

PE9.32 Effect of live weight and gender on carcass quality from gallega breed suckling lamb 219.00

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Abstract-The purpose of this study was to determine the carcass quality characteristic (carcass morphology and carcass commercial cuts) from Gallega breed suckling lambs. Thirty suckling lambs were used in this experiment. The effect of live weight at slaughtered (LW of 12-13, 15-16 and 19-20 kg) and gender of carcass characteristic were investigated. To study animal growth, average daily gain (ADG) was calculated weighted animals once a week. To study carcass morphology and cuts, dissection and measurement of the left half-carcass was carried out. LW affected carcass measurements, carcass cuts ($P < 0,001$) and carcass cold weight (CCW), whereas sex only has influence on CCW.

Index Terms- Meat production, Suckling lamb, Carcass quality, Carcass measurements, Live weight effect

I. INTRODUCTION

In the system of production of meat the quantitative and qualitative characteristics of the carcass are very important, because are directly related to the final product that is the meat. Carcass weight, as well as the rest of the characteristics depend on the breed, slaughtered weight, sex, age..Etc. An optimum slaughtered weight is determined by meat industry and by the consumer. The production of sucking lamb in Spain has increased in the last years, due to its organoleptic characteristics and partly because it is considered natural meat, resulting as it does from traditional live-stock production system [1]. This is because the market demands light carcasses with a characteristics degree of fatness. In particular meat from light lambs is considered to be of better quality (more tender and less intense flavour) than meat from heavier animals and also there are an important differences of price between carcass [2]. On the other hand, there is a lack of information about the quality of carcass and meat from Gallega breed lambs [3,4]. In fact, this study is a part of a project aiming to determine animal growth, carcass and meat quality

characteristics in two production systems (intensive and extensive conditions) of Gallega breed lambs.

Therefore, the aim of this work was to determine the effect of live weight (LW) and gender on carcass quality from Gallega breed suckling lamb.

II. MATERIAL AND METHODS

Thirty suckling lambs (15 males and 15 females) from a flock of COVIGA (agricultural cooperative of ovine breed) were used for this study. Animals were separated into three groups of ten animals (5 males and 5 females) and slaughtered at different live weights (LW) with LW in the next range, 12-13 kg (LW_1), 15-16 (LW_2) and 19-20 (LW_3). LW_1 lambs were raised exclusively on maternal milk from birth to slaughter and did not receive any kind of solid, whereas LW_2 and LW_3 lambs were supplemented with concentrate “*ad libitum*” until animals reached the LW desired. All lambs were weighted at birth, one time a week throughout the experimental period and at slaughtered. Animals were conventionally slaughtered at a commercial abattoir and carcasses were weighted (hot carcasses weight, HCW). pH also was measured at slaughtered moment (pH_0) and after 45 minutes (pH_{45}). At this point carcasses were moved to research centre pilot plant and were chilled at 4°C in a cold chamber for 24 h. Cold carcasses weight (CCW) and pH (pH_{24}) were recorded. Chilling losses were estimated as the difference between HCW and CCW relative to HCW and expressed in percentage. The killing out percentage was calculated as the CCW expressed as a proportion of the slaughter weight. Dissection of the left half-carcass was carried out according to the methodology described by [5] and five joints were obtained: pelvic limb, thoracic limb, loin, neck and tail. The following carcass measurements described by [5] were determined to assess carcass morphology: Chest width, Chest perimeter, Thorax width, Carcass internal length, Thorax perimeter, Pelvic limb length.

For the statistical analysis of the results, data were analyzed using the SPSS (version 15.0, USA). An analysis of variance (ANOVA) using the general lineal

model (GLM) procedure was carried out. Fixed effect of LW, gender and their interaction were included in the initial model. However, as only significant effect of gender was detected for HCW, gender and interaction LW x gender were excluded for the final model. The least squares mean (LSM) were separated using Duncan's t-test. All statistical test of LSM were performed for a significance level <0.05

III. RESULT AND DISCUSSION

Data of animal performance are presented in Table 1. There were no significant differences in live weight at birth and in average daily weight gain (ADG) among LW groups. The effect of LW at slaughtered on carcass characteristic, carcass cuts and carcass morphology are given in table 1. Only carcass weight and fatness scale were improved significantly with a longer LW of the animal ($P<0,001$). Mean pH values ranged between 6.57 and 6.72 at 0 minutes *postmortem* and between 5.74 and 5.99 at 24 hours *postmortem*. The effects of LW on meat pH levels at pH at 0, 45 minutes and 24 hour *postmortem* were not significant ($P>0.05$). These results are in agreement with [6]. With regard to linear carcass measurements and carcass cuts, they are used as indicators of carcass conformation and size and the results of the current study indicate significant effect ($P<0.01$ and $P<0.001$) of LW on carcass measurements and carcass cuts with the exception of half-carcass length. This results was expected because several authors reported an increase in carcass measurements and conformation indexes parallel to increasing carcass weight [7,8].

IV. CONCLUSIONS

Carcass quality characteristics were significantly influenced by live weigh at slaughtered, whereas gender only affected carcass weight in suckling lambs with a live weight less than 20 kg. To know the profits of a sheep farm, an economic study with costs of production must be realized.

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Table 1. Age, live weight, average daily gain, carcass weight, EUROP conformation, fatness scores, other carcass characteristics and carcass cut and morphology from different live weight at slaughtered.

	LW ₁	LW ₂	LW ₃	SED	Sig
Age (days)	32.20 a	45.70 b	54.80 c	2.27	***
LW (at birth) kg	4.14	4.00	3.83	0.14	n.s.
LW (at slaughtered) kg	12.45 a	15.51 b	19.45 c	0.54	***
ADG kg/d	0.26	0.25	0.29	0.008	n.s.
Carcass characteristic					
HCW kg	7.96 a	9.91 b	11.98 c	0.32	***
CCW kg	7.39 a	9.40 b	11.42 c	0.31	***
pH ₀	6.57	6.62	6.72	0.04	n.s.
pH ₄₅	6.44	6.42	6.36	0.04	n.s.
pH ₂₄	5.89	5.74	5.99	0.04	n.s.
Conformation	3.10	3.30	3.70	0.11	n.s.
Fatness scale	2.10 a	1.80 a	3.40 b	0.18	***
Chilling losses (%)	7.19	5.16	5.50	0.47	n.s.
Killing out (%)	59.32	60,66	58.74	0.53	n.s.
Carcass cuts					
Pelvic limb	1.00 a	1.28 b	1.54 c	0.05	***
Thoracic limb	0.46 a	0.53 b	0.65 c	0.01	***
Loin	0.59 a	0.74 b	0.86 c	0.02	***
Neck	0.24 a	0.30 b	0.33 b	0.01	**
Tail	0.07 a	0.08 a	0.11 b	0.003	***
Carcass measurements					
Pelvis width	11.43 a	12.65 b	12.70 b	0.20	**
Leg perimeter	28.81a	31.71 b	34.31 c	0.47	***
Chest width	9.37	10.29	11.34	0.22	***
Half-carcass length	61.59	64,23	67.93	0.50	n.s.
Chest depth	12.72 a	14.25 b	15.71 c	0.27	***
Pelvic limb length	28.87 a	30.19 ab	31.74 b	0.47	*

Significance: *** (p<0.001), ** (p<0.01), * (p<0.05), n.s. (not significant). Conformation: P=1, O=2, R=3, U=4, E=5; Fatness scale 1 to 5. Different letter after the mean value within the same row indicates significant differences (P<0.05) between ageing time.