**Tailoring more nutrient and healthy beans: from lab to fork**

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Current eating habits, primarily based on animal protein sources, are not sustainable and impact both planetary and human health. This has led to the recognition of the need to shift to alternative protein sources. Legumes are an excellent alternative to animal protein. Common bean (*Phaseolus vulgaris* L.) is a significant legume in the human diet and a major source of key nutritional components. However, its consumption and use in developing novel food products are limited by a number of bioactive components such as lectins, α-amylase inhibitor, trypsin inhibitor, raffinosaccharides, and phytic acid that have both negative (ex. limit nutrient availability, cause intestinal discomfort) and positive (ex. prebiotic effect, reduce glycemic index, anticancer activity) impact on human health and nutrition.

To address these challenges and better exploit the nutritional and health potentials of the common bean, we have utilized natural and induced genetic variability. We identified useful nutritional traits such as a low phytic acid (*lpa*) mutant, a lectin null mutant (*lec*-), and a phaseolin null/α-amylase inhibitor enriched mutant (*phsl-*, *αAI++*). These traits have been combined, and the resulting improved genotypes, along with wild-type beans, have been used to develop bean-based bakery products with enhanced nutritional properties1,2, also utilizing fermentation as a beneficial process to improve technological properties.

***References:***

[1] Sparvoli, F. et al, 2016, Front. Plant Sci. 7, 928

[2] Sparvoli, F. et al, 2021, Nutrients, 13, 4517