Beyond the Plate

New Frontiers in Nutrition and Dietetics

Editor
Prof. Dr. Yahya ÖZDOĞAN

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PREFACE

Nutritional science is a dynamic field that continually evolves well beyond the mere quantification of nutrient intake, encompassing complex environmental, microbiological, metabolic, and behavioral dimensions. On one front, global climate crises and the resulting threats to food security necessitate a shift toward sustainable protein sources. On the other, the pervasive presence of ultra-processed foods, driven by technological advancements, profoundly influences human metabolism and the gut microbiota.

Contemporary scientific literature increasingly unveils the novel mechanisms through which nutrition dictates the trajectory of metabolic diseases and chronic conditions. Breakthroughs in understanding the gut-brain axis, cell-signaling bioactive compounds, circadian-aligned dietary models, and novel gene-modulating therapies collectively demand a more personalized and context-specific approach to medical nutrition therapy. Concurrently, the proliferation of digital misinformation and shifting eating behaviors present practitioners with unprecedented clinical and psychosocial challenges.

This volume was conceived to address this multifaceted landscape, spanning from planetary health and cellular metabolism to chrononutrition and digital food environments. Comprising seventeen comprehensive chapters, the works presented herein synthesize the latest empirical evidence with practical clinical insights provided by leading researchers in the field.

I extend my sincere gratitude to all contributing authors for their scholarly rigor, to the peer reviewers for their critical insights, and to the editorial team for their seamless coordination throughout the publication process. It is my hope that this reference book will serve as a valuable guide for dietitians, physicians, academic researchers, and anyone seeking to understand the evolving interplay between food and human health through the lens of science.

Edited by
Prof. Dr. Yahya ÖZDOĞAN
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I

Sustainable Food Systems and Food Processing

CHAPTER 1

POTENTIAL EFFECTS OF CLIMATE CHANGE ON FOOD SECURITY AND NUTRITIONAL STATUS: A GLOBAL FOOD SYSTEMS PERSPECTIVE

Buse ÜNAL[1]
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INTRODUCTION

Beyond its environmental and ecological consequences, climate change represents a major challenge for the sustainability of global food systems and for population nutrition. Higher temperatures, altered rainfall, droughts and extreme weather can jeopardize food security through their impact on agricultural output, food supply and food access. Climate-related impacts also extend beyond the volume of food produced to the nutrient composition of foods and the quality of diets (Myers et al., 2017). Communities that are economically and socially vulnerable are likely to experience these consequences more acutely. Higher food prices, reduced availability of healthy and diverse foods and damage to livelihoods are key drivers that can raise the likelihood of undernutrition (FAO et al., 2018). Accordingly, the link between climate change and food security needs to be examined not only from an agricultural standpoint but also with respect to diet quality, food access and public health (Owino et al., 2022). The purpose of this chapter is to review how climate change may influence global food systems and what risks this may create for food security and undernutrition.

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