

Ainul Mukarromah. NPM 220331100009. Optimasi Produksi Daging Tiruan Dari Ampas Tahu Secara Enzimatis. Di bawah Bimbingan **Cahyo Indarto, S.TP., M.P., Ph.D** dan **Dr. Millatul Ulya, S.TP., M.T.**

ABSTRAK

Ampas tahu merupakan limbah hasil produksi tahu yang masih memiliki kandungan protein yang cukup tinggi sehingga berpotensi dimanfaatkan sebagai bahan baku pembuatan daging tiruan. Namun, karakteristik daging tiruan ampas tahu umumnya masih kurang menyerupai daging asli, sehingga dapat dilakukan dengan modifikasi teknologi enzimatis. Penelitian ini bertujuan untuk mengetahui pengaruh konsentrasi enzim *transglutaminase* dan suhu inkubasi terhadap karakteristik fisik daging tiruan berbasis ampas tahu serta menentukan kondisi optimum proses produksinya menggunakan metode *Response Surface Methodology* (RSM). Penelitian ini menggunakan rancangan *Central Composite Design* (CCD) dengan dua faktor, yaitu konsentrasi enzim *transglutaminase* sebesar 1–3% dan suhu inkubasi sebesar 35–55°C. Parameter yang dianalisis meliputi *water holding capacity* (WHC), *cooking loss*, *hardness*, dan *springiness*. Hasil penelitian menunjukkan bahwa konsentrasi enzim dan suhu inkubasi memberikan pengaruh terhadap karakteristik fisik daging tiruan ampas tahu. Nilai WHC berada pada kisaran 25,3–46,6%, *cooking loss* 6,9–8,6%, *hardness* 2,73–5,29 N, dan *springiness* 0,653–0,949. Hasil analisis menunjukkan bahwa konsentrasi enzim berpengaruh signifikan terhadap WHC dan *hardness*, suhu inkubasi berpengaruh signifikan terhadap *hardness* dan *springiness*, sedangkan interaksi kedua faktor berpengaruh signifikan terhadap *hardness*. Kondisi optimum diperoleh pada konsentrasi enzim 1,932% dan suhu inkubasi 55°C dengan nilai *desirability* sebesar 0,982. Pada kondisi tersebut, nilai prediksi yang diperoleh yaitu WHC 46,600%, *cooking loss* 6,978%, *hardness* 4,898 N, dan *springiness* 0,957. Hasil validasi menunjukkan bahwa selisih antara nilai prediksi dan hasil aktual kurang dari 5%, sehingga model optimasi dinyatakan sesuai dan valid.

Kata kunci: Ampas Tahu, Daging tiruan, Enzim *Transglutaminase*, *Response Surface Methodology*, Optimasi

Ainul Mukarromah. NPM 220331100009 *Enzymatic Optimization of Plant-Based Meat Production from Tofu Residue. Under the guidance of Cahyo Indarto, S.TP., M.P., Ph.D and Dr. Millatul Ulya, S.TP., M.T.*

ABSTRACT

Okara is a by-product of tofu production that still contains a relatively high protein content and therefore has potential as a raw material for meat analog production. However, the characteristics of okara-based meat analog generally still do not closely resemble those of conventional meat, so modification through enzymatic technology can be applied. This study aimed to determine the effect of transglutaminase enzyme concentration and incubation temperature on the physical characteristics of okara-based meat analog and to identify the optimum production conditions using the Response Surface Methodology (RSM). The study employed a Central Composite Design (CCD) with two factors, namely transglutaminase enzyme concentration of 1–3% and incubation temperature of 35–55°C. The analyzed parameters included water holding capacity (WHC), cooking loss, hardness, and springiness. The results showed that enzyme concentration and incubation temperature affected the physical characteristics of the okara-based meat analog. WHC values ranged from 25.3 to 46.6%, cooking loss from 6.9 to 8.6%, hardness from 2.73 to 5.29 N, and springiness from 0.653 to 0.949. The analysis revealed that enzyme concentration significantly affected WHC and hardness, incubation temperature significantly affected hardness and springiness, while the interaction between the two factors significantly affected hardness. The optimum conditions were obtained at an enzyme concentration of 1.932% and an incubation temperature of 55°C, with a desirability value of 0.982. Under these conditions, the predicted values were WHC 46.600%, cooking loss 6.978%, hardness 4.898 N, and springiness 0.957. Validation results showed that the difference between predicted and actual values was less than 5%, indicating that the optimization model was appropriate and valid.

Keywords: Meat Analog, Okara, Optimization, Transglutaminase Enzyme, Response Surface Methodology.