

## AN INVESTIGATION INTO THE ENERGY POTENTIAL OF ABATTOIR WASTE AND PALM OIL MILL EFFLUENT

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### ABSTRACT

This research work investigated the energy potential from the co-digestion of abattoir waste (AW) and palm oil mill effluent (POME). Three anaerobic digesters were employed for this research work. Substrates were collected from various abattoir (Slaughterhouses) around Akure metropolis and a palm oil mill at Ibule near Akure. The substrates were mixed together and characterized before being fed into the digesters in the following proportion; digester A (67% AW + 33% POME), digester B (33% AW + 67% POME) and digester C (50% AW + 50% POME). The digester was equipped with a thermometer for daily temperature monitoring while the pH of the substrates was monitored weekly. The average minimum and maximum temperature for the digesters were recorded to be 26.3°C and 31.5°C which indicates that the biogas were produced in the mesophilic range. The pH values were also recorded to be between 6.8 - 7.4, 6.4 - 7.6, and 6.6 - 7.3 for digesters A, B and C respectively. The volume of biogas produced by 1 kg of each substrate were calculated to be 0.0325 m<sup>3</sup>/kg, 0.0311m<sup>3</sup>/kg and 0.022m<sup>3</sup>/kg for digesters A, B and C respectively. Hence, co-digestion of abattoir effluent and palm oil mill effluent has a high potential to be used as a renewable source of energy.

**Keywords:** Abattoir effluent, palm oil mill effluent, bio-gas, bio-reactor, characterization.