URN etd-0407109-183724-2037
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Statistics This thesis had been viewed 42 times. Download 0 times.
Department
Year 2007
Semester 1
Degree Master
Type of Document Master's Thesis
Language zh-TW.Big5 Chinese
Title Study on Fermentation Condition for Producing Chromium Yeast
Date of Defense 0000-00-00
Page Count 74

Keyword
chromium yeast
GTF
active organic chromium
trivalent chromium

Abstract
The chromium yeast is referred to the yeast containing the active organic chromium with structure similar to Glucose Tolerance Factor (GTF).
The GTF structure is centered with a trivalent chromium, Cr(III), and could bound with some mineral substances, ammonium acids or vitamins. GTF has the capability to enhance the binding efficiency between the insulin and insulin receptor. Therefore, the yeasts with high chromium content has a beneficial potential on the treatment of type II diabetes mellitus. The yeast of Saccharomyces cerevisiae was used in this study.
In the medium selection studies, yeast cultured in MEB medium accumulated chromium more than those altered in the other media. Hence, the MEB medium was chosen as the basic medium for the medium optimization study. In the medium optimization experiments, parameters such as urea, K2HPO4, glucose, inoculation volume, and the dissolved oxygen were tested individually. The results showed that urea at 0.1g per L concentration, glucose at 50 g per L concentration and yeast inoculation volume in 30 ml per L can raise the chromium absorption by Saccharomyces cerevisiae. However, K2HPO4 would inhibit the chromium absorption by the yeast.
By optimizing the culture conditions, the results showed that 50 g / L glucose, 17 g/L malt extract, 3 g / L peptone, 0.1 g / L urea, and 50 ppm chromium(III) could lead to the maximum accumulation of chromium (8182.73 μg/g dry weight).
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Files No Any Full Text File.
Date of Submission 2008-08-08