Optimasi serta Validasi Metode Analisis untuk Penetapan Kadar Protein, Asam Lemak, dan Serat dalam Ekstrak Ragi Hasil Fermentasi Saccharomyces cerevisiae = Optimization and Validation of Analytical Methods for Determination of Protein, Fatty Acid, and Fiber Levels in Yeast Extract from Fermentation of Saccharomyces cerevisiae

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Abstrak

Ekstrak kering ragi dari Saccharomyces cerevisiae merupakan hidrosilat ragi kompleks yang bermanfaat sebagai sumber nutrisi yang dapat digunakan dalam bahan pangan tambahan. Selain itu ekstrak ragi juga memiliki kegunaan dalam bidang farmasi, kesehatan maupun industri. Penelitian ini bertujuan untuk mengoptimalkan produksi dari ekstrak kering ragi dan menganalisis kandungan biomassa yang terdapat dalam sel khamir seperti penetapan kadar protein, asam lemak dan serat. Produksi ekstrak kering ragi dapat dioptimalisasi dengan beberapa media. Yeast extract Peptone Dextrose (YPD) terpilih sebagai media yang digunakan dalam produksi karena hasil optimasi menunjukkan absorbansi pada YPD lebih tinggi dibandingkan media molase dan mengikuti fase pertumbuhan mikroba. Analisis penetapan kadar protein diuji menggunakan metode Bradford. Penetapan kadar serat mengacu pada metode SNI 01-2891-1992. Penetapan kadar asam lemak dilakukan dengan menggunakan kromatografi gas. Kondisi analisis yang optimum pada kromatografi gas diperoleh pada suhu kolom 170°C dan split 20. Metode yang digunakan dikatakan valid dengan hasil linearitas sebesar y = 4132,9x-13592 dan r = 0,9983. Nilai presisi ditunjukkan dari %KV adalah sebesar 1,6091%. Nilai LOD yang didapat sebesar 36,485 µg/mL dan LOQ sebesar 121,431 µg/mL. Hasil rata-rata kadar asam lemak dalam ekstrak kering ragi yakni sebesar 0,3357%. Pada penetapan kadar protein menghasilkan persamaan kurva kalibrasi sebesar y = 0,00096x + 0,3751 dan nilai r = 0,9988. Hasil dari kadar protein yang terkandung dalam ekstrak kering ragi sebesar 0,4332 mg/mL terhitung sebagai albumin. Untuk penetapan kadar serat, hasil yang didapat rata-rata sebesar 1,48%.
.....Dry yeast extract from Saccharomyces cerevisiae is a complex yeast hydrosylate that is useful as a source of nutrients that can be used in food additives. In addition, yeast extract also have uses in the pharmaceutical, health and industrial fields. This study aims to optimize the production of dry yeast extract and analyze the biomass content contained in ragi cells such as determination of protein, fatty acid and fiber content. The production of dry yeast extract can be optimized with several media. Yeast extract Peptone Dextrose (YPD) was chosen as the medium used in the production because the optimization results showed that the absorbance of YPD was higher than that of molasses and followed the microbial growth phase. Analysis of protein assay using the Bradford method. Determination of fiber content refers to the method of SNI 01-2891-1992. Fatty acid content was determined using gas chromatography. The optimum analytical conditions in gas chromatography were obtained at column temperature of 170°C and split 20. The method used was valid with linearity results of y = 4132.9x-13592 and r = 0.9983. The precision value result from % CV is 1.6091%. The LOD value obtained was 36.485 µg/mL and the LOQ was 121.431 µg/mL. The average yield of fatty acid levels in the dry yeast extract was 0.3357%. The determination of protein content resulted in a calibration curve equation of y = 0.00096x + 0.3751 and the value of r = 0.9988. The results of the protein content in the dry yeast extract was 0.4332 mg/mL were counted as an albumin. For the

determination of fiber content, the average results obtained are 1.48%.