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Chapter 10

Nutrigenomics: A way towards the enhancement of nutritional quality in rice

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Abstract

The present chapter is an attempt to study the role of nutrigenomics in enhancing the nutritional quality traits in rice. Nutrigenomics is the merger of nutrition and genomic science that provides ways of working with nutrition. Presently the increasing knowledge on the interference of food with genetic code have widened the scope of the study. Nutrigenomics is the science which helps to understand the interaction between nutrients and molecules in an organism, the implementation of molecular biology and biochemistry in classical nutrition research, followed by the technological revolution of the omics technologies will greatly affect nutritional sciences. The integration of nutrition sciences with communication and marketing also have also led to the emergence of personalized nutritional counselling based on nutrigenomics. The staple food rice which is considered as the queen among cereals is an important nutraceutical. Approaches are directed towards increasing the nutritional quality attributes in rice for fulfilling the dietary needs and also to supplement the elemental and mineral requirements. The advent of omics in the form of genomics, transcriptomics, proteomics and metabolomics have immensely contributed towards enhancing the nutritional quality traits in rice and have paved ways to tackle with the challenges in future. The present chapter on nutrigenomics aims at providing an insight into the contribution of omic approaches along with the use of strategies like biofortification of multiple micronutrients and manipulation of transporters for enhancement of nutrients in rice. These approaches would greatly serve to further increase the spectrum of nutrients in rice contributing immensely towards the abatement of malnutrition in the coming days.

Keywords: Nutrigenomics, Nutraceutical, Transcriptomics, Proteomics, Metabolomics