

Effect of time, moisture content, and substrate amount on sorbitol production using entrapment of *Lactobacillus plantarum* (BAA-793) in sodium alginate beads

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ABSTRACT

Agro-industrial wastes such as *Meranti* wood sawdust (MWS) have great potential as substrates for the production of sorbitol and other biochemical products. In this study, treated cellulose from MWS was used as a substrate to produce sorbitol via solid state fermentation (SSF) process using immobilized cells of *Lactobacillus plantarum* strain (BAA-793), entrapped in sodium alginate. The effect of fermentation time, moisture content, and substrate amount on sorbitol concentration were studied at the following ranges (fermentation time: 2–8 h, moisture content: 40–80%, and substrate amount: 0.5–2.5 g). The results show that the fermentation time of 4 h, substrate amount of 2 g and moisture content of 50% yielded 8.396 g/L of sorbitol. With a moisture content of 50%, substrate amount of 2 g, and fermentation time of 6 h yielded 4.726 g/L of sorbitol. The highest concentration of sorbitol (13.607 g/L) was obtained at the optimized condition of fermentation time 4 h, moisture content 50%, and substrate amount 1.0 g. These results indicate that the fermentation time, moisture content, and substrate amount are important factors to be considered in order to achieve high sorbitol yield.

Keywords: Cellulose; Sorbitol; Entrapment; Sodium alginate