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BIOGAS PRODUCTION POTENTIAL OF DIFFERENT SUBSTRATE IN ALONE AND IN VARIOUS COMBINATIONS

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Abstract

Biogas is produced from organic wastes or all types of biological degradable waste by concerned action of various groups of anaerobic bacteria through anaerobic decomposition. Food waste is the best alternative for biogas production in a community level biogas plant.

In the present investigation, an attempt was made to study and compare the rate of biogas production in plastic – portable biogas digester. Different substrates such as cow dung, food waste and Jatropa deoiled cake in alone and various combinations were tried for the production of biogas. About 5 kg of food waste were collected from the canteen/hostel of PRIST University campus, Vallam, Thanjavur.. It was pulverised in a pulveriser and fed into the digester tank along with the cow dung slurry in various concentration and ratios. Likewise Jatropa deoiled cake was powered and fed into digester tank alone and in combination with food waste and cow dung. The experiments were carried out for 25 days and the rate of gas production was measured by water displacement method. The pH value of the cow dung, food waste and Jatropa deoiled cake was nearer to neutral and gradually increased to acidic and again it got stabilised to the neutral pH which favoured the production of biogas. The percentage of total solids were 9.79, 8.78 and 9.42 for cow dung, Jatropa deoiled cake and food waste respectively. The percentage of volatile solids was 93.4, 88.9 and 96.9 for cow dung, Jatropa deoiled cake and food waste respectively. Observations on daily basis were made on the constituent of biogas, pH, volume and rate of biogas production. Among the 12 different combinations used in the study, maximum production of biogas was achieved in the cow dung and food waste (526 ml) and lowest rate of gas production was achieved in 33.33 % combination of cow dung, Jatropa and food waste.

Keywords: Digester; Slurry; Kitchen Waste; Batch System; Organic Manure