

## **Genetic bio-fortification of cereals from a plant breeding perspective**

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### **Abstract**

Genetic “biofortification” presents an opportunity to provide sustainable and cost effective solution to the perennial problem of ‘hidden hunger’ prevalent in most marginalized regions of the world. Diets in households across many developing countries typically consist of high calorie crops which are mostly cereals with limited diversified food. Production of cereal crops with elevated quantities of micronutrients needed by the human body is thus imperative. This review outlines “biofortification” of cereal crops with emphasis on existing genetic variability, genetic and molecular basis for essential amino acids, zinc and iron accumulation in crops. Key issues emerging are that in most crops there is scope to undertake conventional improvement given the sufficient variability influenced by additive genes or associated with polymorphic molecular markers. Availability of high potential noncommercialized genetically modified cereals points to prohibitive legislative frameworks and the need to adopt other tools such as gene editing, mutation breeding not subject to stiff restrictions. Furthermore, given the output nature of “biofortification” traits there is need to integrate this genetic enhancement in a pipeline breeding approach which integrates breeding objectives so that communities and processors can access these peculiar traits in every new improved variety.

**Key words:** Essential amino acids, micronutrients, nutrition-sensitive agriculture, malnutrition.