

Production of Alpha Amylase from Bacillus subtilis: Effects of Enzyme Hydrolysis on Starches

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Abstract

The enzyme alpha (α) amylase was produced by laboratory fermentation of the bacterium *Bacillus subtilis* in a broth consisting of lactose (4.75% or 7.85%), soya meal, yeast extract, sodium caseinate and magnesium sulphate at pH 7.0 for 24hrs or 48 hrs. Enzyme production was most favoured with lactose (4.75%) at 37°C, pH 7.0 – 8.0 after 48hr fermentation. Partial purification of enzyme was by precipitation with dehydrated alcohol at 4°C. The activity of the enzyme on the rate of starch hydrolysis was indicated spectrophotometrically by the decrease in iodine-staining capacity. Bacterial enzymic activity ranged from approximately 344 amylase units in 24 hr fermentation (14.3 amylase units/hr) to 741-909 amylase units in 48 hr fermentation (15.4 – 18.9 amylase units/hr) on hydrolysis of corn, potato, tapioca and arrowroot starches. Higher sugar intermediates (limit dextrins) and maltose were revealed by liquid chromatography on starch hydrolysis at 60°C for 10 mins at pH 6.0.