

Title Vitamin C and chlorophylls retention on minimally fresh processed red chard baby leaves packed in non-conventional modified atmosphere

Author Alejandro Tomás-Callejas, María Boluda, Pedro A. Robles, Francisco Artés and Francisco Artés-Hernández

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Abstract

The current lifestyle with scarce time to prepare a convenient meal and to have a balanced diet has created a new kind of consumer who demands fresh, healthy and ready-to-eat products. Fruit and vegetables are commodities rich in phytochemicals such as phenolic compounds, antioxidants and vitamins. Several epidemiological studies have reported the benefits of a healthy diet rich in fruit and vegetables in decreasing the risks of cardiovascular diseases and some types of cancer. Minimally fresh processed (MFP) vegetables are ready-to-eat products, which are produced and commercialized under chilling and modified atmosphere packaging (MAP) to maintain their living fresh state and nutritional and sensory quality, ensuring food safety. The aim of this work was to know the effects of non-conventional active MAP on nutritional and sensory quality of MFP red chard baby leaves. The raw material was prewashed for 1 min with tap water at 5°C and washed with chlorine (Cl: 100 ppm at pH 6.5) solution for 2 min. After washing, the red chard was spin dried to eliminate water excess, placed in polypropylene trays and stored in a passive MAP (control) or in two active MAP initially composed by 100 kPa He or 100 kPa O₂. During storage at 5°C up to 8 days the following quality parameters were monitored: gas composition within packages, surface color, total chlorophyll (a + b), vitamin C content and sensory evaluation. Total chlorophyll and vitamin C content decreased throughout storage in all treatments. After 8 days, the high He atmosphere treatment showed a beneficial effect in retaining total chlorophyll ($468 \pm 35 \mu\text{g Chl g}^{-1}$ vegetable tissue) and vitamin C content ($79,89 \pm 6,63 \text{ mg } 100 \text{ g}^{-1}$ f.w.) higher than in control ($373 \pm 13 \mu\text{g Chl g}^{-1}$ and $47,21 \pm 0,87 \text{ mg } 100 \text{ g}^{-1}$ f.w. respectively). Microbial load remained below the limits established for safety consumption, and sensory evaluation determined the shelf life in 8 days at SOC. As conclusion, initial 100 kPa He atmosphere could be considered as a innovative treatment for keeping overall quality of MFP red chard baby leaves.