

**Analisis Produksi Biogas Dari Kotoran Kambing Dengan Penambahan
Serbuk Gergaji Dan Mikroorganisme EM4**

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ABSTRAK

Biogas merupakan salah satu sumber energi terbarukan yang dihasilkan melalui proses fermentasi anaerob bahan organik. Kotoran kambing memiliki potensi sebagai bahan baku biogas, namun rasio karbon dan nitrogen (C/N) perlu dioptimalkan untuk meningkatkan produksi dan kualitas biogas. Penelitian ini bertujuan untuk menganalisis pengaruh penambahan serbuk gergaji dan mikroorganisme EM4 terhadap produksi dan kualitas biogas dari kotoran kambing. Penelitian menggunakan metode eksperimen dengan tiga perlakuan, yaitu F0 (4,5 kg kotoran kambing dan 7,5 L air), F1 (4,5 kg kotoran kambing, 7,15 L air, dan 350 mL EM4), serta F2 (3,5 kg kotoran kambing, 7,45 L air, 350 mL EM4, dan serbuk gergaji 700 gram). Proses fermentasi dilakukan secara anaerob selama 21 hari menggunakan digester berkapasitas 15 liter. Hasil penelitian menunjukkan bahwa perlakuan F2 menghasilkan kinerja terbaik dengan kandungan gas metana sebesar 41,62%, laju produksi biogas sebesar 1.876 mL/hari, lama waktu penyalaan 2 menit 51 detik, dan nyala api berwarna biru cerah. Perlakuan F1 menghasilkan kandungan metana sebesar 25,28%, sedangkan F0 sebesar 18,69%. Berdasarkan hasil penelitian dapat disimpulkan bahwa penambahan serbuk gergaji dan mikroorganisme EM4 berpengaruh positif terhadap peningkatan produksi dan kualitas biogas dari kotoran kambing, sehingga perlakuan F2 menjadi perlakuan terbaik dalam penelitian ini.

Kata kunci: Biogas, EM4, Kotoran Kambing, Serbuk Gergaji

Analysis of Biogas Production from Goat Manure with the Addition of Sawdust and EM4 Microorganisms"

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ABSTRACT

Biogas is a renewable energy source produced through the anaerobic fermentation of organic materials. Goat manure has the potential to be used as a biogas feedstock; however, its carbon-to-nitrogen (C/N) ratio needs to be optimized to improve biogas production and quality. This study aimed to analyze the effect of adding sawdust and EM4 microorganisms on the production and quality of biogas from goat manure. The study employed an experimental method with three treatments: F0 (4.5 kg of goat manure and 7.5 L of water), F1 (4.5 kg of goat manure, 7.15 L of water, and 350 mL of EM4), and F2 (3.5 kg of goat manure, 7.45 L of water, 350 mL of EM4, and 700 g sawdust). The anaerobic fermentation process was carried out for 21 days using a 15-liter digester. The results showed that treatment F2 produced the best performance, with a methane gas content of 41.62%, a biogas production rate of 1,876 mL/day, a burning duration of 171 seconds, and a bright blue flame. Treatment F1 produced a methane content of 25.28%, while F0 produced 18.69%. Based on the results, it can be concluded that the addition of sawdust and EM4 microorganisms had a positive effect on improving the production and quality of biogas from goat manure, making F2 the best treatment in this study.

Keywords: Biogas, EM4, Goat Manure, Sawdust