

ABSTRACT

(For 45th convention of PSST in Lahore)

“Effectiveness of enzymes in achieving higher alcohol yields in fermentation and increasing total reducing sugars during molasses storage”

In molasses fermentation, *Saccharomyces cerevisiae* utilizes fermentable sugars present in molasses to produce ethanol and carbon dioxide under anaerobic conditions. Apart from reducing sugars, molasses contains plant components, non starchy polysaccharides and certain sugars that cannot be fermented to alcohol by yeast and hence remain unused. In this study, it has been shown that by the application of certain carbohydrase enzymes the unfermentable sugars are converted to fermentable form and the alcohol % in final fermented wash can be increased by 0.3% - 0.5%. The study has been conducted on molasses samples from India with Total Reducing Sugars content (TRS) between 38-55% and Un-fermentable sugars content (UFS) between 4-5%. It has also been found that the application of these specific enzymes along with bio-nutrients reduces the fermentation time by 2 hours. The UFS content of molasses had considerably reduced by 1% after fermentation. One more study was done on stored molasses. During molasses storage, the carbohydrates deteriorate due to various factors -poor storage conditions; environmental factors such as temperature, humidity; inhibitory chemicals in molasses carried from sugar processing; bacteria utilizing carbohydrates for growth. In this study it has been demonstrated that certain enzymes increase the Total Reducing Sugars and the increase can be upto 2-3% over a storage period of 30-40 days of use. Over a 50 day study conducted on different molasses samples from all over India, 2- 3.2% increase in TRS, over and above blank kept at similar conditions, has been noted.