Model Kinetika Proses Pengeringan Lapis Tipis Pisang Ambon Dengan Osmotik Dehidrator

(*Kinetics Model of Thin Layer Drying Process of Ambon Banana with Osmotic Dehydrator*)

Ir. Didiek Hermanuadi, M.T.

Sri Rahayu Putri Hariyono
Food Engineering Technology Study Program
Department of Agriculture Technology

ABSTRACT

Bananas are one of the tropical fruits that are abundant in Indonesia, including Ambon bananas. Bananas are climacteric fruits that have a high respiration rate, making them prone to spoilage and damage after harvest. This problem can be minimized through drying. The drying process aims to reduce moisture content, thereby extending shelf life. The objective of this study is to determine the appropriate mathematical model for the kinetics of thin-layer drying of Ambon bananas using osmotic dehydration treatment with a dehydrator. Eight mathematical models will be tested using statistical analysis of the coefficient of determination (R2), root mean square (RMSE), sum of squared error (SSE), chi-square (X2), mean absolute error (MAE), mean bias error (MBE), and Akaike information criterion (AIC) to determine the suitable model and identify the effective moisture diffusivity (Deff). The best kinetic models for the thin-layer drying process of Ambon bananas at temperatures of 50°C and 60°C are the Page, Midilli-Kucuk, and Weibull models, as they have R^2 values > 0.998 at 50°C and R^2 = 0.999 at 60°C. The calculated Deff values at 50°C and 60°C ranged from 1.08×10^{-9} to 1.15×10^{-9} m^2/ s and approximately 2.86×10^{-9} to 5.42×10^{-9} m^2/s, indicating an active drying phase with efficient water diffusion. The most effective and representative Deff value is obtained from a stable slope and shows high linearity (R^2 value close to 1).

Key Words: *Drying kinetics, Thin layer, Mathematical model*