Edited by
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FOOD, NUTRITION AND HEALTH
Garlic has been used by humans for over 7000 years for both culinary and medicinal purposes. It has nutritional benefits; part can be used as an adhesive; it’s often blamed for bad breath; and, in mythology, is noxious to vampires.

An everyday plant that intersects throughout our lives in so many ways.

Food, Nutrition and Health takes a holistic approach to the study of the relationships between food, nutrition and health throughout the lifecycle. It canvases a full spectrum of relevant issues, while providing a clear framework for understanding and working with nutrition science—gradually building up a knowledge base and setting it in practice contexts.

Key concepts are introduced early then built upon in more detail, and it takes a fruitful pedagogical approach that develops knowledge, fosters research skills, and encourages critical thinking.

Supplements

Oxford Educator

PowerPoint slides: organised by chapter and will include tables, images, figures, and diagrams from the text.

Instructor’s Resource Manual

- 60 Tutorial Activities: task-orientated activities related to the week’s topic.
- 60 Discussion Questions: relate to the week’s topic and will encourage group debate.
- Further reading/resources

Testbank

A list of questions that lecturers can draw upon for assessment purposes. 30 questions per chapter, comprising of:

- 20 multiple-choice questions per chapter
- 10 short answer questions per chapter

Image gallery

- Access to the figures, diagrams and tables from the textbook

Oxford Learner

- Oxford Health Hub oup.com.au/ohh. The OHH is the online home to a wealth of resources to help students throughout their health science or nursing degree. Here students will find a huge selection of activities, additional material, and interactive revision devices to help them get the most from their study.
- Weblinks and further reading lists that will expand a student’s understanding of particular topics or concepts
PART I
AN INTRODUCTION TO NUTRITION
1. Food and Health: A Biological Perspective
   - How does food consumption affect health?
   - How do we know that food intake affects health?
   - How has the biological understanding of nutrition evolved and where is it headed?

2. Applying Nutrition Principles in the Lifecycle
   - How can understanding the biological effects of food be applied to human health?
   - How do we know if there is a problem with nutrition?
   - How are nutrition problems in the community addressed?

3. Nutrition in a Social and Environmental Context:
   An Introduction
   - Who are the main stakeholders in food and nutrition at a societal level?
   - What is food and nutrition policy?
   - How does nutrition practice and research relate to food policy?

PART II
FOOD AND HEALTH: A BIOLOGICAL PERSPECTIVE
4. Food: The Primary Source of Energy and Nutrients
   - What happens to food when you eat it?
   - What does energy balance mean?
   - How does eating protein, fat or carbohydrate influence weight?
   - Why do we need vitamins and minerals?
   - How much of all the nutrients do we need?

5. Extending Knowledge on Food Components
   - What are the different types of carbohydrate, fat and protein, and why is this important?
   - What is dietary fibre?
   - What can we say about other components in food?
   - Why is water an important part of nutrition?
   - What about alcohol?

PART III
APPLICATIONS OF NUTRITION THROUGHOUT THE HUMAN LIFECYCLE
6. Categorising Foods in Terms of Nutrient Content
   - Which foods are the best for delivering carbohydrate, protein and fat?
   - Which foods have the most vitamins and minerals?
   - Which foods deliver the best nutritional value?

7. Categorising Foods in Terms of Healthy Diets:
   Cuisines, Dietary Patterns and Dietary Guidelines
   - What is a cuisine?
   - Which dietary patterns are associated with disease?
   - What do dietary guidelines mean?

PART IV
FOOD AND NUTRITION POLICY AND PRACTICE
11. Nutrition during the Lifecycle: Nutrition Needs of Older Adults
    - What are the categories of ageing?
    - What are some of the common nutrition-related health problems seen in old age?
    - Which nutrients are required in higher amounts in old age?
    - Why does malnutrition emerge as a problem in old age?
    - What are the particular considerations for older people living in institutional settings?

