

**Analisis Komparatif Pemanfaatan Kultur Fermentasi
Saccharomyces cerevisiae Strain Baker's Yeast dan Brewer's Yeast
Dalam Produksi Bioetanol**

*(Comparative Analysis of the Utilization of Saccharomyces cerevisiae
Fermentation Culture Strains of Baker's Yeast and Brewer's Yeast in
Bioethanol Production)*

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ABSTRACT

Saccharomyces cerevisiae is the main microorganism used in bioethanol production, with two widely employed commercial strains—brewer's yeast Lalvin EC-1118) and baker's yeast Fermipan that exhibit distinct physiological characteristics. This study aimed to conduct a comparative analysis of these strains in batch fermentation of molasses at room temperature and pH 5 over 96 hours. Brewer's yeast Lalvin EC-1118 was applied at concentrations of 0,02% (w/v), 0,04% (w/v), and 0,06% (w/v), while baker's yeast Fermipan was used at 1% (w/v), 2% (w/v), and 3% (w/v). Sugar concentration (°Brix) and pH were measured every 6 hours to calculate the fermentation rate, and both sugar conversion efficiency and ethanol yield were determined based on the actual ethanol mass and ethanol volume relative to the initial molasses volume. Results indicated that baker's yeast Fermipan achieved a higher initial fermentation rate, peaking at 0,8333 °Brix/h at 3% (w/v) concentration, whereas brewer's yeast Lalvin EC-1118 outperformed in sugar conversion efficiency and ethanol yield, achieving maximum values of 53,13% and 34,41% at 0.06% (w/v) concentration, respectively, compared to 36,90% and 1,83% for the 3% (w/v) Fermipan treatment. These findings suggest that Lalvin EC-1118 is more suitable for optimizing industrial-scale molasses-based bioethanol production.

Keywords: bioethanol; *Saccharomyces cerevisiae*; brewer's yeast; baker's yeast; fermentation rate; sugar conversion efficiency; ethanol yield; molasses.