his sincere appreciation.

Corrections and technical questions should be sent to the Director of Publications, APHA, 1015 Eighteenth Street, NW, Washington, DC 20036 and will be referred to the Editor or the Chairman of the IS/A Committee.

Marvin L. Speck
Editor, First Edition
Chairman, Intersociety/Agency Committee
Compendium of Methods for the Microbiological Examination of Foods

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