# Essentials of Human Nutrition, Fifth Edition

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*Human Nutrition, Thirteenth Edition,* is a comprehensive textbook that introduces the fundamental concepts of the science of food and nutrition from molecular mechanisms to nutrition policies.

This textbook is organized into six main subsections to provide a concrete introduction of the basics such as the chemistry of food, the physiology of digestion, and manifestation of nutrition-related diseases. The first section describes the main sources of nutrition, the sociocultural, geographical and economical factors that determine food choices, nutrient chemical structure, and how nutrients are processed and stored. The second section focuses on food safety, the physiology of nutrient digestion, absorption and secretion, body size and composition, and metabolism of carbohydrates, fats, proteins, and alcohol. The third section emphasizes the absorption and transport of vitamins and minerals. The fourth section explains dietary requirements for various subpopulations such as children, pregnant women, older individuals, vegetarians, and athletes. The fifth section emphasizes clinical nutrition including diseases characterized by an excess and deficiency of nutrients such as obesity, diabetes, cancer, and eating disorders. The sixth section of this textbook discusses nutritional epidemiology, food supply, global nutrition, policies, and interventions. Throughout the book, there is a recurrent theme of increasing global awareness of the adverse effects of nutrient overconsumption and underconsumption as well as suggestions for nutrition policies to address this major global health problem.

The textbook ends with a glossary of terms, appendix of dietary reference values, and a subject index. Overall, *Human Nutrition, Thirteenth Edition* describes the latest developments in the field of nutrition science. This textbook is important for understanding (1) the biology, chemistry, and physiology of nutrient metabolism, (2) how an excess or deficiency in nutrients can lead to disease and, (3) how to address this major global health concern with appropriate interventions.

Editors Geissler and Powers, along with all contributing authors, use clear and concise language to provide thorough but comprehensible coverage of human nutrition. In addition to this text, readers can also view online material support including exam questions, extended coverage of topics, additional figures/data tables, and even case studies. In this new edition, Geissler, Powers, and authors include the most recent advancements of knowledge in food safety, nutrition in the nervous system, diet, and epigenetics.

*Human Nutrition, Thirteenth Edition* is an important addition to the fundamental understanding of food and nutrition science. This textbook is best suited for undergraduate and graduate students and may also serve as a reference guide for practitioners and researchers. Readers will find *Human Nutrition, Thirteenth Edition* to be a valuable and informative learning tool.

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*Essentials of Human Nutrition, Fifth Edition,* introduces the college, health, and food science professional student to human nutrition, arguably one of the most important determinants of health. The book content may also be of interest to the fitness industry and the general public. The editors pride themselves in keeping the writing simple and readable, and they have indeed succeeded in making the information accessible to a broad audience. The book is divided into nine parts. Throughout the book, the authors use informative case studies, tables, figures, and “boxes” to highlight key and interesting takeaways. For example, in Box 1.1, page 8, one learns that some forms of Vitamin A affect transcription of genes for cellular differentiation, and that in some of the plants that provide our food, the genetic makeup has been modified to produce a crop that’s easier to grow or has an improved nutritional profile, like golden rice. References at the end of each chapter provide suggestions for further reading.

Part one introduces human nutrition and describes the idea behind evidence-based nutrition recommendations. Energy and macronutrients are covered in part two. Here, one learns that carbohydrates, like glucose (with the chemical formula $C_{6}H_{12}O_{6}$), are the most important
source of food energy in the world. In this part, Table 3.1 introduces names of fatty acids, like the eicosapentaenoic acid (EPA) found in fish and fish oils. A discussion of proteins also covers the disease phenylketonuria (PKU), a Mendelian recessive condition resulting from an inborn error of amino acid metabolism. Part three describes organic and inorganic essential nutrients. For example, one is reminded that calcium (Ca) is a unique mineral that is an essential constituent of all forms of life, and that variability in normal levels, like high blood calcium, can result in mental confusion and irritability.

The various food groups (like fruits, vegetables, herbs and spices) are introduced in part four. We learn that in the strict botanical sense, the fruit is the fleshy or dry ripened ovary of a plant enclosing the seed, and that some fruits contain many compounds. One such compound found in grapefruit juice, 6',7'-dihydrobergamottin, down-regulates cytochrome P4503A4, which is involved in the first pass metabolism of most statins and the antihypertensive drug felodipine, increasing the blood concentrations of these drugs. Turmeric, an herb, is reviewed for its anti-carcinogenic properties. Nutrition related disorders are the focus of part five. Here, we learn about the diagnostic criteria of anorexia nervosa, an eating disorder with restriction in energy intake leading to a significantly low body weight. Use of biomarkers such as body mass index (BMI) or plasma albumin are introduced in part six as ways to assess nutritional status.

Nutritional needs in the various life stages are described in part seven. Part eight provides suggestions on how to change food habits and visually presents the US updated 2015 MyPlate recommended food groups – fruits, vegetables, grains, protein, and dairy. Part nine includes a discussion on improving meal intake in hospital patients by encouraging family and friends to visit at meal times and help with feeding. Through its various parts, the book impresses upon us the importance of nutrition and its link to health. As the authors note, nutrition during the first 1,000 days of life is an important determinant of short and long-term health! For more on how you can improve your health via nutrition, I invite you to read the book.

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