

## INTISARI

Koro pedang putih (*Canavalia ensiformis* (L.) DC) merupakan legum yang memiliki kadar protein yang tinggi dan potensial digunakan sebagai bahan pangan pengganti kedelai. Namun, koro pedang putih mengandung senyawa antigizi HCN dan bioavailabilitas protein koro pedang putih yang sangat rendah yang ditunjukkan melalui rendahnya nilai *protein efficiency ratio* (PER) dan *biological value* (BV), sehingga kurang dapat menunjang proses pertumbuhan jika dikonsumsi sebagai sumber protein harian. Dengan demikian, penelitian ini bertujuan untuk meningkatkan kualitas gizi protein koro pedang putih.

Koro pedang putih dilakukan penghilangan HCN dengan perendaman selama 24-72 jam, kemudian dilakukan penghilangan lemak (*defatting*) dan dilanjutkan dengan ekstraksi protein pada pH alkali (pH 8 dan 9.5). Protein yang diperoleh dihidrolisis dengan enzim alkalase dengan rasio enzim dan protein 1:1000 (b/b) pada variasi waktu hidrolisis 15, 30, 45, 60, 120, 180, 240, dan 300 menit. Waktu hidrolisis optimum ditentukan melalui persentase derajat hidrolisis (DH) terbaik berdasarkan jumlah protein terlarut (*soluble protein*). Kualitas protein koro pedang putih dianalisis secara *in vivo* menggunakan tikus Wistar jantan lepas sapih melalui pengamatan PER dan BV.

Perendaman koro pedang putih selama 24 jam dapat menurunkan kadar HCN menjadi 8,76 ppm. Ekstraksi protein pada pH 8 memiliki yield dan profile protein pada SDS PAGE yang lebih baik dibandingkan pH 9.5. Perendaman biji koro pedang putih selama 24 jam menunjukkan yield protein sebesar 88,19%, lebih tinggi dibandingkan perendaman 72 jam (42,98%). Perendaman yang semakin lama menurunkan kadar protein terlarut, yakni dari 20,01% pada perendaman 24 menjadi 9,98% pada perendaman 72 jam. Waktu Hidrolisis selama 1 jam pada hidrolisat protein koro pedang putih perlakuan perendaman 24 jam merupakan waktu hidrolisis optimum dengan persentase derajat hidrolisis sebesar 40,18%. Hidrolisat protein koro pedang putih memiliki nilai *corrected* PER 0,56, lebih tinggi secara signifikan dibandingkan konsentrat koro pedang putih perlakuan pemanasan 15 menit. Nilai BV hidrolisat protein koro pedang putih (79,22%) dan konsentrat protein koro pedang putih perlakuan pemanasan 15 menit (73,67) tidak berbeda secara signifikan. Bioavailabilitas protein koro pedang putih (PER dan BV) dapat ditingkatkan dengan perlakuan hidrolisis dengan enzim alkalase.

Kata kunci: Koro Pedang Putih, Alkalase, Derajat Hidrolisis, Protein *Efficiency Ratio*, *Biological Value*

## ABSTRACT

Jack bean (*Canavalia ensiformis* (L.) DC) is legume which is commonly known as high vegetable-based protein source dan projected to be able to replace soybean in diet. However, jack bean has some demerits such as presence of HCN as anti-nutrition dan poor bioavailability which indicated by low protein efficiency ratio (PER) dan biological value (BV), hence it is lack to support the beneficial impact on growth if consumed in diet. Therefore, the objective of this study was to improve the digestibility quality which associated to elevation of bioavailability of jack bean.

Anti-nutrition (HCN) in jack bean was eliminated by soaking in water for 24-72 hours, followed by fat removal (defatting) by n-hexane dan subsequently proceed to protein extraction under alkali condition (pH 8 dan 9.5). Protein obtained was hidrolized by alkalase enzyme with ratio enzyme to protein 1:1000 (b/b) at time course 15, 30, 45, 60, 120, 180, 240, dan 300 minutes. Optimum hydrolysis time was defined by optimum percentage of degree of hydrolysis (DH) that associated by the number of soluble protein. Protein quality was determined by in vivo analysis by evaluating PER dan BV of the feed using weaned-wistar rats.

Soaking of jack bean in water for 24 hours enabled to lower HCN content into remained 8,76 ppm in the bean. Protein extraction at pH 8 exhibited promising protein yield dan protein profile than pH 9.5. Soaking treatment for 24 hours showed protein yield 88,19% which is much higher than soaking for 72 hours (42,98%). Soluble protein content of the jack bean declined as the soaking time increased from 20,01% at 24-hour soaking dropped into 9,98% at 72-hour soaking. Hidrolysis of jack bean protein concentrate for 1 hour was determined as the optimum hydrolysis time with degree of hydrolysis 40,18%. Jack bean protein hydrolysate had higher corrected PER significantly than jack bean protein concentrate terated with heating for 15 minutes with the value 0,56 dan 0,09 respectively. BV of jack bean protein hydrolysate (79,22%) dan protein concentrated terated with heating 15 minutes (73,67%) was not significantly different. Thus follows the bioavailability of jack bean protein (PER dan BV) was able to be elevated by hydrolysis teratment with alcalase.

**Keywords:** Jack Bean, Protein, Alcalase, Degree of Hydrolysis, Protein Efficiency Ratio, Biological Value