

## Produksi i Enzim Keratinase Isolat *Bacillus cereus* LS2B Menggunakan Bulu Angsa, Ayam Layer, dan Ayam Kampung sebagai Substrat

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### INTISARI

Salah satu pengolahan limbah bulu unggas dengan mengolah bulu unggas menjadi pakan ternak karena kaya akan kandungan protein kasar. Hal ini dapat dilakukan dengan mendegradasi bulu unggas menggunakan enzim keratinase yang dihasilkan oleh bakteri *Bacillus cereus* LS2B.. Penelitian ini bertujuan untuk (1) mengetahui pertumbuhan isolat *Bacillus cereus*. LS2B dengan penambahan bulu ayam layer, ayam kampung dan angsa (2) mengetahui tingkat degradasi bulu ayam layer, ayam kampung dan angsa oleh isolat *Bacillus cereus* LS2B, (3) mengetahui aktivitas enzim ekstraseluler bakteri *Bacillus cereus* LS2B, ayam kampung dan angsa dan (4) mengetahui profil asam amino hidrolisat bulu ayam layer, ayam kampung dan angsa. Data pengembangbiakan kultur starter, hidrolisat bulu, viabilitas, keratinolitik zona bening, pertumbuhan *Bacillus cereus* LS2B dan data aktivitas enzim *Bacillus cereus* LS2B, degradasi substrat bulu oleh *Bacillus cereus* LS2B, profil asam amino dan analisis berat molekul dianalisis secara deskriptif. Hasil penelitian menunjukkan bahwa *Bacillus cereus* LS2B mampu tumbuh dan menghasilkan enzim keratinase dalam medium dengan substrat bulu ayam kampung, bulu ayam layer, dan bulu angsa. Aktivitas enzim tertinggi pada substrat keratin sebesar 0,00158 unit/ml pada jam ke-48 sedangkan pada substrat kasein yaitu 0,01215 unit/ml pada jam ke-60. Asam amino yang dihasilkan dari degradasi bulu oleh bakteri *Bacillus cereus* LS2B sebanyak 11 asam amino seperti fenil alanin, metionin, leusin, dan iso leusin. Berat molekul enzim keratinase yang dihasilkan sebesar 100 kDa. Kesimpulan penelitian ini adalah *Bacillus cereus* LS2B mampu tumbuh dan menghasilkan enzim keratinase yang digunakan dalam degradasi bulu ayam kampung, ayam layer, maupun angsa.

(kata kunci : *Bacillus cereus* LS2B, Degradasi bulu, enzim keratinase)

## Production of Keratinase Enzyme Isolate *Bacillus cereus* LS2B Using Goose Feather, Layer Chicken and Native Chicken as Substrates

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### ABSTRACT

One of the processing of poultry feather waste by processing poultry feathers into animal feed because rich in crude protein. This can be done by degrading the feathers of the poultry using the keratinase enzyme produces by bacteria *Bacillus cereus* LS2B. This study aims to (1) determine the growth of *Bacillus cereus* LS2B with the addition of layer, native chicken, and goose feathers (2) determined level of degradation of layer chicken, native chicken, and goose feathers by *Bacillus cereus* LS2B, (3) determine the activity of extraceluller enzyme resulting from degradation of layer chicken feathers, native chickens, and goose, and (4) determine the amino acid profile of layer chicken feathers, native chickens, and goose. Data on starter culture, preparation of feather hydrolyzate, viability test, clear zone keratinolytic test, growth of *Bacillus cereus* LS2B and the extraceluller enzyme activity data of *Bacillus cereus* LS2B, degradation of the feather substrate by *Bacillus cereus* LS2B, amino acid profile and analysis molecular weight analysis descriptively. The results showed that *Bacillus cereus* LS2B can grow and produce the keratinase enzyme in the medium given the addition of substrate of native chicken feathers, layer chicken feathers, and goose feathers. The highest enzyme activity in the keratin substrate was 0,00158 units/ml at the 48th hour while in the casein substrate it was 0,01215 units/ml at the 60th hour. Amino acids are produced from the degradation of hair by the bacteria *Bacillus cereus* LS2B as much as 11 amino acids such as phenylalanine, methionine, leucine, and isoleucine. The molecular weight of the keratinase enzyme produced is 100 kDa. The conclusion of this study is *Bacillus cereus* LS2B can grow and produce a keratinase enzyme which is used in the degradation of native chicken, layer chicken, and goose feathers.

(Keywords: *Bacillus cereus* LS2B, feather degradation, enzyme keratinase)