

# ANALISIS ENERGI PANAS PADA PENGERINGAN GULA SEMUT MENGGUNAKAN ALAT PENGERING SILINDER TIPE RAK

## *Analysis of Heat Energy in Drying Granule Brown Sugar Using A Rack-Type Cylinder Dryer*

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### ABSTRAK

Penelitian ini bertujuan untuk menganalisis energi panas pada proses pengeringan gula semut menggunakan alat pengering silinder tipe rak. Metode yang digunakan dalam penelitian ini adalah metode eksperimental dan terorititis dengan Studi Kasus UKM Maju Bersama di Desa Kekait, Kecamatan Gunung Sari. Pada penelitian ini dilakukan 3 variasi masa yaitu 300 gram, 400 gram, dan 500 gram. Hasil pengujian alat ini diperoleh nilai kadar air awal gula semut pada variasi massa 300 gram sebesar 5,30%, massa 400 gram 5,92% dan massa 500 gram 5,71%. Setelah dikeringkan diperoleh hasil kadar air pada variasi massa 300 gram di bawah standar SNI gula semut No. 01-3743-1995 dengan nilai kadar air akhir rata-rata sebesar 2,10%. Massa 400 gram 2,98%. Massa 500 gram 2,36%. Kesetimbangan energi yang dihasilkan dari 3 variasi massa, yaitu pada massa 300 gram energi masuk sebesar 1655,93 kJ, energi berguna 1161,95 kJ, energi keluar 1031,71 kJ, energi tersimpan 493,98 kJ, dan energi hilang 178,33 kJ. Massa 400 gram energi masuk 1728,90 kJ, energi berguna 1306,20 kJ, energi keluar 1098,25 kJ energi tersimpan 422,70 kJ dan energi hilang 154.33 kJ. Massa 500 gram energi masuk 1709,32 kJ, energi berguna 1357,90 kJ, energi keluar 1060,46 kJ, energi tersimpa 351,42 kJ dan energi hilang 140,21 kJ. Nilai efisiensi penggunaan energi panas yang dihasilkan pada massa 300 gram sebesar 70,17%, massa 400 gram 75,55% dan massa 500 gram 79,44%.

**Kata kunci:** gula semut; kadar air; kesetimbangan energi

### ABSTRACT

*This study aims to analyze the heat energy in the drying process of granule brown sugar using a rack-type cylinder dryer. The method used in this research are an experimental and theoretical with the Case Study of Maju Bersama UKM in Kekait Village, Gunung Sari District. In this study, 3 mass variations were carried out, namely the masses of 300 gram, 400 gram, and 500 gram. The test results of this tool obtained the initial moisture content of ant sugar at the mass variation of 300 gram of 5.30%, a mass of 400 gram of 5.92% and a mass of 500 gram of 5.71%. After drying, the results obtained moisture content in mass variations of 300 gram under SNI standard for ant sugar. 01-3743-1995 with an average final moisture content of 2.10%. Mass of 400 gram 2.98%. Mass of 500 gram is 2.36%. The energy balance resulting from 3 mass variations, namely the mass of 300 gram of incoming energy is 1655.93 kJ, useful energy of*

*1161.95 kJ, energy out of 1031.71 kJ, stored energy of 493.98 kJ and energy lost 178.33 kJ. The mass of 400 gram of incoming energy is 1728.90 kJ, useful energy is 1306.20 kJ, energy out is 1098.25 kJ of stored energy is 422.70 kJ and energy lost is 154.33 kJ. The mass of 500 gram of incoming energy 1709.32 kJ, useful energy of 1357.90 kJ, energy out of 1060.46 kJ, energy dissipated by 351.42 kJ, and energy lost 140.21 kJ. The efficiency of the use of heat energy produced at a mass of 300 gram is 70.17%, a mass of 400 gram is 75.55% and a mass of 500 gram is 79.44%.*

**Keywords:** *granule brown sugar; water content; energy balance*