ABSTRACT

Production of Alpha-Amylase from Bacillus subtilis

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A study was carried out on the production of the enzyme, alpha amylase, by fermentation on a laboratory scale, using a bacterial strain of Bacillus subtilis B20 strain. Fermentation was done in a standard lactose medium that incorporated soya meal, yeast extract, sodium caseinate and magnesium sulphate and adjusted to a pH of 7.0. Enzyme production was achieved at 37°C within a pH range of 7-8 in 48 hours with continuous agitation. The enzyme was partially purified by precipitation with dehydrated alcohol at 4°C.

The activity of the purified enzyme was determined by the rate of starch hydrolysis, as reflected in the rate of decrease in iodine-staining capacity, which was measured spectrophotometrically. Activities in the range of 700-1000 amylase units were obtained for this enzyme by the hydrolysis of the starches of corn, potato, tapioca and arrowroot. Higher sugar intermediates (limit

dextrins) and maltose were produced by hydrolysis at 60°C in 10 minutes.

Commercial production of this enzyme at a low cost is feasible because of the simple nature of the process. Its' use locally, is in the sugar industry, where it is utilised in the hydrolysis of the starches present in the sugar cane. Its' potential use in the Caribbean region, lies in the manufacture of liquid syrups from starches by the alpha-amylase/amyloglucosidase-based process. Starches from corn, arrowroot and cassava can be used commercially to produce liquid syrups, just as the manufacture of corn syrups from corn starch, has revolutionised the sweetener industry in other parts of the world.