

P-01-14**Sensorial acceptance of cooked ham stored in active packaging (#301)**Sol Zamuz, Roberto Bermúdez, Laura Cutillas-Barreiro, Ruben Dominguez, Laura Purriños, José Manuel Lorenzo, [Daniel Franco](#)

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Introduction

During the storage, the lipid oxidation provokes changes in flavor, texture and color of foods because of degradation of pigments, lipids and proteins [1]. One of the main concerns of the meat industry is preserving food to extend its shelf life, whilst ensuring its safety and quality. In this sense, the use of antioxidants is one of the major strategies to prevent the detrimental effects of oxidation [2]. In the recent years, the interest in natural antioxidant has increased due to the use of synthetic antioxidant is being restricted in different countries and consumers prefer natural ingredients. The incorporation of natural antioxidants can be directly on meat product or incorporated into the packaging material. In this regard, the incorporation of natural antioxidants in polyethylene-based films has proved to reduce the oxidation in meat products [3, 4]. The aim of this study was to evaluate the color, the discoloration at surface and the odour attributes during shelf life of cooked ham stored in active packaging with green tea extract and oregano essential oil.

Methods

Fresh pieces of pork legs were purchased at local market. The whole pieces were deboned and cleaned of connective tissue in order to facilitate the brine penetration. Then pork legs were injected with 2% brine solution containing sodium chloride (10.8%), dextrose (3%), polyphosphates (1.8%), carrageenan (1.8%), ascorbic acid (0.6%), ham aroma (0.6%), sodium nitrite (0.3%) and color additive (0.05%). Injection was performed using an injector machine at 2-4 bars and 7 °C. After the injection process a short period of time was necessary in order to obtain an adequate brine homogenization inside the piece. Afterward, a maceration process for 5 hours (temperature controlled of 5 °C and cycles of movement each 20 min) was carried out. Then, ham pieces were packed on vacuum plastic bags and cooked in a cooking kettle until reach an internal temperature of 75 °C. Finally, after the cooking stage, cooked ham was refrigerated until reach an internal temperature of 6 °C for 12 hours.

Cooked ham pieces were cut in slices and stored in polystyrene tray. Samples were randomly divided into three batches. The first batch (control) was packaged without active film; the second batch was packaged with active film contained green extract (1%) and the third batch was packaged with active film contained oregano essential oil (2%). The active packaging was prepared by ARTIBAL, S.A. (Sabiñánigo, Spain) under European Patent EP 00380302.4. All cooked ham slices were packaged using a packaging machine with a gas mixture of 70% N₂ /30%CO₂ supplied by PRAXAIR (Madrid, Spain).

To determine how the panelists liked or disliked the cooked ham stored in the different active trays during shelf life the acceptance test was carried out using a hedonic scale structured in 5-point (1 = excellent and 5 = not acceptable). The trained panelists were asked to evaluate the color, the discoloration at surface and the odour. The sensory sessions were carried out at 0, 7, 14 and 21 days of storage. XLSTAT for Windows version 2018 (Addinsoft, Paris, France) was used to analyze data.

Results

Figure 1 shows the average acceptance value scores for sensorial attributes given by panelists for cooked hams stored in the different active packaging during their shelf life. For the three studied sensory attributes, all scores were obtained between 1 and 3 on the hedonic scale used, ranged between the category regions "excellent" and "acceptable", respectively. The cooked ham stored with active film contained oregano essential oil (batch 3) obtained the best acceptance scores for the three studied sensorial attributes. Specifically, in terms of color and discoloration at surface, it should be noted that the highest acceptances scores were provided by batch 3, which could be suggest a higher antioxidant capacity of compounds from essential oregano for protecting color loss in the product, with respect to batch 2 containing green tea extract.

Focusing on the last day of the shelf life study, the ANOVA results (Figure 2) showed significant differences (P<0.01) among the studied batches for color attribute. The color and odour acceptance scores showed in control batch were close to limit value of acceptance.

Conclusion

The packaging composed of oregano oil presented greater ability to maintain the color, avoid the discoloration at surface and improve the odour acceptance of cooked ham than those that contained green tea extract.

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Notes

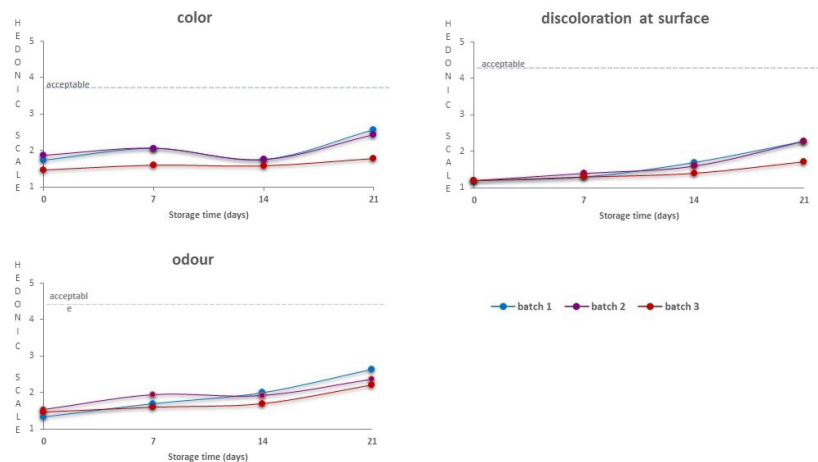


Figure 1. Average sensory scores attributed by the panelist for cooked hams during storage time. Five-point hedonic scale used: 1 = excellent; 2 = good; 3 = acceptable; 4 = hardly acceptable; 5 = not acceptable.

References

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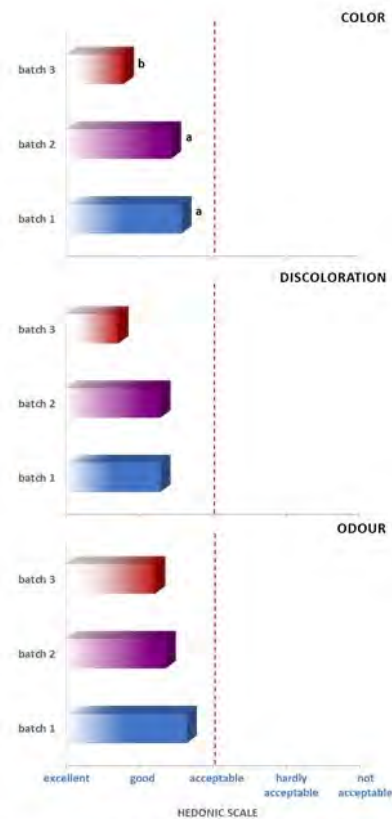


Figure 2. Acceptance scores of cooked hams in the last day of shelf life. Bars with the different letters differ significantly ($P < 0.01$)

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