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Slaughter weight, carcass performance and backfat thickness relations with losses during the cutting process of hams and shoulders from Iberian pigs fattened at *montanera*

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Abstract. Cutting process of hams and shoulders from Iberian pigs is based in removing some muscle mass, fat and skin to obtain the traditional and standard commercial shape, which makes these different from other commercial cured pieces. There is a significant correlation ($p < 0.01$) between backfat thickness (measured at two different levels: last thoracic vertebra 6.67 ± 0.87 cm and 4th lumbar vertebra 9.45 ± 1.12 cm) and weigh loss in hams and shoulders by cutting process (5.95 ± 1.09 kg and $21.40\% \pm 3.32$ in hams vs 4.30 ± 0.61 kg $23.09 \pm 2.77\%$ in shoulders). Besides there is significant correlation ($p < 0.05$) between ham weigh losses by cutting process and carcass performance, and between shoulder weigh losses by cutting process and slaughter and carcass weights ($p < 0.01$).

Keywords. Iberian pig – Montanera – Back fat – Slaughter weigh – Carcass performance – Hams – Shoulder – Cutting process.

Corrélations entre le poids à l'abattage, le rendement de la carcasse, l'épaisseur de graisse dorsale et les pertes au découpage pour les jambons et les épaules du porc Ibérique pur de "bellota"

Résumé. Le processus de découpage consiste à éliminer une part de la musculature, de la graisse et de la peau, pour obtenir une pièce d'une forme et d'une taille précises, selon les standards commerciaux du jambon et de l'épaule Ibériques, ce qui fait qu'il est différent d'autres types de jambon. Il y a une corrélation significative ($p < 0,01$) entre le poids perdu dans les jambons et les épaules par découpage ($5,95 \pm 1,09$ kg et $21,40\% \pm 3,32$ dans les jambons vs $4,30 \pm 0,61$ kg et $23,09 \pm 2,77\%$ dans les épaules) et l'épaisseur de la graisse dorsale au niveau de la dernière vertèbre thoracique ($6,67 \pm 0,87$ cm. d'épaisseur) et de la quatrième vertèbre lombaire ($9,45 \pm 1,12$ cm d'épaisseur). D'autre part, dans les jambons on constate une corrélation ($p < 0,05$) entre le rendement de la carcasse et les pertes par découpage. Par ailleurs, il existe une corrélation positive ($p < 0,01$) entre les pertes par découpage dans les épaules et le poids vif et le rendement et le poids de la carcasse.

Mots-clés. Porc Ibérique – Montanera – Graisse dorsale – Poids à l'abattage – Rendement de la carcasse – Jambons – Épaules – Découpage.

I – Introduction

The Iberian pig constitutes a breed of great economic importance in Spain and Portugal. Cured hams obtained from free-range pigs finished using natural resources (basically *Quercus* acorns and grass) has gained widespread consumer acceptance and a high commercial value by virtue of its characteristic flavour and their high content in unsaturated fats. This production is geographically reduced to the South West of the Iberian Peninsula during the fall and winter seasons.

After slaughtering the carcass, hams and shoulders are cut previously to the dry-curing process during a process called cutting (Forero Vizcaíno, 2002). This is based in removing some

muscle, fat and skin in hams and shoulders to obtain the traditional and standard commercial shape, which makes these different from other hams; it mainly is based in a section in V form in muscular and exterior face from the top of the ham until the hoke level (Gómez-Nieves And Robina, 2003)

By other side, the measuring of back fat thickness is the usual method to evaluate the fattening or greasing degree of the carcasses (Edwards *et al.*, 1992; Fortin, 1986; Mayoral *et al.*, 1999; Medel and Fuentetaja, 2000) and usually it is a complementary measurement with the carcass performance (carcass weigh in relation to animal weigh), in order to have more information about the final performance and rentability of different husbandry systems, varieties, strains and genetical lines of Iberian pigs (Ellis *et al.*, 1996; Latorre *et al.*, 2003).

This research has been conducted to know if there is any relation between the carcass performance and the backfat thickness with the weigh of losses during the cutting process of shoulders and hams from the Iberian pig carcass.

II – Materials and methods

191 Iberian pigs (males and females) of the Silvela variety fattened in *montanera* were used. The animals were slaughtered after 69.90 ± 0.45 days eating only acorns and grass, with a mean weigh of 162.53 ± 1.71 kg according to Spanish regulations and standard commercial procedures. All pigs were castrated following the Spanish regulations, to work with the same kind of pigs of the traditional *montanera* system. The stocking rate (0.76 pigs/ha) was established with margins that guaranteed that the acorns would not run out before the fattening was completed (Rodríguez-Estévez *et al.*, 2008).

The backfat thickness was measured at two levels: last thoracic vertebra and fourth lumbar vertebra level. Hams and shoulders were individually weighed before and after the cutting process; All the pieces from the carcasses were weight in a scale with a precision of ± 5 g. The results and values in this study are averages and percentages for the addition of the two pieces of each animal.

SPSS 11.5© was used for statistical analysis (mean \pm standard error) and to model a linear regression.

III –Results and discussion

The backfat thicknesses measured at the two levels were: 6.67 ± 0.87 cm at the last thoracic vertebra and 9.45 ± 1.12 cm at the fourth lumbar vertebra level. Table 1 shows hams and shoulders weighs and percentages before and after cutting process.

Table 1. Hams and shoulders weighs and percentages before and after cutting process

	Minimum value	Maximum value	Mean	Standard error
Fresh shoulders before cutting (kg)	14.90	24.00	18.81	1.46
Fresh hams before cutting (kg)	13.00	34.65	29.35	3.79
Fresh shoulders after cutting (kg)	11.10	18.40	14.33	1.25
Fresh hams after cutting (kg)	17.70	26.15	21.75	1.68
Weigh losses in hams (kg)	0.15	9.55	5.95	1.09
Weigh losses in shoulders (kg)	0.75	5.95	4.3	0.61
% Weigh losses shoulders	4.41	29.46	23.09	2.77
% Weigh losses ham	0.63	31.95	21.40	3.32

Table 2 shows that there is a significant correlation ($p < 0.01$) between backfat thickness (measured at two different levels) and weigh losses in hams and shoulders during the cutting process ($21.40\% \pm 3.32$ for hams and $23.09 \pm 2.77\%$ for shoulders). Besides there are significant correlations between ham weigh losses during the cutting process and carcass performance ($p < 0.05$), and between shoulder weigh losses during the cutting process and the slaughter and carcass weight ($p < 0.01$).

Table 2. Pearson correlations between weigh losses during the cutting process and back fat thickness at last thoracic vertebra (BFTult) and fourth lumbar vertebra levels (BFT4) and carcass weigh and performance

	BFT4	BF Tult	Slaughter weigh	Carcass weigh	Carcass performance (%)
Weigh losses of hams during the cutting process	0.86(**)	0.75(**)	-0.04	0.02	0.21(*)
Weigh losses of shoulders during the cutting process	0.29(**)	0.21(**)	0.42(**)	0.51(**)	0.15

*Correlation significance $P < 0.05$; ** Correlation significance $P < 0.01$.

IV – Conclusions

Iberian pigs finished at *montanera* present a positive correlation between the fattening degree of the carcass (measured as back fat thickness) and the weigh losses in hams and shoulders during the cutting process.

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