

CONVERSION OF RAW CASSAVA ROOTS TO BIOGAS

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ABSTRACT Cassava roots, the starch-rich tubers, are one of the cheap and abundant agriculture products in Thailand. The potential conversion of raw cassava roots to biogas, an alternative source of energy, using the single-state digesters was investigated. Dry cassava roots, which contained 18.65% of moisture content and 81.35% of total solids (TS), were used for preparing raw cassava slurry. The total solids 1% (w/v) and the addition of urea (0.4 g/L) were found to be suitable for the bioconversion performed at ambient temperature (29-31°C). When five liters of the raw cassava slurry were fed into the digester, the gas yield of 1.95 L/day containing the maximum methane content of 67.92% was achieved at 10-day retention time. When the fermentation volumes were scaled up to 20 L and 50 L respectively, the gas yields of 5.50 and 24.40 L/day containing 55.70 and 68.65% methane were obtained at 10-day retention time. Whereas the methane contents of 67.57 and 69.79% and the gas yields of 3.88 and 9.95 L/day were achieved at 14-day retention time. These results reveal that biogas containing 67-69% of methane could be potentially produced from raw cassava roots using the simple single-state digesters.