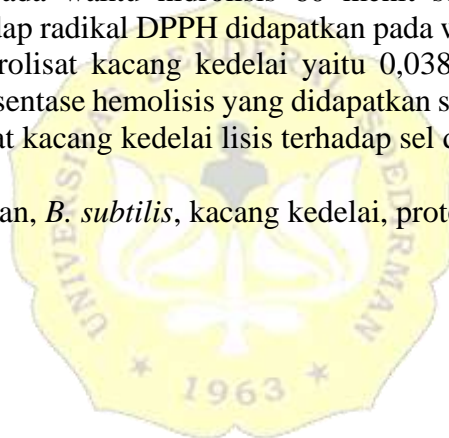


## ABSTRAK

Kacang kedelai merupakan sumber protein nabati yang cukup tinggi sekitar 35% dalam setiap 100 gramnya, sehingga berpotensi untuk menghasilkan peptida bioaktif yang memiliki aktivitas antioksidan. Melalui proses hidrolisis secara enzimatis menggunakan bakteri *Bacillus subtilis* B298 bisa didapatkan peptida bioaktif yang aman untuk pangan. Tujuan dari penelitian ini adalah mengetahui kondisi optimum enzim protease dari bakteri *B. subtilis* B298 dan mengetahui aktivitas antioksidan protein hidrolisat kacang kedelai oleh enzim protease. Tahap penelitian yang dilakukan adalah produksi isolat protein kacang kedelai dan produksi ekstrak kasar enzim protease, kemudian karakterisasi suhu dan pH enzim. Hidrolisis dilakukan dengan menginkubasi isolat protein kacang kedelai dengan variasi waktu 10, 20, 30, 40, 50, dan 60 menit pada kondisi optimum. Protein hidrolisat yang didapat ditentukan derajat hidrolisisnya, kemudian diuji aktivitas antioksidannya dengan metode DPPH dan uji hemolisis. Hasil penelitian menunjukkan bahwa aktivitas ekstrak kasar enzim protease sebesar 0,056 U/mL yang bekerja pada suhu optimum 45 °C dan pH optimum 7. Nilai derajat hidrolisis tertinggi didapatkan pada waktu hidrolisis 60 menit sebesar 70%. Persentase inhibisi tertinggi terhadap radikal DPPH didapatkan pada waktu inkubasi 10 menit. Nilai AAI protein hidrolisat kacang kedelai yaitu 0,038 menunjukkan aktivitas antioksidan lemah. Persentase hemolisis yang didapatkan sebesar 6% menunjukkan bahwa protein hidrolisat kacang kedelai lisis terhadap sel darah merah.

**Kata Kunci:** antioksidan, *B. subtilis*, kacang kedelai, protease, protein hidrolisat



## ABSTRACT

Soybean is a source of vegetable protein that is quite high at around 35% in every 100 grams, so it has the potential to produce bioactive peptides that have antioxidant activity. Through the enzymatic hydrolysis process using *Bacillus subtilis* B298 bacteria, bioactive peptides that are safe for food can be obtained. The purpose of this study was to determine the optimum condition of protease enzyme from bacteria *B. subtilis* B298 and to determine the antioxidant activity of soy bean protein hydrolysate by protease enzyme. The research stages carried out were the production of soybean protein isolate and the production of protease enzyme crude extract, then the characterization of temperature and pH of the enzyme. Hydrolysis was carried out by incubating soy bean protein isolate with a time variation of 10, 20, 30, 40, 50, and 60 minutes at optimum conditions. The protein hydrolysate obtained was determined by the degree of hydrolysis, then tested for antioxidant activity using the DPPH method and continued with the hemolysis test. The results showed that the activity of protease enzyme crude extract was 0.056 U/mL which worked at an optimum temperature of 45 °C and an optimum pH of 7. The highest degree of hydrolysis was obtained at 60 minutes of hydrolysis time by 70%. The highest percentage of inhibition against DPPH radical was obtained at 10 min incubation time. The AAI value of soy bean protein hydrolysate is 0.038, indicating weak antioxidant activity. The percentage of hemolysis obtained at 6% shows that soybean protein hydrolysate lysis to red blood cells.

**Keywords:** antioxidant, *B.subtilis*, protease, protein hydrolysate, soybeans

