Title: Biogas Production from Organic Waste

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Outlet: Journal of Science and Technology Research, Vol 8, No. 2. pp 72-78

Date: 2009

Abstract: Waste management is a very big challenge in Nigeria today. With increased poultry farming and animal husbandry, a lot of droppings is generated which is presently constituting a nuisance in many neighbourhoods. One simple, effective and low cost method of management, which has not been optimally utilized, is the anaerobic digestion. The main objective of this project is to design and fabricate a simple, low cost household biogas plant, which can serve as waste management device and, also as a source of energy for cooking.

A 100 litre galvanized plate biodigester was designed, fabricated and used to obtain biogas from these waste. The digester was charged with cow dung slurry, which had the composition: potassium (1.47), phosphorus (4.60), Nitrogen (3.19) and Organic Carbon (68.6). To 300 litres of the feed (dung), an equal volume of water was added and made into 600 litres slurry.

An average of 0.3151m³ of methane gas was generated daily - a quantity of gas capable of sustaining cooking for 2.6403 hrs. On the 44th day from the day the first charging began, the process attained stable steady-state with 15 litres of slurry fed into the digester daily and an equal volume of spent sludge discharged. On the average, the gas generated was enough to provide an average of 1hr, 36mins cooking daily.