

***EFFICIENCY ANALYSIS OF USED OIL COMBUSTION AS AN  
ALTERNATIVE FUEL IN A GALAM LEAF DISTILLATION SYSTEM***

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***ABSTRACT***

*This study aims to analyze the efficiency of the combustion process of used oil as an alternative fuel in a three-burner stove for a distillation of galam leaves. Utilization of used oil is expected to be an economical energy solution while reducing environmental pollution due to oil waste. The research method was carried out with variations in valve openings of 30°, 35°, and 40°, where each variation was measured for fuel consumption, combustion temperature, and thermal efficiency. The results showed that the valve opening setting had a significant effect on combustion efficiency. The lowest efficiency occurred at a valve opening of 30° due to limited fuel and air supply. Efficiency increased at an opening of 35° due to more optimal mixing of air and fuel, resulting in more complete combustion. An opening of 40° provided the highest efficiency in all stoves (around 32–33%), but caused the problem of used oil overflow due to the fuel flow rate exceeding the combustion capacity. The conclusion of this study is that used cooking oil can be effectively utilized as an alternative fuel in the distillation process of galam leaves, with a valve opening of 35° recommended as the optimal setting to achieve high efficiency while maintaining operational stability and safety.*

***Keywords :*** *Combustion efficiency, used cooking oil stove, valve opening, temperature, fuel consumption, distillation.*