

# **Foodborne disease**

*a focus for health education*

◆◆◆



World Health Organization  
Geneva  
2000

WHO Library Cataloguing-in-Publication Data

Food-borne disease : a focus for health education.

1.Food hygiene 2.Health education 3.Food contamination 4.Food handling 5.Disease transmission – prevention and control 6.Enterobacteriaceae infections – prevention and control 7.Consumer participation

ISBN 92 4 156196 3

(NLM classification: WA 701)

The World Health Organization welcomes requests for permission to reproduce or translate its publications, in part or in full. Applications and enquiries should be addressed to the Office of Publications, World Health Organization, Geneva, Switzerland, which will be glad to provide the latest information on any changes made to the text, plans for new editions, and reprints and translations already available.

© World Health Organization 2000

Publications of the World Health Organization enjoy copyright protection in accordance with the provisions of Protocol 2 of the Universal Copyright Convention. All rights reserved.

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

Designed in New Zealand

Typeset in Hong Kong

Printed in Malta

98/12231—minimum graphics/Best-set/Interprint—7000

# Contents

Preface	v
Acknowledgements	viii
Introduction	x
<b>1. Foodborne diseases: a global health and economic problem</b>	<b>1</b>
Magnitude and nature of foodborne diseases	1
Trends and under-reporting of foodborne diseases	11
Emergence of new or newly recognized types of foodborne diseases	14
Health consequences of foodborne diseases	17
Cost of foodborne diseases	20
Factors leading to the prevalence of foodborne diseases	23
Prevention of foodborne diseases	33
<b>2. Why health education in food safety?</b>	<b>48</b>
Food preparation: a critical stage in the food chain	48
Routine food processing	50
Experience in industrialized and developing countries	56
Shared responsibility	57
High-risk groups	59
New food technologies	61
Awareness and risk perception	62
Effectiveness of education	65
Conditions in developing countries	67
Foodborne diseases: preventable diseases	67
<b>3. Approaches for selection of key behaviours</b>	<b>71</b>
Selection of behaviour	74
Factors underlying food-related behaviour	81
<b>4. Strategies and partners</b>	<b>91</b>
Health sector	91
Education sector	101
Tourism sector	104
Food and health inspectors	109
Mass media	109

**Contents**

The food industry	113
The community	116
<b>5. Implementation of health education in food safety</b>	<b>127</b>
Recognition, commitment and resources	127
Coordination	130
Assessment of the situation	130
Analysis of problems	134
Planning and implementation	134
Monitoring and evaluation	135
Lessons learned from health education	135
<b>6. Conclusion</b>	<b>141</b>
<b>Annex 1</b>	<b>143</b>
Foodborne illnesses: some facts and figures	
Bibliography	191
<b>Annex 2</b>	<b>192</b>
Risk communication	

# Preface

WHO has recognized the importance of education of food handlers and consumers for a number of years. In 1983, the Joint FAO/WHO Expert Committee on Food Safety, which discussed the role of food safety in health and development (Geneva, 1983), identified public education and community participation as essential pillars of strategies for improving food safety and for intervening to prevent foodborne disease. As a follow-up to this Expert Committee, a consultation on health education in food safety in 1987 gave further guidance in this regard. Since then numerous efforts have been made to promote health education in food safety, and several publications and educational materials have been developed for this purpose.

The present book is intended to highlight the public health aspects of food safety. It is an invitation to all who are concerned with food safety and public health education to make every effort to further educate consumers and train food handlers. It tries to capture the concept developed at the WHO consultation on health education in food safety, while at the same time reflecting the extensive experience of WHO's programme on food safety in terms of prevailing fallacies and the need for guidance.

At the time when the plans for this book were first laid some years ago, public health authorities were paying little attention to food safety and even less to health education in food safety. Today there is greater awareness and recognition of the importance of food safety for public health and development in some countries. This may be partly due to WHO's advocacy, but the subject has also received publicity as a result of some important events.

The large-scale outbreak of cholera in Peru and other Latin American countries in the early 1990s was a turning point in that it drew the attention of public health authorities to the link between food and cholera—a link that had previously been overlooked. The epidemic had devastating effects on the health and economy of several countries.

Within the context of the General Agreement on Tariffs and Trade (GATT), the Uruguay Round of Multilateral Trade Negotiations was successfully concluded in April 1994, resulting in liberalization of the food trade. According to the Agreement on the Application of Sanitary and Phytosanitary Measures the work of Codex Alimentarius Commission (through the establishment of standards, guidelines and recommendations) has been recognized as the reference for national food safety requirements. This implies that countries that are involved in international trade and that are members of the World Trade Organization can no longer reject foodstuffs which meet Codex standards,

## **Preface**

recommendations or guidelines without providing justification. Although these developments have concerned principally the regulatory approach to food safety and the need for countries to update their food control systems, they have nevertheless sparked off a debate regarding the responsibilities of consumers and food handlers in food safety and the need for definition of the degree of safety that should be expected from producers and processors.

