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# **METHODS FOR INCREASING THE BIOGAS POTENTIAL FROM RECALCITRANT ORGANIC MATTER CONTAINED IN MANURE – A Review**

Surabhi Suresh and S.MuraliTharan

Department of Biotechnology, Kumaraguru College of Technology, Coimbatore - 641 049

Affiliated to Anna University

[subhisuresh95@gmail.com](mailto:subhisuresh95@gmail.com) Ph.no: 9965597567

[muralitharan2396@gmail.com](mailto:muralitharan2396@gmail.com) Ph.no: 8523934024

## **Abstract:**

Around 50% of the total solids in manure and other wastes consist of Biofibres. Biofibre is a lignocellulosic matter, largely composed of carbohydrates and holocellulose (cellulose and hemicelluloses), supported by lignin. Holocellulose is easily degradable whereas the lignin part is almost recalcitrant to degradation because of the tight association of lignin to hemicelluloses and the crystalline structural arrangement of cellulose. To improve its biodegradability and thereby increase the biogas potential of manure, several treatment methods have been investigated. The physical treatments such as mechanical maceration and decompression explosions were implemented. The chemical treatments include the usage of NaOH or NH<sub>4</sub>OH or combination of bases. The biological treatment is done by the hemicellulose degrading bacteria B4. These methods were evaluated through anaerobic batch and continuous stirred tank reactor experiments and further the methane and volatile fatty acids produced were measured by Gas Chromatography. Both the results were almost in agreement with each other. The physical treatment showed a 17% increase of biogas potential, chemical treatment resulted in 20% increase and the biological treatment resulted in significance increase of 30% in biogas potential of manures. Thereby, to keep biogas plants economically viable, it is necessary to maintain high biogas potential substrates in manure.

**Keywords:** Bio fibres; lignin; maceration; bacterium B4; biogas.

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