

عنوان مقاله:

Analysis of Shrinkage Phenomena of whole fig (Ficus carica, cv. Siah) during Convective Dehydration

محل انتشار:

نخستین کنفرانس خاورمیانه ای خشک کردن (سال: 1390)

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خلاصه مقاله:

Shrinkage during drying plays an important role in determining the quality of the dried products. The fruit behavior must be characterized not only for evaluating the final quality but also to use in process and equipment simulation models. No literature reports were found on the fig behavior. The aim of this work is to study experimentally the volume and surface area changes during the drying of whole black figs and to analyze if existing models are adequate for prediction. Whole black fig fruits were dehydrated in heated air at temperature of 45, 50, 60, 70 and 75 °C and air velocities of 0.8, 1, 1.5, 2, and 2.5 m/s in a dryer. The effect of loss of moisture content from the fruits on the linear dimensions, size and volumetric ratio were studied. The volume changes of individual fruits were determined by means of geometric measurements by Vernier caliper averaging two main axes. Surface area changes were evaluated from geometric measurements and by calculation the approximate surface area of the equivalent sphere. A logarithmic relationship was found between the dimensionless volume change and the moisture content of the partially dehydrated fruits. Moreover the volume was fitted well with the linear proposed model. The experimental data was also validated with some models proposed by different authors, to predict the change in relative dimensions. It was observed that the shrinkage has occurred in relation with the amount of removal of moisture from the fruit. The area depended on moisture according to a third-grade polynomial. The results indicated that both volume and area changes are independent of operating conditions in the range tested and related only to the moisture content of the partially dehydrated fruit.

کلمات کلیدی:

Fig (Ficus carica); shrinkage; geometric measurements; volume and superficial area changes

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