

PRODUKSI BIOGAS DARI LIMBAH KOTORAN SAPI YANG DISUBSTITUSI DENGAN LIMBAH BUAH NANAS DAN RUMAH POTONG HEWAN

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INTISARI

Penelitian bertujuan untuk mengetahui produksi biogas yang berasal dari feses sapi dengan penambahan limbah buah nanas (*Ananas comosus L.merr*), dan limbah rumah potong hewan. Penelitian terdiri atas empat perlakuan, perlakuan pertama (P1) sebagai kontrol yaitu feses sapi 100%, perlakuan kedua (P2) feses sapi 60%, limbah buah nanas 20%, dan limbah rumah potong hewan (RPH) 20%, perlakuan ketiga (P3) feses sapi 40%, limbah buah nanas 20%, dan limbah RPH 40%, dan perlakuan keempat (P4) fese sapi 20%, limbah buah nanas 20%, dan limbah RPH 60%. Parameter yang diamati meliputi: temperatur *sludge*, temperatur lingkungan, pH, tekanan gas, produksi biogas, lama pembakaran, dan persentase kandungan gas metan. Data yang diperoleh dianalisis menggunakan analisis variansi rancangan acak lengkap pola searah (*one way anova*) apabila menunjukkan perbedaan dilanjutkan uji beda mean dengan *Duncan's New Multiple Range Test* (DMRT). Hasil penelitian menunjukkan bahwa perlakuan P1, P2, P3, dan P4 untuk temperatur lingkungan, temperature *sludge* dan tekanan gas berbeda tidak nyata. Data hasil analisis P1, P2, P3 dan P4 untuk temperatur lingkungan adalah 32,09°C; temperatur *sludge* adalah 31,38°C; 31,35°C; 31,03°C dan 31,22 °C; dan tekanan gas 188,98 N/m²; 201,06 N/m²; 193,83 N/m² dan 210,18 N/m²; Hasil analisis pH adalah 6,86; 6,68; 6,60 dan 6,65; produksi biogas 1,84; 1,63; 1,25 dan 1,57 liter; lama pembakaran 76,85; 67,30; 46,27 dan 56,60 detik; dan kandungan gas metan (CH₄) adalah 32,31; 11,55; 12,42 dan 12,76% menunjukkan perbedaan yang nyata (P<0,05). Kesimpulan penelitian menunjukkan bahwa penambahan limbah buah nanas dan limbah rumah potong hewan pada feses sapi dapat memproduksi biogas namun tidak mampu meningkatkan produksi biogas dibandingkan dengan limbah sapi secara individual.

(Kata kunci: Feses sapi, Limbah buah nanas, Limbah rumah potong hewan, dan Produksi biogas)

BIOGAS PRODUCTION FROM CATTLE WASTE WITH PINEAPPLE AND SLOUGHTERHOUSE WASTE ADDITION

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ABSTRACT

This study was aimed to know biogas production of cattle manure with pineapple and slaughterhouse waste addition. Study consists of four treatments that are first treatment (P1) as the control that is 100% cattle feces, the second treatment (P2) 60% of cattle feces, 20% of pineapple waste, and 40% of slaughterhouse waste, the third treatment (P3) 40% of cattle feces, 20% of pineapple waste, and 40% of slaughterhouse waste, and the fourth treatment (P4) 20% of cattle feces, 20% of pineapple waste, and 60% of slaughterhouse waste. Data was analyzed using complete randomized designed (*one way anova*). Mean differences were tested by Duncan's New Multiple Range Test (DMRT). Parameter observed include temperature of sludge, environment temperature, pH, gas pressure, gas production volume, retention time of burning, and the percentage of methana gasses. The results of this study showed the average of P1, P2, P3, and P4 of environment temperature, digester sludge temperature, and gas pressure were not significant. The calculated data were 32.097°C for environment temperature; 31.38°C; 31.35°C; 31.03°C and 31.22°C for digester sludge temperature and 188.98 N/m²; 201.06 N/m²; 193.83 N/m² and 210.18 N/m² for gas pressure. The result of pH (6.86; 6.68; 6.60; 6.65), biogas production (1.84; 1.63; 1.25 and 1.57 liter), retention time of burning (76.85; 67.30; 46.27 and 56.60 second) and methana gasses percentage (CH₄) (32.31%; 11.55%; 12.42% and 12.76%) were significantly different (P<0.05). In conclusion, the addition of pineapple and slaughterhouse waste into cattle feces can produce methane gasses but did not increase gas production volume.

(Keywords: Cattle feces, Pineapple waste, Slaughterhouse waste and Biogas production)