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Design and Fabrication of Biogas Brooder System Utilizing Chicken Waste for Sustainable Poultry Farming

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Abstract: *Sustainable agricultural practices are essential for addressing environmental degradation, resource depletion and energy inefficiency in traditional farming methods. One promising solution is integrating biogas technology with poultry farming, particularly in Nigeria, where poultry farming plays a crucial role in livelihoods and economic growth. This approach uses renewable energy sources, such as chicken manure, to generate biogas for heating poultry brooders, offering a sustainable alternative to fossil fuels. The goal of this project is to design and develop an efficient, eco-friendly portable biogas brooder system specifically for poultry farms. The system includes a digester tank to produce biogas from chicken manure, PVC pipes for transporting slurry, a stirrer for mixing and a drainer valve to manage excess liquid. Biogas is transported through a gas pipe to abiogas container for storage, which is then used in a burner to generate heat. The design incorporates seals and gaskets to prevent leaks and utilizes cost-effective materials for construction. The system is estimated to produce enough energy to power the burner for 2 hours daily, demonstrating its potential to improve operational efficiency, reduce costs and promote sustainable practices in poultry farming.*

Keywords: Biogas production, Sustainable agriculture, Poultry farming, Renewable energy, Chicken manure

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