

Optimalization of Unfeasible Rice to Rice Sugar by Hydrolysis Method to Enhance Farmer Welfare

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ABSTRACT

Unfeasible rice is one of the problems in food logistics in Indonesia. This unfeasible rice tends to make farmers or BULOG losers because they have to sell it at a cheaper price or turn it into animal feed. The characteristics of unfeasible rice are many breeds of rice lice, yellow in color, musty smell, and overgrown with fungus. Based on the data, in 100 grams of rice contains 0.1 grams of sucrose ($C_{12}H_{22}O_{11}$). Sucrose is a double sugar molecule (disaccharide) that can be broken down into simple sugars (monosaccharides) through enzymatic reactions. Monosaccharides are utilized by humans as the main energy source. This shows that rice is not suitable for consumption and can be used as an alternative raw material for making sugar. Therefore, the idea of innovation of rice that is not suitable for consumption was born into sugar. This study aims to determine the enzymatic ratio and the optimum reaction time of the hydrolysis reaction of unfit rice using alpha amylase. So, it is hoped that this research can be used as an initial study to optimize agricultural yields in finding alternative raw materials for making sugar. The method used in this research is the hydrolysis method on rice that has been mashed using the amylase enzyme. Experiments were carried out with variations in the number of enzymes used and the length of time for hydrolysis. The percentages of enzymes used for one kilogram of rice were 0.8%, 0.9%, and 1% with two days of hydrolysis, three days and four days. The optimum results obtained showed that the highest glucose level was 11,769.45 ppm at a ratio of 0.9% w/w enzyme raw material on the fourth day.

Keywords: Unfeasible rice, sugar, hydrolysis, amilase enzyme