

**FUNDAMENTALS
OF
NUTRITION**

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FUNDAMENTALS OF NUTRITION



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Preface

The purpose of this introductory nutrition text is to present current fundamental facts and information about nutrition to the student who cares about people's nutritional status. The world of nutrition is dynamic, exciting, and ever changing, and offers the student many opportunities for personal and professional application of knowledge and skills. This book deals with the science and art of nutrition care, how people are alike and how they differ in relation to nutrition, and how the application of nutrition knowledge and skills helps people live, grow, and maintain good health.

This book brings together in one volume the basic facts about nutrition and helps students understand and apply nutrition knowledge to both "normal" persons and those who need modified diets. Such a focus prepares the student to participate in the health care team that assesses, applies, and communicates nutrition facts and information to people.

Fundamentals of Nutrition is written for the beginning student in nutrition. It is organized for use in nutrition courses that may vary in scheduled class hours. The content and organization can be adopted to specific curriculum needs. The book aims to encourage a spirit of inquiry and foster independent study by students.

Each chapter presents nutrition facts and information in easy-to-read and easy-to-understand language. The objectives stated at the beginning enable the student to assess what learning outcomes can be expected from the chapter. The end of each chapter includes a brief review and summary of the important concepts, as well as questions and activities for applying the facts and information presented.

Fundamentals of Nutrition is divided into four parts. The first four chapters (Part I) introduce nutrition, provide basic tools of nutrition care, and assess the food situation in the United States and the world at large. Part II (ten chapters) focuses on areas of nutrition common to all—the nutrients and how the human body uses them.

Part III (ten chapters) deals with nutrition and diversity—how individuals' nutritional needs differ. The last seven chapters, which make up Part IV, are concerned with the application of nutrition knowledge and skills—how the application of facts and understanding can help individuals and groups achieve a desired state of health and fulfill their human potential.

The Appendix includes information from USDA about the nutritive value of foods. This information is necessary for students to assess diet quality and suggest foods to meet dietary recommendations.

The Teacher's Guide provides activities that review the learning that has occurred in relation to the stated objectives. Nutrition professionals will find that this text supports their efforts for quality teaching and stimulates enthusiasm and interest on the part of the student during the learning process.

The careful reading and thoughtful recommendations of several persons involved daily in nutrition care contributed greatly to the preparation of this book. They were Raymonda Twyman Wright, R.D., Louisville, Kentucky; Chris Chesnulovitch, R.D., Sparta, New Jersey; and Mary Faye Smithson, B.Sc., Elizabethtown, Kentucky.

I appreciate the encouragement and support of my mother, F. Mabel Davis, Malta, Ohio, who introduced me to the world of food and nutrition and whetted my interest and enthusiasm for knowing and communicating nutrition facts and information—and for caring about the health and well being of people.

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Part I

NUTRITION AND YOU



Chapter 1

Introduction to Nutrition

This chapter will help you:

1. Appreciate the relation of nutrition to food and health.
2. Understand the impact of dietary trends upon nutritional care.
3. Become acquainted with some of the important people who contributed to the development of the science of nutrition.

Interest in food and dietetics can be traced back to the early Greek and Roman philosophers and physicians. Hippocrates, a Greek physician, is referred to as the "father of medicine." He believed that good diet was an important part of the convalescence process during illness and disease. He also believed that "the physician must not only be prepared to do what is right himself, but also to make the patient, the attendants, and externals cooperate."

The beliefs that Hippocrates held were stated simply but based upon few scientific facts. Today's ideas about nutrition are based upon a much stronger foundation and implemented by many members of health care teams across the country. The delivery of health care services is more complex and comprehensive today. Physicians are assisted in care of patients by dietitians, nutritionists, nurses, dietetic technicians, and many others. These health care

team members also work with people who are well to help them protect their good health.

