

**COMPARATIVE POULTRY BIOGAS PRODUCTION FROM  
PLASTIC DRUM BIOGAS DIGESTER DURING  
NIGHT AND DAYTIME COLLECTION**

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# COMPARATIVE POULTRY BIOGAS PRODUCTION FROM PLASTIC DRUM BIOGAS DIGESTER DURING NIGHT AND DAYTIME COLLECTION<sup>1</sup>

CHATERINE B. SANTOS

## ABSTRACT

**Background:** Plastic drum biogas digester is now a fast becoming popular alternative source of non-fossil fuel based renewable energy. Aside from being a low cost and practical method for methane capture, for an 8, 200 ℓ plastic drum, it can be assembled and installed in 6 hours and biogas production can resume 9 hours after installation from an open pit and odourless and flies free slurry/septic tank. The study aimed to compare biogas production during night and day collection. **Methods** The PDBD with open bottom and gas fitting above a closed lid was immersed in front of an effluent drainage leading to a poultry slurry lagoon with a volume of 350.75 m<sup>3</sup>. Biogas related parameters namely: full capacity drum duration, volume of biogas capture, flow rate, depletion time and economic efficiency were gathered. **Results:** The volume of biogas produced after 96 hours (4 days) was 2,580.64 ℓ or 1316.65 kg which when allowed to uninterruptedly deplete through a single burner stove lasted for 4 hours and was equivalent to a flow rate of 10.98 ℓ/minute. **Conclusions:** Total cost of PDBD is PhP15,086.5 .The savings derived in the use of biogas instead of LPG was Php27.42/ ℓ; ROI of 468.72%, Payback Period of 0.21 yr, and Marginal Benefit Cost Ratio of 0.50 indicating that investing in an innovative PDB was financially viable. Finally for a 4-day trial collection , a total methane capture of 789.98 kg was quantified from broiler slurry lagoon. Moreover the total emission factor for CH<sub>4</sub> in the study for 248, 000 broiler population is 4,960 kg based on IPCC Guidelines, 2006.

**Keywords:** Biogas, plastic drum, flow-rate, methane

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