

F. Muñoz, Instituto de Ingeniería, UNAM, "Experiencias en la digestión anaeróbica de estiércoles".

The principal objective was to obtain and use biogas as a fuel in rural houses. Some aspects related were researched: biogas purification; identification of methanogenic bacteria; elimination of pathogens during digestion process; and use of the digested manure as a fertilizer.

RESULTS

1.- Only hindu and chinese and horizontal displacement digesters were researched. Hindu and horizontal displacement digesters were fed with cow manure, and the chinese with pig manure. We built nineteen hindu digesters: seventeen of 3 m³ capacity and two of 15 m³ capacity. The only horizontal displacement digester was 40 m³ capacity and the only chinese one was 1.5 m³ capacity.

2.- Hot water (60 °C), from solar collectors and biogas burners, was used for mixing with raw manure.

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3.- The methods of biogas purification were: gravity for humidity; reaction with iron for H₂S and reaction with lime for CO₂. The efficiencies of the last methods were 68% and 65 %, respectively.

4.- The digestion average operational conditions were: 31 °C; 0.8 m³ of biogas/ m³ of digester volume; ph of 7.6, 8 % of total solids, retention time of 19 days, the concentrations in the biogas were 58 % CH₄ and 41 % CO₂.

5.- Pathogenics were removed with 95 % efficiency during digestion process.

6.- The dry digester effluent was 15 % more efficient than conventional fertilizer (experiment with corn plant).

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- 7.- We evaluated that the cost of electricity generated using biogas was 265 \$ /kwh (installed) higher than conventional plants (137 \$/kwh for gas and 58 \$/kwh for oil). We estimated biogas produced by pig manure digestion in hindu digesters.

- 8.- The 3 m³ anaerobic digesters using cow manure were installed in rural communities of Oaxaca, Tlaxcala and Morelos states. One 40 m³ capacity horizontal displacement digester was installed in Morelos. Only rural communities of Oaxaca used the digesters premanently; the others used them only during 2 or 3 years.