

Energy valuation of animal excrement in the production of biogas: Study of the biomethanation of rabbit droppings in the laboratory and on the experimental device in Senegal

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Domestic biogas is increasingly seen as an alternative solution to the difficulty of access to energy in rural areas in Africa. However, its development will necessarily pass through the use of accessible substrates and high methanogenic power. The objective of this study is to produce biogas based on rabbit droppings from a pilot biodigester. The methodology adopted is essentially based on the determination of the methanogenic potential of rabbit droppings, droppings co-digested with sludge and market waste and the methane yield. The evaluation of the production of the different mixtures in the laboratory shows that it is the combination of droppings and market waste which gives the best methane yield with 85.8%, followed by combinations of droppings and sludge, droppings and sewage sludge which respectively produce 66.5% and 66.2% of methane. Finally, the droppings alone recorded a 50% yield of methane. Open experimentation (pilot) of rabbit droppings confirms the results obtained in a controlled environment (laboratory). Fermentation of the rabbit droppings from the mobile biodigester gave a methane yield of 144.75cm³/g or about 60% of the total biogas production. The biofertilizers obtained from the anaerobic digestion of droppings can be valued as a fertilizer in agriculture and as a nutrient in fish farming. Thereby, the valorization of rabbit droppings in the production of biogas can open interesting perspectives in energy production and in the fight against climate change (greenhouse gas).

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