KESETIMBANGAN ENERGI DAN MASSA PADA PENGERINGAN LENGKUAS DENGAN ALAT PEGERING *HYBRID* TIPE RAK BERPUTAR

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ABSTRAK

Lengkuas merupakan salah satu hasil pertanian biofarmaka rimpang yang yang umum digunakan sebagai bumbu masakan, mempunyai aroma yang harum dan rasa yang pedas. Pengeringan merupakan salah satu cara pengawetan hasil pertanian yang sudah lama dikenal yang tujuannya untuk mengurangi kadar air bahan, mempertahankan mutu, memperlambat kerusakan akibat mikroorganisme, dan memperpanjang massa simpan. Penelitian ini bertujuan untuk menganalisa kesetimbangan energi dan massa serta efisiensi pengeringan pada proses pengeringan lengkuas menggunakan alat pengering *hybrid* tipe rak berputar. Metode yang digunakan dalam penelitian ini yaitu metode eksperimental dengan menganalis energi yang masuk, energi yang berguna, kehilangan panas, kesetimbangan energi, kesetimbangan massa dan efisiensi pengeringan. Hasil pengujian alat ini diperoleh nilai kalor cangkang kemiri 18966.204 kJ/kg dengan kadar air 3%. Kadar air awal lengkuas 827.69%bk, kadar air lengkuas kering 10.11%bk.Total energi yang masuk alat pengering 612052.47 kJ, energi yang berguna 187434.91 kJ dan total energi yang keluar 112437.89 kJ. Massa input 5.47 kg, massa *output* 5.06 kg dan massa terakumulasi 0.41 kg. Nilai efisiensi pengeringan adalah 30.62%.

Kata kunci : Efisiensi, Pengering *Hybrid* Tipe Rak Berputar, Pindah Massa dan Panas

ENERGY AND MASS BALANCES FOR GALANGAL DRYING IN ROTARY RACKS TYPE HYBRID DRYER

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ABSTRACT

Galangal is one of the agricultural products of the rhizome biopharmaca which is commonly used as a seasoning, has a fragrant aroma and a spicy flavor. Drying is one of the long-known ways to preserve agricultural products whose purpose is to reduce the water content of the material, maintain quality, slow down damage caused by microorganisms, and prolong storage times. This study aims to analyze the energy and mass balances and drying efficiency in the galangal drying process using a rotary racks type hybrid dryer. Method used in this research was experimental method by analyzing incoming energy, useful energy, heat loss, energy balance, mass balance and drying efficiency. The test results of this tool obtained the calorific value of candlenut shell was 18966.204 kJ/kg with moisture content was 3%. The initial moisture content of galangal was 827.69%db, the moisture content of dried galangal was 10.11% db. Total energy entering the dryer was 612052.47 kJ, useful energy was 187434.91 kJ and the total energy coming out was 112437.89 kJ. The input mass was 5.47 kg, the output mass was 5.06 kg and the mass accumulates was 0.41 kg. The drying efficiency value was 30.62%.

Keywords: *Efficiency, Rotary racks type hybrid dryer, Heat and mass transfer*