

Modelling of Vacuum Drying of Cherry Pepper

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Abstract—Vacuum drying characteristics of cherry pepper was studied at different drying temperatures (50, 60 and 70 °C). Experiments were done to dry cherry pepper from initial moisture content of about 400% (dry basis) to 13 – 14.5% (d. b.) at different temperatures at 630 mm Hg vacuum. Time required to dry cherry peppers at 50, 60 and 70 °C plate temperatures were 19 h, 9.75 h and 8 h respectively. Moisture reduction of cherry pepper at various temperatures was modelled using thin-layer models viz. Lewis, Page, Modified Page and Henderson & Pabis model. Based on highest value of coefficient of determination, lowest values of reduce d chi square and root mean square error, Modified Page model was found to be the best fit. Moisture diffusivity increased from 6.27×10^{-10} to 1.9×10^{-9} m²s⁻¹ as plate temperature increased from 50 – 70 °C. Activation energy was estimated to be 50.98 kJ kg mol⁻¹.

Keywords: Cherry pepper; vacuum drying; thin-layer model; effective moisture diffusivity.