

**ISOLASI, SELEKSI BAKTERI ASAM LAKTAT DAN APLIKASINYA  
DALAM PRODUKSI BAKTERIOSIN DAN PRODUKSI PROTEIN  
MIKROBIA PADA FERMENTASI LIMBAH TAHU**

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**INTISARI**

Penelitian ini bertujuan untuk mengisolasi dan menyeleksi bakteri asam laktat (BAL) sebagai inokulum dalam fermentasi ampas tahu untuk meningkatkan kualitas ampas tahu. BAL diisolasi dengan teknik *roll tube* dari alat dan isi pencernaan ikan tawes (*Puntius javanicus*). Seleksi dilakukan dengan penambahan 0,5 N glisin HCl pH 3,0 selama 100 menit dalam suasana anaerobik pada suhu kamar dan kadar asam laktat tertinggi (mg/ml). Mikrobia ditumbuhkan pada media cair dan padat pH 6,6 sampai 7,0 dalam suasana anaerobik pada suhu 30°C, diinkubasi 48 jam. Isolat media cair diaplikasikan untuk fermentasi ampas tahu dengan level persentase inokulum 0, 5 dan 10% V/B dan lama inkubasi 0, 3, 6, 12, 24, 48 dan 72 jam. Evaluasi dilakukan terhadap pertumbuhan, kadar asam laktat, pH, total koloni, kadar protein mikrobia fermentasi ampas tahu dan potensi proauksi bakteriosin. Data hasil isolasi dianalisis dengan regresi linier dan kadar protein mikrobia dianalisis dengan analisis variansi Rancangan Acak Lengkap Pola Faktorial 3x7. Hasil isolasi dan seleksi diperoleh 40 isolat dengan rata-rata pH 5,56, kadar asam laktat 2,7345 mg/ml dan total koloni  $1,043 \times 10^7$  CFU/ml. Persamaan regresi antara pH dan kadar asam laktat:  $Y = -0,2641X + 6,2857$ . Semakin tinggi inokulum yang ditambahkan, semakin tinggi protein mikrobia yang dihasilkan ( $P < 0,05$ ). Aktivitas penghambatan bakteriosin BAL terhadap bakteri kontrol *Staphylococcus aureus* FNCC 0047 memberikan hasil yang negatif.

(Kata kunci : Ikan tawes, Fermentasi, BAL, Ampas tahu, Protein mikrobia, Bakteriosin)

**LACTIC ACID BACTERIA ISOLATION, SELECTION AND ITS  
APPLICATION IN PRODUCING BACTERIOCIN AND MICROBIAL  
PROTEIN OF TOFU WASTE INDUSTRY FERMENTATION**

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ABSTRACT

The objective of this study was to isolate and select lactic acid bacteria (LAB) and its application for improvement of tofu waste industry as animal feed. LAB were isolated and selected using the roll tube technique by Hungate from digestive tracts content of fish (*Puntius javanicus*). The first selection of LAB was conducted anaerobically by adding the 0.5 N, pH 3.0 glisin HCl solution into the sample for 100 minute at room temperature. The second selection of LAB was determined based on the lactic acid produced. Selected LAB was inoculated either into solid or liquid media anaerobically at pH 6.6-7.0 and incubated at 30°C for 48 hours. The selected LAB as starter was applied anaerobically for improvement of tofu waste industry at different content (0, 5, and 10% V/W) and at different incubation time (0, 3, 6, 12, 24, 48 and 72 hours). Variables of this study were collected including lactic acid produced, pH, total of colony, microbial protein of tofu waste industry fermentation and bacteriocin produced. The result of this study showed that the average pH, lactic acid produced and total colony of the 40 isolates was 5.56, 2.7345 mg/ml and  $1.043 \times 10^7$  CFU/ml respectively. The regression equation of pH and lactic acid produced was  $Y = -0.2641X + 6.2857$ . Protein microbial produced increased with the increased of the inoculum addition on the tofu waste industry fermentation ( $P < 0.05$ ). The activity of bacteriocin produced by the LAB did not influence the growth of *Staphylococcus aureus* FNCC 0047.

(Key words: Fish, Fermentation, LAB, Tofu waste industry, Microbial protein, Bacteriocin)