

PHYSICOCHEMICAL CHARACTERISTICS OF DRY-CURED LOIN FROM TWO DIFFERENT BREEDS

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Abstract – Dry-cured loin is one of the most popular meat products processed from pork *longissimus dorsi* muscle, and has been received considerable attention by consumers due its palatability and typical flavor. The aim of this study was to evaluate physicochemical characteristics of dry-cured loins manufactured from two different pig breed (Celta and Duroc). At the end of process, the pH, chemical composition, color parameters, lipid oxidation and textural traits were analyzed in forty one dry-cured loins. The obtained results showed higher IMF contents (17.6 vs. 9.1%) and redness values (9.4 vs. 8.5) in Celta samples, whereas samples from Duroc genotype presented the lowest hardness values (338.3 vs. 293.5 N). Overall conclusion, breed had a significant effect on physicochemical composition of dry-cured loins.

Key Words – chemical composition, hardness, meat product

I. INTRODUCTION

Celta pig is a native breed of Galicia (NW Spain) highly appreciated by the profuse infiltration of fat in lean meat which resulted in a succulent meat and in the production of high quality meat products [1-2]. Previous studies have shown that muscles from rustic pig breeds, in contrast to the muscle from selected pig breeds, contain higher amounts of intramuscular lipids [3]. Dry-cured loin is one of the most appreciated Celta meat products. Its quality depends on raw material and processing conditions since has a great influence on sensory properties, colour, tenderness, juiciness and the final flavor of dry-cured loin. These parameters are consider important quality indicators and have a great influence on consumer acceptability [4]. Crossbreeding look for improve the lean-to-fat ratio of pig carcasses and the production of high quality dry-ripened meat products. Therefore, the aim of this study was to evaluate physicochemical characteristics of dry-cured loin of two different breeds (Celta and Duroc).

II. MATERIALS AND METHODS

The study was carried out with forty one dry-cured loins from Celta pig lines (24 samples) and Duroc pig genotype (17 samples). The manufacture of dry-cured loins consisted in seasoned loins by rubbing with 7.5 g per kg of supplement “Diana 655 AL” and 12 g per kg of supplement composed with sugar, salt, dextrin, olive oil, potassium nitrate, sodium nitrite, sodium ascorbate and spices. Loins were kept at 4°C for 3 days to allow to penetrate the seasoning mixture. Then, the loins were stuffed into collage casings and transferred to a *post*-seasoning room where they stayed for 30 days at 2-5°C and around 85-90% of relative humidity. After the *post*-seasoning stage, the pieces were transferred to a room at 12-14°C and 74-78% of relative humidity where a drying-ripening process took place for 60 days. After drying-ripening process, pH, color, proximate composition, lipid oxidation and texture profile analysis (TPA) were conducted in the pieces following the methodology proposed by Pateiro *et al.* [5]. ANOVA of one way using SPSS package (SPSS 19.0, USA) was performed and LSM were separated using Duncan's t-test ($P<0.05$).

III. RESULTS AND DISCUSSION

The effect of breed on the chemical composition, color parameters, lipid oxidation and textural parameters of dry-cured loins are shown in Table 1. Color parameters showed significant differences ($P<0.05$) between both genotypes for redness (a *) index (9.39 vs. 8.48, Celta vs. Duroc) and yellowness (b *) (11.21 vs. 9.97, Celta vs. Duroc). These values were lower than those found by other authors in dry-cured loins from pig crosses of Iberian with Duroc [6]. Regarding to the chemical composition, the moisture content was significantly different ($P<0.001$) between breeds, with mean values of 42.46% in Celta samples and 48.07% in Duroc. These values were similar to those found by Martin *et al.* [7] and higher than those found in Iberian dry-cured loins [6, 8]. The intramuscular fat (IMF) content was

significantly ($P<0.001$) higher in Celta (17.57%) than in Duroc (9.13%) samples. On the other hand, protein levels were significantly ($P<0.05$) higher in Duroc samples (33.24 vs. 35.01%, for Celta and Duroc loins, respectively). Finally, no significant differences were found ($P>0.05$) for ash content, with mean values around 5.48%.

Table 1 Proximate composition and physicochemical parameters of dry-cured loin

	Celta	Duroc	SEM	SIG
pH	5.71	5.71	0.02	n.s.
Colour parameters				
Luminosity (L*)	43.21	43.49	0.44	n.s.
Redness (a*)	9.39	8.48	0.22	*
Yellowness (b*)	11.21	9.97	0.25	*
Chemical composition (%)				
Moisture	42.46	48.07	0.72	***
IMF	17.57	9.13	0.91	***
Protein	33.24	35.01	0.39	*
Ashes	5.63	5.32	0.09	n.s.
Lipid oxidation				
TBARs (mg MDA/kg)	0.26	0.23	0.02	n.s.
TPA test				
Hardness (N)	338.3	293.5	8.82	*
Springiness (mm)	0.64	0.70	0.01	**
Cohesiveness	0.46	0.48	0.01	n.s.
Gumminess (N)	156.6	139.7	4.70	n.s.
Chewiness (N·mm)	101.4	99.27	3.63	n.s.

SEM: Standard error of the mean; SIG: Significance: *** ($P<0.001$), ** ($P<0.01$), * ($P<0.05$), n.s. (not significant)

Regarding lipid oxidation, there were not significant values between breeds with mean values of 0.24 mg MDA/kg. Among texture parameters, significant differences ($P<0.05$) were observed in both hardness and springiness between breeds, since the highest hardness values were found in Celta samples (338.3 vs. 293.5 N, for Celta and Duroc breeds, respectively), whereas springiness showed an opposite behavior (0.64 mm vs. 0.70 mm, or Celta and Duroc breeds, respectively).

IV. CONCLUSION

The results obtained showed that breed had a significant effect on the color parameters, chemical composition and textural traits physicochemical parameters of dry-cured loin.

ACKNOWLEDGEMENTS

Authors are grateful to Axencia Galega de Innovación-GAIN (Regional Government) (PORCEL/2015) for the financial support.

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