

**Title** The effect of active MA packaging on the browning and microbial growth of fresh-cut head lettuce

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### **Abstract**

This study investigated the gas concentration required in active MA packaging of fresh-cut lettuce to minimize quality changes and to inhibit microbial growth of fresh-cut lettuce. Each sample was packaged in a 60 mm Nylone/EVOH/polyolephin film bag with air (passive MA) or active MA ( $N_2:CO_2:O_2 = 93:5:2, 88:10:2, 83:15:2$ ), and was then stored at 10°C. Browning increased rapidly when leaves were kept in air, but active MA packaging inhibited of browning. Total phenolic content was greater in leaves in active MA packing than in air treatment. Ethanol content increased as the  $CO_2$  concentration in the film bag increased. Sensory testing indicated that marketability for lettuce packaging in air expired after 3 days of storage due to browning, but as sustained for up to 9 days in active MA packaging. Marketability of fresh cut lettuce in 10%  $CO_2$ : 2%  $O_2$  active MA was the best of all treatments. Vitamin C contents decreased slightly during storage, but no significant differences occurred among the treatments. The test result from the experiment with five classified microbe groups proved that any treatment containing more than 10%  $CO_2$  had an inhibitory effect on growth of fluorescent and nonfluorescant white mucoid bacterium, although no significant difference was detected for total number of microorganisms. Active MA packaging inhibited browning and growth of some microbes in fresh-cut lettuce, and the active package treatment of 10%  $CO_2$  : 2%  $O_2$  maintained the highest marketability for up to 9 days at 10°C