

ABSTRAK

PENGARUH WAKTU TERHADAP VOLUME BIOGAS HASIL OLAHAN LIMBAH CAIR KELAPA SAWIT MENGGUNAKAN STARTER KOTORAN SAPI

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Salah satu industri yang cukup penting dalam memenuhi kebutuhan umat manusia adalah industri pengolahan kelapa sawit. Pabrik kelapa sawit menghasilkan setidaknya 60% limbah cair. Pada umumnya limbah cair kelapa sawit belum dimanfaatkan secara optimal walaupun memiliki potensi sebagai sumber energi yang tinggi dalam bentuk biogas.

Pada penelitian ini biogas diproduksi menggunakan tambahan starter kotoran sapi dibuat tiga perlakuan dengan perbandingan bahan yang berbeda, yakni A1 (4;6), A2 (5;5), dan A3 (6;4). Fermentasi biogas dilakukan selama 40 hari fermentasi dengan pengamatan harian suhu dan volume biogas. Pengukuran kualitas limbah meliputi pH, *Chemical Oxygen Demand* (COD), *Biochemical Oxygen Demand* (BOD), *Total Suspended Solids* (TSS), dan *Total Dissolved Solid* (TDS) yang hanya diukur pada awal dan akhir proses fermentasi.

Hasil penelitian menunjukkan bahwa limbah cair kelapa sawit dapat diolah sebagai bahan baku biogas. Fermentasi biogas dilakukan selama 40 hari dengan volume tertinggi 22,300 L pada digester A1. Biogas dari perlakuan A1 dapat menghasilkan nyala api. Analisis dan pengamatan nilai *Chemical Oxygen Demand* (COD), *Biochemical Oxygen Demand* (BOD), dan *Total Dissolved Solid* (TDS) pada biogas hasil fermentasi mengalami penurunan berturut-turut sebesar 63%, 62%, dan 58% untuk nilai *Total Suspended Solids* (TSS) terjadi peningkatan sebesar 13%.

Kata kunci : Limbah cair kelapa sawit, biogas, anaerobik, kotoran sapi.

ABSTRACT

THE EFFECT OF TIME ON THE VOLUME OF BIOGAS FROM PROCESSED PALM OIL LIQUID WASTE USING COW DUNG STARTER

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One industry that is quite important in meeting the needs of humans is the palm oil processing industry. Palm oil mills produce at least 60% liquid waste. In general, palm oil liquid waste has not been optimally utilized despite its potential as a high energy source in the form of biogas.

In this study, biogas was produced using additional cow dung starter made in three treatments with different material comparisons, namely A1 (4;6), A2 (5;5), and A3 (6;4). Biogas fermentation was carried out for 40 days with daily observation of temperature and biogas volume. Waste quality measurements include *Chemical Oxygen Demand* (COD), *Biochemical Oxygen Demand* (BOD), *Total Suspended Solids* (TSS), and *Total Dissolved Solid* (TDS) which are only measured at the beginning and end of the fermentation process.

The results showed that palm oil liquid waste can be processed as biogas raw material. Biogas fermentation was carried out for 40 days with the highest volume of 22,300 L in digester A1. Biogas from treatments A1 can produce flame. Analysis and observation of *Chemical Oxygen Demand* (COD), *Biochemical Oxygen Demand* (BOD), and *Total Dissolved Solid* (TDS) values in fermented biogas decreased by 63%, 62%, and 58%, respectively, for *Total Suspended Solids* (TSS) values, there was an increase 13%.

Keywords: Palm oil liquid waste, biogas, anaerobic, cow manure.