

Post-harvest conservation of chestnut (cv. *Martaínha*), comparison of two controlled atmospheres during 60 days.

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According to Instituto Nacional de Estatística, during 2021, Portugal produced 38 thousand tons of chestnuts. The northern region of mainland Portugal is the largest concentration of chestnut trees is found and accounts for about 88% of the volume of national production. Portugal is the seventh-largest producer of chestnuts globally, although this value only represents approximately 2% of world production¹.

The quality parameters of chestnut are defined by colour, flavour and texture; however, this optimal status is only maintained for a short period of time. Chestnuts have a high moisture value that is quickly lost during conservation compared to other nuts. The significant factors in post-harvest depreciation are moulding or rotting caused by larval development of insects on the tree and later by fungi. Infections often start in the larval galleries of insects by the contact of the fruits with the ground before picking².

According to Cecchini (2011)³ the best storage conditions are -1/-2°C and 90% relative humidity but the range of CO₂ and O₂ in a controlled atmosphere are yet to be optimized.

This study aims to increase the storage time of chestnuts. All of them were selected by immersion, and those that floated were rejected. For the control of the evolution, sixty chestnuts for each treatment were marked (numbered), weighed, and colour evaluated. Half of the fruits were submitted to a pre-treatment for seven days with CO₂ (40%), and another group did not undergo any pre-treatment. The chestnuts were conserved in two types of controlled atmospheres, a first with CO₂ (5%) and O₂ (3%) and a second with CO₂ (15%) and O₂ (3%). The numbered chestnuts were evaluated for each combination in weight, colour, texture, TSS, and sensory analysis.

According to the results obtained, we concluded that there are losses over 60 days in terms of quality, reaching a maximum difference of 10,5% in texture and 18,2% in weight loss. Regarding the sensory analysis, the chestnut maintained acceptability throughout the whole study.

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