Human Body Composition, 2nd ed, edited by SB Heymsfield, TG Lohman, ZM Wang, and SB Going, 2005, 536 pages, hardcover, $89. Human Kinetics, Champaign, IL.

This new edition of Human Body Composition is a complete reference text and is divided into 5 parts: Part I: The Science of Body Composition Research, Part II: Body Composition Measurement Methods, Part III: Body Composition Models and Components, Part IV: Body Composition and Biological Influences, and Part V: Body Composition and Pathological States. In addition to this reorganization, the second edition has been revised so that all the references are listed at the end of the book in order by chapter.

Part I: The Science of Body Composition Research is a single chapter, which seems a little unusual, and includes a historical overview. Some of the information in chapter 1 is covered in more depth in Part III, Chapter 12 (“Multicomponent Molecular-Level Models of Body Composition Analysis”). Chapter 12 would be more appropriately placed in Part I and would reinforce the scientific basis for body-composition research.

Part II: Body Composition Measurements Methods is focused on the methodologic aspects of body-composition assessment. The hydrometry chapter has been revised to include air-displacement plethysmography, which is also known as Bod Pod (Life Measurement Inc, Concord, CA). Chapters on body water compartments and total body potassium (TBK) are effectively unchanged; however, reference data are provided for ratios of TBK to fat-free mass (FFM) for white and African American men and women. The chapter on dual-energy X-ray absorptiometry (DXA) has been updated to include a more extensive table comparing the Hologic, Lunar, and Stratec (Norland) system software. This table also includes software changes associated with fan-beam instruments. Although “Steps Toward Standardization of DXA” and “Recommended Procedures for DXA Measurements” are covered in this chapter, the issue of variance due to DXA operator is not addressed. It would have been helpful to include procedures for standardization within and between DXA operators. This information is especially important for longitudinal and multicenter studies.

The bioimpedance chapter includes discussion of single-frequency bioelectrical impedance analysis (BIA), multifrequency BIA (MF-BIA), and bioimpedance spectroscopy (BIS) with use of the Cole-Cole model. The material presented is generally acceptable, but more recent information on the use of BIS is not incorporated. Imaging techniques (eg, computed tomography and magnetic resonance imaging) are covered in Chapter 7, and the discussion is expanded to include liver and skeletal muscle. A full chapter has been added on pediatric body composition and methodologies that provides age- and sex-specific constants for FFM density, TBK/FFM, and the ratio of total body water to FFM and constants for the ratio of total body mineral to FFM. This is a valuable new addition.

Given the title of this book, Human Body Composition, the chapter on animal body composition seems out of place. Rather than include a separate chapter on techniques for determination of animal composition, it would have been better to put this information in Part I: The Science of Body Composition with a focus on the role animal body composition has played in our understanding of human body composition and changes therein. The approach presented in the “Statistical Methods” focuses on the development of prediction equations and understanding the precision, errors, and limitation of prediction equations. Although this information is always good to review, the authors missed a good opportunity to expand the nature of the statistical methods section to include other statistical approaches for data analysis, such as statistical approaches used in a longitudinal study of changes in body composition with diet and exercise intervention or as the result of biological influences or disease state.

The most improved sections of this revised edition are Part IV: Body Composition and Biological Influences and Part V: Body Composition and Pathological States. The newest addition is the inclusion of pregnancy in Part IV. However, the author appears to be not entirely up to date on the use of BIS as a method for body-composition assessment during pregnancy.

Part V: Body Composition and Pathological States has been expanded to 5 chapters. Topics include morbidity and mortality, cancer, obesity and diabetes, HIV, and inflammatory diseases. Even though the pathology line must be drawn somewhere, it would be helpful to clinicians if a chapter on renal disease were also included.

Overall, the 2nd edition of Human Body Composition is an outstanding reference text that provides a sound basis for body-composition research and offers many practical features on specific methods.

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