

AKTIVITAS HIDROLISAT DAGING SAPI *TRIMMING* SEBAGAI ANTIOKSIDAN, ANTIINFLAMASI DAN ANTIBAKTERI

INTISARI

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Penelitian ini bertujuan untuk menganalisis kemampuan sebagai antioksidan, antiinflamasi dan antibakteri pada hidrolisat daging sapi *trimming* yang dihidrolisis dengan enzim tripsin dan bromelin. Bahan utama yang digunakan dalam penelitian ini adalah daging sapi *trimming*, enzim tripsin, dan bromelin. Parameter yang diukur pada penelitian ini meliputi konsentrasi protein hidrolisat, berat molekul protein, profil asam amino, antioksidan dengan *2,2-difenil-1-pikrihidrazil* (DPPH), *2,2-azinobis-3-ethylbenzothiazoline-6-sulfonic acid* (ABTS), *total antioxidant capacity* (TAC) dan *reducing power assay* (RPA), antiinflamasi dengan *egg albumin denaturation inhibition assay* dan antibakteri dengan daya hambat, *minimum inhibitory concentration* (MIC) dan *minimum bactericidal concentration* (MBC). Penelitian ini menggunakan rancangan acak lengkap (RAL) pola searah 3 perlakuan dan 3 kali ulangan dengan perlakuan penggunaan hidrolisat daging sapi *trimming* (0,25%, 0,5%, dan 1%) dengan hidrolisis enzim tripsin dan bromelin. Data penelitian dianalisis menggunakan *Analysis Of Variance* (ANOVA) dilanjutkan dengan uji *Duncan Multiple Range Test* (DMRT) taraf signifikan $\alpha = 0,05$. Hasil penelitian menunjukkan bahwa hidrolisat daging sapi *trimming* yang dihidrolisis dengan enzim tripsin lebih baik daripada bromelin dengan nilai konsentrasi protein 0,0381 mg/mL, berat molekul protein 10-30 kDa dan dominasi asam amino terbesar yaitu asam glutamat, histidin, dan glisin. Hidrolisat daging sapi *trimming* konsentrasi 1% berpengaruh nyata ($P < 0,05$) terhadap aktivitas antioksidan dengan rerata persen inhibisi DPPH 66,50% dengan IC_{50} 43,264 μ g/mL, ABTS 33,85% dengan IC_{50} 90,32 μ g/mL, TAC 54,55%, RPA 3,78%, antiinflamasi sebesar 25,54%, serta tidak berpengaruh terhadap antibakteri secara daya hambat, MIC, dan MBC. Berdasarkan hasil penelitian dapat disimpulkan bahwa hidrolisat daging sapi *trimming* dengan konsentrasi 1% memiliki aktivitas antioksidan dan antiinflamasi, tetapi tidak memiliki kemampuan antibakteri.

Kata kunci: Antibakteri, Antiinflamasi, Antioksidan, Daging Sapi *Trimming*, Hidrolisat.

ANTIOXIDANT, ANTI-INFLAMMATORY AND ANTIBACTERIAL ACTIVITIES OF BEEF TRIMMING HYDROLYSATES

ABSTRACT

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This study aimed to analyze the antioxidant, anti-inflammatory, and antibacterial properties of beef trimming hydrolysates produced using trypsin and bromelain enzymes. The main materials used in this study included beef trimming, trypsin, and bromelain enzymes. The measured parameters encompassed protein concentration, protein molecular weight, amino acid profile, antioxidant activity (2,2-diphenyl-1-picrylhydrazyl (DPPH), 2,2-azinobis-3-ethylbenzothiazoline-6-sulfonic acid (ABTS), total antioxidant capacity (TAC), and reducing power assay (RPA)), anti-inflammatory activity using the egg albumin denaturation inhibition assay, and antibacterial activity including inhibition test, minimum inhibitory concentration (MIC), and minimum bactericidal concentration (MBC). The study employed a Completely Randomized Design (CRD) with a unidirectional pattern consisting of three treatments and replications. The treatments involved hydrolysates of beef trimming at concentrations of 0.25%, 0.5%, and 1% using trypsin and bromelain enzymes. Data were analyzed using Analysis of Variance (ANOVA), followed by Duncan's Multiple Range Test (DMRT) at a significance level of $\alpha = 0.05$. The results revealed that beef trimming hydrolysates produced using trypsin exhibited superior performance compared to bromelain, with a protein concentration of 0.0381 mg/mL, protein molecular weight of 10–30 kDa, and dominance of the largest amino acids namely glutamic acid, histidine, and glycine. Hydrolysates at a 1% concentration significantly ($P < 0.05$) improved antioxidant activity, with mean DPPH inhibition of 66.50% ($IC_{50} = 43.264 \mu\text{g/mL}$), ABTS inhibition of 33.85% ($IC_{50} = 90.32 \mu\text{g/mL}$), TAC of 54.55%, and RPA of 3.78%. Anti-inflammatory activity was recorded at 25.54%, while no significant antibacterial activity was observed in terms of inhibition test, MIC, or MBC. In conclusion, beef trimming hydrolysates at a 1% concentration demonstrated antioxidant and anti-inflammatory activities but lacked antibacterial efficacy.

Keywords: Antibacterial, Anti-inflammatory, Antioxidant, Beef Trimming, Hydrolysate.