

عنوان مقاله:

Mathematical Modeling of Thin Layer Drying of Pomegranate (*Punica granatum* L.) Arils: Various Drying Methods

محل انتشار:

مجله علوم و فناوری کشاورزی، دوره 19، شماره 7 (سال: 1396)

تعداد صفحات اصل مقاله: 11

نویسندگان:

Z. Mazandarani - Islamic Azad University, Azadshahr Branch, Azadshahr, Islamic Republic of Iran

N. Aghajani - Department of Food Science and Technology, Bahar Faculty of Food Science and Technology, Bu-Ali Sina University, Bahar City, Hamedan, Islamic Republic of Iran

A. Daraei Garmakhany - Department of Food Science and Technology, Toyserkan Faculty of Industrial Engineering, Bu-Ali Sina University, Beheshti Ave., Bahri Esfahani Ave., Toyserkan, Hamadan, Islamic Republic of Iran

Mohammadjafar Baniardalan - Department of language & linguistics, Bu-Ali Sina University, Hamedan, Iran

M. Nouri - Department of Linguistics, Humanities Faculty, Bu -Ali Sina University, Hamedan, Islamic Republic of Iran

خلاصه مقاله:

For years, sun and hot air drying have been considered as traditional drying methods. Today, using microwave is one the newest methods of drying. Iran is one of the main producers of pomegranate fruit in the world. To manufacture better product, drying needs to be handled in controlled and optimized process, therefore investigation of process condition kinetic is an obligation. In this study, thin layer drying behavior of pomegranate arils using microwave drier at 4 power levels (180, 360, 540 and 720W), oven drier at 4 temperature levels (45, 55, 65 and 75°C) and sun drying was studied. Page, Henderson and Pabis, Midilli et al., Newton, Logarithmic and Two-Term models were compared according to their Root Mean Square error (RMSE), Chi-square (χ^2), Mean Bias Error (MBE) and correlation coefficient (R^2). The results of the studied models indicated that Midilli et al., model exhibited the best fit to the data obtained for oven, microwave and sun drying. Increasing the oven drier temperature and the microwave drier power lead to an increase in the drying rate. Dried samples at 75°C exhibited the highest $R^2 = 0.9998$, and the least RMSE and χ^2 , 0.2059 and 0.5576 respectively in comparison with other samples. While dried samples by microwave, 720W, showed the highest $R^2 = 0.9998$ and the least RMSE and χ^2 were 0.1894 and 0.4203, respectively in comparison with other samples. Sun dried samples had the highest R^2 in Midilli Model, the least RMSE and χ^2 were 0.338 and 0.7059 respectively.

کلمات کلیدی:

Drying modeling, Microwave drier, Oven drier, Pomegranate arils, Sun drying

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