

**ANALISIS PERPINDAHAN PANAS DAN MASSA PADA PROSES
PENGERINGAN KACANG TANAH (*Arachis hypogea* L.)
MENGUNAKAN PENGERING TIPE ROTARI**

INTISARI

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Pengeringan merupakan tahapan penting dalam penanganan pascapanen kacang tanah. Proses pengeringan kacang tanah dilakukan untuk menurunkan kadar air kacang tanah dari 40-50% (wb) hingga 6-7% (wb). Saat ini cukup banyak pengering mekanis yang dikembangkan untuk mendukung proses pengeringan kacang tanah, salah satunya adalah *rotary dryer*. Tujuan penelitian adalah menganalisis perpindahan panas, perpindahan massa dan kinerja *rotary dryer* selama proses pengeringan kacang tanah. Kacang tanah sebanyak 3 kg, 6 kg dan 9 kg masing-masing dikeringkan dengan variasi suhu 60°C, 70°C dan 80°C. Perubahan kadar air dan suhu bahan selama pengeringan diukur pada interval waktu tertentu. Data perubahan kadar air dianalisis menggunakan Hukum Pendinginan Newton sehingga diperoleh nilai k. Sedangkan data perubahan suhu dianalisis menggunakan metode *lumped system* untuk mendapatkan nilai koefisien perpindahan panas gabungan (U). Hasil penelitian menunjukkan semakin tinggi suhu pengering maka laju pengeringan akan semakin cepat dan nilai koefisien perpindahan panas juga akan semakin tinggi. Nilai koefisien perpindahan panas U yang terukur berkisar antara 0,28-0,87 W/m².°C. Nilai konstanta laju pengeringan k konstan pada biji dan kulit kacang tanah berturut-turut 0,32-0,56/jam dan 1,04-1,34/jam, sedangkan k menurun pada biji dan kulit kacang tanah berturut-turut berkisar antara 0,32-1,05/jam dan 0,51-1,29/jam. Sedangkan efisiensi pengeringan yang terukur adalah 4,51-15,75 %, dimana bila semakin banyak kapasitas bahan yang dikeringkan maka efisiensi pengeringan akan semakin besar.

Kata Kunci: kacang tanah, *rotary dryer*, perpindahan panas, perpindahan massa, efisiensi pengeringan.

***ANALYSIS OF HEAT AND MASS TRANSFER DURING THE DRYING
PROCESSES OF PEANUTS (*Arachis hypogea* L.) USING ROTARY DRYER***

ABSTRACT

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Drying is an important step in post-harvest handling peanuts. The process of peanuts drying aims to reduce the water content of peanuts from 40-50% (wb) for up to 6-7% (wb). There are currently quite a lot kind of mechanical dryers are developed to support the process of drying peanuts, one of which is the rotary dryer. The aims of this research is to analyse heat transfer, mass transfer and to assess the performance of the rotary dryer during drying process. Peanuts as much as 3 kg, 6 kg and 9 kg respectively dried by variations in temperature of 60 °C, 70 °C and 80 °C. Changes of water content and temperature of the material during drying is measured at specific time intervals. Data changes in the water content was analyzed using Newton's Law of Cooling in order to obtain the value of k . While the temperature change data were analyzed using lumped system to get the value of the combined heat transfer coefficient (U). The results showed that the higher the temperature dryer arranged is, it causes the drying rate will be faster and the heat transfer coefficient (U) will be higher. The measured values of the heat transfer coefficient (U) is ranged from 0,28-0,87W / m². ° C. The values constant drying rate constant k in the seeds and skins of peanuts consecutively is ranged from 0,32-0,56 / h and 1,04–1,34 / h, while k decreases in grain and peanut skins in a row ranged from 0,32–1,05 / hour and 0.51 -1.29 / hours. While the drying efficiency is ranged from 4,51-15,75%, which it means if more drying capacity so then drying efficiency will be even higher.

Keynotes: peanuts, rotary dryer, heat transfer, mass transfer, drying efficiency.