



E419

Screening and optimization of fermentation medium for β -galactosidase production from probiotic *Lactobacillus* strains

Kristijan Hristovski ; Barnabás Tóth ; Erika Bujna ; Quang D. Nguyen
Hungarian University of Agriculture and Life Sciences

β -galactosidase or commonly known as lactase is commercially very important enzyme which can be applied in different fields of industry, such as: production of hydrolyzed milk products, whey utilization and synthesis of galactooligosaccharides. The importance of using the probiotic strains as an enzyme producing sources has increased rapidly, mostly because they have the GRAS (generally recognized as safe) status. The aim of this study was to select the most promising probiotic *Lactobacillus* strains for β -galactosidase enzyme production. Furthermore, to determine the effect of different carbon sources supplemented in the MRS medium on the enzymatic activity. Firstly, 13 different *Lactobacillus* strains were screened for β -galactosidase activity and it was determined that these bacteria produce the enzyme intracellularly. Highest enzyme activity was obtained from the strains *L.crispatus* LCRO1 and *L. fermentum* LF08 at 16 hours. The effect of different carbon sources on enzyme activity was investigated with using *L. fermentum* LF08 at 16 and 24 hours of fermentation. It was determined that lactose and galactose supplemented in the medium have highest importance for production of the β -galactosidase during fermentation time of 16 hours. Different concentrations of lactose and galactose were tested ranging from 0.5 to 6 % and in the both cases, the concentration of 4.5 % of supplemented sugar showed highest enzyme activity. Besides galactose and glucose as sole carbon source, further combinations of carbohydrates, such as: glucose and galactose, galactose and lactose were investigated. Highest enzymatic activity was obtained when only galactose was used in the medium. These results reveal the importance of the type and concentration of the carbon source provided in fermentation medium on the level of produced β -galactosidase enzyme.