

Thesis Title Household Excreta Treatment by Two Compartment
Anaerobic Digestion

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Date of Graduation 17 June B.E. 2535 (1992)

ABSTRACT

The purpose of this study was to evaluate and investigate the main chemical and biological factors, BOD, SS, $\text{NO}_3\text{-N}$ and fecal coliform bacteria in the treatment of household excreta using a two compartment anaerobic digester for residential areas located on the river bank.

Field experimental research was conducted in this study. Two 6 - person households on the river bank were selected. An anaerobic digestion model consisting of 2 cylindrical collection tanks, each with a capacity of 1,000 litres was installed in each household. These tanks were built with concrete rings with a diameter of 0.80 metres and 2.4 metres in height and were installed on a reinforced concrete base. The tanks were connected by a pipe which served as an overflow

by-pass for excreta from one to the other. The detention time of the system was 37 - 45 days.

The results showed that the system had a loading capacity of between 44.7 and 53.7 litres/day and an organic loading of between 0.0335 and 0.0367 kg/m³ / day. The reduction efficiencies of BOD, SS, NO₃-N and fecal coliform bacteria were 76.8 - 78.7 %, 91.0 - 92.8 %, 31.5 - 35.6 % and 99.97 % respectively. The effluent mean values were as follows: pH = 7.5 - 8.0, temperature = 28.6°C., BOD = 159 - 160 mg/l, SS = 90 - 167 mg/l, NO₃-N = 0.56 - 0.76 mg/l and fecal coliform bacteria counts = 1.5×10^5 - 2.2×10^5 MPN/100 ml.

It was found that the NO₃-N effluent from the system was lower than the surface water quality, class 3, standard of 0.5 mg/l, while BOD and SS were higher than the domestic effluent standard of a community of less than 101 persons (90 mg/l and 60 mg/l respectively), and fecal coliform bacteria counts were also higher than the surface water quality, class 3, standard of 4.0×10^3 MPN/100 ml. The results indicated that the two compartment anaerobic digester system can treat household excreta but it should be improved in the efficiency of the system and in reducing fecal coliform counts. It is suggested that a three compartment anaerobic digester system be used to improve the efficiency of the system.