ISOLASI DAN KARAKTERISASI PEPTON DARI KACANG KEDELAI (*Glycine max* (L.) Merrill)

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ABSTRAK

Latar Belakang: Kebutuhan pepton yang cukup tinggi di Indonesia dipenuhi dengan cara impor dan membutuhkan biaya yang tinggi. Kacang kedelai (*Glycine max* (L.) Merrill) memiliki kandungan protein yang cukup tinggi, namun belum banyak dikaji potensinya sebagai media pertumbuhan mikroba.

Tujuan: Mengetahui karakteristik pepton dari kacang kedelai, mengetahui waktu hidrolisis dan rasio enzim/susbtrat yang optimal untuk mengisolasi pepton dari kacang kedelai, dan mengetahui perbedaan kurva pertumbuhan serta karakteristik bakteri *Bacillus subtilis* subsp. *spizizenii* ATCC 6633 yang ditumbuhkan pada media pepton dari kacang kedelai dan pepton komersial.

Metode: Isolasi pepton kacang kedelai dilakukan dengan metode enzimatis menggunakan enzim papain pada suhu 50°C, pH 6, variasi waktu hidrolisis (2, 3, 4 jam), dan rasio enzim/substrat (0,2; 0,4; 0,6 g/g). Karakteristik pepton meliputi parameter kadar air, kadar nitrogen total, dan bobot molekul dengan SDS-Page. Analisis respons dilakukan menggunakan Response Surface Methodology (RSM).

Hasil: Karakteristik pepton terpilih (run 9) yang dihasilkan memiliki bobot molekul <10 kDa, kadar air sebesar 4,94%, dan kadar total nitrogen sebesar 5,04%. Hasil kondisi optimum dari *software* Design Expert diperoleh pada run ke-9, yaitu waktu hidrolisis selama 4 jam dengan rasio enzim/substrat sebesar 0,2 g/g menghasilkan nilai respons derajat hidrolisis sebesar 35,87% dan respons konsentrasi protein total sebesar 797,64 mg/mL. Pepton kacang kedelai (*Glycine max* (L.) Merrill) sebagai komposisi media alternatif memiliki perbedaan terhadap kurva pertumbuhan dan karakteristik bakteri *B. subtilis* subsp. *spizizenii* ATCC 6633 dengan pepton komersial.

Kesimpulan: Pepton hidrolisat protein kacang kedelai (*Glycine max* (L.) Merrill) berpotensi sebagai media pertumbuhan bakteri.

Kata Kunci: Kacang kedelai, pepton, isolasi, media alternatif, *Bacillus subtilis*

ISOLATION DAN CHARACTERIZATION OF PEPTONE FROM SOYBEAN (*Glycine max* (L.) Merrill)

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ABSTRACT

Background: High needs for peptone in Indonesia are fulfilled by imports and requires high costs. Soybean (*Glycine max* (L.) Merrill) has high protein content, but its potential as a microbial growth medium has not been widely studied.

Aim: To know the characteristics of peptone from soybean, to know optimal hydrolysis time and enzyme/substrate ratio to isolate peptone from soybean, and to determine differences in growth curve and characteristics of *Bacillus subtilis* subsp. *spizizenii* ATCC 6633 with soybean peptone and commercial peptone.

Methods: Isolation of soybean peptone was carried out by enzymatic method using papain enzyme at 50°C, pH 6, variation of hydrolysis time (2, 3, 4 hours), and enzyme/substrate ratio (0,2; 0,4; 0,6 g/g). Characterization of peptone includes the parameters of water content, total nitrogen content, and molecular weight by SDS-Page. Response analysis was conducted using Response Surface Methodology (RSM).

Results: Characteristics of the selected peptone (run 9) has molecular weight of <10 kDa, moisture content of 4,94%, and total nitrogen content of 5,04%. Optimum condition results from Design Expert software were obtained in 9th run, with hydrolysis time of 4 hours and enzyme/substrate ratio of 0,2 g/g resulting in response value of hydrolysis degree of 35,87% and total protein concentration of 797,64 mg/mL. Soybean peptone (*Glycine max* (L.) Merrill) as an alternative media composition has differences in growth curve and characteristics of *B. subtilis* subsp. *spizizenii* ATCC 6633 with commercial peptones.

Conclusion: Soybean (*Glycine max* (L.) Merrill) protein hydrolyzate peptone has potential as a bacterial growth medium.

Key Words: Soybean, peptone, isolation, alternative media, *Bacillus subtilis*