

Title Temperature effect on sugar concentration and moisture profiles during osmotic dehydration of chestnut fruits

Authors F. Chenlo, R. Moreira and C. Fernández-Herrero

Citation ISHS Acta Horticulturae 693: 103-110. 2005.

Keywords *Castanea sativa* Mill., moisture, impregnation, sucrose, glucose, HPLC, process quality

Abstract

Osmotic dehydration of chestnut (*Castanea sativa* Mill.) is used to obtain a better quality of the final product, reducing at the same time the high energy consumption involved in other methods of conservation. It presents the advantage of using lower temperatures and thus it avoids thermal deterioration of the cellular tissue. The method used in this work is based on the immersion of whole chestnuts (two cuts were previously made, creating two parallel plane faces in order to bring the parenchymatic tissue directly into contact with the osmotic medium, and the rest of the chestnut remained with its external skin on the surface) into concentrated hypertonic solutions containing sucrose (50% or 60% (w/w)) or glucose (50% or 56.5% (w/w)). These solutions have higher osmotic pressure and lower water activity than chestnut cellular tissue, which also represents the semipermeable membrane needed for the osmotic interchange. After certain periods of time, the samples were removed from the solutions, blotted, and, to obtain the profiles, cut into slabs parallel to the stem edge with 0.004 m of thickness (six samples from each chestnut, three pairs similar symmetrically). Sugar concentration values were determined by HPLC for each slab. Moisture contents were also determined in this way using a vacuum oven and all this work was repeated at two temperatures (25 and 45°C). Experimental data showed that higher temperatures of operation produced samples with higher sugar concentration values, and also these samples reached their final concentration value in a quicker way.