Other controversial issues, such as the problem of bovine spongiform encephalopathy (BSE) and the use of hormones in food production, have also called into question modern methods of food production and the measures taken to ensure food safety. In addition, the problem of dioxin in animal feed has increased consumer concern.

Perhaps the most important factor in increasing the concern of public health authorities in some countries (mainly industrialized) has been the increasing incidence of foodborne illnesses and a series of outbreaks with fatal or severe health consequences. Some outbreaks were of massive proportions, affecting hundreds of thousands of people; others caused consternation and apprehension because of their severity or the number of deaths that resulted as well as their new epidemiological features. Weaknesses in investigation and surveillance systems for foodborne diseases in developing countries have meant that alarming figures or news about such outbreaks have been relatively scarce, but countries have been alerted worldwide to potential problems looming in the area of food safety and the potential increase and spread of foodborne illnesses.

The climate of concern among food control and public health authorities, as well as industries and consumers, has been an impetus for many governments to take a fresh look at their food safety programmes and to pay greater attention to information, education and training of food handlers. Nevertheless, the subject is far from receiving the attention that it deserves and in most countries the issue of food safety, and in particular health education in food safety, is frequently overlooked or receives low priority in public health programmes.

Even in countries where the authorities are conscious of the problem, very few have taken the step from recognition to action by developing a comprehensive, systematic and continuous programme of health education based on modern approaches to food safety. Several of the reviewers of this book requested examples of success stories regarding health education in food safety and failure to do so is an indication of the small amount of work that has been done in this area. Unfortunately, even where educational activities in food safety have been carried out, the activities have often not been properly coordinated with those primarily concerned, or the programme has lacked proper planning or evaluation that would have enabled improvements and adjustments to be made. Many attempts have also been based on traditional or outdated

approaches to hygiene education, with the result that some of these activities have done more harm than good.

Admittedly the situation has changed greatly over the last few years, and today in some countries there is a greater awareness among consumers. However, in many instances this change has been a consequence of negative publicity in the media, leading to a feeling of insecurity among consumers rather than to a sustained information and education campaign about consumer roles and responsibilities. While this book was in preparation new data became available that could not be included but that clearly supported the book's message. Therefore, the need to produce this book has persisted, and it is hoped that it will achieve its objectives of raising awareness of the need for health education in food safety and of prompting actions. Even if it succeeds only in stimulating scientific debate and research, it will have accomplished a great deal in enhancing the know-how of the scientific community and shaping its views in this important area.

Finally, the attention of the reader is drawn to the sad story of Dr Ignaz Semmelweiss (1818–1865) and the lesson that we should learn from it. For years, thousands of women lost their lives simply because of the unwillingness of his peers to recognize the importance of his discovery and to follow his recommendations with regard to washing their hands in order to prevent perinatal infections. It is strongly hoped that this book can bring a change in health education in food safety and that the recommendations in it will be duly considered by the relevant authorities.

## Acknowledgements

This publication has been prepared by Dr Yasmine Motarjemi, Scientist, Food Safety programme, WHO, with contributions from Dr Akbar Moarefi, former Chief, WHO Health Education programme, and Mr Mike Jacob, consultant in food safety and food law, United Kingdom. The book is the result of collaboration between WHO's Food Safety and Health Education and Health Promotion programmes.

The following persons reviewed the book and provided valuable comments and suggestions:

- Professor M. Abdussalam, Pakistan and Germany
- Ms Akosua Asante, Food Safety, WHO, Geneva, Switzerland
- Dr Michele Beaudry, UNICEF, New York, USA
- Dr John S. Crowther, UNILEVER Research, Bedford, England (on behalf of the Industry Council for Development)
- Professor Michael P. Doyle, University of Georgia, USA (on behalf of International Life Sciences Institute, Washington, DC, USA)
- Professor Layi Erinosh, Ogun State University, Nigeria
- Dr Jack Theodore Jones, Division of Health Promotion, Education and Communication, WHO, Geneva, Switzerland
- Mrs Joanna Koch, Convener of the NGO Working Group on Nutrition, Kilchberg, Switzerland
- Professor Rolf Korte, Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), Eschborn, Germany
- Dr Raj K. Malik, New Delhi, India
- Professor Silvia C. Michanie, Buenos Aires, Argentina
- Dr Serve Notermans, WHO Collaborating Centre for Microbiological Aspects of Food Safety, Bilthoven, Netherlands
- Dr Fernando Quevedo, Lima, Peru
- Dr Jocelyne Rocourt, Pasteur Institute, Paris, France
- Group Captain Roger A. Smith, Secretary, Royal Institute of Public Health and Hygiene, London, England
- Dr Eghbal Taheri, Ministry of Health and Medical Education, Teheran, Islamic Republic of Iran
- Mr Robert Tanner, National Sanitation Foundation International, Brussels, Belgium
- Mrs Susan Van der Vynckt, UNESCO, Paris, France

