

**DRYING KINETICS OF GARLIC USING A FOOD DEHYDRATOR.
(KINETIKA PROSES PENGERINGAN BAWANG PUTIH
MENGUNAKAN *FOOD DEHYDRATOR*).**

Ir. Didiek Hermanuadi, M.T.

Muhammad Nur Khoiruddin Arifien
Food Engineering Technology Study Program
Department of Agricultural Technology
Email : arifienmuhammad0@gmail.com

ABSTRACT

*Garlic (*Allium sativum*) is a strategic spice commodity susceptible to post-harvest spoilage due to its high initial moisture content (57–61% wet basis). The use of a food dehydrator offers a relevant drying technology alternative, providing consistent temperature control and superior hygiene. This study aimed to identify the drying kinetics of garlic slices (± 2 mm thick) in a food dehydrator at 50°C and 60°C and to determine the most accurate thin-layer kinetic model. Testing involved fitting moisture ratio (MR) reduction data over time to six thin-layer models, with reliability evaluated using statistical indicators: R^2 , RMSE, MAE, and χ^2 . Results indicated that the drying process at both temperatures was entirely dominated by the falling-rate period. Increasing the temperature from 50°C to 60°C significantly accelerated the time required to reach constant weight reducing it from 56–62 minutes to 48–52 minutes and increased the effective moisture diffusivity ($Deff$) from $5.066 \times 10^{-10} \text{ m}^2/\text{s}$ to $8.106 \times 10^{-10} \text{ m}^2/\text{s}$. Model evaluation revealed that the Midilli-Küçük model provided the best fit at both temperatures, with an R^2 value of 0.996. In conclusion, drying garlic at 60°C is more time-efficient, and both the Midilli-Küçük and Page models are highly recommended for predicting drying duration to optimize production for MSMEs.*

Keywords: *garlic, food dehydrator, drying kinetics, thin-layer model, moisture ratio.*