

Analysis of Functional Properties and Bioactive Components of Local Soybean Flour as a Functional Food Ingredient

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ABSTRACT

The prevalence of degenerative diseases in Indonesia, such as hypertension, diabetes mellitus, stroke, and chronic kidney failure, continues to increase. One preventative measure is through the development of functional foods based on local ingredients, such as soybeans. This study aims to analyze the functional properties and bioactive components of soybean flour from two local varieties: Grobogan and Wilis. Parameters observed included water-holding capacity, oil-holding capacity, swelling power, as well as the content of iron (Fe), potassium, resistant starch, isoflavones, tannins, and antioxidant activity based on IC₅₀ values. This research method was descriptive, namely by describing and explaining the research object according to its actual condition. The results showed that Grobogan variety soybean flour had a water binding capacity of 175.84% and swelling power of 332.72%, higher than the Wilis variety which were 165.54% and 211.60%, respectively. Meanwhile, the oil binding capacity of both varieties showed the same value, namely 101.07%. In terms of bioactive components, the Wilis variety had an iron (Fe) content of 8.25 mg/100 g and resistant starch of 4.62%, higher than Grobogan (7.94 mg/100 g and 4.09%). In contrast, the Grobogan variety had a potassium content of 1250.5 mg/100 g, isoflavones of 337.5 mg/100 g, and tannins of 0.35%, higher than the Wilis variety (1223 mg/100 g; 332 mg/100 g; and 0.30%). The antioxidant activity of both varieties was classified as very weak, with IC₅₀ values of 2,409.933 ppm for Grobogan and 2,305.193 ppm for Wilis. Overall, the Grobogan variety excelled in functional properties (water-holding capacity and swelling power) and in potassium, isoflavone, and tannin content. Meanwhile, the Wilis variety was superior in iron (Fe) and resistant starch content, and had a lower IC₅₀ value, although still classified as very weak. Both varieties have the potential to be developed as functional food ingredients based on needs.

Keywords: soybean flour, Grobogan variety, Wilis variety, functional properties, bioactive components, functional food