

## THIN LAYER DRYING KINETICS OF POTATO MASH

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### ABSTRACT

This study was conducted to investigate the effect of temperature on hot-air drying kinetics of potato (*Solanum tuberosum*) mash and to evaluate the best model predicting the drying kinetics along with the colour changes during mechanical tray drying. Commonly cultivated variety namely Kufri Pukhraj was selected for the study. Potato mash were soaked in 0.2 % Kms solution to reduce the reducing sugar % followed by hot-air drying in single layer mash with thickness vary from 5-7 mm at different temperatures (50–70°C) in a forced convection dryer. In order to estimate and select the appropriate drying model, five different models which are semi theoretical and/or empirical were applied to the experimental data and compared. The goodness of fit was determined using the coefficient of determination ( $R^2$ ), reduced chi square ( $\chi^2$ ), root mean square error (RMSE) and mean bias error (MBE). Among the models proposed, the semi-empirical logarithmic model was found to best explain thin layer drying behavior of the potato mash as compared to the other models over the experimental temperature range. By increasing the drying air temperature, the effective moisture diffusivity values increased from from  $1.43684 \times 10^{-10} \text{ m}^2/\text{sec}$  to  $2.40882 \times 10^{-10} \text{ m}^2/\text{sec}$  as temperature increase from 50°C to 70°C. The relationship between the drying rate constant and drying air temperature was also established. Samples dried at lower temperature had better lightness (higher L values) compared to those dried at higher temperature.

**KEYWORDS:** Kufri Pukhraj, Tray Drying, Moisture Diffusivity, Drying Model, Drying Rate