

ABSTRAK

PENGARUH VARIASI BEBAN KELAPA TERHADAP ARUS, DAYA DAN KAPASITAS PRODUKSI MESIN PEMARUT DAN PEMERAS KELAPA

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Mesin pamarut dan pemeras kelapa merupakan alat produksi penting bagi UMKM pengolahan santan di Indonesia. Tanpa acuan kuantitatif beban optimal, motor penggerak rentan mengalami pembebanan berlebih atau kekurangan beban sehingga menurunkan efisiensi dan merusak komponen. Penelitian ini bertujuan menganalisis pengaruh variasi beban kelapa terhadap arus listrik, daya listrik, dan kapasitas produksi, serta menentukan kondisi operasi paling optimal. Metode eksperimen dilakukan dengan tiga variasi beban (2 kg, 4 kg, dan 6 kg), masing-masing diulang tiga kali, dan data dianalisis menggunakan regresi linear sederhana. Hasil menunjukkan peningkatan beban meningkatkan seluruh parameter secara konsisten. Arus listrik meningkat dari 3,41 A (2 kg) hingga 4,32 A (6 kg), daya listrik dari 750,2 W hingga 950,4 W, dan kapasitas produksi dari 41,33 kg/jam hingga 53,20 kg/jam. Persamaan regresi daya: $Y = 649,000 + 50,050X$ ($R^2 = 0,961$); kapasitas produksi: $Y = 36,183 + 2,993X$ ($R^2 = 0,939$). Beban 6 kg merupakan kondisi optimal karena menghasilkan kapasitas tertinggi dengan arus yang masih dalam batas aman motor. Hasil penelitian dapat dijadikan acuan operasional bagi pelaku UMKM.

Kata Kunci: Mesin pamarut kelapa, pemeras kelapa, variasi beban, arus listrik, daya listrik, kapasitas produksi, regresi linear, UMKM.

ABSTRACT

THE EFFECT OF COCONUT LOAD VARIATION ON CURRENT, POWER AND PRODUCTION CAPACITY OF A COCONUT GRATER AND PRESS MACHINE

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Coconut grating and pressing machines are essential production tools for micro, small, and medium enterprises (MSMEs) in Indonesia's coconut milk processing industry. Without a quantitative reference for optimal load, the drive motor is prone to overloading or underloading, reducing machine efficiency and causing component damage. This study aims to analyze the effect of coconut load variation on electric current, electric power, and production capacity, as well as to determine the most optimal operating condition. An experimental method was applied using three load variations (2 kg, 4 kg, and 6 kg), each repeated three times, and the data were analyzed using simple linear regression. The results showed that increasing the load consistently raised all observed parameters. Electric current increased from 3.41 A (2 kg) to 4.32 A (6 kg), electric power from 750.2 W to 950.4 W, and production capacity from 41.33 kg/h to 53.20 kg/h. The regression equation for power was $Y = 649.000 + 50.050X$ ($R^2 = 0.961$), and for production capacity $Y = 36.183 + 2.993X$ ($R^2 = 0.939$). A load of 6 kg was identified as the optimal condition, yielding the highest production capacity while keeping the current within the motor's safe operating limit. These findings provide measurable technical data as an operational reference for MSME operators in determining the optimal workload for coconut grating and pressing machines.

Keywords: Coconut grater machine, coconut press machine, load variation, electric current, electric power, production capacity, linear regression, MSME.