

Analisis Pengaruh *Steam Blanching* terhadap Kinetika Pengeringan dan Karakteristik Mutu Bawang Prei (*Allium porrum* L.) Menggunakan *Microwave*
*Analysis of the Effect of Steam Blanching on the Drying Kinetics and Quality Characteristics of Leeks (*Allium porrum* L.) Using a Microwave*
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ABSTRAK

Bawang prei (*Allium porrum* L.) merupakan sayuran berkadar air tinggi yang mudah rusak pascapanen sehingga memerlukan pengeringan untuk memperpanjang umur simpannya. Penelitian ini bertujuan menganalisis pengaruh lama *steam blanching* dan level daya *microwave* terhadap kinetika pengeringan, menentukan model matematika pengeringan yang paling sesuai, mengevaluasi karakteristik mutu bawang prei kering, serta menentukan kombinasi perlakuan terbaik. Penelitian menggunakan Rancangan Acak Lengkap (RAL) faktorial dua faktor dengan tiga ulangan, yaitu lama *steam blanching* (0, 2, 4, dan 6 menit) dan level daya *microwave* (low, medium, dan high). Parameter kinetika meliputi kadar air relatif, *moisture ratio* (MR), laju pengeringan, dan *effective moisture diffusivity* (Deff), sedangkan karakteristik mutu meliputi kadar air akhir, warna, tekstur, rasio rehidrasi, dan uji hedonik. Data MR dimodelkan dengan model Lewis, Page, Modified Page, Two-Term, dan Midilli-Kucuk, dianalisis menggunakan ANOVA dua arah pada taraf nyata 5%, dan perlakuan terbaik ditentukan dengan indeks efektivitas De Garmo. Hasil penelitian menunjukkan peningkatan daya *microwave* mempersingkat waktu pengeringan menjadi 11,67–23,67 menit dan meningkatkan nilai Deff ($2,5 \times 10^{-9}$ – $1,29 \times 10^{-8}$ m²/s), sedangkan *steam blanching* berpengaruh nyata terhadap waktu pengeringan, rasio rehidrasi, dan atribut sensori. Model Midilli-Kucuk paling sesuai menggambarkan kinetika pengeringan (R² 0,9966; SSE 0,0065; RMSE 0,0138). Kombinasi *steam blanching* 4 menit dengan daya *microwave* high (A2B3) direkomendasikan sebagai perlakuan terbaik karena menyeimbangkan efisiensi pengeringan dan mutu produk.

Kata Kunci : bawang prei, *steam blanching*, pengeringan *microwave*, kinetika pengeringan, Midilli-Kucuk.

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ABSTRACT

*Leeks (*Allium porrum* L.) is a high-moisture vegetable that deteriorates rapidly after harvest, so drying is required to extend its shelf life. This study analyzed the effects of steam blanching duration and microwave power level on drying kinetics, determined the most suitable drying model, evaluated the quality of dried leek, and identified the best treatment combination. A two-factor Completely Randomized Design (CRD) with three replications was applied, consisting of steam blanching duration (0, 2, 4, and 6 min) and microwave power level (low, medium, and high). Kinetic parameters were relative moisture content, moisture ratio (MR), drying rate, and effective moisture diffusivity (Deff); quality parameters were final moisture content, color, texture, rehydration ratio, and hedonic acceptance. MR data were fitted to the Lewis, Page, Modified Page, Two-Term, and Midilli-Kucuk models, analyzed by two-way ANOVA at a 5% significance level, with the best treatment determined by the De Garmo effectiveness index. Increasing microwave power shortened the drying time to 11.67–23.67 min and increased Deff (2.5×10^{-9} – $1.29 \times 10^{-8} \text{ m}^2/\text{s}$), whereas steam blanching significantly affected drying time, rehydration ratio, and sensory attributes. The Midilli-Kucuk model best described the drying kinetics (R^2 0.9966; SSE 0.0065; RMSE 0.0138). The combination of 4 min steam blanching and high microwave power (A2B3) is recommended as the best treatment, balancing drying efficiency and product quality.*

Kata kunci: *drying kinetics, microwave drying, Midilli-Kucuk, steam blanching, leeks.*