12. Nutrition Tools: Dietary Assessment, Food Databases and Dietary Modelling
    - What is dietary assessment?
    - How is dietary assessment conducted at the population level?
    - What is the role of food and nutrient databases?
    - What is dietary modelling?

PART V
FOOD AND NUTRITION POLICY AND PRACTICE
13. Food and Nutrition Policy and Frameworks
    - What is a food and nutrition system and how does nutrition policy work?
    - What is food security?
    - What are food standards and laws?
    - How does food innovation work?

14. Locations of Nutrition Practice
    - How can individuals and communities get help with nutrition problems and advice?
    - How do government agencies work in nutrition?
    - What is the role of nutrition researchers?
    - What role does the food industry play in nutrition?

15. Future Directions in Nutrition
    - What are the main challenges facing nutrition today?
    - What is needed in nutrition research?
    - Where will nutrition practice go in the future?
    - What will the food supply of the future look like?
Introduction

This chapter will enable the reader to:

- Broadly define food and the relationship between food consumption and health
- Describe the ways in which scientific research provides the evidence on effects of food on health
- Appreciate the relative contributions of different scientific disciplines in providing this evidence
- Briefly describe the history of nutrition science and identify emerging areas of knowledge

Building blocks

Understanding the relationship between food, nutrition and health first requires a ‘big picture’ of health and where food consumption fits in. One way of doing that is to start with a biological view of health. Even then there are many aspects to understanding how the human body operates and what happens when food is consumed. This introductory chapter provides the overall conceptual framework on how food influences health from a biological perspective, how we know this to be the case, and the directions for building this understanding in the future. Concepts raised here will be expanded on in future chapters.

Chapter objectives

Each chapter begins with clearly described and achievable objectives that reflect the main content of the chapter. You will see throughout the text that these objectives build in complexity as you build up blocks of knowledge.

Dietary guidelines statements on strategies for choosing a healthy diet based on scientific evidence on the effects of food intake and dietary patterns on health. Dietary guidelines provide recommendations for achieving a healthy diet; food standards regulate the composition of food and the statements that can be made about food products.

Key terms

- Dietary guidelines
- Life stage
- Food composition databases
- Nutrient reference values

Dotted throughout the text are Margin notes, drawn from the Glossary and Key terms to help identify and readily check understanding of key terms in use across the health disciplines.

Controversy 4.1

Which diet is best for weight loss?

The assumptions behind different diet formulations are often based on mechanistic understandings of the energy value and/or of the satiating properties of macronutrients. Some of these formulations are adopted in diets with notable names, for example the Atkins diet is an example of a high-protein formulation. The best diet for weight loss is one that achieves a negative energy balance and this may vary for different people under different circumstances.

Low-fat diets

Fat has the greatest energy density (kilojoules per gram), so low-fat diets would be assumed to be lower in energy, and low-fat foods may be less energy-dense (contain fewer kilojoules per gram of food). However, energy density is not the only factor in managing weight loss [10], and low-fat foods are not necessarily low-energy foods.

In one sense the study of food, nutrition and health is relatively straightforward and tangible, but at the same time it is complex and multidimensional. Controversies highlight the complex issues and are easily located on part openers throughout the book.
Iodine

Australia has been classified as mildly iodine-deficient by the World Health Organization. Numerous studies have shown that children and pregnant and breastfeeding women are most at risk [4–9]. Meta-analyses indicate that moderate to severe iodine deficiency without supplementation may result in a population-level loss of intelligence in children of around 10–13.5 IQ points [10, 11].

The internationally recognised standard for assessing iodine adequacy in populations is to assess median urinary iodine concentrations (MUIC) of groups by taking spot (casual) urine samples. Over 90% of iodine intake is excreted in the urine, so urinary excretion values provide a good proxy for dietary intake. To compare populations, and because of the relative ease of obtaining samples in children at school, it is recommended that MUIC be assessed in schoolchildren aged 6–12 every five years [12].

