

Investigation on the Possibility of Harnessing Biogas from Spent Tea Leaf

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Made tea is generally used as raw material in instant tea manufacture. Spent tea the materials left after extraction of water soluble components from made tea is discarded as a waste material in instant tea manufacture. Discarding this solid waste is a costly and problematic operation. Spent tea is rich in nutrients but no effective method has yet been developed to utilize it. This study was conducted to investigate the potential of utilizing spent tea leaf in biogas production. An experiment was conducted using five different combinations (percent by mass) of spent tea leaf and cow dung as 100:0, 99:1, 80:20, 50:50 and 0:100, by using laboratory scale biogas reactor set-ups. Biogas production was measured daily by means of water displacement technique. Biogas generated (mL kg^{-1} of dry matter) by the above treatments were 1101.8, 988.33, 2126.17, 2069.33 and 0 respectively. Volume of biogas generated by the mixture of 80% of spent tea leaf and 20% of cow dung ($2126.17 \text{ mL kg}^{-1}$ of dry matter) was significantly ($P < 0.05$) higher than that of other mixtures. Spent tea leaf can be used effectively in biogas production. Further research is suggested to optimize the process and to evaluate its feasibility.

Keywords: Spent tea leaf, Biogas, Cow dung, Instant tea