KERAGAMAN METANOGEN DAN PRODUK FERMENTASI DALAM RUMEN YANG DIBERI PAKAN TAMBAHAN CAMPURAN TEPUNG DAUN NANGKA, MAHONI, DAN AKASIA SEBAGAI SUMBER TANIN

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INTISARI

Penelitian ini bertujuan untuk mengetahui pengaruh penambahan campuran tepung daun nangka, mahoni, dan akasia sebagai sumber tanin terhadap karakteristik cairan rumen domba ekor tipis. Penelitian ini menggunakan 12 domba ekor tipis. Ternak ditempatkan pada kandang metabolisme secara individu. Perlakuan yang diberikan pada penelitian ini yaitu level tanin dari campuran tepung daun sebesar 0%, 1,5%, dan 3%. Penelitian ini dimulai dengan periode adaptasi selama 2 minggu kemudian periode perlakuan selama 6 minggu. Pemberian pakan dilakukan sebanyak 2 kali sehari pada pukul 07.00-08.00 dan 15.00-16.00. Pengambilan cairan rumen dilakukan di akhir periode pemeliharaan. Cairan rumen kemudian dianalisis nilai pH, *Volatile fatty acids* (VFA), NH_3, protein mikroba, jumlah protozoa. Keragaman bakteri dianalisis dengan metode *Terminal Restriction Fragment Length Polymorphism* (TRFLP). Data yang diperoleh dianalisis dengan analisis variansi pola searah dan diuji lanjut dengan uji *Duncan Multiple Range Test*. Peningkatan level campuran tepung daun nangka, mahoni, dan akasia sebagai sumber tanin pada level 1,5% menurunkan kadar amonia (16,185 mg/100ml), dan pH (6,46) ($P<0,05$), namun tidak berpengaruh pada produksi VFA dan protein mikroba. Peningkatan level campuran tepung daun sampai level 3% menurunkan populasi protozoa rumen ($2,28x10^3$ sel/ml) dan meningkatkan protein mikroba (0,518 mg/ml) ($P<0,05$). Hasil pemotongan dengan enzim *MspI* menunjukkan semakin tinggi level tanin yang diberikan kelimpahan *Uncultured Methanoculleus sp.* dan *Uncultured Methanobrevibacter* sp. semakin meningkat. *Uncultured Methanomicrobiales archaeon clone* Chem-m-DO2 dan *Methanotorris igneus* Kol5 semakin menurun kelimpahannya seiring peningkatan level tanin, bahkan *Uncultured archaeon clone* ATB-EN10710 pada penambahan tanin level 3% tidak teramati. Hasil penelitian disimpulkan bahwa penggunaan campuran tepung daun sumber tanin sampai level 1,5% menurunkan produk fermentasi rumen dan mengubah keragaman bakteri metanogenik.

(Kata kunci: Domba ekor tipis, Nangka, Mahoni, Akasia, Karakteristik cairan rumen.)

METHANOGEN DIVERSITY AND FERMENTATION PRODUCTS IN RUMENT FED WITH ADDITIONAL MIXED FLOUR OF NANGKA LEAVES, MAHAGONY, AND ACACIA AS A SOURCE OF TANIN

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ABSTRACT

This study aims to determine the effect of adding a mixture of jackfruit, mahogany, and acacia flour as a source of tannins on the rumen fluid characteristics of thin tail sheep. This study used 12 thin-tailed sheep. The animal were placed individually on metabolic cages. The treatments given in this study were the level of tanin from mixed leaves flour as much as 0%, 1.5% and 3%. This study began with an adaptation period of 2 weeks then a treatment period of 6 weeks. Feeding was carried out 2 times a day at 07.00-08.00 and 15.00-16.00. The rumen fluid was collected at the end of the maintenance period. The rumen fluid was then analyzed for pH, volatile fatty acids (VFA), NH_3, microbial protein, number of protozoa. Methanogenic bacteria diversity was analyzed with *Terminal Restriction Fragment Length Polymorphism* (TRFLP). The data obtained were analyzed with one-way analysis of variance and continued by *Duncan Multiple Range Test*. Increasing the level of a mixture of jackfruit, mahogany, and acacia leaves flour as a source of tannins reduced ammonia levels (16,185 mg/100ml) and pH (6,46) ($P < 0.05$), but did not affect Volatile Fatty Acid (VFA) production and microbial protein. Increasing the level of the leaf meal mixture to a level of 3% decreased protozoan rumen population ($2{,}28 \times 10^3$ sel/ml) and increased microbial protein (0,518 mg/ml) ($P < 0.05$). The cutting result by enzyme *MspI* indicated the higher the level of tannins given higher abundance of *Uncultured Methanoculleus sp.* and *Uncultured Methanobrevibacter* sp. while *Uncultured Methanomicrobiales archaeon clone* Chem-m-DO2 and *Methanotorris igneus* Col5 decreased as tannin levels increased, even *Uncultured archaeon clone* ATB-EN10710 at level 3% tannin addition was not observed. The results of the study concluded that the use of a mixture of tannin source leaf meal up to a level of 1.5% reduced rumen fermentation products and changed the diversity of methanogenic bacteria.

(Keywords: Thin tailed sheep, Jackfruit, Mahogany, Acacia, Rumen fluid characteristics.)