EFFECT OF NATURAL ANTIOXIDANTS ATTACHED TO THE PACKAGING ON THE SHELF LIFE OF COOKED HAM

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I. OBJECTIVES

Cooked ham is a meat product that is susceptible to oxidation. There is a deterioration in color, texture, and nutritional value that generates bad odors and decreases acceptability through this process. One of the main objectives of the meat industry is to prevent oxidation to increase the shelf life of the final product. In this regard, the use of films and coatings with natural extracts as packaging has increased in recent years. Therefore, the aim of this work was to evaluate the effect of packaging with natural antioxidants (Eugenol [Eu], Thymol [Th], and Carvacrol [Ca]) on physicochemical parameters during 21 d on cooked ham.

II. MATERIALS AND METHODS

The hams were deboned and cleaned of connective tissue in order to facilitate the injection of 2% brine solution. Then, the pieces were injected, macerated, cooked (75°C/45 min), and refrigerated. Cooked ham pieces were cut in slices and packaged in polyethylene-based packaging, in which 3 different kinds of terpene natural antioxidants (0.9% Eu, 0.9% Th, 0.9% Ca) have been incorporated, antioxidants previously absorbed by an inorganic compound with retention capacity. At the same time, a control sample without antioxidants was analyzed. All batches were packaged under a protective atmosphere (70% N_2/30% CO_2) supplied by PRAXAIR (Madrid, Spain). The pH values (digital portable pH meter equipped with a penetration probe), color parameters (portable colorimeter to estimate cooked ham color in the CIELAB space), chemical composition, and textural parameters were determined. An analysis of variance using the general linear model was performed for all variables considered in the study, and the least-squares means were separated using Duncan's test ($P < 0.05$) using the IBM-SPSS Statistics 23.0 program (IBM Corp., Armonk, NY).

III. RESULTS

Chemical composition of samples was determined on day 0, showing mean values of 79.55% moisture, 2.31% fat, 12.36% protein, and 3.97% ashes. The pH values ranged from 5.92 to 6.48, which are normal values for cooked ham. Regarding color parameters, lightness showed a decrease ($P < 0.001$) in Eu batch, whereas Th and Ca treatments displayed an increase over time. Regarding a^* values, Eu samples showed the highest redness (7.21; $P < 0.05$) at the end of the storage period. Finally, texture parameters also did not show significant differences among treatments probably due to high variability on samples of sliced cooked ham. Hardness values ranged between 28.69 N and 20.49 N, for C and Ca samples, respectively, after 21 d of storage.

IV. CONCLUSION

The use of these active packaging did not show significant differences among treatments for chemical composition, pH value, and hardness. However, Eu treatment presented the highest *a** values after 21 d of storage. Further studies need to be done in order to test a longer period as well as other concentrations of the extracts.

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