

Pengaruh *Organic Loading Rate* terhadap Stabilitas Proses Pengolahan Limbah Cair *Nata de Coco* secara Anaerobik

INTISARI

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Tujuan penelitian ini adalah mengetahui pengaruh *organic loading rate* (OLR) terhadap stabilitas proses pengolahan limbah cair *nata de coco* secara anaerobik berdasarkan parameter *Chemical Oxygen Demand* (COD), *Biochemical Oxygen Demand* (BOD), *Total Suspended Solid* (TSS), produksi biogas dan derajat keasaman (pH) effluent yang dihasilkan. Dari hasil penelitian ini didapatkan bahwa pada OLR 0,5 g COD/L/hari, COD *removal efficiency* yang diperoleh adalah sebesar 46,52%, BOD *removal efficiency* sebesar 35,95%, pH effluent 7, produksi biogas 259 ml dan TSS *removal efficiency* sebesar 40,2%. Pada OLR 1,0 g COD/L/hari, COD *removal efficiency* sebesar yang diperoleh adalah sebesar 70,92%, BOD *removal efficiency* sebesar 72,16%, pH effluent 7,11, produksi biogas 493,5 ml dan TSS *removal efficiency* sebesar 62,5%. Sedangkan pada OLR 1,5 g COD/L/hari, COD *removal efficiency* sebesar 50,88%, BOD *removal efficiency* sebesar 59,82%, pH effluent 5,47, produksi biogas 301 ml, dan TSS *removal efficiency* sebesar 44,44%. Efisiensi penurunan tingkat cemaran pada limbah cair akan meningkat seiring dengan peningkatan OLR sampai titik tertentu. Dalam penelitian ini, peningkatan OLR hingga 1,0 g/L/hari meningkatkan efisiensi penurunan tingkat cemaran, namun peningkatan hingga 1,5 g/L/hari akan menurunkan efisiensi penurunan tingkat cemaran karena terjadi *organic overload*.

Kata Kunci : *Organic Loading Rate*, limbah, *nata de coco*, anaerobik

Effect of Organic Loading Rate on Process Stability of *Nata de Coco* Wastewater Anaerobic Treatment

ABSTRACT

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In this study, experiments were conducted to investigate the effect of organic loading rate (OLR) on process stability of *nata de coco* wastewater anaerobic treatment using semi-continuous digester. The standard-rate anaerobic digester with working volume of 9,1 L was used. The digester was operated at different organic loading rates of 0,5, 1 and 1,5 g/L/day. Based on data from this study, the reduction of organic content in *nata de coco* wastewater, pH value and biogas production increased when OLR increased until 1 g/L/day. But then those parameters value decreased when OLR being increased further to 1,5 g/L/day. It showed that at 1,5 g/L/day the amount of substrate fed to the system was exceeding the total degradation capacity of methanogenic microorganisms, hence the organic overload happened and decreased the efficiency of organic content reduction in anaerobic treatment of *nata de coco* wastewater.

Keywords : Organic Loading Rate, wastewater, *nata de coco*, anaerobic digestion