

HOW PORK CUTS IMPROVE DURING WET OR DRY AGING?

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I. INTRODUCTION

Ageing meat is one of the strategies to improve sensory quality, especially in terms of tenderness [1]. There are two types of ageing, wet and dry. In wet ageing, meat is vacuum packaged and aged under controlled environmental temperature. In dry ageing, meat is aged without packaging under controlled relative humidity and temperature [1]. The application of these procedures is well widespread in beef, but other species might be also used. Information on aged pork is limited [2,3], and in Spain its commercialization is not common yet. The application of aging processes in different cuts might improve its tenderness and upgrade the market value. The aim of this study was to describe the evolution of 3 pork cuts during dry or wet ageing: loins (M. *Longissimus dorsi*) dry aged up to 44 days, tenderloin (M. *Psoas major*) wet aged up to 40 days, and “secretos” (highly-marbled cut from behind the shoulder blade; M. *Latissimus dorsi* and M. *Trapezius pars cervicalis*) wet aged up to 40 days.

II. MATERIALS AND METHODS

Three different pork cuts ((Landrace X Large White) X Du) were obtained from a commercial slaughterhouse at 48 h *post-mortem* and transported to IRTA's cutting room maintaining the cold chain. Ten loins (5 trimmed; 5 with subcutaneous fat) were cut in 4 portions, and a 2.5 cm-width slice was cut, vacuum packed and frozen to later determine non-aged shear force-SF (t_0). The rest of the portion was dry aged. Fifteen pork tenderloins were split in two sections. Section 1 was vacuum packed and frozen to later determine non-aged SF (t_0), and Section 2 was wet aged. Twenty-one “secretos” were used to elucidate the effect of wet ageing: six “secretos” were directly vacuum-packed and frozen at 48 h *post-mortem* to later determine non-aged SF (t_0) and 15 units were vacuum packed and wet aged. The pieces were aged to 6 (except loin), 15, 20, 30 or 40 days at $2\pm 0.5^\circ\text{C}$ and $85\pm 5\%$ humidity. All pieces were weighted at the beginning and at the end of the ageing period to determine weight losses (%). For all texture analyses, defrosted samples were cooked in a pre-heated oven at 200°C until an internal temperature of 75°C . SF of loins and tenderloins was determined with the Warner Bratzler test, whereas the SF of “secretos” was determined with the Allo-Kramer test.

The MEANS and MIXED procedure of SAS software (v.9.4, SAS Institute Inc., Cary, NC, US) was applied to describe Weight losses and SF of each cut. For loins and tenderloins, the change in SF (%) was calculated using the initial SF as a reference, since a portion of the same piece was kept at t_0 . For “secretos”, 6 pieces were used to determine non-aged SF and its results are presented as SF means.

III. RESULTS AND DISCUSSION

Weight losses are presented in Fig. 1 (a-c). Pork loins showed significant differences between ageing time and final format ($P < 0.001$ both), although the interaction (time x format) was not significant ($P = 0.28$). Dry aged pork loins lost between 24.0 and 31.3 % (mean = 27.6 ± 5.48 %) of their weight after 44 days, depending on the final format (trimmed or aged with subcutaneous fat, respectively), Wet aged tenderloins lost -2.8 ± 1.20 %, with no significant differences with ageing time ($P > 0.1$), and “secretos” lost 1.7 ± 0.58 % of their weight ($P > 0.1$) after 40 days.

During ageing, although SF numerically decreased for the three cuts (Fig.1 (d-f)), results did not show significant differences for pork loins ($P>0.1$) maybe due to the small number of samples used. Loins showed changes in SF decreasing up to 28.4 % after 44 days. Looking at the tenderloins, the change in SF was almost 9% after 6 days of wet ageing and showed a maximum change (44%) after 20 days ($P=0.003$). The "secretos" showed a decrease in the SF very early, at 6 days *post-mortem*, and it was almost steady throughout the whole process ($P=0.0768$).



Figure 1. Weight losses (WL; %) of a) dry aged pork loins up to 44 days, b) pork tenderloins wet aged up to 40 days and c) "secretos" wet aged for up to 40 days and Shear force (SF) change (%) with respect to the initial of d) dry aged pork loins up to 44 days determined with Warner-Bratzler test, e) pork tenderloins wet aged up to 40 days determined with Warner-Bratzler test, and f) "secretos" wet aged for up to 40 days determined with Allo-Kramer test.

IV. CONCLUSION

Under the conditions of the present experiment, it can be concluded that the tenderness of the three cuts improved during the ageing process. According to the results, it is possible to mature pork loins for up to 44 days. Wet ageing was also beneficial for pork tenderloins and "secretos". The first showed an increase in tenderness after 20 days, while the "secretos" reached the maximum tenderness after 6 days. In the latter case, it would be interesting to consider shorter periods to determine the minimum SF values.

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