

**PENGARUH PENAMBAHAN INOKULAN
Lactiplantibacillus plantarum MTR 25 TERHADAP
KOMPOSISI KIMIA, DAN KARAKTERISTIK FERMENTASI
LIMBAH SERAI WANGI (*Cymbopogon nardus* L.)**

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INTISARI

Lactiplantibacillus plantarum MTR strain 25 merupakan isolat bakteri asam laktat hasil peremajaan Laboratorium Teknologi Makanan Ternak Fakultas Peternakan UGM yang berasal dari silase sorgum yang memiliki sifat antifungal serta kemampuan menurunkan pH hingga kisaran 3,98–4,10, sehingga berpotensi sebagai inokulan efektif dalam meningkatkan kualitas fermentasi. Penelitian ini bertujuan untuk mengetahui pengaruh penambahan *Lactiplantibacillus plantarum* MTR strain 25 terhadap komposisi kimia, karakteristik fermentasi, dan kualitas fisik limbah serai wangi (*Cymbopogon nardus* L.). Limbah dengan kadar air 55% difermentasi dalam mini silo (5 kg) menggunakan dua perlakuan, yaitu tanpa aditif (H0) dan dengan penambahan BAL 1% (H1) pada konsentrasi 1×10^5 cfu/mL, masing-masing dengan empat ulangan. Fermentasi dilakukan selama 67 hari dalam kondisi anaerob pada suhu ruang, kemudian dilakukan analisis laboratorium dan uji statistik menggunakan *independent sample t-test* (SPSS versi 27). Hasil penelitian menunjukkan bahwa penambahan BAL 1% tidak berpengaruh nyata terhadap bahan kering, bahan organik, protein kasar, lemak kasar, *neutral detergent fiber*, dan *acid detergent fiber* ($P > 0,05$), namun mampu menekan kehilangan bahan kering secara signifikan ($P < 0,05$). Penambahan BAL juga menghasilkan pH yang lebih rendah, kadar asam laktat yang lebih tinggi, serta kadar amonia yang lebih rendah ($P < 0,05$). Secara fisik, kedua perlakuan menunjukkan kualitas yang baik dengan warna kuning kecokelatan, tekstur tidak menggumpal dan tidak berlendir, aroma asam segar, serta tanpa kontaminasi jamur. Secara keseluruhan, penambahan BAL 1% memperbaiki proses fermentasi limbah serai wangi yang ditunjukkan oleh penurunan kehilangan bahan kering serta perbaikan karakteristik fermentasi.

Kata kunci: Fermentasi, komposisi kimia, *Lactiplantibacillus plantarum* MTR strain 25, limbah serai wangi,

**THE EFFECT OF *Lactiplantibacillus plantarum* MTR 25
INOCULANT ADDITION ON CHEMICAL
COMPOSITION AND FERMENTATION CHARACTERISTICS
OF CITRONELLA WASTE (*Cymbopogon nardus* L.)**

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ABSTRACT

Lactiplantibacillus plantarum MTR strain 25 is a lactic acid bacteria isolate rejuvenated in the Laboratory of Animal Feed Technology, Faculty of Animal Science, Universitas Gadjah Mada, originating from sorghum silage. This strain exhibits antifungal properties and the ability to reduce pH to a range of 3.98–4.10, indicating its potential as an effective inoculant to improve fermentation quality. This study aimed to evaluate the effect of *Lactiplantibacillus plantarum* MTR strain 25 on the chemical composition, fermentation characteristics, and physical quality of citronella waste (*Cymbopogon nardus* L.). The material with 55% moisture content was fermented in mini silos (5 kg) using two treatments: without additive (H0) and with 1% lactic acid bacteria inoculant (H1) at a concentration of 1×10^5 cfu/mL, each with four replications. Fermentation was conducted for 67 days under anaerobic conditions at room temperature, followed by laboratory analysis and statistical evaluation using an independent sample t-test (SPSS version 27). The results showed that the addition of 1% LAB had no significant effect on dry matter, organic matter, crude protein, crude fat, neutral detergent fiber, and acid detergent fiber ($P > 0.05$), but significantly reduced dry matter loss ($P < 0.05$). The addition of LAB also resulted in lower pH, higher lactic acid content, and lower ammonia levels ($P < 0.05$). Physically, both treatments produced good quality silage characterized by a yellowish-brown color, non-clumping and non-slimy texture, a fresh acidic aroma, and absence of mold contamination. Overall, the addition of 1% LAB improved the fermentation process of citronella waste, as indicated by reduced dry matter loss and improved fermentation characteristics.

Keywords: Chemical composition, citronella grass waste, fermentation, *Lactiplantibacillus plantarum* MTR 25.