

# Pengaruh penambahan limbah minyak dan lemak terhadap kinerja reaktor DRY anaerobic digestion sampah makanan = Effect of fat oil and grease fog addition to DRY anaerobic digestion food waste reactor performance

Dwita Fitriani Wijayanti, author

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## Abstrak

Sampah organik sebagian besar berasal dari sampah makanan yang menyebabkan karakteristiknya memiliki konsentrasi nitrogen dan lemak tinggi, kelembaban tinggi. Limbah domestik di Indonesia memiliki karakteristik kandungan organik yang sesuai dengan kondisi anaerobik. Limbah minyak dan lemak dapat membantu dalam proses AD yang dijadikan sebagai ko-substrat.

Penelitian ini bertujuan untuk menganalisis kinerja reaktor dry anaerobic digestion sampah makanan dan menganalisis pengaruh penambahan limbah minyak dan lemak terhadap kinerja reaktor dry anaerobic digestion. Penelitian dilakukan menggunakan Continuous Stirred Tank Reactor CSTR dengan volume terisi 400 L yang beroperasi pada suhu rata-rata 27,8 1,07oC.

Penelitian operasi skenario pertama dilakukan dengan input substrat sampah makanan dengan Organic Loading Rate OLR 10 kg VS/m<sup>3</sup> selama 43 hari dan diaduk menggunakan variasi intensitas pengadukan 30 rpm dan 60 rpm secara konstan.

Operasi skenario kedua dilakukan selama 59 hari menggunakan substrat sampah makanan dan kotoran sapi banding limbah Fat Oil and Grease FOG dengan Organic Loading Rate OLR yang sama dengan skenario pertama dan diaduk menggunakan intensitas 30 rpm secara konstan.

Hasil penelitian menunjukkan terdapat perbedaan yang signifikan antara input substrat sampah makanan dengan penambahan limbah minyak dan lemak.

*Organic waste mostly comes from food waste that has characteristics of high concentrations of nitrogen and fat, high humidity. Domestic waste in Indonesia has characteristics of organic content which is suitable with anaerobic conditions. Waste oil and fat can help in the process of AD which is used as co substrate.*

*This research is intended to analyze the performance of dry anaerobic digestion reactor of food waste and analyze the effect of oil and waste addition on dry anaerobic digestion reactor performance. The research was conducted using Continuous Stirred Tank Reactor CSTR with a volume of 400 L applied at an average temperature of 27.8 1.07oC.*

*The first scenario operation study was performed with food waste substrate input with Organic Loading rate OLR is 10 kg VS m<sup>3</sup> for 43 days and stirred using constantly stirring intensity variation of 30 rpm and 60 rpm.*

*The second scenario operation was conducted for 59 days using food waste and cow dung substrate of Fat Oil and Grease waste FOG with Organic Loading Rate OLR which is similar to the first scenario and stirred using constant 30 rpm intensity.*

*The results of study showed that there was a significant difference between the input of food waste substrate with the addition of Fat Oil and Grease p.*