Title : Evaluation of the Optimal Dosage of a New Glucoamylase Enzyme for the Saccharification Process.

Author(s) : **1.** Pakpoom Sornsati **Student ID :** 640510167

Major : Biochemistry and Biochemical Innovation

Advisor(s) : **1.** Associate Professor Dr. Hataichanoke Niamsup

2. Assistant Professor Dr. Jidapha Tinoi

Type of presentation* *(choose 1)* **:**

- ☐ **Oral Presentation** (เฉพาะ ตัวแทนนศ.ที่สาขาเลือกให้นำเสนอแบบบรรยาย)
- ☐ **Poster** (กรณี นำเสนอผลงานปัญหาพิเศษ/การค้นคว้าอิสระ)
- ☑ **Cooperative Education** (กรณี นำเสนอผลงานสหกิจศึกษา)

ABSTRACT

This study aims to determine the optimal concentration of a new glucoamylase enzyme for the saccharification process of starch, with the objective of producing glucose syrup that meets the quality standards established by the industry. The findings from this experiment will be used to assess the feasibility of replacing the currently used glucoamylase enzyme in the saccharification process with the new glucoamylase enzyme. Preliminary studies have demonstrated that, at the same concentration, the new glucoamylase enzyme produces a higher-quality sugar product compared with the enzyme currently utilized by the industry, therefore detailed experiment is needed for justification. This study investigated four different concentrations of the new glucoamylase enzyme: 0.43 l/DS-t, 0.23 l/DS-t, 0.17 l/DS-t, and 0.09 l/DS-t, in comparison with the currently used glucoamylase enzyme (0.692 l/DS-t). The saccharification process was conducted for 30 hours, and the results were evaluated based on Reducing Sugar (RS), Total Reducing Sugar (TRS), Saccharification Percentage (%Saccharification), and Degree of Polymerization (DP). The experimental results indicated that enzyme concentrations of 0.43 l/DS-t, 0.23 l/DS-t, and 0.17 l/DS-t met the quality standards specified by the industry in terms of RS, TRS, %Saccharification, and DP. However, the concentration of 0.09 l/DS-t did not meet the required criteria, as its lower enzyme concentration necessitated a hydrolysis period exceeding 30 hours under the saccharification conditions currently employed in industrial processes. Based on these findings, it can be concluded that the minimum concentration of the new glucoamylase enzyme that can be utilized in the saccharification process within

**Type of presentation must be matched with an option you choosing on student upload system.*

***The abstract can be more than one page and must be approved by project advisor before upload.*

30 hours while ensuring that the glucose syrup meets industry quality standards is 0.17 l/DS-t.

**Type of presentation must be matched with an option you choosing on student upload system.*

***The abstract can be more than one page and must be approved by project advisor before upload.*