Concepts and applications in nutrition research and practice

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Abstract

Nutrigenomics refers to the application of genomic principles in nutritional research, enables us to formulate associations between specific nutrients and genetic factors, e.g. the way in which food or food ingredients influence gene expression. It aims to identify the genes that influence the risk of diet-related diseases and also helpful to solve the mechanisms that underlie these genetic predispositions. In contrast, nutrigenetics reveals the coordination of genetic makeup of individuals with their responses to various dietary nutrients. It clarifies different responses to same nutrient by different individuals. Interaction of genetic background and diet with regard to development of chronic conditions as obesity, cardiovascular disease, hypertension and cancer are discussed in present review. These two branches of nutrition resemble with two sides of a coin, facing towards opposite sides but simultaneously, they are intimately attached with each other. Collective efforts by the scientific community are needed to strictly follow guidelines put forth regarding experimental designs, analysis, and data storage for nutritional research. This strategy will be helpful to generate a sound database useful for clinicians and dietetic practitioners.

Concepts & Applications assists students in developing the skills necessary to become knowledgeable consumers of research, conduct and document research projects, and use research findings in the classroom and in supervised practice. Nutrition Research makes research articles approachable and understandable so students can feel confident reading and interpreting not just primary research, but also narrative and systematic reviews. In turn, this text also helps students understand and access practice guidelines to enable their participation in evidence-based nutrition and dietetics practice.

Features and Benefits

Nutrition Research provides plentiful examples of concepts, ample practice opportunities using questions tied to actual studies, and occasions for step-by-step mastery of concepts. This is the first nutrition research text that starts with the basics and is comprehensive in approach, making it ideal for undergraduate students as well as graduate students with minimal skills reading research.

Uses an incremental approach so that students learn to identify a study as quantitative or qualitative, then identify variables, then determine if an intervention took place, and so on.Includes two full-length studies at the end of the text that help students make connections. Utilizes a variety of pedagogical aids to enhance student learning, including Tips and Application boxes, researcher interviews, and end-of-chapter Review Questions and Critical Thinking Questions.Instructor resources include a test bank, slides in PowerPoint format, and an instructor's manual. Student resources include a Navigate Companion Website featuring video lectures, fill-in-the-blank chapter summaries, web links, flashcards, and an interactive glossary.

This review provides diverse viewpoints on the theory of nutrigenomics and nutrigenetics and the way that ‘omic’ technologies can be applied to interrogate nutrient-gene interactions and underlying mechanisms that may explain the genetic basis of interindividual differences in response to the same nutritional intakes. Various experimental approaches and interventional study designs are used in this field, and some of the typical examples and their results are discussed in the context of various aspects of health including the determination of dietary reference values for disease prevention, e.g. coeliac, neurodegenerative and cardiovascular diseases, obesity and cancer. It is evident, at this point in time, that despite the great promise of nutrigenetics and nutrigenomics, there is still a long way to go before dietary recommendations based on genetic testing either alone or in combination with gene expression, and metabolic and nutritional status biomarkers can make a substantial difference to current disease prevention and control practices.