

# 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