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ROBERTS
SKINNER

Isolation and Identification of Bacteria
for Food Poisoning Investigations



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ISOLATION AND IDENTIFICATION METHODS FOR FOOD POISONING ORGANISMS

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**ISOLATION AND IDENTIFICATION
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Preface

This book is the 17th in the Technical Series of the Society for Applied Bacteriology. Each chapter is the written version of a practical contribution given at the Demonstration Meeting of the Society held at University College, London on September 24th 1980.

Methods for the isolation and identification of all the well-known 'food poisoning' bacteria are covered, including the salmonellas, *Staphylococcus aureus*, *Clostridium perfringens* and *Cl. botulinum*, as well as other organisms such as *Bacillus cereus* and *Vibrio parahaemolyticus* which have relatively recently been recognized as causing problems. *Yersinia enterocolitica* and *Campylobacter* spp. are included although there is still some disagreement about whether they are true food poisoning organisms or whether they are merely transmitted by food. Viruses and food-transmitted parasites are not included.

Phage-typing and serotyping schemes as aids to epidemiological investigations are described. Methods for the detection and identification of enterotoxins are also included. These are likely to be more widely applied in the food microbiology field when reagents such as antisera and pure reference toxins are more widely available. Work on *Cl. botulinum*, however, is likely to remain confined to relatively few laboratories with the necessary safety facilities and practical experience.

Fungi too can cause severe illness by growing and producing toxins in food. In fact it would have been easy to fill several volumes on the subject of mycotoxins and mycotoxigenic fungi. As a compromise we have included three chapters covering the most important genera and toxins.

The contributors to this book include not only leading workers in food microbiology in Britain, but also a number from mainland Europe. Widely accepted 'standard' methods and novel methods not yet adopted by international bodies are covered, as well as a selection of 'personal' methods peculiar to individual laboratories, and adaptations for special purposes.

In spite of all efforts the number of cases of food poisoning shows little sign of diminishing. It is clearly important to discover the reason for each food poisoning incident, but this can only be done satisfactorily if effective methods for identifying the organism causing the disease are available.

The investigation of outbreaks of food-associated disease is discussed in the introductory chapter.

This volume should be a useful practical guide to those working in public health, food industry, food research and teaching laboratories. We should like to thank the contributors on whose hard work this book depends, as well as Dr David Smith and other staff at University College, without whose efficient organization the meeting could not have been held.

December 1981

JANET E. L. CORRY
DIANE ROBERTS
F. A. SKINNER

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The Investigation of Food Poisoning Outbreaks in England and Wales

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Food poisoning in man can be caused by a variety of food-borne agents which may be intrinsic or extrinsic to the food (Table 1). Intrinsic causes include food allergens and certain foods which are toxic in themselves. Extrinsic causes include chemicals, parasites and micro-organisms which are present in the food as unwanted contaminants. Of the micro-organisms bacteria are well recognized as agents of food poisoning but there is still considerable speculation as to the extent to which foods act as vehicles for the transmission of viral diseases. For certain virus diseases, for example hepatitis A, there is conclusive evidence that they can be food-borne.

This chapter is mainly concerned with bacterial food poisoning which can be of two main types. Certain organisms cause an intoxication due to the production of toxins in the food by the bacteria before its consumption, often encouraged by storage of the food in a condition which allows considerable multiplication of the bacteria. Other bacteria cause infection; these multiply and elaborate their toxins in the intestine after consumption of the food and thereby cause the disease. In this situation the bacteria may be present in the food in relatively small numbers when it is consumed but they must, of course, be viable.

The Investigation of Food Poisoning Outbreaks

This involves the following:

- (i) recognition, collection and communication of information and specimens;
- (ii) examination of specimens in laboratories;
- (iii) notification of the findings to investigating authorities and to the Communicable Disease Surveillance Centre (CDSC).