

Title           Drying Kinetics of Red Chillies in a Rotary Dryer  
Author         S. Kaleemullah, and R. Kailappan  
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### Abstract

Drying kinetics of red chillies in a rotary dryer was determined within a temperature range of 50–65 °C. The time required to dry 10.5 kg chillies (loaded to 75% of dryer volume) from an initial moisture content of around 330% dry basis (db) to the final moisture content of around 10.5% db was 32, 27, 23 and 20 h at 50, 55, 60 and 65 °C of drying air temperature, respectively. The average capsaicin content and value for the red/green chromaticity coordinate  $a^*$  of dried chillies decreased from 0.54% to 0.28% and 22.83 to 12.31, respectively, as the drying air temperature increased from 50 to 65 °C. The overall performance of the chillies dried at 55 °C was the best, when the quality attributes *viz.*, drying time, capsaicin content and red colour, were considered. Suitable models are identified to predict the moisture ratio of chillies at different drying air temperature of a rotary dryer. The effective moisture diffusivity  $D_{eff}$  of chillies increased from 13.635 to 19.949  $\text{mm}^2 \text{h}^{-1}$  as the drying air temperature of a rotary dryer increased from 50 to 65 °C. The activation energy of diffusion  $E_a$  was calculated as 24.476  $\text{MJ kg mol}^{-1}$ .