Kajian Kinetika dan Analisis Eksergi
Pada Proses Pengeringan Emping Melinjo
(Kinetic Study and Exergy Analysis of Melinjo Chips Drying Process)
Ir. Didiek Hermanuadi, M.T.

Hanik Nur Widiyaningsih
Food Engineering Technology Study Program
Department of Agriculture Technology

ABSTRACT

Melinjo (*Gnetum Gnemon* L.) is a high-value economic plant whose seeds are processed into melinjo chips. Drying is a crucial stage in the production process as it significantly affects product quality and shelf life. This study aims to analyze the drying kinetics and exergy efficiency of melinjo chips using a food dehydrator at three different temperatures: 50°C, 60°C, and 70°C. The drying data were evaluated using nine mathematical drying models to determine the best fit based on the coefficient of determination (R^2), sum of squared error (SSE), and root mean square error (RMSE). Results showed that at 50°C, the best-fitting models were Modified Midilli (Tray 1), Wang and Singh (Trays 2, 4, and 5), and Midilli Kucuk (Tray 3). At 60°C, Midilli Kucuk (Tray 1) and Wang and Singh (Trays 2–5) were most suitable. At 70°C, Wang and Singh was the best model for all trays. Exergy efficiency during the drying process ranged from 3.31% to 3.77%. These results indicate that the food dehydrator has low efficiency, the Wang and Singh and Midilli Kucuk models accurately represent the drying kinetics.

Keywords: drying, exergy, food dehydrator, kinetics, melinjo chips.