Pemanfaatan Limbah Cucian Beras untuk Pembuatan Makanan Berserat Tinggi Menggunakan Bakteri *Acetobacter xylinum*

Utilization of Waste Water Wased Rice for Producing of High-Fiber Foods by *Acetobacter xylinum*

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Abstract

This research aimed to utilize water used for washing rice as raw material to make high-fiber foods (nata de leri), and to search the optimum sugar levels that can produce the best nata. Laboratory scale experiments were prepared using a factorial design with three repetitions. The treatments tested were four types of rice, such as white rice, brown rice, white and black sticky rice consists of 0, 5, 10, and 15% sugar content. The parameters analyzed were color, thickness, wet weight, fiber content and protein content of nata formed. Observational data were analyzed statistically using analysis of variance with α 1% and 5% followed by DMRT 5% test. Fermentation of various types of rice by the bacterium *Acetobacter xylinum* took five to seven days. Based on the analysis of variance α 1%, there was significant difference between the type of rice and sugar content to the quality of nata formed. Optimum sugar content that produces the best nata was 5%, which occurs in all types of rice. Excessive sugar in the fermentation medium inhibits the process of medium density allegedly causing bacterial cell lysis. Fermentation derived from white sticky rice produce the thickest and hardest nata, and had the highest fiber content, with values 130 cm, 200 gr, and 75% respectively. This was because the starch content was much in white sticky rice than others. Carbohydrates were used by bacteria as a source of nutrients and energy, which has rich of starch from white sticky rice. While the highest protein content was by nata formed from white rice, which is 1.2%.

Keywords: Sugar, *Acetobacter xylinum*, *nata de leri*

Abstrak

Penelitian ini bertujuan memanfaatkan air bekas cucian beras sebagai bahan baku pembuatan makanan berserat tinggi (*nata de leri*), dan mencari kadar gula optimum yang bisa menghasilkan nata terbaik. Percobaan dilakukan pada skala laboratorium yang disusun menggunakan rancangan faktorial dengan tiga ulangan. Perlakuan yang diuji adalah jenis beras, meliputi beras putih, beras merah, ketan putih dan ketan hitam; serta kadar gula yang terdiri dari 0%, 5%, 10%, dan 15%. Parameter yang dianalisis yakni warna, tebal, berat basah, kadar serat, dan kadar protein nata yang terbentuk. Data pengamatan dianalisis statistik memakai analisis keragaman dengan α 1% dan α 5%, dilanjutkan uji DMRT α 5% bila ada perbedaan yang nyata. Berdasarkan analisis keragaman α 1%, terbukti bahwa ada pengaruh yang sangat signifikan antara jenis beras dan kadar gula dengan kualitas *nata de leri* yang terbentuk. Kadar gula optimum yang menghasilkan nata terbaik adalah 5% yang terjadi pada semua jenis beras. Gula yang berlebihan dalam medium justru menghambat proses fermentasi karena medium yang pekat menyebabkan sel bakteri lisis. Fermentasi leri yang berasal dari ketan putih menghasilkan nata paling tebal (130 cm), paling berat (200 g) serta mempunyai kadar serat tertinggi (7,5%). Hal ini disebabkan oleh kadar pati dalam leri ketan putih terbanyak dibandingkan dengan lainnya. Kadar protein tertinggi dikandung oleh nata yang dibentuk dari leri beras putih 1,2%.

Kata kunci: Leri, gula, *Acetobacter xylinum*, nata