

Analysis of the Physicochemical Properties of Local Soybean Flour as a Functional Food Development Ingredient

Arna Nurieta Putri Istiyani

Clinical Nutrition Study Program

Department of Health

ABSTRACT

*Locally-based functional food holds significant potential in addressing nutritional issues in Indonesia, including stunting, which still reached 19.8% in 2024. Local soybean is one commodity with high potential for development as a functional food ingredient, owing to its rich content of protein, vegetable fat, dietary fiber, and various bioactive compounds. This study aimed to analyze the physicochemical properties of local soybean flour from the Grobogan and Wilis varieties as potential raw materials for functional food products. This descriptive study was conducted at the Food Analysis Laboratory of Politeknik Negeri Jember and the CDAST Laboratory of Universitas Negeri Jember from January to March 2026. Physical parameters analyzed included gelatinization viscosity, bulk density, color (CIE $L^*a^*b^*$ system), and syneresis, while chemical parameters encompassed protein, fat, carbohydrate, moisture content, ash content, amylose, amylopectin, dietary fiber, and phytic acid. The results revealed that Grobogan variety flour was superior in protein content (43.22%) and had lower moisture content (4.81%), whereas Wilis variety excelled in fat content (18.14%), ash content (5.37%), and dietary fiber (4.93%). Carbohydrate content was nearly identical between the two varieties (Grobogan 29.42%; Wilis 29.20%), as were amylose content (5.24%) and amylopectin levels. In terms of physical properties, Wilis flour demonstrated higher gelatinization viscosity (15 cP vs. 13 cP), higher bulk density (0.51 g/mL vs. 0.49 g/mL), brighter color (L^* 89.12 vs. 88.13), and lower syneresis (34.33% vs. 36.62%), indicating better gel stability. Phytic acid content in both varieties was within a safe range (556–567 mg/100 g); however, further processing such as soaking or fermentation is recommended to enhance mineral bioavailability. Overall, both local soybean flour varieties show considerable potential as functional food raw materials, each with distinct advantages depending on the intended application.*

Keywords: *soybean flour, Grobogan, Wilis, physicochemical, functional food*