

**KARAKTERISTIK FISIK, INSTAN, DAN ALIR BUBUK MINUMAN
KAKAO INSTAN DENGAN PERLAKUAN KOMPOSISI BAHAN,
INPUT HOPPER, DAN TEKANAN BOILER MENGGUNAKAN
CONTINUOUS-TYPE STEAM JET AGGLOMERATOR
TERINTEGRASI DRYER**

INTISARI

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Kakao merupakan produk perkebunan yang menyumbang devisa terbesar ketiga dengan konsumsi nasional mencapai angka 138.424 ton pada tahun 2020. Tumbuhnya agroindustri kakao menghasilkan produk turunan berupa minuman coklat instan yang biasa disajikan dalam bentuk es/dingin. Minuman es coklat cenderung memiliki banyak peminat karena Indonesia termasuk negara tropis dengan suhu lingkungan yang tinggi. Produk minuman coklat instan yang beredar di pasar secara umum mengandung 11-22% lemak sehingga sukar larut dalam air dingin. Tujuan penelitian ini yaitu untuk mengkaji secara matematis karakteristik bubuk minuman kakao instan yang diproduksi dengan *continuous-type steam jet agglomerator* yang terintegrasi dengan *dryer*. Integrasi antara alat agglomerator termal dengan *dryer* memudahkan operator dalam proses produksi. Variabel penelitian yang digunakan yaitu komposisi bahan (KM, KS, KP), *input hopper* (100 gram dan 300 gram), serta tekanan *boiler* (0,4 bar, 0,8 bar, dan 1,2 bar). Batasan pengaturan alat yaitu suhu *dryer* yang digunakan yaitu 60°C dengan durasi pengeringan selama 4 jam serta proses agglomerasi termal dilakukan sebanyak tiga kali iterasi dengan tiga kran *steam* dalam kondisi terbuka. Hasil penelitian menunjukkan ketiga variabel beserta interaksinya dapat mempengaruhi karakteristik bubuk minuman kakao instan. Karakteristik yang dibandingkan dengan kontrol menunjukkan perubahan seperti nilai *solubility* dan *dispersibility* yang meningkat, *lightness* yang menurun, serta ukuran partikel yang lebih besar. Sampel terbaik yaitu KP100P12 berupa komposisi bahan KP (45% gula sukrosa + 55% bubuk kakao), *input hopper* 100 gram, dan tekanan *boiler* 1,2 bar.

Kata Kunci : minuman coklat instan, *steam jet agglomerator*, *dryer*, integrasi

**PHYSICAL, INSTANTANEOUS, AND FLOW CHARACTERISTICS OF
INSTANT COCOA DRINKING POWDER AS TREATED BY
INGREDIENTS COMPOSITION, INPUT HOPPER, AND BOILER
PRESSURE (USING DRYER-INTREGATED CONTINUOUS-TYPE
STEAM JET AGGLOMERATOR**

ABSTRACT

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Cocoa is a plantation product that contributes the third largest in trades, with national consumption reaching 138,424 tons in 2020. The growth of the cocoa agro-industry produces derivative products in the form of instant chocolate drinks which are commonly serve chilled/cold. Chocolate ice drinks tend to garner a lot of enthusiasts because Indonesia is a warm tropical country. Instant chocolate drink products that circulate in the market generally contain 11-22% fat which is difficult to dissolve in cold water. The purpose of this research is to study mathematically the characteristics of instant cocoa drinking powder produced with a continuous-type steam jet agglomerator integrated with a dryer. The integration between the thermal agglomerator and dryer makes it easier for operators in the production process. The research variables used were material composition (KM, KS, KP), input hopper (100 grams and 300 grams), and boiler pressure (0,4 bar, 0,8 bar, and 1,2 bar). The control applied were the dryer temperature set to 60°C with a drying duration of 4 hours and the three replications of the thermal agglomeration process with three steam valves in an open condition. The results showed that the three variables and their interactions could affect the characteristics of instant cocoa drinking powder. Characteristics that were compared with the control showed changes such as increased solubility and dispersibility value, decreased lightness, and larger particle size. The best sample was achieved in KP100P12, with KP material composition (45% sucrose sugar + 55% cocoa powder), 100 gram input hopper, and 1,2 bar boiler pressure.

Keywords: instant chocolate drink, steam jet agglomerator, dryer, integration