

**PENGARUH PENAMBAHAN INULIN SEBAGAI SUBSTRAT DAN
PREBIOTIK PADA FERMENTASI IKAN RUCAH OLEH BAKTERI**

Limosilactobacillus fermentum

BAL Pro 4

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INTISARI

Penelitian ini bertujuan untuk mengetahui pengaruh penambahan inulin sebagai substrat pada fermentasi ikan rucah oleh bakteri *Limosilactobacillus fermentum* BAL Pro 4. Penelitian ini dilakukan dengan dua tahap yaitu penentuan nilai tetapan kejenuhan substrat (K_s) dan laju pertumbuhan spesifik maksimum (μ_{maks}) kinetika fermentasi *L. Fermentum* BAL Pro 4 pada substrat inulin sebagai sumber karbon dan aplikasi nilai K_s pada fermentasi ikan rucah. Konsentrasi inulin (sebagai substrat) yang digunakan untuk menentukan nilai kinetika fermentasi *L. fermentum* BAL Pro 4 sebanyak 0; 0,01%; 0,05%; 0,10% dan 0,15%. Pada fermentasi ikan rucah, pemberian inulin sebagai substrat didasarkan atas nilai K_s yaitu 0, 1, 2, dan 3 kali nilai K_s . Selain itu dalam fermentasi ikan rucah juga diamati lama inkubasi fermentasi ikan rucah yang terdiri dari 0, 14, dan 21 hari. Hasil uji parameter penelitian yang dilakukan pada fermentasi ikan rucah oleh *L. Fermentum* BAL Pro 4 menggunakan prebiotik inulin dilakukan analisis variansi dengan rancangan faktorial dan bila terdapat variabel yang berbeda karena perlakuan, dilanjutkan uji lanjut dengan uji *Duncan's new multiple range test*. Nilai K_s dan μ_{max} yang diperoleh yaitu 0,2 g/100 mL dan 0,0168 /jam. Berdasarkan data yang diperoleh bahwa pengaruh perbedaan level substrat inulin berpengaruh nyata ($P < 0,05$) terhadap protein terlarut, bahan kering, bahan organik, kadar asam laktat, protein kasar, dan pencernaan protein. Sedangkan pengaruh perbedaan lama inkubasi yang dilakukan berpengaruh nyata ($P < 0,05$) terhadap nilai pH, protein terlarut, bahan kering, bahan organik, kadar asam laktat, protein kasar, dan pencernaan protein. Kesimpulan dari hasil penelitian yaitu penambahan substrat inulin 0,6 g/100 g atau setara dengan 3 kali K_s dengan perlakuan lama inkubasi selama 21 hari memberikan peningkatan kualitas ikan rucah terbaik.

Kata kunci : fermentasi ikan rucah, inulin, *L. fermentum* BAL Pro 4

THE EFFECT OF INULIN ADDITION AS A SUBSTRATE AND PREBIOTIC IN FISH WASTE FERMENTATION BY BACTERIA

Limosilactobacillus fermentum BAL Pro 4

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Abstract

The purpose of this study was to determine the effect of adding inulin as a substrate on waste fish fermentation by the bacteria *Limosilactobacillus fermentum* BAL Pro 4. This study was conducted in two stages, namely determining the value of the substrate saturation constant (K_s) and the maximum specific growth rate (μ_{max}) of *L. fermentum* BAL Pro 4 fermentation kinetics. Inulin substrate as a carbon source and application of K_s value in waste fish fermentation. The concentration of inulin (as a substrate) used to determine the kinetics of fermentation of *L. fermentum* BAL Pro 4 was 0; 0.01%; 0.05%; 0.10% and 0.15%. In waste fish fermentation, the administration of inulin as a substrate was based on the K_s values of 0, 1, 2, and 3 times the K_s value. In addition, in the waste fish fermentation, the incubation time of waste fish fermentation was also observed, which consisted of 0, 14, and 21 days. The results of the parameter test of the research conducted on waste fish fermentation by *L. fermentum* BAL Pro 4 using the prebiotic inulin were analyzed for variance using a factorial design and if there were different variables due to treatment, further testing was carried out with *Duncan's new multiple range test*. The values of K_s and μ_{max} obtained were 0.2 g/100 mL and 0.0168/hour. Based on the data obtained, the effect of different inulin substrate levels significantly ($P < 0.05$) on dissolved protein, dry matter, organic matter, lactic acid content, crude protein, and protein digestibility. Meanwhile, the difference in incubation time had a significant effect ($P < 0.05$) on the pH value, dissolved protein, dry matter, organic matter, lactic acid content, crude protein, and protein digestibility. The conclusion from the results of the study was that the addition of inulin substrate 0.6 g/100 g or equivalent to 3 times K_s with an incubation period of 21 days gave the best quality improvement of waste fish.

Keywords: fish waste fermentation, inulin, *L. fermentum* BAL Pro 4