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SUKUNYA OAEW: PROCESS DEVELOPMENT FOR BIOMASS PRODUCTION OF *ENTEROCOCCUS FAECIUM* FOR PROBIOTICS USE.

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In order to develop high cell density cultivation of *Enterococcus faecium* for probiotics use, the growth inhibitory effect of lactic acid should be reduced. With the aim of controlling lactic acid formation, the effects of protein as a C-source and aeration conditions on cell growth and lactic acid production were investigated. It was found that protein supplementation as a C-source, coupled with aeration promoted good cell growth and efficiently reduced lactic acid production. Furthermore, it was observed that protein digestion improved the cell growth yield. For industrial scale cell production, medium containing digested fish solubles and whey was successfully developed to replace costly meat extract, tryptone and yeast extract that were present in the original MRS medium used. However, the utilization of protein as the sole C-source was less efficient than when it was combined with sugar supplementation. Although the cell growth yield could be improved by sugar utilization, lactic acid formation due to excess sugar supply had to be avoided. To achieve this, a fed-batch technique was applied to limit the protein and sugar supply and thus control lactic acid formation. The maximum cell density obtained in the fed-batch cultivation was 4.3×10^{10} cfu/ml, which was 7 times higher than that obtained by batch cultivation. However, a leveling off of cell viability was observed when the fed-batch culture reached a high cell concentration. The results also suggested that Browning reaction products formed during the sterilization of high protein media may have a major inhibitory effect on cell growth. In addition, cell viability was much improved in the presence of low quantities of Browning reaction products.