Title Study of the drying kinetics of solar-dried pears

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Abstract

In this study, the drying rates of solar-dried pears were investigated for fruits of the varieties *Amêndoa*, *Amorim*, *Carapinheira Branca* and *S. Bartolomeu*, all originating from Portugal. From the results it was possible to conclude that the varieties showed a similar drying behaviour, characterised by the absence of the constant drying-rate period and by a falling-rate period involving two different stages, according to the degree of moisture removal.

The experimental data for the variations in water content over time was fitted to two different empirical models with the better performance coming from the sigmoid function. The data for the curves of drying rate versus moisture content were fitted to one model, with good results. The variations of the drying rate with time were fitted to two models with the first-order kinetic function fitting the experimental data better than a second-degree polynomial.

The experimental data were used to predict effective diffusivity according to Fick's law with the values of diffusivity obtained ranging from 9.756e−10 $m^2 s^{-1}$ for the variety *S. Bartolomeu* to 1.160e−9 $m^2 s^{-1}$ for pears of the variety *Amorim*.