

Title Dehydration Characteristics of Kastamonu Garlic Slices
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Citation Biosystems Engineering Volume 92, Issue 2, October 2005, Pages 207-215
Keyword garlic; dehydration

Abstract

This study was undertaken to investigate the dehydration characteristics of the Kastamonu garlic (*Allium sativum* L.) in a convective hot-air dryer. The dehydration characteristics of garlic slices were examined at air temperatures of 40, 50 and 60 °C and sample thicknesses of 3 and 5 mm. During the dehydration experiments, air velocity was held stable at 0.8 m s⁻¹. The effects of air temperature and sample thickness on the dehydration characteristics and quality parameters of the dehydrated garlic slices were determined. The transport of water during dehydration was described by Fick's equation and the effective diffusivity was between 195 and 335 μm² s⁻¹. The effect of temperature on the effective diffusivity was described by the Arrhenius-type relationship. The activation energy was found as 23.48 kJ mol⁻¹. The experimental dehydration data of garlic slices obtained were fitted to the four well-known semi-theoretical drying models, *i.e.* the Henderson and Pabis, two-term, Lewis and Page models. The accuracies of the models were measured using the coefficient of determination, mean relative percent deviation, root mean square error and reduced mean square of the deviation. All four models are acceptable for describing dehydration characteristics of garlic slices. However, the two-term model proved the most precise for predicting dehydration characteristics based on statistical analysis. Rehydration capacity was found to be in the range between 2.37 and 2.84. In the experiments, samples with a lighter colour were obtained at lower air temperatures.