

Strategies in fed-batch cultivation on the production performance of *Lactobacillus salivarius* I 24 viable cells

ABSTRACT

The potential use of fed-batch cultivation (FBC) for improvement of the production of *Lactobacillus salivarius* I 24 biomass for subsequent use as probiotics was studied using a 2-L stirred-tank bioreactor. Three different constant feeding rates (0.1, 0.05, and 0.033 L/h) were applied in FBCs and their effect on carbon metabolism was evaluated. The carbon flux for cell built-up with reduction in lactic acid synthesis was observed in the fed-batch as compared to the batch cultivation mode. The viable cell number obtained in the constant FBC (CFBC) operated at a feeding rate of 0.05 L/h was 8 times higher (10.7×10^{10} CFU/mL) than that recorded in the batch cultivation. This gave the viable cell yield based on glucose consumed for CFBC of 26 times higher (11.3×10^{12} CFU/g_{Glucose}) than the batch cultivation. This study demonstrated CFBC, which is simple with minimal use of process control equipment, has an industrial potential for improvement of probiotic production.

Keyword: Fed-batch cultivation; *Lactobacillus salivarius*; Lactic acid bacteria; Probiotics; Carbon metabolism