## **Acknowledgements**

The following WHO programmes assisted in revising the text: Nutrition, Rural Environmental Health, Child Health and Development.

WHO would like also to express its appreciation to the International Life Sciences Institute (ILSI) for its financial support towards the preparation of this book.

# Introduction

Foodborne diseases are a widespread public health problem and a significant cause of reduced economic productivity. Each year throughout the world, millions of people, particularly infants and children, suffer and die from foodborne diseases (1). While the role of food producers and processors in ensuring food safety should not be underestimated, many cases of foodborne illnesses, if not most, could be prevented—and many lives saved—if food handlers were better educated and trained in safe food-handling and consumers were better advised in the choice of their food.<sup>1</sup>

The importance of food safety, and particularly the need for education about it, has been highlighted at many international meetings. The WHO/UNICEF International Conference on Primary Health Care (Alma-Ata, 1978) proclaimed that “education concerning prevailing health problems and the methods of preventing and controlling them” is an essential element of primary health care. Promotion of the food supply and proper nutrition were considered to be other essential components (2). The importance of the subject was reiterated at the World Summit for Children (New York, 1990), the United Nations Conference on Environment and Health (Rio de Janeiro, 1992) and the International Conference on Nutrition (Rome, 1992). In its Plan of Action, the Rome conference made the recommendation to “support consumer education to contribute to an educated and knowledgeable public, safe practices in the home, community participation and active consumer associations” (1).

In response to this call for the promotion of health education, including food safety, the Forty-second World Health Assembly passed a resolution (WHA42.44) in 1989 requesting WHO to support Member States in strengthening national capabilities in all aspects of health promotion, public information and education for health. It also requested that particular attention be paid to the development of new and effective methodologies and strategies. Later, the Forty-sixth World Health Assembly passed a resolution (WHA46.7) urging Member States to reduce foodborne diseases by the year 2000 and to remedy poor hygiene.

Independently of these developments, the General Assembly of the United Nations adopted on 9 April 1985 guidelines for consumer protection in which

---

<sup>1</sup> The term “food” is taken here to include drinking-water and water used in food preparation. In certain circumstances water is referred to as a separate entity.

it encouraged countries, and particularly developing countries, to develop consumer education programmes. The protection of consumers from hazards to their health and safety, the access of consumers to adequate information to enable them to make informed choices according to their wishes and needs, and consumer education are principles of these guidelines (3).

In spite of this recognition, food safety, and in particular the education of consumers and food handlers in food safety, has often been given very low priority in national health programmes. Further, the significance of food safety has often not been recognized in programmes for the prevention of diarrhoea. In a review of 67 articles that described and evaluated health education programmes in developing countries, none of the studies was designed to educate consumers/food handlers in food safety (4). Although the importance of food safety is being increasingly recognized, neglect of this subject in the past has perpetuated the high prevalence of diarrhoeal diseases. Many hygiene education programmes for the prevention of diarrhoeal diseases have not been very effective, since issues of food safety have not been considered.

One of the factors contributing to the scant attention to this subject is perhaps the insufficient awareness of health policy-makers and medical and health personnel of the health consequences of food contamination and the links between many diseases and food. The purpose of this book is therefore to:

- raise the awareness of health policy-makers of the importance of foodborne diseases for public health and outline the scope of food safety problems;
- highlight the importance of the education of food handlers and consumers for the prevention of foodborne illnesses;
- describe approaches used to select health education messages and key behaviours that need to be changed or reinforced;
- suggest possible partners or channels for implementation and communication, drawing on past experiences and initiatives or existing materials as examples of how objectives can be achieved.

