

Potensi produksi biogas dari proses anaerobic co-digestion limbah minyak dan lemak dengan sampah makanan: studi kasus kantin Fakultas Teknik Universitas Indonesia = Potential of biogas production from anaerobic co-digestion process of oil and grease waste and food waste: case study Engineering Faculty Cafeteria in Universitas Indonesia

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Abstrak

Adanya kecenderungan masyarakat Indonesia untuk mengonsumsi makanan mengandung minyak dan lemak menjadi pemicu peningkatan timbulan limbah minyak dan lemak serta nilai COD dan VS air limbah. Penelitian ini bertujuan untuk mengetahui potensi biogas dan rasio limbah minyak dan lemak dengan sampah makanan yang paling optimum.

Penelitian dilaksanakan selama 42 hari inkubasi pada suhu 37C dengan tiga variasi rasio VS limbah minyak dan lemak dan sampah makanan yaitu 1:7, 1:2, dan 1:1 dengan metode biochemical methane potential. Limbah minyak dan lemak memiliki karakteristik COD 148 g/L, TS 763 g/L, dan VS 759 g/L.

Penelitian ini menunjukkan bahwa limbah minyak dan lemak memiliki potensi menghasilkan biogas tertinggi melalui proses anaerobic co- digestion dengan sampah makanan dan menghasilkan 485 mLCH₄/grVS dari variasi 1:7. Sementara variasi rasio limbah minyak dan lemak dengan sampah makanan 1:2 dan 1:1 hanya menghasilkan 128 dan 4 mLCH₄/grVS.

Tendency of Indonesian people to eat foods containing oils dan fats trigger increasing in generation of fat, oil, and grease waste and increasing in wastewater's COD and VS. This research is conducted to know potential of fat, oil, and grease and its ratio with food waste that obtain the highest biogas production through biochemical methane potential method.

The research was conducted over 42 days incubation at 37C including three variation of volatile solids (VS) ratio of fat, oil, and grease waste with food waste, that is 1:7, 1:2, and 1:1. As co- substrate of the anaerobic co- digestion process, fat, oil, and grease characteristics are COD 148 g/L, TS 763 g/L, and VS 759 g/L. Result showed that fat, oil, and grease waste has potential to produce biogas through anaerobic co- digestion process with food waste and produce 485 mLCH₄/grVS as the highest methane yield of 1:7 ratio. While the variation of ratio fat, oil, and grease waste with food waste at 1:2 and 1:1 only produce 128 and 4 mLCH₄/grVS, respectively.