



Kinetics of convective heat and mass transfer coefficient of green chilli during open-sun and greenhouse drying

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ABSTRACT

The convective heat and mass transfer coefficient of green chilli has been investigated during open-sun (natural convection) and greenhouse (forced convection) drying. Experiments on solar drying of green chilli have been conducted after blanching in sodium hydroxide and sodium chloride solutions. The hourly data were recorded for moisture evaporation, temperature of green chilli and relative humidity of surrounding moist air. Heat transfer analysis is mainly dependent on rate of moisture evaporation and temperature of chilli has been performed during drying process. The average convective heat transfer coefficients evaluated for green chilli blanched in sodium hydroxide and sodium chloride solutions were 3.9499 and $2.448 \text{ W m}^{-2} \text{ K}^{-1}$, respectively during open sun drying; and 4.333 and $4.520 \text{ W m}^{-2} \text{ K}^{-1}$, respectively, during greenhouse drying. The convective heat and mass transfer coefficient during drying has been analyzed as the function of moisture content of green chilli and drying time. The logarithmic model has been developed to predict the convective heat and mass transfer coefficient with moisture content.

Keywords: Open sun drying; Greenhouse drying; Convective heat and mass transfer coefficient; Green chilli

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