The term “education” (in the context of the expression *health education in food safety*) is used in this book in its broadest sense and includes all types of activities, from communication and information to training, which enable the target audience to acquire the know-how and skills necessary to understand and manage food safety hazards. Strictly speaking, there is a distinction between training and education. Training is a process by which one is enabled to acquire a skill, while education—particularly health education—aims at influencing the way of life and empowering people to make a reasonable and informed choice without imposing preconceived values. The views expressed in the educational interventions do not necessarily represent the views of WHO. The initiatives and educational material presented in this book are given only as examples of efforts that have already been made.

## **Introduction**

The book emphasizes microbial and parasitic foodborne illnesses as these account for most episodes of acute foodborne disease and because education can help consumers and food handlers to play a greater role in their prevention. The term “food handlers” is taken to mean all people who handle, prepare or serve food, be they domestic food handlers (preparing family food) or professional food handlers such as those working in food service or catering establishments (cooks, waiters), retail stores, supermarkets, cottage industries or small businesses (e.g. bakeries) or street food vendors. Depending on their tasks, other professionals such as nurses and flight attendants may also be food handlers. Food handlers working in medium and large industries require education and training in food safety. However, this book focuses on operations where regulatory agencies have little or no power to control the safety of prepared food and where the type of food prepared often changes.

- Chapter 1 describes the extent of the problem of foodborne diseases. It outlines the nature of foodborne diseases, trends, economic implications, emerging pathogens and factors that affect prevalence. By citing examples, the chapter demonstrates the formidable task that is before the health sector.
- Chapter 2 gives 10 reasons why health education in food safety is both necessary and effective. It calls for the systematic education and training of professional food handlers, and for increased consumer information.
- Chapter 3 explains the complexity of behaviours that have an influence on food safety and describes approaches that have been used in selecting behaviours as the focus for change. Particular emphasis is given to the Hazard Analysis Critical Control Point (HACCP) system, which is a modern approach to food safety assurance that also has applications for health education about food safety.
- Chapter 4 suggests strategies and partners for educational programmes and draws on initiatives from different countries as examples.
- Chapter 5 gives guidance in implementing educational programmes and the infrastructure needed for the design and planning of such programmes, without extending to behavioural sciences and educational methods, for which references to appropriate publications are provided (5–8).
- Following the conclusion, Annex 1 contains a series of tables on the characteristics, transmission and prevention of foodborne illnesses, while Annex 2 describes the issue of risk communication as an element of health education.

The information and examples in this book have been drawn from a wide variety of sources around the world. However, much of the work in the area of

health education for food safety has taken place in developed countries. Examples from these countries may predominate in some parts of the book because of the limited extent of this kind of activity elsewhere.

A number of other WHO books deal with related topics. *Education for health* (9) explains methods of education, *Safe food-handling* (10) is an application of food safety to food and catering establishments, and *Basic food safety for health workers* is a resource book for health workers (11).

The primary target audiences of this book are health policy-makers, the managers of food safety and health education programmes in both the public and private sectors, and consumer bodies. The book is also intended for those working in cooperation and development agencies, national and international organizations, academic institutions, nongovernmental organizations and all who have responsibility for public health protection and promotion.

## References

1. FAO/WHO. *International Conference on Nutrition. World Declaration and Plan of Action for Nutrition, Rome, December 1992*. Geneva, World Health Organization, 1992 (unpublished document ICN/92/2; available on request from Nutrition, World Health Organization, 1211 Geneva 27, Switzerland).
2. *Primary health care. Report of the International Conference on Primary Health Care, Alma-Ata, USSR, 6–12 September 1978*. Geneva, World Health Organization, 1978.
3. *Guidelines for consumer protection*. New York, United Nations, 1986.
4. Loevinsohn BP. Health education interventions in developing countries: a methodological review of published articles. *International journal of epidemiology*, 1990, 19(4):788–794.
5. Green LW, Kreuter M. *Health promotion planning: an educational and environmental approach*. Mountain View, CA, Mayfield Publishing Company, 1991.
6. Arnhold W et al. *Healthy eating for young people in Europe: nutrition education in health promoting schools* (draft). Kiel, Ministry of Education of Schleswig-Holstein, 1995.
7. *Facts for life. Lessons from experience*. New York, United Nations Children's Fund, 1996.
8. Srinivasan L. *Tools for community participation: a manual for training trainers in participatory technique*. New York, United Nations Development Programme, 1990.
9. *Education for health: a manual on health education in primary health care*. Geneva, World Health Organization, 1988.
10. *Safe food handling. A training guide for managers of food service establishments*. Geneva, World Health Organization, 1989.
11. *Basic food safety for health workers*. Geneva, World Health Organization, 1999 (unpublished document WHO/SDE/PHE/99.1; available on request from Food Safety, World Health Organization, 1211 Geneva 27, Switzerland).

