

TITLE: FERMENTATION PROFILE OF THE YEAST STRAIN CAT-1 IN FED-BATCH SYSTEM WITH USING VHG WORT

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ABSTRACT

Sugarcane derivatives compose a significant portion of the renewable energy matrix, especially with fuel ethanol. The Brazilian industrial process most used to obtain ethanol is the fed-batch, or Melle-Boinot, where the yeast cells are recovered by centrifugation and used for a new fermentative cycle. Alcoholic fermentations with high sugar concentration or very high gravity (VHG) are being studied to improve the process of converting biomass to fuel ethanol and reducing the cost of production. In this context the aimed of this work was to study the fermentation profile of the yeast strain CAT-1 in a simple discontinuous system (laboratory scale) and fed-batch system with cell recycle, using molasses wort and supplemented with 5 or 10 g/L of peptone or ammonium sulfate. In a simple discontinuous system, the fermentation of must without supplementation (control) or supplemented with peptone (5 g/L) showed higher ethanol production, yield and productivity compared to the others treatments. However, in the fed - batch system, there was no significant difference between the control and peptone treatments, and the wort supplemented with ammonium sulfate (10 g/L) presented fermentation parameters of ethanol production and productivity higher than the others. The increase in scale (1:20), from a discontinuous system to fed-batch system, caused many differences in the fermentative parameters, especially in terms of productivity. The yeast cells, submitted to increasing concentrations of sugar, as is the case of the fed-batch system, an adaptation occurs, providing better results, with a reduction in the fermentation time to 16h. In addition, the high concentration of ethanol in the fermentation medium causes a detrimental effect on the cells, since in the treatments with higher levels of ethanol; less viability and more residual sugar were observed.

KEYWORDS: Bioreactor; Peptone; Ammonium sulfate.

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