Food and nutrition facts

Meals on Wheels: More than just a meal

The concept of Meals on Wheels, delivering meals to frail elderly people who wish to remain in their own homes and maintain a degree of independence, but who require a little extra help, began in Britain during the Second World War. The service came to Australia in 1952; it was started in Melbourne by an individual, taken over by the Red Cross and then spread to other states. Over 14.8 million meals are delivered each year to approximately 53 000 Australians in need by a band of around 78 000 volunteers. The work carried out by the service also includes food safety and labelling for Meals on Wheels, research and resource development, advocacy in regard to national policy issues, and membership support [17, 19].

Research in practice


All forms of food outlets form part of the environmental exposure to food of varying types and quantities. Researchers have now developed ways of mapping the presence of these outlets as a starting point for examining how the environmental exposure to food might be addressed to improve health. In a review of studies it was found that methods for measuring local food environments included recording the number, type and location of food outlets as well as other factors, such as available food and beverage products, price, quality, and the presence of promotions or information. Research of this type informs areas of community nutrition practice and can be incorporated into the development of food policy and guidelines.

Case study: Iodine deficiency in Australia

Australia's Health 2012 [1] reports:

1. There were 737 400 workers in health services industries in 2010 and in the period 2005–10 employment grew faster in that sector (23%) than in total employment (12%).
2. The number of workers in health occupations also grew in that period, increasing by 26% compared to 12% for all occupations.

What are some of the roles of health workers and how could they all be involved in promoting health by applying nutritional principles to practice?
Try it yourself

Look at a food product you have recently purchased from a supermarket. Using the information on the packet, identify as many groups as possible that may be related to the production of this food and the reasons behind your purchasing it.

Further encouragement towards critical reflection is provided through Try it yourself sections.

Key points enable quick revision of the some of the main topics covered throughout the chapter.

Table 4.1 Nutrient composition of wholemeal bread

<table>
<thead>
<tr>
<th>Nutrient component of wholemeal bread</th>
<th>Amount per 100 g*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein</td>
<td>9 g</td>
</tr>
<tr>
<td>Fat</td>
<td>2.3 g</td>
</tr>
<tr>
<td>Dietary fibre</td>
<td>4.3 g</td>
</tr>
<tr>
<td>Carbohydrates</td>
<td>2.07 g</td>
</tr>
<tr>
<td>Niacin (vitamin B3)</td>
<td>0.03 mg</td>
</tr>
<tr>
<td>Riboflavin (vitamin B2)</td>
<td>118 μg</td>
</tr>
<tr>
<td>Folic acid</td>
<td>48 μg</td>
</tr>
<tr>
<td>Potassium</td>
<td>183 mg</td>
</tr>
<tr>
<td>Zinc</td>
<td>1.06 mg</td>
</tr>
</tbody>
</table>

*Values shown are taken from the NUTTAB 2010 food composition database.
The stages of life provide a useful framework for applying knowledge of the biological aspects of nutrition to health-related practice.

Different emphases on nutritional aspects will be given for different stages of life.

Managing nutrition problems throughout the life stages requires assessment tools and the use of standards for evaluating measurements.

The applications of nutrition science in practice can occur at a number of levels, from individualised self-care through to managing individuals in healthcare institutions.

The level of knowledge and demands for practice at these levels will vary as the complexity of the problem and levels of responsibility increase.

1. What are the main stages in life from a nutrition and health perspective?
2. Why do life stages provide a useful framework for defining nutritional needs?
3. How might requirements be determined using this framework?
4. Why is it important to have good data on what people are eating?
5. What are some of the methods used to identify nutrition problems in the community?
6. How do we know if there are nutrition problems in the community?
7. What are some of the nutrition-related problems likely to be seen in the community?
8. How do governments and community groups work to provide nutritional support for people in the community?
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