



Bioenergetics Primer for Exercise Science (Primers in Exercise Science)

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Although there are chapters in exercise physiology texts and a few books on the topics of human bioenergetics and energy metabolism, those chapters and books often do not cover the pertinent information in sufficient detail and are generally highly research oriented or outdated. *Bioenergetics Primer for Exercise Science* is an up-to-date text that encompasses all available information regarding human bioenergetics and energy metabolism and brings together diverse issues that are of theoretical interest and practical importance.

Written as a primer, this text explains the foundational and critical knowledge and research findings in bioenergetics and the application of those findings. To evaluate research more knowledgeably and decide which techniques best fit their own research, students and professionals will learn about lab- and field-based techniques used to measure energy metabolism, including lipid metabolism.

In addition to bioenergetics concepts and research, the text emphasizes the metabolic challenges brought about by obesity and diabetes. A dedicated chapter discusses metabolic impairments associated with both diseases, alterations in metabolism during exercise for affected individuals, and the role of exercise in enhancing energy utilization and improving glucose response and insulin sensitivity. The text also provides a more specific discussion of bioenergetics applied to the subpopulations of children, elderly people, and women.

Without weighing down the reader with highly academic and technical jargon, the text explains the science behind energy metabolism in an accessible and inclusive format specifically designed for exercise science students studying areas other than bioenergetics and professionals working in related areas such as health and fitness, nutrition, and weight management. Bioenergetics novices will appreciate the cohesive presentation of information within a four-part structure:

-Part I illustrates how carbohydrate, fat, and protein are metabolized and converted into energy for sport and physical activity. It conveys basic but critical information before pursuing more advanced topics in bioenergetics.

-Part II presents lab- and field-based techniques for measuring energy metabolism, including a variety of instrumentations and protocols commonly used to assess energy and fuel utilization. Connections to sport and physical activity, including the energy cost of walking, running, cycling, and resistance exercise, are emphasized. Strategies that can be used to enhance energy utilization with special focus on weight management are also introduced.

-Part III explores ideas and strategies for enhancing energy production and expenditure. Metabolic adaptations to exercise training are covered (such as changes in cellular function, fuel utilization, and oxygen uptake after aerobic, anaerobic, and resistance training). Special attention is given to obesity and diabetes, primarily the effect of glucose responses and insulin sensitivity on affected populations and how age, gender, and metabolic diseases affect those populations.

-Part IV discusses additional aspects of bioenergetics, including factors influencing resting metabolic rate and the thermic effect of food and its relationship to physical activity and obesity. Also included is a discussion of intended use, working mechanism, related research, and potential side effects for select pharmacologic and nutritional substances.

Helpful textbook features such as chapter summaries, key point boxes, key terms bolded in the text and defined in the glossary, review questions with an appendix of answers, and an extensive reference list make this text ideal for effective learning and retention for students.

More in-depth than cursory discussions found in exercise physiology texts and more practical and accessible than dedicated bioenergetics texts, *Bioenergetics Primer for Exercise Science* encompasses all the up-to-date research and information regarding human bioenergetics and energy metabolism, offering both students and professionals a depth of knowledge that will inform their further study, research, and profession.

Bioenergetics Primer for Exercise Science is the third volume in Human Kinetics' Primers in Exercise Science Series. This series presents a foundational understanding of the science behind each topic in the series and, when appropriate, its application. Written by leading researchers and teachers in their respective areas of expertise, these books convey the essential concepts in dynamic, complex areas of scientific knowledge using an accessible writing style. Designed for quick reference and ease of assimilation, these books provide students and professionals with up-to-date foundational knowledge in an otherwise unfamiliar scientific area. Other books that have appeared in the series include *Biochemistry Primer for Exercise Science, Third Edition*, by Michael E. Houston and *Genetics Primer for Exercise Science and Health* by Stephen M. Roth.

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