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Effect of spontaneous fermentation time on physicochemical, nutrient, anti-nutrient and microbiological composition of Lima Bean (*Phaseolus lunatus*) flour

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ABSTRACT

Objective: Lima bean (*Phaseolus lunatus*) is a protein-rich legume species, which the consumption causes a problem of digestion due to the high content of anti-nutritional factors. Thus, the objective of this study is to improve the nutritional quality of lima bean by means of fermentation.

Methodology and results: The impact of spontaneous fermentation time on lima bean flour proximate composition, antinutrient factors and microbiological composition was evaluated. Lactic acid bacteria counts were the most abundant and their evolution was increased from 0 to 24 hours (3.66 to 10.34 log CFU/mL) and remained stable until 72 hours. A significant increase was observed in yeast and mould counts (2.89 to 6.61 log CFU/mL), while *Bacillus* counts remained stable. Furthermore, there was a significant reduction ($P < 0.05$) of anti-nutritional factors such as tannins, phytate and oxalate during fermentation. Finally, lipids, fibres, ash, proteins and sugar content decreased significantly ($P < 0.05$) unlike carbohydrate content.

Conclusion and Application of results: Spontaneous fermentation improved the nutritional quality of Lima bean flour. Fermented lima bean flour could be used in the formulation of instant infant meal and animal feed.

Keywords: spontaneous fermentation, physicochemical, nutrient, anti-nutrition factors, fermentative microorganisms.