Review

Novel concepts on functional foods and nutrigenomics in healthy aging and chronic diseases: a review of fermented papaya preparation research progress

Francesco Marotta1*, Gulcin Sagdicoglu Celep2, Anna Cabeca3, Ascanio Polimeni1

1ReGenera Research Group for Aging Intervention, Milano, Italy and WHO-Center for Traditional Medicine and Biotechnology, University of Milano, Italy; 2Gazi University, Family and Consumer Sciences Department, Food and Nutrition Technology, Ankara, Turkey, 3Woman’s Health Care Center, Brunswick, GA, USA

*Corresponding author: Professor Francesco Marotta, ReGenera Research Group for Aging Intervention, Milano, Italy and WHO-Center for Traditional Medicine and Biotechnology, University of Milano, Italy

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Abstract

Functional foods are an emerging research field corresponding with genomical, epidemiological and clinical studies integrated with the food industry in accordance with the consumer demands. Consequently, the features of the functional foods are being discussed by various researchers and related institutions, and a common view has been pointed out about the availability and the nature of the components of functional foods. Recently, the outcomes of functional foods are being assessed by the help of all the available scientific tools. Genomic medicine is one of the most promising areas of research to reveal the benefits of functional foods and the bioactive ingredients. Nutrigenomics aims at studying the genetic and epigenetic interactions with a nutrient or the functional component in order to lead to a phenotype change and therefore to the cell metabolism, differentiation or even apoptosis. Papaya and its fermentation product are specific products derived from the technologically advanced and controlled environmentally-friendly bio-fermentation process.
It has been well known for a long time that the natural anti-oxidant properties of papaya, mainly depending on vitamins A and C in addition to certain amino acids, were consistent both in the fruit and derived from the papain enzyme which is no longer present in the fermented product. In this article, functional foods in genomic medicine are discussed in review of the fermented papaya preparation research progress. Clinical evidences about fermented papaya as a functional food are reported as supported by various research protocols and experimental models. The benefits of fermented papaya preparation are also discussed in nutrigenomic basis and it is reported to have an important antioxidant and transcriptomic potential which deserves further investigation. As a conclusion, fermented papaya preparation represents a Functional Food highly compliant with the novel features of the new nutrigenomic-driven action plan strategy aimed to reduce the incidences of diseases and successful integration within specific pharmacological treatments.

**Keywords:** functional foods, fermented papaya preparation, nutrigenomics