

## Production of Exopolysaccharides by Submerged Culture of *Agaricus blazei*

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An experimental study was carried out on the production of  $\beta$ -glucans, a group of immuno-stimulating exopolysaccharides, by *Agaricus blazei* in submerged cultures. Effects of dissolved oxygen concentration (DOC) on cell growth and exopolysaccharides production were investigated in a 7L bioreactor system. When DOC was controlled at 20 % by manipulation of agitation speed, cellular and exopolysaccharides productivities were observed to increase by 41 % and 100 %, respectively, as compared to the control (cultures with no DOC control). The cellular and exopolysaccharides productivities at 20 % of DOC were 0.13 g/L-h and 0.10 g/L-h, respectively. When DOC was controlled at 20 % by manipulating pure oxygen supply at a fixed agitation speed, cellular and exopolysaccharides productivities were observed to be 42 % and 70 % higher, respectively, than the control. These results imply that an increased shear stress caused by more rigorous agitation speed as in the first case without pure oxygen supply might have had a positive effect on exopolysaccharides production. In order to overcome cell growth retardation at the end of batch fermentation and maximize cell growth and exopolysaccharides production, two types of fed-batch operation modes, pH-stat and DO-stat cultures, were performed for various feeding medium compositions. Under the optimal conditions, 37.10 g/L of maximum cell mass and 10.90 g/L of maximum exopolysaccharides concentration were obtained. The cellular and exopolysaccharides productivities were 0.34 g/L-h and 0.10 g/L-h, respectively.