

# Evaluation of the shelf life of minimally processed lettuce packed in modified atmosphere packaging treated with calcium lactate and heat shock, cysteine and ascorbic acid and sodium hypochlorite

Akhbariye Leila, Zamindar Nafiseh, Nasiri Samira, Paidari Saeed, Goli Mohammad and Abbasi Hajar

Journal of Food Measurement and Characterization 15: 4438–4445. (2021)

---

## Abstract

Modified atmosphere packaging and related technologies are increasingly used to extend shelf-life of fresh products. This paper covers the effect of such techniques on increasing shelf life. Salad-cut lettuce was washed in different solutions for a period of 1 min. Then, salad-cut lettuce was packed in modified atmosphere (3–5% CO<sub>2</sub>, 3–5% O<sub>2</sub>, 97–95% N<sub>2</sub>) and stored at 4 °C for 12 days. Quality indicators of packaged lettuce including color, texture, sensory properties, total phenol content and antioxidant activity were analyzed at 1, 3, 6, 9 and 12 days of storage. This study showed that combination of sodium hypochlorite and ascorbic acid was the best treatment to maintain most of the qualitative indicators of lettuce during storage at 4 °C ( $p < 0.05$ ). Ascorbic acid and cysteine caused synergistic effect in preventing oxidation. Treatments containing calcium lactate and heat shock, caused better crispiness till the 9th day of storage. According to the results of current study, application of MAP alongside implementation of food grade chemicals showed to be remarkably effective in increasing the shelf life of lettuce.