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Abstract

Biogas Production from Mixtures of Manure and Other Residues in Batch Reactors

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Abstract: In this research biogas production of anaerobic digesters was evaluated at laboratory scale (1 L), batch reactors were operated with mixtures of livestock manure and diverse residues; where rumen was included. Mixtures of residues were adjusted to a 20% of total solids content with an 80:20 ratio ; manure-milk fat, manure-oat straw, manure-oat residue, food residues-manure and rumen-oat residue. The volume of gas was measured by the displacement method and the biogas composition was determined with a portable biogas analyzer. The processes lasted 70 days and were conducted by triplicate. The differences among mixtures in production and quality of the biogas were determined by an ANOVA and Neuman-Keuls means test with $\alpha = 0.05$. Biogas production in reactors with manure (1.3 to 2.4 L) did not show any statistical significant differences during the observation period, as well as in methane production (0.85 to 1.3 L). However, the rumen mixture had the highest methane content (1.7 L), whereas the mixture of food residues and manure produced only 0.074 L of biogas. It is suggested to reduce by half the solids content and include rumen as inoculum to increase quantity and speed of biogas production.

Keywords: *livestock manure, food residue, milk fat, agricultural residue, rumen*

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