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Czech J. Food Sci.

**Sirousazar M.,
Mohammadi-Doust A.,**

Mathematical investigation of the effects of slicing on the osmotic dehydration of sphere and cylinder shaped fruits

Czech J. Food Sci., 27 (2009): 95-101

The dehydration kinetics of the fruits with special geometries, i.e. spherical and cylindrical (e.g. apple, peach, banana, pineapple, etc.), were studied based on mathematical methods. The influence of the size reduction (slicing) of these fruits into smaller rings was also investigated. The mathematical modelling was performed based on the Fick's second law. The results showed that increasing the value of the water diffusion coefficient in fruit (for instance, via increasing the process temperature) promotes faster water migration from the fruit. Mathematical modelling also showed that

the characteristic length of fruits (radius) is in an inverse relation to the dehydration kinetics. Comparing the results obtained with both the sphere- and cylinder-shaped fruits revealed that slicing the fruit into more thin rings makes a better condition for operating the osmotic dehydration process with a higher efficiency and a shorter duration.

Keywords:

osmotic dehydration; slicing; mass transfer; mathematical modelling

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