

UJI KINERJA TEKNIS *SMART PORTABLE ROASTER* UNTUK PENYANGRAIAN KAKAO

INTISARI

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Salah satu tahap kunci dalam proses ini adalah penyangraian biji kakao. Penelitian ini berfokus pada mesin penyangrai kakao "*Smart Portable Roaster*" yang memiliki sistem kontrol otomatis berbasis android. Penelitian ini bertujuan untuk menguji kinerja dan menganalisis kelayakan ekonomi dari mesin tersebut. Parameter uji mencakup suhu penyangraian, kadar air biji kakao hasil penyangraian, laju penyangraian, efisiensi penyangraian, kebutuhan daya listrik, rendemen, dan konsumsi bahan bakar. Pengujian ini dilakukan dengan suhu sangrai 130°C dan lama waktu 10 menit variasi kapasitas penyangraian 1 kg, 2 kg, dan 3 kg biji kakao. Hasil pengamatan diperoleh sebagai berikut: (1) Pada penyangraian 1 kg laju penyangraian 0.42% per menit, rendemen 94.9%, penggunaan daya listrik 0.022 kWh dan konsumsi bahan bakar 0.12 kg per jam, (2) Pada penyangraian 2 kg laju penyangraian 0.40% per menit, rendemen 95.1%, penggunaan daya listrik 0.021 kWh dan konsumsi bahan bakar 0.17 kg (3) Pada penyangraian 3 kg laju penyangraian 0.36% per jam, rendemen 96.9%, penggunaan daya listrik 0.027 kWh dan konsumsi bahan bakar 0.24 kg. Kadar air rata-rata biji kakao hasil penyangraian adalah sebesar 3.04%. Efisiensi penyangraian dari mesin tersebut sebesar 11.75%. Hasil analisis ekonomi diperoleh biaya penyangraian kakao sebesar Rp79.783,00 per kg, nilai NPV>0 sebesar Rp32.812.759,00, B/C ratio >1 sebesar 1.06, dan PBP 2.03 tahun. Berdasarkan hasil uji, mesin dapat menyangrai hingga kapasitas 2kg, tetapi belum memenuhi beberapa syarat SNI. Berdasarkan analisis kelayakan ekonomi, penyangraian dengan mesin ini dianggap layak secara ekonomi.

Kata kunci: Penyangraian, mesin sangrai, uji kinerja, analisis ekonomi

TECHNICAL PERFORMANCE TEST OF SMART PORTABLE ROASTER FOR COCOA ROASTING

ABSTRACT

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One of the key stages in this process is the roasting of cocoa beans. This research focuses on a cocoa roaster machine "Smart Portable Roaster" which has an android-based automatic control system. This research aims to test the performance and analyze the economic feasibility of the machine. The test parameters include roasting temperature, moisture content of roasted cocoa beans, roasting rate, roasting efficiency, electrical power requirement, yield, and fuel consumption. This test was conducted with a roasting temperature of 130°C and a time of 10 minutes for variations in roasting capacity of 1 kg, 2 kg, and 3 kg of cocoa beans. The observation results were obtained as follows: (1) At 1 kg roasting the roasting rate was 0.42% per minute, yield 94.9%, electric power usage 0.022 kWh and fuel consumption 0.12 kg per hour, (2) At 2 kg roasting the roasting rate was 0.40% per minute, (3) At 3 kg roasting, the roasting rate was 0.36% per hour, the yield was 96.9%, the electric power consumption was 0.027 kWh and the fuel consumption was 0.24 kg. The average moisture content of roasted cocoa beans was 3.04%. The roasting efficiency of the machine is 11.75%. The results of the economic analysis obtained a roasting cost of Rp79.783,00 per kg, NPV>0 of Rp32.812.759,00, B/C ratio>1 of 1.06, and PBP of 0.83 years. Based on the test results, the machine can roast up to 2kg capacity, but has not met some SNI requirements. Based on the economic feasibility analysis, roasting with this machine is considered economically feasible.

Keywords: Roasting, roasting machine, performance test, economic analysis