

TITLE: EFFECT OF SIMPLE FEEDING IN HIGH-ALCOHOL FERMENTATION FROM MIXED MUST

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ABSTRACT:

Concerns about the environmental impacts caused by the use of fossil fuels fueled the energy demand for alternative energy sources and fuels derived from renewable sources. In this scenario, bioethanol, the main product of the Brazilian sugar-energy sector, stands out. The aim is to optimize and develop new and existing technologies, resulting in increased yields, reducing losses without raising production costs. Sugarcane is the main raw material for the production of bioethanol in Brazil, and this fermentation is characterized as low gravity (musts containing less than 180g L⁻¹ of total reducing sugars - T.R.S.). But corn has been gaining prominence, and this fermentation is characterized as high gravity (musts containing more than 200g L⁻¹ of T.R.S.), since in the off-season of sugarcane mills, corn ethanol gains great importance in maintaining the supply of biofuel in the market. The objective of this work was to analyze the yield and productivity of mixed must fermentations (sugar cane syrup and corn hydrolyzate). To this end, fermentation was carried out with must obtained from corn hydrolyzate, where in the hydrolysis process the water was replaced by sugarcane juice must and subsequently sterilized in flowing steam. The bioreactors used for the fermentations were 250 mL Erlenmeyers containing 100 mL of musts previously prepared and inoculated with the addition of 3% of Thermosacc[®] yeast. Fermentations were carried out in a shaker model Minitron, brand Infors HT[®], under agitation of 150 rpm and 30°C ± 1°C. The fermentation started with must containing 115.80 g L⁻¹ of T.R.S. for 4 hours, then the simple feeding of 50 mL of must containing 120.69 g L⁻¹ of T.R.S. together with 1% urea was carried out, the fermentation lasted 43 h. The follow-up of the fermentation was due to the release of CO₂. The results were submitted to Tukey's test (p<0.05), it was possible to observe that during fermentation cell viability decreased from 70.8% (A) to 59.81% (B), a possible explanation is that despite yeast generate ethanol, from a certain concentration it becomes toxic for it, causing a decrease in cell viability. The residual sugar content was only 1.43 g L⁻¹. In relation to the alcohol content, it produced around 84.81 g L⁻¹. It is concluded that a fractionated diet can increase ethanol production.

Keywords: single fed batch, mixed must (corn/sugar cane).

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