

PENGARUH PENAMBAHAN *BLEND ESSENTIAL OIL* DAN NaNO_3 TERHADAP KINETIKA PRODUKSI GAS DAN KECERNAAN DI DALAM RUMEN *IN VITRO*

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INTISARI

Penelitian ini bertujuan untuk mengetahui pengaruh penambahan *blend essential oil* dan natrium nitrat (NaNO_3) sebagai aditif pakan terhadap kinetika produksi gas dan pencernaan secara *in vitro*. *Blend essential oil* (BEO) terdiri dari *Pinus merkusii* Jung and de Vriese dan *Melaleuca leucadendra* Linn. dengan perbandingan 1 : 3. Pakan yang digunakan sebagai substrat fermentasi berupa rumput odot (*Pennisetum purpureum* cv. Mott), bekatul, dan *pollard* dengan perbandingan berdasarkan bahan kering 60:20:20. Level NaNO_3 yang dipakai yaitu 0 dan 0,1 % sebagai sumber nitrat dikombinasikan dengan BEO pada level 0 dan 200 $\mu\text{L/L}$. BEO dan NaNO_3 masing-masing ditambah ke dalam substrat pakan pada *in vitro* fermentasi rumen. Analisis kinetika produksi gas dilakukan dengan teknik *in vitro* produksi gas menurut Menke and Steingass, (1988) selama 24 jam. Produksi gas hasil fermentasi diukur pada 1, 2, 4, 6, 8, 12, dan 24 jam setelah inkubasi. Analisis pencernaan nutrisi pakan dilakukan dengan teknik *in vitro* menurut metode Theodorou *et al.* (1994). Data yang diambil setelah fermentasi adalah pencernaan bahan kering (KcBK), pencernaan bahan organik (KcBO), pencernaan serat kasar (KcSK) dan pencernaan protein kasar (KcPK). Pengaruh penambahan BEO, dan NaNO_3 serta kombinasi keduanya dianalisis menggunakan Rancangan Acak Lengkap (RAL) pola faktorial 2 x 2. Apabila terdapat perbedaan nyata, dilanjutkan uji *Duncan's New Multiple Range Test* (DMRT). Penambahan BEO menurunkan KcPK dan fraksi a ($P < 0,01$). Penambahan NaNO_3 menyebabkan penurunan KcPK, fraksi a, fraksi a+b ($P < 0,01$) serta menurunkan fraksi b dan fraksi c ($P < 0,05$). Penambahan BEO maupun NaNO_3 tidak berpengaruh nyata terhadap KcBK, KcBO, KcSK ($P > 0,05$). Interaksi antara BEO dan NaNO_3 menunjukkan pengaruh yang tidak nyata terhadap semua parameter pencernaan dan kinetika produksi gas. Kesimpulan dari penelitian ini adalah penambahan BEO dan NaNO_3 tidak mengganggu kinetika produksi gas dan pencernaan nutrisi di dalam rumen *in vitro*.

Kata kunci: *Blend essential oil*, Pencernaan *in vitro*, Kinetika produksi gas

THE EFFECT OF *BLEND ESSENTIAL OIL* AND NaNO₃ ON *IN VITRO* GAS PRODUCTION KINETIC AND NUTRIENT DIGESTIBILITY

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ABSTRACT

This study was conducted to determine the effect of adding *blend essential oil* and sodium nitrate (NaNO₃) as feed additive on *in vitro* gas production kinetics and nutrient digestibility. The *blend essential oil* (BEO) consists of *Pinus merkusii* Jung and de Vriese and *Melaleuca leucadendra* Linn. in a ratio of 1: 3. The feed used as a fermentation substrate is *Pennisetum purpureum* cv. Mott, rice bran, and pollard with a ratio of 60:20:20 based on dry matter. The doses of NaNO₃ used were 0 and 0.1% as a source of nitrate combined with BEO at doses of 0 and 200 µL/L. BEO dan NaNO₃ were added to the feed substrate for *in vitro* rumen fermentation. The kinetics analysis of gas production was carried out by using the *in vitro* technique of gas production according to Menke and Steingass, (1988) for 24 hours. Gas production from fermentation was measured at 1, 2, 4, 6, 8, 12, and 24 hours after incubation. Nutrient digestibility analysis of feed was carried out using an *in vitro* technique according to the method of Theodorou et al. (1994). The data taken after fermentation were dry matter digestibility (DMD), organic matter digestibility (OMD), crude fiber digestibility (CFD) and crude protein digestibility (CPD). The effect of adding BEO, NaNO₃ and a combination of both were analyzed using a completely randomized design with a 2 x 2 factorial pattern. If there was a significant difference, the Duncan's New Multiple Range Test (DMRT) was continued. The addition of BEO caused a decrease in CPD and fraction a (P<0.01). The addition of NaNO₃ caused a decrease in CPD, fraction a, fraction a+b (P<0.01) and decreased fraction b, fraction c (P<0.05). The addition of BEO and NaNO₃ had no effect on DMD, OMD, CFD (P>0.05). The interaction between BEO and NaNO₃ did not show a significant effect on all digestibility parameters and gas production kinetics. The conclusion of this study is that the addition of BEO and NaNO₃ does not interfere with the kinetics of gas production and nutrient digestibility in the rumen *in vitro*.

Keywords: *Blend essential oil*, *In vitro* digestibility, Gas production kinetics