

Analysis of the Functional Properties and Bioactive Components of Local of Local Red Kidney Bean Flour (Phaseolus vulgaris L.) Obtained Through Germination as a Raw Material for Functional Foods

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ABSTRACT

Red beans (Phaseolus vulgaris L.) are a food source rich in protein, fiber, and bioactive compounds with the potential to be developed as raw materials for functional foods. One processing method that can improve nutritional quality while reducing the content of antinutrients in red beans is germination. This study aims to analyze the functional properties and bioactive components of local-variety red kidney bean flour produced through germination as a raw material for functional foods. This study is a single factor laboratory experiment involving a 48 hour germination process of red beans (Phaseolus vulgaris L.). The analysis of functional properties included water-holding capacity (WHC), oil-holding capacity (OHC), and swelling power, while the analysis of bioactive components included phenols, resistant starch, phytic acid, and antioxidant activity. This study was conducted with three replicates for each treatment and analyzed using an independent samples t-test at a 95% confidence level. The results showed that the germination process improved most of the functional properties of red bean flour, specifically the OHC and swelling power values, which showed significant differences ($p < 0.05$). Meanwhile, the WHC value showed no significant difference ($p > 0.05$). Furthermore, the germination process significantly increased bioactive components namely resistant starch and antioxidant activity while reducing phytic acid levels (an antinutrient) and phenolic content. Therefore, red bean sprout flour has the potential to be developed as a raw material for functional foods compared to non-germinated red bean flour.

Keywords: *red bean flour, germination, functional properties, bioactive components, functional foods.*