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Impact of size and shape of fresh-cut fruit on the drying time and fruit quality

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Abstract

Insights are provided on how fruit size and shape affect the drying time and fruit quality loss, by simulating the convective drying process for cubic, rectangular, circular and half-circular fruit slices. Combined hygrothermal-quality modelling of the drying process unveiled, quantitatively, to which extent smaller samples dry faster and retain their quality better. For rectangular pieces with a large aspect ratio, so called fruit sticks, the drying time did not change anymore for increasing length. The compactness is proposed as a parameter to compare the drying process of fruits with different sizes and shapes with one another. The compactness is the ratio of the fruit volume to the surface area exposed to the environment. A good correlation function was found of both drying time and quality loss with the fruit compactness, where fruit with a lower compactness clearly dry faster. Such correlations can aid in estimating a-priori the drying time for a fruit of a certain size and shape.

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