

ABSTRAK

PENGARUH VARIASI KONSENTRASI ENZIM GLUKOAMILASE DAN WAKTU SAKARIFIKASI TERHADAP KADAR GLUKOSA PADA PRODUKSI GULA CAIR DARI PATI SINGKONG (*Manihot Esculenta*)

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Kebutuhan gula di Indonesia terus meningkat seiring dengan pertumbuhan penduduk dan perkembangan industri pangan, namun produksi gula dalam negeri belum mampu memenuhi kebutuhan tersebut. Oleh karena itu, diperlukan alternatif pemanis yang dapat diproduksi dari bahan baku lokal, salah satunya adalah gula cair berbasis pati singkong (*Manihot esculenta*). Singkong memiliki kandungan pati yang tinggi sehingga berpotensi diolah menjadi gula sederhana melalui proses hidrolisis enzimatis. Proses hidrolisis enzimatis dilakukan melalui beberapa tahap, yaitu pembuatan pati singkong, gelatinisasi, likuifikasi menggunakan enzim α -amilase, sakarifikasi menggunakan enzim glukoamilase, serta pemekatan larutan. Penelitian ini bertujuan untuk mengetahui pengaruh konsentrasi enzim glukoamilase dan waktu sakarifikasi terhadap kadar glukosa yang ditunjukkan oleh kadar gula pereduksi serta karakteristik gula cair dari pati singkong. Variasi yang digunakan dalam penelitian ini adalah konsentrasi enzim glukoamilase sebesar 0,5%, 1%, 1,5%, 2%, dan 2,5%, serta waktu sakarifikasi selama 24 jam dan 48 jam. Parameter yang dianalisis meliputi kadar gula pereduksi, kadar abu, pH dan kadar air. Hasil penelitian menunjukkan bahwa peningkatan konsentrasi enzim glukoamilase dan waktu sakarifikasi mempengaruhi peningkatan kadar gula pereduksi. Perlakuan terbaik diperoleh pada konsentrasi enzim glukoamilase 2,5% dengan waktu sakarifikasi 72 jam dengan kadar gula pereduksi 1,3178%. Karakteristik gula car yang didapat yaitu kadar abu 0,5010 – 0,9014% , pH 3,5 – 5, dan kadar air 15,28 – 51,20%. Berdasarkan SNI 01-2978-1992, seluruh perlakuan telah memenuhi persyatan kadar abu, sebagian besar perlakuan telah meemenuhi persyaratan pH, sedangkan persyaratan kadar air hanya terpenuhi oleh perlakuan konsentrasi enzim 2,5%, dan kadar gula pereduksi belum memenuhi persyaratan SNI gula cair yaitu 30%.

Kata kunci: *singkong, hidrolisis enzimatis, glukoamilase, sakarifikasi, gula cair*

ABSTRACT

THE EFFECT OF GLUCOAMYLASE ENZYME CONCENTRATION VARIATION AND SACCHARIFICATION TIME ON GLUCOSE CONTENT IN LIQUID SUGAR PRODUCTION FROM CASSAVA STARCH (*Manihot Esculenta*)

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*Sugar demand in Indonesia continues to increase along with population growth and the development of the food industry; however, domestic sugar production has not yet been able to meet this demand. Therefore, alternative sweeteners produced from local raw materials are needed, one of which is liquid sugar derived from cassava starch (*Manihot esculenta*). Cassava contains a high starch content and therefore has the potential to be converted into simple sugars through enzymatic hydrolysis. The enzymatic hydrolysis process consists of several stages, namely cassava starch preparation, gelatinization, liquefaction using α -amylase, saccharification using glucoamylase, and solution concentration. This study aimed to determine the effect of glucoamylase enzyme concentration and saccharification time on glucose content, as indicated by reducing sugar content, as well as the characteristics of liquid sugar produced from cassava starch. The variables used in this study were glucoamylase enzyme concentrations of 0.5%, 1%, 1.5%, 2%, and 2.5%, and saccharification times of 24 and 48 hours. The parameters analyzed included reducing sugar content, ash content, pH, and moisture content. The results showed that increasing glucoamylase enzyme concentration and saccharification time affected the increase in reducing sugar content. The best treatment was obtained at a glucoamylase enzyme concentration of 2.5% with a saccharification time of 72 hours, resulting in a reducing sugar content of 1.3178%. The characteristics of the liquid sugar obtained were ash content of 0.5010–0.9014%, pH of 3.5–5.0, and moisture content of 15.28–51.20%. Based on SNI 01-2978-1992, all treatments met the ash content requirement, most treatments met the pH requirement, while the moisture content requirement was only fulfilled by the 2.5% enzyme concentration treatment, and the reducing sugar content had not yet met the liquid sugar standard requirement of 30%.*

Keywords: cassava, enzymatic hydrolysis, glucoamylase, saccharification, liquid sugar