

ANALISIS TEKNIS ALAT *CONTINUOUS TYPE STEAM JET* AGGLOMERATOR TERINTEGRASI DRYER DENGAN PERLAKUAN TEKANAN, SUHU, DAN DURASI PENGERINGAN

INTISARI

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Penelitian saat ini banyak dilakukan mengenai karakterisasi dari bahan bubuk kakao sedangkan penelitian tentang kinerja alat *steam jet agglomerator* sulit ditemukan. Artikel penelitian kinerja alat sangat dibutuhkan bagi pelaku usaha terutama bagi pelaku usaha kecil menengah. teknis meliputi konsumsi energi, efisiensi energi pengeringan, laju pengeringan, dan rendemen produksi selain itu, penelitian juga digunakan untuk menentukan perlakuan terbaik untuk alat *Continuous type Steam Jet Agglomerator terintegrasi Dryer*. Perlakuan yang digunakan pada penelitian ini yaitu tekanan *boiler* (0,4 bar; 0,8 bar; dan 1,2 bar), suhu pengeringan (80°C, 70°C, dan 60°C), dan durasi pengeringan (4 jam dan 2 jam). Hasil menunjukkan kadar air terendah sebesar 0,84% d.b, konsumsi energi gas terendah sebesar 0,83 kg, konsumsi energi listrik terendah 0,16 kWh, efisiensi pengeringan tertinggi sebesar 0,5%, efisiensi sistem pengeringan tertinggi sebesar 0,2%, laju pengeringan tertinggi sebesar 27% d.b./jam, rendemen tertinggi sebesar 86,78%, dan *solubility* tertinggi sebesar 34%. Selanjutnya, ketiga variabel memiliki pengaruh signifikan ($p < 0,05$) terhadap karakter bubuk kakao instan dan sebagian kinerja alat kecuali kebutuhan gas dan rendemen. Karakteristik instan menunjukkan adanya kenaikan dari semua sampel terhadap sampel kontrol. Perlakuan terbaik berdasarkan analisis TOPSIS dalam penelitian ini adalah sampel dengan durasi pengeringan 2 jam, suhu 70°C, dan pemberian tekanan 0,8 bar dengan nilai *Ci* sebesar 0,766.

Kata kunci: minuman kakao, kakao instan, aglomerasi, *continuous type steam jet agglomerator*

**TECHNICAL ANALYSIS OF CONTINUOUS TYPE STEAM JET
AGGLOMERATOR INTEGRATED DRYER WITH PRESSURE
TREATMENT, TEMPERATURE, AND DURATION OF DRYING**

ABSTRACT

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Currently, many studies have been carried out on the characterization of cocoa powder, while research on the performance of the steam jet agglomerator is difficult to find. Research articles on tool performance are very much needed for business actors, especially for small and medium businesses. This study aims to examine technical performance including energy consumption, drying energy efficiency, drying rate, and production yield. The treatments used in this study were boiler pressure (0.4 bar; 0.8 bar; and 1.2 bar), drying temperature (80°C, 70°C, and 60°C), and drying duration (4 hours and 2 hours). The results show the lowest water content is 0.84% d.b, the lowest gas energy consumption is 0.83 kg, the lowest energy consumption is 0.16 kWh, the highest drying efficiency is 0.5%, the highest drying system efficiency is 0.2%, the highest highest was 27%d.b./hour, the highest yield was 86.78%, and the highest solubility was 34%. Furthermore, the third variable has a significant effect ($p < 0.05$) on the character of instant cocoa powder and part of the tool's performance except for gas requirements and yield. The instantaneous characteristic indicates the appearance of all samples against the control sample. The best treatment based on the TOPSIS analysis of this study was a sample with a drying duration of 2 hours, a temperature of 70°C, and a pressure of 0.8 bar with a C_i value of 0.766.

Keywords: *cocoa drink, instant cocoa, agglomeration, continuous type steam jet agglomerator, fluidized dryer*