

Improvement of Functional Properties of Jack Bean (*Canavalia ensiformis*) Flour by Germination and Its Relation to Amino Acids Profile

ABSTRACT

Jack bean as a source of vegetable protein had not been popular. Seed germination had been known to improve its nutritional quality, especially protein and amino acid profile. This study determined the effect of germination on the color, beany flavor, protein content, functional properties, and amino acid profile of jack bean flour. A complete randomized design was used for this experiment. Germination was carried out for 0, 24, 48, and 72 hours. The seed (control) and germinated jack bean flours were analyzed for oil absorption, water absorption, emulsifying and foaming capacities, as well as the soluble protein content to determine the best germination time. Furthermore, the amino acid profile of the jack bean flour produced from the best germination time was analyzed. The results of this study indicated that the total and soluble protein of the seed and germinated jack bean seeds for 0, 24, 48, 60, and 72 hours were 23.30 and 5.95; 22.61 and 7.61; 21.18 and 10.68; 23.26 and 10.22; 23.98 and 10.81%, respectively. Germination of jack bean improved the functional properties. A germination time of 72 hours increased the oil capacity, water absorption capacity, foaming capacity and decreased the emulsion capacity significantly. The hydrophilic and hydrophobic amino acids of the germinated jack bean flour increased to 3.21 and 2.12% of the seed flour, respectively. The increase of the foaming capacity was related to the increase in hydrophobic amino acids of germinated jack bean flour compared to seed flours, that were glycine 1.23 and 1.01; alanine 1.29 and 1.01; valine 1.16 and 1.00; leucine 1.84 and 1.09%, respectively. Germination of jack bean for 72 hours increased significantly the essential amino acids, namely: leucine, lysine, and valine.