Title Ultrasonic study of the complete dehydration process of orange peel

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Abstract

The use of ultrasonic measurements as an alternative technique to control the natural dehydration process of the orange peel is assessed by means of studying a sample of 140 fully hydrous "Navelina" oranges at ambient conditions. Velocity and absorption coefficients of ultrasound waves through the orange peel were measured together with physico-mechanical properties (weight loss, oil-gland break stress and thickness of the peel) for a period of 84 days, i.e. as far as the complete dehydration state of the fruit. In this study, the time dependence of the properties and the correlations between them are shown. Finally, an absolute scale of the hydration state of the orange has been established using ultrasonic properties that could be measured in a non-destructive way. These measurements can also be used to obtain information about the peel thickness.