Title Combined effect of active coating and MAP to prolong the shelf life of minimally processed kiwifruit (*Actinidia deliciosa* cv. Hayward)

Author Marianna Mastromatteo, Marcella Mastromatteo, Amalia Conte and Matteo Alessandro Del Nobile

Citation Food Research International, Volume 44, Issue 5, June 2011, Pages 1224-1230

Keywords Kiwifruit; Minimally processing; Antimicrobial compounds; MAP

Abstract

In this work different strategies aimed to prolong the shelf life of minimally processed kiwifruits are presented. First, the effectiveness of several treatments in delaying the quality loss of the investigated produce packaged under passive MAP was addressed; afterward, the treatments that have shown the best performances were used to assess the effectiveness of active MAP in prolonging the packaged produce shelf life. Different treatments such as coating with sodium alginate in combination with dipping into an hydro-alcoholic solution (Coat-dipp-EtOH), dipping into an hydro-alcoholic solution (Dipp-EtOH) and coating with sodium alginate containing grape fruit seed extract solution (Coat-GFSE) were investigated. The untreated samples were used as control. Headspace gas concentrations, pH, mass loss, sensory quality and viable cell load of main spoilage microorganisms were monitored in both the experimental steps. Results suggested that the best performances under passive MAP were recorded with the coating treatments, justifying the choice of this treatment in the second step. In fact, the coatings were more effective in delaying dehydration and slowing down respiratory activity of minimally processed kiwifruits both in passive and active MAP. The combination of active compounds with alginate-based coating delayed the microbial growth whereas the sole dipping treatment was inefficient. In particular, a viability loss of the mesophilic and psychrotrophic bacteria of about 2 log cycle for the coated samples with respect to control and dipped samples was found. However, as the microbial load was always found below the threshold value imposed by law, the sensorial acceptability limit of the packaged fresh-cut produce coincided with its shelf life. Alginate-based coating reduced respiratory activity, as well as sensory decay, increasing the sensorial acceptability limit of the samples packaged under passive MAP up to 12 days with respect to the control (8 days). For the samples packaged under active MAP, the coating treatments reduced the excessive dehydration of the produce due to the MAP conditions. In fact, when the active MAP was used alone a very short shelf life of the uncoated samples occurred (2.7 days). Whereas, the combined use of active MAP and coating treatments prolonged the produce shelf life up to 13 days.