

## Improving the nutritional quality of cereal crops

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Amino acids in the soluble form are key participants in the general metabolism of plants, but their major role is as constituents of proteins. In addition, over 300 non-protein amino acids have been isolated from plants, having important roles in medicine, nutrition and agriculture. They also act as metabolic pathway intermediates and N storage molecules, but in some cases are toxic to humans. Among the protein amino acids, nine are termed as “essential”, since they cannot be synthesized by humans and monogastric animals, and must be obtained through the diet. Aspartate is the common precursor of the key essential amino acids lysine, threonine, methionine and isoleucine in higher plants. The importance of this pathway in cereal crops is easy to understand since this plant group is characterized by the poor nutritional quality of its storage proteins mainly due to the low concentrations of lysine and threonine. Therefore, the understanding of the overall regulatory control of the flux through the pathways is undisputedly of great interest. The latest information on the properties of some key enzymes involved in the pathway and the genes that encode them will be presented. The latest results obtained in my laboratory for several high-lysine mutants and quality protein maize lines, plus new developed transgenic plants expressing a new storage protein will be presented. Finally, new strategies and methods by which the concentrations of the limiting amino acids may be increased in the seeds will be proposed.