

Thesis Title	Effect of Reactor Configuration on Biogas Production of Cake from Palm Oil Mill Industry
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### Abstract

This thesis was to study the biogas production of decantered cake from palm oil mill industry and the efficiencies of single-stage and two-stage anaerobic sequencing batch reactors (ASBR). Two temperatures were investigated with the total of 4 studied systems, i.e., single-stage (S30) and two-stage (T30) units at mesophilic temperature (30°C), and single-stage (S55) and two-stage (T55) units at thermophilic temperature (55°C). The single-stage system consisted of a 2-liter reactor with the hydraulic retention time of 10 days. The two-stage system consisted of a 0.4-liter acidogenic reactor and a 1.6-liter methanogenic reactor with the hydraulic retention times of 2 and 8 days, respectively. All 4 systems were initially operated at organic loading rate of 0.5 gCOD/L-d and gradually increased to 4 gCOD/L-d. It was found that the methane composition in the biogas were 69, 65, 68 and 63 % with the average methane gas yield of 231, 207, 243 and 224 mL CH<sub>4</sub>/gCOD<sub>added</sub> for S30, T30, S55, and T55, respectively. The result indicated that, at the same operating temperature, the single-stage reactor was more efficient than the two-stage reactor. In addition, for the same reactor configuration, the systems at 55°C were more efficient than the systems at 30°C.

Keywords : Decantered Cake / Two-Stage / ASBR / Biogas / Thermophilic