

SIFAT FUNGSIONAL KONSENTRAT PROTEIN KORO PEDANG PUTIH (*Canavalia ensiformis* (L.) DC.) DENGAN VARIASI WAKTU FERMENTASI DAN pH ALKALI

INTISARI

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Koro pedang putih (*Canavalia ensiformis* (L.) DC.) berpotensi sebagai sumber protein nabati alternatif, namun pemanfaatannya masih terbatas. Penelitian ini bertujuan menganalisis pengaruh waktu fermentasi menggunakan *Rhizopus oligosporus* terhadap komposisi proksimat tepung koro pedang putih serta mengevaluasi pengaruh defatting dan variasi pH alkali terhadap estimasi *protein recovery* dan sifat fungsional konsentrat protein. Fermentasi dilakukan selama 0, 24, dan 48 jam, dilanjutkan dengan ekstraksi protein menggunakan *metode alkaline extraction–isoelectric precipitation* pada pH 8,5 dan 11 dengan perlakuan defatting dan non-defatting. Parameter yang dianalisis meliputi *water holding capacity* (WHC), *oil holding capacity* (OHC), *water solubility* (WS), dan *protein solubility*. Hasil penelitian menunjukkan bahwa fermentasi memengaruhi komposisi proksimat tepung koro pedang putih, ditandai dengan kenaikan kadar air, protein, abu, serta menurunkan lemak dan karbohidrat. Estimasi *protein recovery* meningkat seiring waktu fermentasi, dengan nilai tertinggi pada kombinasi non-defatting fermentasi 48 jam pH ekstraksi 11 sebesar $\pm 7,90\%$. Nilai WHC berkisar 0,23–2,36 g/g, OHC 1,22–2,63 g/g, dan protein solubility 50,38–93,42%. Secara keseluruhan, fermentasi dan variasi pH alkali berpengaruh terhadap sifat fungsional konsentrat protein koro pedang putih, sehingga berpotensi dikembangkan sebagai sumber protein nabati untuk aplikasi pangan.

Kata kunci: koro pedang putih, fermentasi, pH, defatting, whc, ohc, protein solubility

FUNCTIONAL PROPERTIES OF JACK BEAN (*Canavalia ensiformis* (L.) DC.) PROTEIN CONCENTRATE WITH VARIATIONS IN FERMENTATION TIME AND ALKALINE pH

ABSTRACT

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Jack bean (*Canavalia ensiformis* (L.) DC.) has potential as an alternative plant-based protein source; however, its utilization remains limited. This study aimed to evaluate the effect of fermentation time using *Rhizopus oligosporus* on the proximate composition of jack bean flour, and to assess the effects of defatting and alkaline pH variation on protein recovery estimation and functional properties of the resulting protein concentrate. Fermentation was conducted for 0, 24, and 48 hours, followed by protein extraction using the alkaline extraction–isoelectric precipitation method at pH 8.5 and 11, with defatting and non-defatting treatments. The evaluated parameters included water holding capacity (WHC), oil holding capacity (OHC), water solubility (WS), and protein solubility. The results showed that fermentation increased moisture, protein, and ash contents, while decreasing fat and carbohydrate contents. Protein recovery increased with fermentation time, with the highest value observed in the non-defatted sample fermented for 48 hours at pH 11 ($\pm 7.90\%$). WHC ranged from 0.23 to 2.36 g/g, OHC from 1.22 to 2.63 g/g, and protein solubility from 50.38% to 93.42%. In conclusion, fermentation and alkaline pH significantly influenced the functional properties of sword bean protein concentrate, indicating its potential for development as a plant-based protein ingredient in food applications.

Keywords: jack bean, fermentation. pH, defatting, whc, ohc, protein solubility