Fed-Batch Fermentations Using a Pulse-Feeding Strategy and Revitalized Cells of *S. cerevisiae* as Inoculum Between Fermentation Cycles.

Morais, M.R., Oliveira, K.F., Souza, C.S., Marchetto R. and Laluce C.
UNESP- Depto de Bioquímica e Tecnologia Química - Instituto de Química - Araraquara, S. Paulo - Brazil.

SUMMARY
Fermentation conditions play essential roles in physiology, genetic and aging of the cells over the long periods of industrial ethanol production. The effects of sucrose concentration, temperature and establishment of conditions for cell renewal between fermentation cycles were determined in a chemically defined medium (Thomas et al, *J. Ind, Microbiol*, 21: 247, 1998). The pH was re-adjusted to 4.5 after the addition of each pulse of sucrose to avoid cell death. The inoculum revitalization in the medium containing sucrose and yeast extract led to biomass gains without drops in viability. The toxic effects of ethanol formed in the successions of fermentation cycles were lower at sucrose concentrations ranging from 150g/L to 180 g/l in the final medium. Final ethanol levels of 8-10% (v/v) were obtained at the end of 10-cycles of fermentations at 34°C and 37°C using both the laboratory strain IQAR/45-1 and the industrial strain BG1 of *S. cerevisiae.* However, the total cellular protein was higher after 10 fermentation cycles at 34°C using the yeast strain IQAr/45-1. The present data proved that it is possible to carry out repeated batch fermentations in synthetic medium, particularly when the fermentation cycles are interrupted by periods of incubation to regenerate the inoculum. Young cells, resulting from cell budding in the revitalization medium are a guarantee for the re- start of a next fermentation cycle with renewed cells.

Key words: *Saccharomyces cerevisise*, ethanol, temperature, sugar concentration, inoculum revitalization.

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