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# NUTRIGENOMICS AND PERSONALIZED NUTRITION: BRIDGING GENETIC INSIGHTS WITH PUBLIC HEALTH INTERVENTIONS

**Fitri Dian Nila Sari**
Universitas Nahdlatul Ulama Sumatera Utara, Indonesia
Email: firawadi16@gmail.com

***Abstract***

This study aims to explore the role of nutrigenomics and personalized nutrition in the context of public health interventions through a literature review approach. Nutrigenomics is a branch of science that studies the interaction between genes and nutrients, and how individual genetic variations influence responses to certain food intakes. In recent decades, the development of genomic technologies has enabled a deeper understanding of how nutrition can be tailored to an individual's genetic profile to prevent disease and promote optimal health. Through a systematic review of various scientific publications, articles, and recent research reports, this study identifies the potential for integrating nutrigenomics into community nutrition strategies, while analyzing the ethical, social, and practical challenges in its implementation. The results of the study indicate that personalized nutrition based on genetic data has great prospects in improving the effectiveness of public health programs, especially in efforts to prevent non-communicable diseases such as diabetes, obesity, and cardiovascular disease. However, the widespread implementation of this approach still requires a strong regulatory framework, public education, and multidisciplinary collaboration between nutritionists, geneticists, and policy makers. This study is expected to be the basis for the development of scientific evidence-based nutrition policies and more precise approaches in the future.

**Keywords:** nutrigenomics, personalized nutrition, genetics, public health, nutrition interventions

## INTRODUCTION

Advances in genetics and biotechnology have provided a new paradigm in understanding the relationship between genes and the environment, especially in the context of health and nutrition. One branch of science that has developed rapidly in the last decade is nutrigenomics, which is the study of how interactions between genes and nutrients can influence genetic expression and the risk of various chronic diseases (Fischer, 2024a). The basic concept of nutrigenomics rests on the understanding that physiological responses to food are not uniform, but are strongly influenced by individual