Medium and Process Optimization for Diphtheria Toxin Production

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Corynebacterium diphtheria PW 8 have been used for diphtheria toxin(DT) production using DTaP vaccination. The previous medium for DT production contains beef hydrolysate which may give bovine spongiform encephalopathy(BSE)[1]. Therefore, we investigated new medium complex for the high yield of DT which is one of the composition of DTaP vaccine. NZ case plus was selected as a main component of medium as a nitrogen source, a tryptic digest of casein[2]. It has been found that DT production was harmonized by suitable addition of maltose, sodium lactate, growth factor, L-cystine, ferrous sulphate, and inorganic phosphate solutions. Over the 100Lf/mL of DT were produced on specific concentration of each component in shaking flask. DT production of approximate 150Lf/mL in the 3L fermenter was obtained with a aeration of 0.167vvm, a agitation rate of 400rpm, and a temperature of 35℃. When the agitation of the fermenter was under or over the adequate rpm, the DT production was decreased.

References

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