

***THE INFLUENCE OF VARIATION IN MOLASSES
ADHESIVE COMPOSITION ON CORN COB AND GOAT
MANURE BRIQUETTES AS AN ALTERNATIVE FUEL***

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ABSTRACT

This study aims to analyze the effect of variations in molasses adhesive composition on the physical characteristics and combustion performance of bio-briquettes made from a mixture of goat manure and corn cobs. An experimental method using a Completely Randomized Design (CRD) was employed. The raw materials were carbonized through pyrolysis (300-350 °C), ground, and sieved (80 mesh). The charcoal mixture used a fixed ratio of 3:1 (corn cobs : goat manure). The tested variations of molasses adhesive were 30%, 35%, and 40% of the total briquette mass of 20 grams. The briquettes were hydraulically molded and dried in an oven at 105 °C for 6 hours. The results showed that increasing the molasses percentage (from 30% to 40%) increased the density (0.864-0.926 g/cm³), bulk density (0,035-0,041 g/m³), moisture content (4.82%-5.39%), ash content (7.28%-7.93%), and volatile matter (7.21%-9.50%). Conversely, the calorific value, burning rate, and fixed carbon decreased. Nevertheless, all samples still met the SNI 01-6235-2000 quality standards. The optimum formulation was obtained at the 30% molasses adhesive variation. This composition produced the highest calorific value of 5,217.18 cal/g (SNI standard ≥ 5000 cal/g), moisture content of 4.82% (SNI standard $\leq 8\%$), ash content of 7.28% (SNI standard $\leq 8\%$), volatile matter of 7.21% (SNI standard $\leq 15\%$), fixed carbon of 80.69%, and a burning rate of 0.0071 g/s. A lower adhesive content preserved the dominance of biomass carbon, thereby generating higher and more efficient heat energy.

Keywords: *Bio-briquette, Corn Cobs, Goat Manure, Molasses Adhesive, Briquette Characteristics.*