Co-digestion of Dairy Manure and Poultry Litter to Increase Methane Production

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Introduction

Laguna region in Mexico is the biggest producer of dairy milk at national level and occupies second place in the production of broilers/layers. Both industries produce large quantities of animal waste. Thus waste can be utilized sustainably by employing anaerobic digestion—a technology that combines energy production with pollution control.

Results

Forty four batch reactors were tested for a period of 51 days for biogas production and methane concentration. Among the different treatments, viz; A, B and C, 20% DM + 80% PL, 40% DM + 60% PL and 40% DM + 60% PL respectively recorded the best results.

Materials and Methods

Three different treatments with eleven reactors per treatment were employed. The treatments were (A) without inoculum, (B) adapted inoculum and (C) rumen inoculum. The substrates were Dairy manure (DM) and poultry litter (PL) in different proportions: 100% DM, 90% DM+10% PL, 80% DM+20% PL, 70% DM+30% PL, 60% DM+40% PL, 50% DM+50% PL, 40% DM+60% PL, 30% DM+70% PL, 20% DM+80% PL, 10% DM+90% PL and 100% PL. The volume of total biogas produced was measured by water displacement method and the methane concentration was measured using saccharometer. The degradation of substrate was determined in terms of total solids, total volatile solids, and total organic carbon by wet oxidation method (Walkley and Black, 1932).

Conclusion

The treatment inoculated with rumen fluid as inoculum (C) recorded the best performance followed by the adapted inoculum (B). Co-digestion of dairy manure and poultry litter produces more methane than 100% dairy manure or poultry litter and can be a good strategy for the better utilization of the livestock industry wastes.

References


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For further information

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