

ABSTRACT

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Title	Pre-Design of Maltodextrin Plant from Peel Cassava with a Capacity of 1700 tons/year

Maltodextrin is a glucose polymer with an average chain length of 5-10 glucose units per molecule. This compound is one of the modified starch products made from the hydrolysis of starch, either through a controlled enzymatic process using acid hydrolysis. In the process of making maltodextrin, two reaction methods were carried out, namely liquefaction and saccharification using two fermenters. Maltodextrin production has good prospects for development because Indonesia does not yet have a maltodextrin processing industri, not to mention the export price of maltodextrin is cheaper than the import price because maltodextrin exports are still in raw form. Maltodextrin is used in the food industri and pharmaceutical industries.

The maltodextrin plant is designed with a capacity of 1700 tons/year and will start operating in 2023 it is located in the Subang Regency area. The raw materials used are water, cassava which consists of (starch, protein, and fiber ash), and calcium chloride which are mixed in a mixer to obtain a slurry, stirring is carried out then flowed into the liquefication reaction process for starch degradation with the alpha-amylase enzyme catalyst and continued in the process of saccharification into the fermenter to obtain maltodextrin products with the required dextrose equivalent. Maltodextrin is purified by-product purification by means of a rotary drum filter, followed by a membrane filtration called an ultrafiltration membrane, to eliminate ions and minerals contained in the product along with an ion exchange device. The purity of the maltodextrin product and the equivalent dextrose value were obtained so that the last stage was evaporation using a multi-effect evaporator and drying using a spray dryer. Maltodextrin is stored in silos ready for distribution to consumers who need maltodextrin as raw material for industries such as the food and pharmaceutical industries.

The form company's legal entity is a Limited Liability Company (PT) with the organizational structure used as a line system. The company is led by a director with a total of 125 employees. Employees consist of shift employees and non-shift employees who work according to working hours. This factory operates 330 days a year. Based on the results of the economic analysis carried out with a bank interest rate of 10% are as follows:

a. Total Capital Investment = Rp. 61.705.000.000

b. Own capital (53.72%) = Rp. 37.100.000.000

c. Bank loans (46.28%) = Rp. 31.920.000.000

Interest Rate = 10%

Loan Period = 5 years

d. Break Even Point (BEP) first year = 58%

e. Minimum Payback Period (MPP) = 4 years 0 months 1-day

f. Internal Rate of Return (IRR) = 40%

g. Net Cash Flow at Present Value = Rp. 340.000.000.000

Based on the results of the economic analysis conducted, it can be concluded that this maltodextrin factory is feasible.

Keywords: *Maltodextrin, Liquification, saccharification, Reactor, dextrose equivalent*