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NUTRITION IN
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THE MAJOR DEFICIENCY SYNDROMES,
EPIDEMIOLOGY,
AND APPROACHES TO CONTROL

Edited by

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MEASUREMENT OF ENERGY

Since the joule (J) is now the accepted international unit of energy, the use of the term “calorie” as a synonym for “energy” has been discontinued. Thus in this monograph the term “protein-energy malnutrition” (PEM) replaces the term “protein-calorie malnutrition”, which has hitherto been in common use.

Conversion factors are:

$$\begin{array}{ll} 1 \text{ cal} = 4.184 \text{ J} & 1 \text{ J} = 0.239 \text{ cal} \\ 1 \text{ 000 kcal} = 4.184 \text{ MJ} & 1 \text{ MJ} = 239 \text{ kcal} \end{array}$$

PREFACE

The importance of malnutrition and undernutrition as obstacles to social and economic development and as conditioning factors in a wide range of diseases is being increasingly recognized. Children are particularly vulnerable to the effects of malnutrition because of their special food requirements. The high infant mortality rates from infectious disease in many of the developing countries are partly attributable to the poor nutritional status of the child population. Health care personnel and those employed in related services in those countries need a better knowledge and understanding of nutritional principles and problems so that they can attack malnutrition with confidence.

While many excellent textbooks on the fundamentals of nutrition and preventive medicine exist, few discuss at length the manifestations and control of malnutrition in the community. This monograph is intended to fill that gap. A number of topics are not dealt with because they are well covered in other publications ; among them are dietotherapy, nutrition and dental health, food hygiene, food additives, and food economics. Similarly, it was felt that it would be premature, in a field expanding so rapidly, to make any attempt to summarize the state of knowledge about the relationship of nutrition to functional development, including mental development.

The reviewers, to whom WHO is most grateful and whose names are listed at the front of this monograph, made many valuable suggestions, which have been duly taken into account. Several urged that sociocultural factors and feeding practices in malnutrition should be discussed in detail, as well as operational programmes based on such considerations. The editors' view was that regional differences are so considerable that a balanced account of those topics would be difficult to achieve and that regional, national, and local guides are required to do justice to them.

The monograph is arranged in three main sections. Following an introductory chapter, the first part consists of 9 chapters covering the major deficiency syndromes, their treatment and prevention. The second part contains 4 chapters on the principles of epidemiology as applied to malnutrition. The third part contains 15 chapters dealing with approaches to the control of malnutrition in the community. Six annexes discuss at greater length selected topics of particular interest and importance.

In inviting authors to prepare the various chapters an attempt was made to obtain a wide selection of authoritative and expert opinion. Altogether, 26 authors have participated in this collaborative effort; to all of them WHO is greatly indebted. The two chapters on food production and distribution contributed by the Secretariat of the Food and Agriculture Organization of the

United Nations (FAO) are particularly welcome, being based on long and extensive experience and representing the kind of fruitful cooperation that can be achieved between various organizations and services with the common goal of solving major human problems.

This monograph is intended as a field guide for health workers, as a work of reference for planners, and as a teaching resource for students in medical schools and schools of public health, nursing, and allied fields and for those participating in some of the intensive short courses that have been instituted in recent years. It is hoped, too, that it will interest and stimulate professionals in the agricultural services, whose work is essential in efforts to improve nutritional status. Although the monograph is less relevant to the immediate needs of health professionals in the developed countries, where other aspects of malnutrition assume greater importance, many of the more general chapters could find a useful place in teaching curricula, especially in these times when a period of voluntary service in a developing country is regarded with favour by many newly graduating physicians and nurses.
