


Evaluation of ascorbic acid impregnation by ultrasound-assisted osmotic dehydration in plantain

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Abstract

The objective of this study was to evaluate the impregnation of ascorbic acid (AA) by ultrasound (US)-assisted osmotic dehydration (OD). A 2⁵ factorial design was used. The highest water loss (WL) of 42% was obtained with the combined use of OD+US+AA. The effective diffusivities of water (ED_w) and solids (ED_s) were increased when OD was employed with a temperature of 60°C, a sucrose concentration of 60%, and a simultaneous application of US+AA treatments in plantain thin slices. The use of OD+US favored AA impregnation; in the treatment with 45% sucrose at 40°C, AA increased from 18% to 42%. Tonality did not change significantly in the OD+US+AA treatments at 40°C. However, except for the gumminess, significant differences from the control were observed in the texture profile analysis (TPA). In microstructure analyses, it was observed that by applying OD+US+AA, the cellular structure was not altered. Applying the specified operational conditions for OD, the AA impregnation pretreatments, and US, a plantain dry food could be obtained without reducing the specified quality parameters in this study.

Novelty impact statement

Applying the ultrasound pretreatment before osmotic dehydration favors the impregnation of ascorbic acid in the plantain, preserving its original physical and sensory characteristics,