

**POTENSI PEMANFAATAN CRUDE SUPERNATAN DARI
Limosilactobacillus fermentum SEBAGAI AGENSIA
BIOLOGIS UNTUK PENGAWETAN KULIT DOMBA**

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INTISARI

Penelitian ini bertujuan untuk mengetahui efektivitas *crude* supernatan *Limosilactobacillus fermentum* sebagai agen biopreservasi dalam proses pengawetan kulit domba, dan mengetahui efektivitas, kualitas kimiamikrobiologi, dan morfologi kulit awetan domba serta tingkat polutan limbah cair. Penelitian dilaksanakan selama tujuh bulan di Laboratorium Teknologi Kulit, Hasil Ikutan dan Limbah Peternakan, Fakultas Peternakan Universitas Gadjah Mada. Perlakuan digunakan, yaitu P1 (garam 50% v/w) dan P2 (*crude supernatan* 15% v/w). Parameter yang dianalisis meliputi kualitas kimia kulit (kadar air, pH, dan *extractable nitrogen*), kualitas mikrobiologis (*Total plate count* (TPC), total bakteri asam laktat (BAL), dan *total coliform*), kualitas limbah cair *soaking* (*Total solid* (TS), *total fixed solid* (TFS), *total volatil solid* (TVS), *chemical oxygen demand* (COD), dan *biochemical oxygen demand* (BOD), serta struktur morfologi kulit dengan pengamatan SEM. Hasil penelitian menunjukkan kadar air *crude* supernatan (P2) ($16,42 \pm 0,37$) dan *extractable nitrogen* ($132,05 \pm 34,12$) lebih rendah dibandingkan perlakuan garam (P1) masing-masing sebesar $49,80 \pm 1,41$ dan $1020,74 \pm 74,99$, sehingga P2 lebih efektif dalam menurunkan kadar air serta menjaga kualitas protein kulit. Nilai pH kedua perlakuan tidak berbeda nyata yaitu P1 ($7,8 \pm 0,16$) dan P2 ($7,6 \pm 0,23$). Aktivitas mikrobiologis *crude* supernatan lebih tinggi karena mengandung bakteriosin dan H_2O_2 . Penggunaan *crude* supernatan menghasilkan limbah cair dengan kandungan *Total Solid* dan *Total Fixed Solid* lebih rendah, meskipun nilai COD dan BOD lebih tinggi. Hasil pengamatan SEM memperlihatkan struktur kolagen kulit pada P2 lebih utuh dibanding P1. Berdasarkan hasil tersebut, *crude supernatan Limosilactobacillus fermentum* dinilai memiliki potensi sebagai agen biopreservatif alternatif yang efektif dan ramah lingkungan dalam proses pengawetan kulit domba.

Kata kunci: Biopreservasi, *crude* supernatan *Limosilactobacillus fermentum*, kulit domba

POTENTIAL USE OF CRUDE SUPERNATANT FROM *Limosilactobacillus fermentum* AS A BIOLOGICAL AGENT FOR SHEEP SKIN PRESERVATION

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ABSTRACT

This study aims to determine the effectiveness of crude supernatant *Limosilactobacillus fermentum* as a biopreservation agent in the preservation process of sheep skin, and to determine the effectiveness, chemical quality, microbiology, and morphology of preserved sheep skin as well as the level of liquid waste pollutants. The study was conducted over seven months at the Laboratory of Leather Technology, By-products, and Livestock Waste, Faculty of Animal Science, Gadjah Mada University. Two treatments were applied: P1 (50% v/w salt) and P2 (15% v/w crude supernatant). The parameters analyzed included chemical quality of the skin (moisture content, pH, and extractable nitrogen), microbiological quality (Total Plate Count (TPC), Total Lactic Acid Bacteria (BAL), and Total Coliform), quality of the liquid waste soaking solution (Total Solids (TS), Total Fixed Solids (TFS), Total Volatile Solids (TVS), Chemical Oxygen Demand (COD), and Biochemical Oxygen Demand (BOD), as well as skin morphological structure through SEM observation. The results showed that the water content of the crude supernatant (P2) (16.42 ± 0.37) and extractable nitrogen (132.05 ± 34.12) were lower compared to the salt treatment (P1), which were 49.80 ± 1.41 and 1020.74 ± 74.99 , respectively, indicating that P2 is more effective in reducing moisture content and maintaining protein quality in the skin. The pH values of both treatments were not significantly different, with P1 at 7.8 ± 0.16 and P2 at 7.6 ± 0.23 . The microbiological activity of the crude supernatant was higher due to the presence of bacteriocins and H_2O_2 . The use of crude supernatant produced liquid waste with lower TS and TFS content, although COD and BOD values were higher. SEM observations showed that the collagen structure of the skin in P2 was more intact than in P1. Based on these results, the crude supernatant of *Limosilactobacillus fermentum* is considered to have potential as an effective and environmentally friendly alternative biopreservative agent in the preservation of sheepskin.

Keywords: Biopreservation, crude supernatant *Limosilactobacillus fermentum*, sheepskin