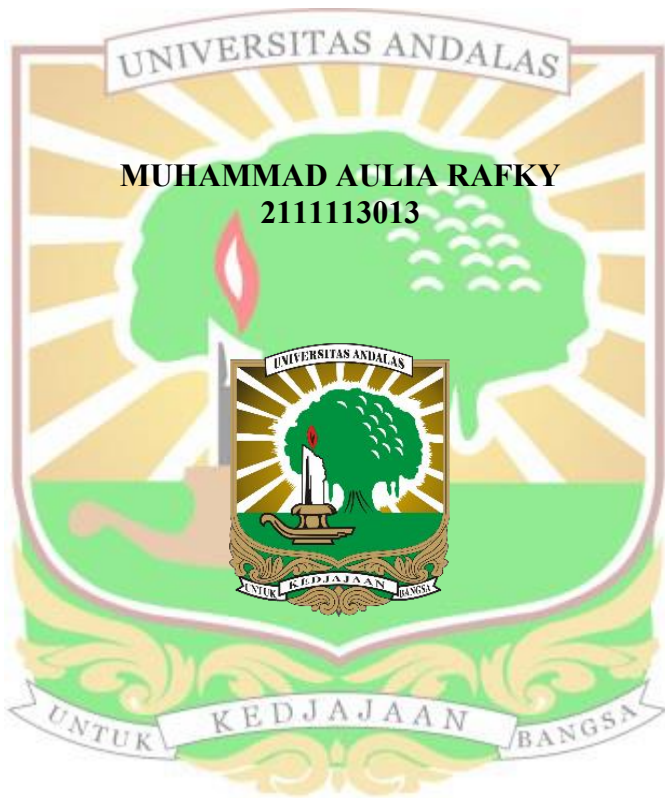


**ANALISIS THERMO EKONOMI MESIN
PENGERING GABAH TIPE *BATCH* DI
KECAMATAN GUNUNG TALANG, KABUPATEN
SOLOK**



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ANALISIS THERMO EKONOMI MESIN PENGERING GABAH TIPE *BATCH* DI KECAMATAN GUNUNG TALANG, KABUPATEN SOLOK

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ABSTRAK

Penelitian ini bertujuan menganalisis kinerja teknis dan ekonomi mesin pengering gabah tipe *batch* di Kecamatan Gunung Talang, Kabupaten Solok. Mesin ini menggunakan panas dari pembakaran sekam padi dengan kapasitas 6 ton per siklus dan durasi pengeringan 8 jam. Parameter yang diamati meliputi suhu, kadar air, kelembapan relatif, efisiensi thermal, kebutuhan daya spesifik, rendemen, laju pengeringan, konsumsi bahan bakar, analisis energi, dan biaya. Suhu rata-rata dalam bak pengering mencapai 28–32°C, dengan penurunan kadar air dari 23–25% menjadi 15,4%. Efisiensi thermal tertinggi sebesar 85,57%, kebutuhan energi spesifik rata-rata 0,00188 kW/kg, dan rendemen pengeringan rata-rata 97,68%. Laju pengeringan mencapai 17,55 kg/jam. Rata-rata energi untuk memanaskan gabah sebesar 1.451.332 kJ dan untuk menguapkan air 587 kJ, dengan total energi output 1.451.919 kJ. Energi input dari tungku dan listrik sebesar 1.656.022,27 kJ, menghasilkan efisiensi pengeringan sebesar 88%. Konsumsi sekam per siklus sebanyak 120 kg. Biaya tetap tahunan Rp 21.321.000, biaya tidak tetap Rp 32.360 per jam, dan biaya pokok pengeringan Rp 53,55/kg, dengan titik impas pada 1.740 jam kerja/tahun. Mesin ini dinilai efisien secara teknis dan layak secara ekonomi sebagai alternatif pengeringan pascapanen di tingkat petani.

Kata Kunci: Mesin Pengering Gabah, Tipe *Batch*, Gabah, Analisis Teknis, Analisis Energi, Analisis Ekonomi.

THERMO-ECONOMIC ANALYSIS OF BATCH-TYPE PADDY DRYER IN GUNUNG TALANG SUBDISTRICT, SOLOK REGENCY

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ABSTRACT

This study aims to analyze the technical and economic performance of a batch-type paddy dryer used in Gunung Talang District, Solok Regency. The dryer utilizes heat from rice husk combustion with a drying capacity of approximately 6 tons per cycle and a duration of about 8 hours. Observed parameters include temperature, moisture content, relative humidity, thermal efficiency, specific energy consumption, drying yield, drying rate, fuel consumption, energy analysis, and cost analysis. The average drying chamber temperature ranged from 28–32°C, with moisture content reduced from 23–25% to 15.4%. The highest thermal efficiency reached 85.57%, average specific energy consumption was 0.00188 kW/kg, and the average drying yield was 97.68%. The drying rate reached 17.55 kg/hour. The average energy required to heat the paddy was 1.451.332 kJ, and to evaporate water was 587 kJ, resulting in a total output energy of 1.451.919 kJ. The input energy from the furnace and electricity was 1.656.022,27 kJ, resulting in a drying efficiency of 88 %. Husk fuel consumption per cycle was 120 kg. Fixed costs were Rp 21,321,000 per year, variable costs were Rp 32,360 per hour, and the unit cost of drying was Rp 53.55/kg, with a break-even point at 1,740 operating hours per year. The dryer is technically efficient and economically feasible as a modern post-harvest drying alternative for farmers.

Keywords: paddy dryer, batch type, paddy, technical analysis, energy analysis, economic analysis