

ABSTRACT

ENGINEERING AND COST ANALYSIS BALLOON TYPE BIOGAS DIGESTION SCALE FOR HOUSEHOLDS

By

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This study aims to determine the working principle of balloon type biogas digestion and find out the production cost of biogas energy. Furthermore, this study is also to determine whether the biogas production reliable or not in terms of energy produced and cost.

The research was conducted in Umbul Tebu village, Gisting district of Tanggamus, and at the Laboratory of Water and Land Resources Engineering (TSDAL) Agricultural Engineering Department, College of Agriculture University of Lampung in August to November 2010.

Parameters observed in this study included measurement of the performace of the digester, biogas volume, the productivity of biogas, biogas composition, biogas energy value, and cost analysis..

Based on the research by using the digester volume of 3.45 m³ and cow manure which contained 8% of total solids (TS) for stuffing material, the digester could produce biogas of 0.49 m³ a day. The working temperature in the slurry was

between 32° - 47°C and the pH was alkaline. It was found the biogas contained 66,67% CH₄.

The biogas production efficiency was suboptimal ranging 30–60 %, as compared to available literatures. The resulting energy value was 12 256 kJ and the cost was Rp 0,62 including maintenance with assumption of 6 year economic life. If the operational cost and repairs and maintenance cost were neglected, the production cost was Rp 0,13 per 1 kJ, cheaper than either kerosene and firewood price.

Based on these results it can be concluded that technically and economically ballon type biogas digestion was quite feasible to be developed for household usage among the community.

Key words: biogas, engineering analysis, cost analysis.