

Analisis pengolahan sampah makanan menggunakan dry anaerobic digester dengan penambahan air lindi = Analysis of the food waste treatment using dry anaerobic digester with leachete addition

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Abstrak

Limbah organik terutama sampah makanan memiliki volume yang sangat tinggi dan membutuhkan pengolahan di sumber. Dry anaerobic digestion merupakan salah satu teknologi pengolahan limbah organik yang cukup sederhana, kebutuhan air yang lebih sedikit dan tidak membutuhkan alat pengadukan yang terpasang pada reaktor. Pada penelitian ini substrat yang digunakan berupa sampah makanan yang berasal dari Kantin Fakultas Universitas Indonesia dengan inokulum air lindi dari anaerobic digester yang berada di Pasar Timbul Petamburan, Jakarta Barat. Penelitian ini dilakukan dengan reaktor dry anaerobik batch (TS 19,78%) selama 43 hari dengan nilai C/N campuran 9. Penambahan air lindi dilakukan dua kali pada minggu ke-5 dan ke-6 sebanyak 2 L yang terdiri dari 30% lindi dan 70% air suling. Selama operasi reaktor proses degradasi material organik berjalan dengan baik, dengan penurunan nilai VS dari 82,4% mencapai nilai 57,78% dengan efisiensi penurunan sebesar 30% dengan nilai VSremoved 70,77%. Namun pembentukan metana kurang berjalan dengan baik karena pH yang rendah 3,7-5 pada awal operasi. Volume metana yang dihasilkan sebanyak 0,2452 L dengan presentase gas metana tertinggi pada minggu ke-6 sebesar 8,66%. Pengaruh penambahan air lindi menjaga moisture 93% selama proses operasi di minggu 5 dan 6, meningkatkan nilai COD 9115 mg/l dan peningkatan nilai amonia mencapai 1002 mg/l N NH₃ tetapi masih dalam batas toleransi dan belum bersifat toksik.

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Organic waste especially food waste have a very high volume and requires processing at the source. Dry anaerobic digestion is one of the organic waste processing technology was quite simple, less water needs and required no stirring tool attached to the reactor. On this study substrate which is used in the form of food waste that comes from the University of Indonesia Faculty Canteen with inokulum leachete from anaerobic digester are in the Timbul market Petamburan, West Jakarta. This research was conducted with reactors dry anaerobic batch (TS 19,78%) during the 43-day with a grade of C/N mix 9. The addition of leachete performed twice in week 5 and 6 as much as 2 L consisting of leachete 30% and 70% distilled water. During the operation of the reactor the process of degradation of organic material went well, with the declining value of its 82.4% VS reached 57.78% efficiency with a decrease of 30% with a value of VSremoved 70,77%. However the formation of methane less going well because of the low pH of 3.7-5 at the start of the operation. The volume of methane produced as much as 0.2452 L with the highest percentage of methane gas on weeks 6 of 8,66%. Influence of addition of leachete moisture keep in \pm 93% during the process of operation in weeks 5 and 6, increase the value of COD 9115 mg/l and increased the value of ammonia reached 1002 mg/l NH₃ N but still within the boundaries of tolerance and yet are toxic.