

**DRYING KINETICS OF RED CHILLIES UNDER NATURAL
CONVECTIVE SOLAR DRYER AND OPEN SUN DRYING**



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ABSTRACT

The thin layer drying kinetics of chillies at different layers (*Capsicum annuum L*) were experimentally investigated in a natural convective solar dryer and open sun drying. In both drying methods 1 cm, 2 cm and 3 cm layer thicknesses were used. The chillies were dried from an initial moisture content of about 81.23% (w.b) to a moisture content of 7.13% (w.b) and the moisture content of chillies were determined at 3 hours interval. The drying data were fitted with two thin layer drying models namely Page model and Henderson & Pabis model. The values of the drying constants for the models were determined. The performance of these models was investigated by comparing the correlation coefficient (r), chi-square and root mean square error (RMSE) between the observed and predicted moisture ratios.

The dramatic moisture reduction of chillies took place during first day of drying process and the drying process occurred in falling rate period. The effects of drying method and layer thickness of chillies on the drying characteristics and drying time of drying process were determined. The results have shown that an increase in the drying layer thickness causes longer drying times. According to the moisture ratio predicted by both models, Page model and Henderson & Pabis model were suitable for drying chillies with 1 cm layer thickness in convective solar dryer. Both models satisfactorily described the drying curve of chillies with correlation coefficient of 0.814 in Page model and 0.852 in Henderson & Pabis model. Page model was found to be more suitable for open sun drying with the layer thickness of 3 cm as it satisfactorily described the drying curve with correlation coefficient of 0.989.

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