

Title Shelf life of ready to use peeled shrimps as affected by thymol essential oil and modified atmosphere packaging

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Abstract

In this work the influence of different packaging strategies on the shelf life of ready to use peeled shrimps was investigated. First, the effectiveness of the coating (Coat) and the active coating loaded with different concentrations of thymol (Coat-500, Coat-1000, and Coat-1500) on the quality loss of the investigated food product packaged in air was addressed; afterwards, the thymol concentration that had shown the best performance was used in combination with MAP (5% O₂; 95% CO₂). Microbial cell load of main spoilage microorganisms, pH and sensorial quality were monitored during the refrigerated storage. Results of the first step suggested that the sole coating did not affect the microbial growth. A slight antimicrobial effect was obtained when the coating was loaded with thymol and a concentration dependence was also observed. Moreover, the active coating was effective in minimizing the sensory quality loss of the investigated product, it was particularly true at the lowest thymol concentration. In the second step, the thymol concentration (1000 ppm) that showed the strike balance between microbial and sensorial quality was chosen in combination with MAP. As expected, MAP significantly affected the growth of the mesophilic bacteria. In particular, a cell load reduction of about 2 log cycle for the samples under MAP respect to that in air was obtained. Moreover, the MAP packaging inhibited the growth of the *Pseudomonas* spp. and hydrogen sulphide-producing bacteria. The MAP alone was not able to improve the shelf life of the uncoated samples. In fact, no significant difference between the control samples packaged in air and MAP was observed. Whilst, the use of coating under MAP condition prolonged the shelf life of about 6 days with respect to the same samples packaged in air. Moreover, when the MAP was used in combination with thymol, a further shelf life prolongation with respect to the samples packaged in air was observed. In particular, a shelf life of about 14 days for the active coating under MAP compared to the same samples in air (5 days) was obtained.