

PERFORMANCE ANALYSIS AND MODIFICATION OF A SLAUGHTERHOUSE WASTE BIOGAS PLANT FOR BIOGAS AND ELECTRICITY GENERATION

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ABSTRACT

In this study, the performance of an operating biogas plant using slaughterhouse waste was carried with the view of improving its operation and hence protect the environment from pollution coming from slaughterhouse waste. This research was conducted through site visits, observations, oral interviews, and document reviews. It was established that the existing biogas plant was not performing as expected. The study showed that the biogas plant performance is about 72.9% of the optimum production and uses only 5% of the available waste thus 95% is not processed leading to environmental pollution and waste of potential energy resource. It was observed that the substrate to water mixing ratio used 1:2.5, temperature in the digester averaged 34°C, average pH of the substrate was 6.5 and the pressure was 400mm of water. These parameters were regarded as outside the optimum production range. Modification on the plant was therefore proposed based on the analysis done. The proposed new biogas plant design is expected to increase slaughterhouse waste utilization, increase biogas production, and reduce environmental pollution. The new biogas plant design has a 1600m³ digester with an expected output of 1920m³ and slaughterhouse waste utilization of will increase to 92.86%.

Key Words: Slaughterhouse; Slaughterhouse waste; biogas production, biogas from slaughterhouse waste.

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