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**Co-digestion of rice straw-vegetable waste for biogas production under different total solids levels**

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Biogas technology can play a vital role in solving energy problem. New researches on biogas technology are required for the better adoption of this technology with the use of abundant waste materials. The objective of the study was to evaluate the biogas production potential of a mixture of market waste and rice straw (1:3) at different total solid levels (TS) (20~40%). Market waste and rice straw were dried and ground to less than 1 mm particle size. Market waste and rice straw were mixed in a 1:3 ratio. (total solid of mixed wastes were adjusted to 20%, 30% and 40%). Twenty litre plastic cans were used as batch reactors. After filling the reactors with the required mixed wastes (TS 20~40%), the inoculums were also added, sealed and allowed for anaerobic digestion under room environmental conditions. Daily biogas production and pH were monitored during the study period. Temperature and pressure were also recorded. The total solid (TS), total volatile solids (TVS) and ash content were determined in leachate once in two weeks. No gas production was observed during the first few days (1-7). After 7 days, gas production gradually increased and maximum gas production was observed after 8 weeks. Gas production decreased gradually thereafter. The maximum gas production was noted in treatment 1 (TS level 20%). Total gas production of digester among three different TS levels 20, 30 and 40%, were ~180, ~86 and ~81 L/kg of dry matter, respectively. The highest methane content was determined in the treatment having a TS level of 20%. The TS gradually decreased during the digestion period. Similarly TVS also gradually increased up to 55 days and then gradually decreased. Based on the results, it can be concluded that the volume of biogas production and its methane content were influenced by the different total solid levels.

Keywords: Market waste, rice straw, biogas, anaerobic digestion