

Enhancing biogas production rate of cattle manure using rumen fluid of ruminants

ABSTRACT

The effects of rumen fluid from cattle and goats used as inoculums to increase biogas production using cattle manure as a substrate were investigated. Approximately 100 grams of fresh cattle manure (M) was assigned to each biodigester and mixed with rumen fluid (R) and a distilled water (W) according to five different treatment ratios, T1 (1:1:0); T2 (1:0.75:0.25); T3 (1:0.5:0.5); T4 (1:0.25:0.75); and T5 (1:0:1) (correspond to 0; 12.5; 25, 37.5; 50 % rumen fluid, respectively). All treatments were prepared in triplicates and runs at mesophilic condition. No significant different ($P>0.05$) was observed when comparing the biogas produced between the two type of rumen fluid used in this study. However, significant difference was noted when comparing between hours interval in the cattle manure inoculated with rumen fluid of the cattle and also goats. Data recorded that cattle rumen fluids produced more biogas than the goats. It was established that the increase in the biogas production at certain level was in respond to the amount of rumen fluids added into the mixture. The best performance of biogas production in this study was observed if the rumen fluid used between the ranges of 0.75 to 1 that correspond to 37.5 ó 50 % of rumen fluid respectively.

Keyword: Biogas; Cattle manure; Rumen fluid