Relation of Nutrition to Food and Health

Nutrition is the science that deals with the effects of food on the body, or the way the body uses food for optimal health. According to Mary Swartz Rose, outstanding nutritionist, "Nutrition deals with the scientific laws governing the requirements of human beings for maintenance, growth, activity, reproduction, and lactation." Another well-known nutritionist, E. Neige Todhunter, added to Rose's definition: "and deals with all that makes man a healthy, functioning, creative human being through a well chosen diet."

People who study nutrition are concerned about the food that a person eats to live, to grow, to reproduce, to keep healthy and well, and to have energy for work and play.

Nutrition is the science that has accumulated facts about the forty to forty-five *nutrients* that the body must have. A *nutrient* is defined as a substance that the body must have in adequate amounts to grow, reproduce, and maintain a normal healthy life. When a person eats foods that contain these nutrients, the body uses them to manufacture many other substances essential for the body to function. Knowledge about the nutrients and why they are needed by the body will help promote understanding of the relationship of food to the body. Then, one appreciates why certain nutrients are important during the time a child or adolescent is growing, during pregnancy, during illness, and throughout life.

The *nutritive value* of food will be discussed frequently in this book. This refers to the nutrients found in a specific food and the quality and quantity of nutrients.

Knowledge and understanding of nutrition will help people to know better how their bodies function and what foods should be eaten to achieve optimal health. The many people involved in nutrition care are physicians, dietitians, nutritionists, nurses, dietetic technicians and assistants, social workers, teachers, public health workers, and homemaker-home health aides.

Their functions vary. For example, the physician prescribes a therapeutic diet for a patient with heart disease. The dietitian or nutritionist plans the daily diet with the patient so that the quantity and the quality of food conforms to the diet prescription. The dietetic technician assists the dietitian in providing the nutritional care services. The technician might obtain information about the patient's food habits, life style, and attitudes toward food that would be useful in planning nutritional care.

Health care means to provide for the needs of the patient, but it also means to care about what becomes of another human being. Health team members involved in nutrition care must apply nutrition knowledge to real-life situations. Application of nutrition knowledge is more of an art than a science. It requires understanding not only nutrition facts and principles, but human behavior. One needs to appreciate why people eat what they do, how to assist others to modify their behavior and eating patterns, how to communicate effectively with people, and how to evaluate what difference the nutrition knowledge makes.

Nutrition is not an exact or precise science. Many facts have been accumulated but much remains to be learned. Human beings are alike in many ways, but they are also different. Nutrition must take into account the likenesses as well as the differences. Because nutrition is not an exact or precise science with absolute answers, this makes the work of a health care professional more difficult in nutrition education and nutritional care.

The human body is a marvelous machine. It takes food with all its nutrients and uses the nutrients to manufacture substances that the body must have to perform its daily tasks.

The body draws on the available nutrients from the food for normal organ development and functioning; for normal reproduction, growth, and maintenance; for optimum activity level and working efficiency; for resistance to infection and disease; and for the ability to repair bodily damage or injury. This is why nutrients are necessary for the human being to move about, to speak, to taste, to feel, to laugh, to enjoy life, and to be a creative person.

In summary, the body requires nutrients to operate at optimal health and performance levels. The body must have these nutrients to take care of the body's daily functions—growth, maintenance, repair, and reproduction. Except for water and oxygen taken from air, the nutrient needs of your body can be met through food. The body requires some forty to forty-five substances or nutrients regularly. The nutrients can be grouped under carbohydrates, fats, proteins, vitamins, and minerals. People are alike in their need for these nutrients. The quantity or amount needed may vary, but all the nutrients are required throughout the life cycle.

What should be consumed to get the nutrients the body needs? As stated earlier, food is made up of the nutrients essential to the body. Knowledge about the *nutritive value* of foods will help one choose the proper foods and plan a daily diet that is adequate or balanced. A diet is simply defined as *the food and drink regularly consumed*.

All the food and drink that are taken into the body each day make up the diet. An *adequate diet* is food and drink that is sufficient to meet nutritional requirements. A *balanced diet* is another term referred to frequently. Balanced diet is used interchangeably with