

ABSTRAK

Krisis energi dan ketergantungan terhadap bahan bakar fosil mendorong pengembangan energi mutakhir, salah satunya bioetanol dari bahan baku lokal seperti singkong. Penelitian ini bertujuan mengkaji pengaruh variasi berat ragi dan waktu fermentasi terhadap yield, kadar, dan nilai kalor bioetanol dari singkong. Metode yang digunakan adalah eksperimen dengan fermentasi memanfaatkan *Saccharomyces cerevisiae* pada konsentrasi ragi 5%, 10%, dan 15% selama 72, 96, dan 120 jam, dilanjutkan dengan distilasi untuk memperoleh bioetanol murni. Pengujian dilakukan untuk mengukur yield bioetanol, kadar bioetanol, dan nilai kalor. Hasil penelitian menunjukkan bahwa kombinasi berat ragi 10% dan waktu fermentasi 120 jam menghasilkan yield tertinggi sebesar 150%, kadar bioetanol tertinggi sebesar 79% diperoleh pada fermentasi 72 jam, dan nilai kalor tertinggi sebesar 119,30 Cal/gram tercapai pada fermentasi 96 jam. Temuan ini menunjukkan bahwa singkong memiliki potensi sebagai bahan baku bioetanol yang efisien dan mendukung pengembangan energi alternatif berkelanjutan.

Kata kunci: Bioetanol, Distilasi, Fermentasi, Ragi, Singkong.

ABSTRACT

*The global energy crisis and dependence on fossil fuels have driven the development of renewable energy sources, one of which is bioethanol derived from local materials such as cassava. This study aims to examine the effect of yeast weight variation and fermentation time on the yield, concentration, and calorific value of bioethanol from cassava. The experimental method involved fermentation using *Saccharomyces cerevisiae* at yeast concentrations of 5%, 10%, and 15% for 72, 96, and 120 hours, followed by distillation to obtain purified bioethanol. Tests were conducted to measure bioethanol yield, concentration, and calorific value. The results showed that the combination of 10% yeast and 120 hours of fermentation produced the highest yield of 150%, while the highest bioethanol concentration of 79% was obtained at 72 hours of fermentation with 10% yeast. The highest calorific value, 119.30 Cal/gram, was recorded at 96 hours of fermentation with 10% yeast. These findings demonstrate that cassava has strong potential as an efficient and sustainable bioethanol feedstock.*

Keywords: Bioethanol, Cassava, Distillation, Fermentation, Yeast.