PENGARUH PENGGUNAAN ADITIF PAKAN EKSTRAK DAUN MENIRAN (*Phyllanthus niruri*) TERHADAP PRODUKSI GAS METANA DAN KARAKTERISTIK FERMENTASI RUMEN SECARA *IN VITRO*

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INTISARI

Upaya menurunkan gas CH_4 dari industri peternakan menjadi solusi meminimalisir dampak *global warming*. Salah satunya yaitu dengan pemberian aditif pakan tinggi senyawa fenolik dan flavonoid. Penelitian ini dilakukan untuk menguji potensi aditif pakan ekstrak daun meniran (*Phyllanthus niruri*) terhadap produksi gas CH_4, karakteristik fermentasi rumen, dan tingkat kecernaan nutrien pakan secara *in vitro*. Pada penelitian ini dilakukan empat perlakuan dengan empat replikasi terdiri dari kontrol 0% bahan kering (BK) (CTRL) dan tiga perlakuan suplementasi ekstrak dosis 0,5% BK (M1), 1,0% BK (M2), dan 1,5% BK (M3). Penelitian *in vitro* menggunakan cairan rumen sapi Bali (*Bos sondaicus*) dengan ransum basal rumput *Pennisetum purpureum* dan konsentrat (60:40). Analisis data dengan rancangan *one-way* ANOVA dilanjutkan uji lanjutan *Duncan's New Multiple Range Test* (DMRT). Hasil penelitian menunjukkan bahwa suplementasi ekstrak daun meniran menurunkan produksi gas CH_4 berdasarkan jumlah BK, bahan kering tercerna (BKT), dan bahan organik tercerna (BOT) ($P<0,05$). Total produksi gas, produksi gas tiap BKT dan BOT, fraksi "b", fraksi "c", dan fraksi "a+b" menurun signifikan pasca suplementasi ($P<0,05$), namun tidak berefek nyata terhadap fraksi "a" ($P>0,05$). Suplementasi ekstrak daun meniran tidak berpengaruh nyata terhadap nilai pH, kadar NH_3, kadar protein mikroba, jumlah protozoa, dan kecernaan bahan organik ($P>0,05$), namun berpengaruh nyata terhadap peningkatan kecernaan bahan kering, total VFA, kadar propionat, dan kadar butirat ($P<0,05$). Dapat disimpulkan bahwa suplementasi ekstrak meniran hingga dosis 1,5% BK dapat menurunkan produksi gas CH_4 tanpa berpengaruh negatif terhadap karakteristik fermentasi rumen dan tingkat kecernaan nutrien pakan.

Kata kunci : gas metana (CH_4), *Phyllanthus niruri*, flavonoid, fenolik

THE EFFECT OF FEED ADDITIVE OF PHYLLANTHUS NIRURI LEAF EXTRACT ON METHANE GAS PRODUCTION AND RUMEN FERMENTATION CHARACTERISTIC IN VITRO

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ABSTRACT

Efforts to reduce CH_4 gas production from the livestock industry are a challenge in minimizing the impact of global warming. One of the effort is the use of feed additives with high phenolic and flavonoid content. This research was conducted to explore the potential of meniran leaf extract (*Phyllanthus niruri*) as feed additive on CH_4 gas production, rumen fermentation characteristics, and feed nutrient digestibility through in vitro approach. In this study, four treatments with four replicates were conducted, consisting control 0% DM (CTRL) and three treatments supplemented with extracts at doses of 0.5% DM (M1), 1.0% DM (M2), and 1.5% DM (M3). The in vitro study was conducted using rumen fluid from Bali cattle (*Bos sondaicus*) with a basal diet *Pennisetum purpureum* grass and concentrate (60:40). Data analysis was performed using one-way ANOVA and followed by Duncan's New Multiple Range Test (DMRT). The results showed that supplementation with meniran leaf extract reduced CH_4 gas production based on dry matter, dry matter digested (DMD), and organic matter digested(OMD) ($P<0.05$). Total gas production, gas production each DMD and OMD, fraction “b”, fraction “c”, and fraction “a+b” decreased significantly after supplementation with meniran leaf extract ($P<0.05$), but had no significant effect on fraction “a” ($P>0,05$). The supplementation had no significant effect on pH value, NH_3 concentration, microbial protein concentration, protozoa cell count, and organic matter digestibility ($P>0,05$), but had significant effect on increasing dry matter digestibility, total VFA, propionate concentration, butyrate concentration ($P<0,05$). It can be concluded that meniran extract supplementation up to 1,5% DM dosage reduce CH_4 gas production significantly without negatively affect rumen fermentation characteristics and feed nutrient digestibility.

Keywords: methane gas (CH_4), *Phyllanthus niruri*, flavonoid, phenolic