

## ABSTRACT

Glucose is one of the monosaccharide groups with chemical formula  $C_6H_{12}O_6$ . In the food industry, glucose syrup is commonly used as flavour, manufacture of monosodium glutamate, caramels, jellies, pastilles, maltodextrins, coffee whitener, dessert powders and other things. Glucose syrup from tapioca starch is planned to be built in Center Lampung, Lampung and operated during 330 days in a year with production capacity of 100,000 ton/year. Raw materials are 109,553 ton/year. Main process in the factory is an enzyme hydrolysis process of tapioca starch to glucose syrup supported by  $\alpha$ -amylase enzyme and Glucoamylase enzyme. Generally, the process stages are liquification and saccharification. Liquification process used *Continuous Stirred-Tank Reactor (CSTR)* will be operated at temperature  $95\text{ }^\circ\text{C}$  and pressure 1 atm with refrigerated jacket. Whereas saccharification process used Batch Reactor will be operated at temperature  $60\text{ }^\circ\text{C}$  and pressure 1 atm with refrigerated coil.

As a support unit, utility unit provides Steam as much as 21642.1850 kg/hour, total electricity requirement of 1677,5832 kVA, and water as much as 423512.9725 kg per hour. The economic evaluation is used to calculate the profitability of Glucose Syrup plant. The results in the fixed capital cost \$ 81,296,961. The working capital costs \$ 38,909,486. Based on the feasibility studies, the Rate of Return On Investment (ROI) before tax is 28.13% and ROI after tax is 14.63 %. The Pay Out Time (POT) before tax is 2.62 years and POT after tax is 4.06 years. The Break Even Point (BEP) is 43.65 % and the Shut Down Point (SDP) is 17.60 %. The Discounted Cash Flow Rate of Return (DCFRR) is 18.08%. Overall from these results, this plant is interesting to be built and deserves to be reviewed.

**Keywords :** *Glucose Syrup, Enzymatic, Hydrolysis*