

**PENGARUH HIJAUAN DAUN LAMTORO (*Leucaena leucocephala*)  
SEBAGAI SUMBER TANIN TERHADAP AKTIVITAS ENZIM DAN  
KINETIKA PRODUKSI GAS PADA FERMENTASI RUMEN  
SECARA *IN VITRO***

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**INTISARI**

Penelitian ini bertujuan untuk mengetahui pengaruh penggunaan daun lamtoro sebagai sumber tanin terhadap aktivitas enzim hidrolitik amilase, CMC-ase,  $\beta$ -glukosidase, dan protease dalam rumen. Penelitian diawali dengan evaluasi kapasitas tanin dalam mengikat protein. Perlakuan penggunaan daun lamtoro diberikan dengan level 0%, 10%, dan 25%. Fermentasi pakan dilakukan dengan teknik *in vitro* (Menke and Steingass, 1979) selama 48 jam. Produksi gas hasil fermentasi diukur pada jam ke-1, 2, 4, 6, 8, 12, 24, 36, dan 48. Medium setelah fermentasi digunakan untuk menentukan aktivitas enzim hidrolitik rumen. Produksi gas hasil fermentasi digunakan untuk menentukan kinetika produksi gas. Data yang diperoleh dianalisis variansi pola searah, dan dilanjutkan dengan uji *Duncan's New Multiple Range Test* (DMRT) bila berbeda nyata. Hasil penelitian menunjukkan bahwa kapasitas tanin dalam mengikat protein adalah 1,2680 mg BSA/mg BK daun lamtoro. Aktivitas enzim CMC-ase,  $\beta$ -glukosidase, dan protease menurun secara nyata ( $P < 0,01$ ) pada lamtoro 10% dan 25%. Aktivitas enzim amilase menurun secara nyata ( $P < 0,01$ ) pada lamtoro 10% dan 25%. Produksi gas dari fraksi mudah larut (a) tidak terpengaruh oleh perlakuan penggunaan lamtoro. Produksi gas dari fraksi potensial terdegradasi (b) menurun secara nyata ( $P < 0,05$ ) pada lamtoro 10% dan 25%. Jumlah produksi gas dari fraksi mudah larut dan potensial terdegradasi (a+b) menurun secara nyata ( $P < 0,05$ ) pada lamtoro 25%. Laju degradasi pakan (c) mengalami kenaikan yang nyata ( $P < 0,05$ ) pada lamtoro 25%. Kesimpulan dari penelitian ini adalah penggunaan daun lamtoro dapat menurunkan aktivitas enzim hidrolitik dalam rumen dan kinetika produksi gas.

Kata kunci : tanin, aktivitas enzim, amilase, protease, CMC-ase,  $\beta$ -glukosidase, rumen, kinetika produksi gas, dan lamtoro.

**THE EFFECT OF LAMTORO LEAVES (*Leucaena leucocephala*)  
AS TANNIN SOURCE ON THE ACTIVITY OF ENZYMES AND  
GAS PRODUCTION KINETICS ON *IN VITRO*  
RUMEN FERMENTATION**

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**ABSTRACT**

The objective of this study was to determine the effect of lamtoro leaves as tannin source on the activity of hydrolytic enzyme amylase, CMC-ase,  $\beta$ -glucosidase, and protease in the rumen. The study began with an evaluation of the protein-binding capacity by tannins. The levels of lamtoro leaves which used were 0%, 10%, and 25%. Feed fermentation was conducted by *in vitro* technique (Menke and Steingass, 1979) for 48 hours. Fermented gas production was measured at 1, 2, 4, 6, 8, 12, 24, 36, and 48 hours. Medium after fermentation was used to determine rumen hydrolytic enzymes activity. Fermented gas production was used to determine gas production kinetics. Data obtained were analyzed using one way analysis of variance, and continued by DMRT. The results of this study showed that the protein-binding capacity of tannins was 1.2680 mg BSA/mg BK of lamtoro leaves. The enzyme activity of CMC-ase,  $\beta$ -glucosidase, and protease decreased significantly ( $P < 0.01$ ) at 10% and 25% lamtoro. Amylase enzyme activity decreased significantly ( $P < 0.01$ ) at 10% and 25% lamtoro. Gas production from soluble fractions (a) was not affected by the treatment. Gas production from potentially degraded fraction (b) decreased significantly ( $P < 0.05$ ) at 10% and 25% lamtoro. The amount of gas production from soluble fraction and potentially degraded fraction (a+b) decreased significantly ( $P < 0.05$ ) at 25% lamtoro. Feed degradation rate (c) increased significantly ( $P < 0.05$ ) at 25% lamtoro. The conclusion of this study is lamtoro leaves can reduce the activity of hydrolytic enzymes in the rumen and the kinetics of gas production.

Keyword: tannin, enzyme activity, amylase, protease, CMC-ase,  $\beta$ -glucosidase, rumen, gas production kinetics, dan lamtoro.