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An assessment of biogas production from food wastes

ABSTRACT

Electricity usage and demand has risen tremendously over the years and so has its price. This has resulted in the need for less expensive, viable and ecologically acceptable means of producing energy for electricity. Currently, the primary source of electricity and power in South Africa is sourced from fossil fuels which has impacts on global warming. Bongumusa Secondary School in Mpumalanga province uses about 500kg of firewood weekly for preparing the school nutrition and this contributes to global warming; so is the dumping of these wastes in the landfills. This study is aimed at designing and constructing two low-cost pilot biogas digesters and assess their performances when fed with food wastes obtained from the school nutrition programme. The main objective of the study is to measure biogas produced from the two 0.21m^3 volume biogas digester setups which were designed from a polyethylene plastic drum. One digester setup was placed on surface and temperatures recorded were fluctuating; the other plant was buried underground and the fluctuations were kept minimal hence produced the most biogas. The composition of methane and carbon-dioxide were 4.0796m^3 ; 62% and 2.5004m^3 ; 38% respectively for maximum biogas of 6.58m^3 produced and was obtained between day 15 and 16 of the retention period at a pH of 6.9 and temperature of 35°C . 11.2112 total solids/day per 0.21m^3 and 53.3867 volatile solids per 0.21m^3 .

Keywords: Biogas Digester, Biogas, Methane yield, temperature,

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