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WHY ONE DIET DOES NOT FIT ALL: FROM HUMAN GENETICS TO PERSONALIZED NUTRITION

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Abstract: Human nutritional requirements and dietary responses vary according to genetics, gut microbiota, metabolism, age, hormonal status, and lifestyle. This review examines the biological basis of nutritional individuality and the potential of personalized dietary strategies to improve metabolic health.

• Introduction

Individual responses to food differ due to genetic, metabolic, physiological, and lifestyle factors. Although general dietary guidelines support healthy eating, personalized nutrition considers these individual differences to optimize nutrient intake, improve metabolic regulation, and address specific nutritional needs.

• Material and method

A narrative review of scientific literature was conducted, focusing on human studies investigating genetic variability, gut microbiota, metabolic responses, and lifestyle factors influencing nutritional requirements and individual differences in dietary outcomes. Particular attention was given to nutrigenetics, metabolic biomarkers, and individualized dietary interventions, including their potential clinical applications.

• Results and discussions(continue)

Individual responses to identical diets vary according to genetic background, gut microbiota composition, insulin sensitivity, hormonal status, and physical activity. Differences in postprandial glucose and lipid metabolism illustrate this variability. Personalized nutritional approaches may improve dietary management, although their effectiveness depends on the quality of individual assessments and available clinical evidence.

Conclussions

Personalized nutrition considers biological and lifestyle differences that influence individual dietary responses. Integrating physiological characteristics, metabolic biomarkers, and nutritional needs may improve dietary recommendations, although further clinical validation is needed for advanced precision nutrition approaches.

