

BIOPROCESSING OF LACTIC ACID BY FERMENTATION TECHNIQUE

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Chapter 7

Effect of Different Process Conditions on Lactic Acid Production by *Lactobacillus rhamnosus*

Maizirwan Mel, Mohamed Ismail Abdul Karim, Parveen Jamal, Mohammad Ramlan Mohammad Salleh, Ruzi Aini Zakaria

Abstract

This chapter discussed about the optimization of the lactic acid production by *Lactobacillus rhamnosus* (*L. rhamnosus*) in laboratory scale fermenter or bioreactor by varying the most influence operating parameters of the fermentation process such as the agitation speed of impeller, dissolve oxygen level (pO_2) and sample pH. The experiment was designed by Taguchi Method using STATISTICA software to improve the process quality and to increase the lactic acid production. Comparing among the four Runs, it was found out that the optimum conditions for lactic acid production were at lower agitation rate (cascade control, 1-500 rpm), lower pO_2 level (10%), and lower pH value (pH 6) where 14.55 g/L lactic acid was produced. The optimum growth rate and productivity have been obtained at 0.5 h^{-1} and 0.1282 g/g.h. , respectively.

Keyword(s): *Lactobacillus rhamnosus*, lactic acid, growth kinetic, optimization, fermentation.