

Extended Shelf Life of Chicken Meat Using Carboxymethyl Cellulose Coated Polypropylene Films Containing Zataria multiflora Essential Oil

Authors : Z. Honarvar, M. Farhoodi, M. R. Khani, S. Shojaee-Aliabadi

Abstract : The purpose of the present study was to evaluate carboxymethyl cellulose (CMC) coated polypropylene (PP) films containing *Zataria multiflora* (ZEO) essential oils (4%) as an antimicrobial packaging for chicken breast stored at 4 °C. To increase PP film hydrophilicity, it was treated by atmospheric cold plasma prior to coating by CMC. Then, different films including PP, PP/CMC, PP/CMC containing 4% of ZEO were used for the chicken meat packaging in vapor phase. Total viable count and pseudomonads population and oxidative (TBA) changes of the chicken breast were analyzed during shelf life. Results showed that the shelf life of chicken meat kept in films containing ZEO improved from three to nine days compared to the control sample without any direct contact with the film. Study of oxygen barrier properties of bilayer film without essential oils ($0.096 \text{ cm}^3/\mu\text{m/m}^2 \text{ d kPa}$) in comparison with PP film ($416 \text{ cm}^3/\mu\text{m/m}^2 \text{ d kPa}$) shows that coating of PP with CMC significantly reduces oxygen permeation of the obtained packaging ($P < 0.05$), which reduced aerobic bacteria growth. Chemical composition of ZEO was also evaluated by gas chromatography-mass spectrometry (GC-MS), and this shows that thymol was the main antimicrobial and antioxidant component of the essential oil. The results revealed that PP/CMC containing ZEO has good potential for application as active food packaging in indirect contact which would also improve sensory properties of product.

Keywords : shelf life, chicken breast, polypropylene, carboxymethyl cellulose, essential oil

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