PENGARUH MASA SIMPAN PELET DAUN MAHONI DAN NANGKA SEBAGAI SUMBER TANIN TERHADAP AKTIVITAS ENZIM DAN KINETIKA FERMENTASI RUMEN SECARA *IN VITRO*

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INTISARI

Penelitian ini bertujuan untuk mengetahui pengaruh masa simpan pelet daun mahoni (*Swietenia mahagoni*) dan pelet daun nangka (*Artocarpus heterophyllus*) terhadap kandungan tanin, aktivitas enzim CMC-ase dan protease, serta kinetika fermentasi rumen. Penelitian menggunakan Rancangan Acak Lengkap (RAL) pola faktorial 3x2 (sumber tanin dan penyimpanan). Penyimpanan pelet dilakukan pada 0 minggu dan 6 minggu. Perbandingan hijauan, konsentrat dan pelet yang digunakan yaitu 60:36:4. Fermentasi pakan dilakukan dengan metode *in vitro* selama 48 jam. Produksi gas hasil fermentasi diukur pada jam ke-1, 2, 4, 6, 8, 12, 24, 36, dan 48. Medium hasil fermentasi digunakan untuk menentukan aktivitas enzim, sedangkan produksi gas untuk menentukan kinetika fermentasi rumen. Data dianalisis statistik Rancangan Acak Lengkap (RAL) pola faktorial dan dilanjutkan dengan *Duncan's New Multiple Range Test* (DMRT) apabila berbeda nyata. Hasil penelitian menunjukkan bahwa total fenol dan tanin dari pelet daun mahoni lebih tinggi dibandingkan daun nangka. Penyimpanan pelet menurunkan kadar total fenol dan tanin ($P<0,01$). Penggunaan pelet daun mahoni dan daun nangka menurunkan aktivitas enzim protease ($P<0,01$) meskipun tidak berpengaruh terhadap aktivitas enzim CMC-ase ($P>0,05$). Penyimpanan pelet meningkatkan aktivitas enzim protease ($P<0,01$) meskipun tidak berpengaruh terhadap aktivitas enzim CMC-ase ($P>0,05$). Penggunaan pelet daun mahoni dan daun nangka menurunkan nilai fraksi a+b ($P<0,05$) dan meningkatkan nilai fraksi c ($P<0,01$). Penyimpanan pelet menurunkan nilai fraksi a+b ($P<0,05$), tetapi tidak berpengaruh terhadap nilai fraksi c ($P>0,05$). Terdapat interaksi antara jenis daun dan masa simpan pada kadar tanin, aktivitas enzim protease, dan nilai fraksi c ($P<0,01$). Kesimpulan dari penelitian ini adalah penggunaan pelet daun mahoni dan daun nangka menurunkan aktivitas enzim protease dan kinetika fermentasi rumen. Penyimpanan pelet selama 6 minggu menurunkan kadar tanin dan kinetika fermentasi rumen, tetapi meningkatkan aktivitas enzim protease. Penggunaan pelet daun mahoni dengan masa simpan 0 minggu memiliki aktivitas enzim protease yang paling rendah.

Kata kunci : tanin, pakan pelet, daun nangka, daun mahoni, masa simpan, aktivitas enzim, kinetika fermentasi rumen.

THE EFFECT OF MAHOGANY LEAF AND JACKFRUIT LEAF PELLETS STORAGE TIME ON ENZYME ACTIVITY AND RUMEN FERMENTATION KINETICS *IN VITRO*

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ABSTRACT

This research aimed to determine the impact of the storage time from mahogany leaf pellets (*Swietenia mahagoni*) and jackfruit leaf pellets (*Artocarpus heterophyllus*) on tannin content, the activity of CMC-ase and protease, and the kinetics of rumen fermentation. The research used a Completely Randomized Design (CRD) with a 3x2 factorial pattern (tannin source and storage). Storage time of pellet was carried out at 0 weeks and 6 weeks. The ratio of forage, concentrate, and pellets were used 60:36:4. Feed fermentation was arranged using the in vitro method for 48 hours. Fermentation gas production was measured at 1, 2, 4, 6, 8, 12, 24, 36, and 48 hours. The fermentation medium was used to determine enzyme activity, while gas production was used to determine rumen fermentation kinetics. The data obtained were analyzed by statistically using a Completely Randomized Design (CRD) factorial pattern and continued with Duncan's New Multiple Range Test (DMRT) if significantly different. The results showed that the total phenols and tannins from mahogany leaf were higher than from jackfruit leaf pellets. Storage time reduced total phenol and tannin levels ($P<0.01$). The use of mahogany leaf and jackfruit leaf pellets reduced protease enzyme activity ($P<0.01$), but no effect on CMC-ase enzyme activity ($P>0.05$). Storage time increased protease enzyme activity ($P<0.01$), but no effect on CMC-ase enzyme activity ($P>0.05$). The use of mahogany leaf and jackfruit leaf pellets reduced the value of fraction a+b ($P<0.05$) and increased the value of fraction c ($P<0.01$). Storage time reduced the value of fraction a+b ($P<0.05$), but had no effect on the value of fraction c ($P>0.05$). There was an interaction between leaf type and storage time on tannin levels, protease enzyme activity, and the c fraction value ($P<0.01$). The conclusion of this research was the use of mahogany leaf and jackfruit leaf pellets reduced protease enzyme activity and rumen fermentation kinetics. Storage time reduced tannin levels and rumen fermentation kinetics, but increased protease enzyme activity. The use of mahogany leaf pellets at 0 weeks had the lowest protease enzyme activity.

Key words: tannin, pellets feed, jackfruit leaf, mahogany leaf, storage time, enzyme activity, rumen fermentation kinetics.