Carcass characterization of Galician mountain foals

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Abstract-This preliminary study was conducted to characterize the carcass traits of Galician mountain foals (n=14) in freedom regime. The carcass parameters recorded were weight, carcass morphology, main primal cuts and tisular composition. Mean values, maximum, minimum and standard deviation were presented in this work. A great variability in carcass traits was observed. A low carcass weight was obtained due to early slaughter age and feeding regime. However, carcases are characterised by high meat contents, with a mean meat content of 68.41 and low fat content of 2.92.

***Keywords*: Foals, Carcass morphology, Primal cuts, Freedom regime**

I. INTRODUCTION

The consumption of horsemeat is marginal compared to other types of conventional meat such as beef, chicken or pork, more important in human diet (Lombardi-Boccia, Lanzi, & Aguzzi, 2005); horsemeat intake is related to problems of food safety as, *Bovine Spongiform Encephalopathy* (BSE), dioxins or recent pork influenza problems (FAOSTAT, 2007). However the production of horsemeat presents several advantages due to higher dressing percentages, closer to 60-70 % in meat yield (Sarries, & Beriain, 2005; Lanza, Landi, Scerra, Galofaro, & Pennisi, 2009). Although horsemeat is commercialized in a minority market, it has excellent nutritional properties, as low fat, rich in iron and and favourable dietetic fatty acid profile, with a high content of unsaturated fatty acids and vitamin B (Badiani, Nanni, Gatta, Tolomelli, & Manfredini, 1997; Tateo, De Palo, Ceci, & Centoducati, 2008).

The "Galician Mountain" horse is a local autochthonous crossbreed located in Galicia (NW of Spain). These animals can be useful in the cleaning of forests and mountains therefore avoiding fires on rural areas; they were used for transport and to work in farms in the past. Obviously, there is a lack of information about the quality of these animals as meat producers, but if we want focused this crossbreed to meat production, it is necessary to improve the handling of this cattle and the utilization of this forest biomass, available in abundance.

There is a census of around 15,000 Galician mountain foals registered, but more accurate estimations increase this value to 36,000 (internal communication). In Spain there is a few recent studies describing equine livestock production systems, carcass and meat quality (Sarries, Murray, Troy, & Beriain, 2006; Juárez, Polvillo, Gómez, Alcalde, Romero, & Varela, 2009), but there are no studies about carcass and meat quality in this crossbreed.

Therefore, the aim of this study was to characterize the carcass traits of Galician mountain foals in freedom regime.

II. MATERIALS AND METHODS

II.1. Animal management

For this study, fourteen foals were obtained from Sabucedo Puxa (agricultural cooperative). Animals were captured in a mountain that is located in (Sabucedo, Pontevedra, Spain). All foals were reared with their mothers in an extensive system in freedom regimen, according to an extensive production system on wood pasture. Animals were slaughtered at seven months old. It was not possible to obtain live weight due to nervous temperament of these animals.

Animals were conventionally slaughtered at a commercial abattoir (Council Directive of the European Union 95/221EC).

II.2. Carcass measurements

Immediately after slaughter, carcasses were weighed (hot carcasses weight, HCW) and chilled at 4 °C in a cold chamber for 24 h. At this point the left half-carcasses were moved to the research centre pilot plant and the following carcass measurements were made: length of carcass (LC), length of leg (LL), width of leg (WL), and internal depth of chest (IDC) as described by De Boer, Dumont, Pomeroy, & Weniger, (1974) whereas external depth of chest (EDC) and perimeter of leg (PL) were obtained following Carballo Monserrat, & Sánchez (2000); these parameters were determined to assess carcass morphology. Also, carcass compactness index (CCI)= (HCW / LC) and hindlimb compactness index (LTI)= (LL / WL) were also calculated (Espejo, García, López, Izquierdo, Robles, & Costela, 2000). Dissection of the left half-carcass was carried out according to the methodology described by Carballo et al (2000). Carcasses were cut into 19 primal cuts, which are indicated in Table 1.

II.3.Statistical analysis

Standard deviation, minimum, maximum and mean values were calculated using the SPSS (version 15.0, USA).

III. RESULTS AND DISCUSSION

Table 1 presents the results of carcass measurements, primal cuts and tisular composition obtained from Galician mountain foals. Carcases differed in both linear and mass measures as a consequence of breeds and types of horses. The wide range in HCW founded in this study can be explained by slaughter weight (not shown data), which is very closely related to the age of the foals.

HCW can not be compared with data obtained for other foals because usually foals carcasses have been obtained from old (16-24 months of age) animals. In addition, most of the foals used in these researches belong to specialized breeds for meat production. Sarries, & Beriain, (2005) and Juárez et al., (2009) observed higher carcass weight and carcass measurements in Burguete and Hispano-Bretón breed foals that were slaughtered at 16 and 24 months of age (carcass weight of 258 and 275 kg, respectively). Also, Lanza et al., (2009) reported better carcass weights at around 243 kg in Sanfratellano foals slaughtered at 18 months of age.

For the same reason above mentioned our carcass measurements are not comparable to the ones made by other authors. However, foals carcasses are characterised by high meat contents, with a mean meat content of 68.41, agree with results reported by Znamirowska (2005) in horse of 6-10 years old.

The fat and bone content in the half-carcass had higher variability in respect to both mass and percentage. Such wide range is probably caused by differing breeding, months of age and rearing conditions.

Table 1. Hot carcass weight, carcass morphology, main primal cuts and tisular composition of Galician mountain foals

	Minimum	Maximum	Mean	SD
Years old	159	307	212	49
HCW	37.83	103.01	66.25	21.32
Carcass measurements (cm)				
LL	55.00	72.00	62.60	5.44
LC	58.00	98.00	82.5	10.79
WL	8.00	15.00	12.28	2.34
PL	57.00	87.00	70.92	9.97
EDC	41.00	65.00	46.71	6.76
IDC	27.00	36.00	30.28	3.07
CCI	0.50	1.06	0.79	0.19
LTI	4.30	7.13	5.22	0.76
Primal cuts (kg)				
Front quarter				
Shoulder clod	0.88	2.75	1.66	0.65
Top blade	0.23	0.73	0.42	0.15
Chuck tender	0.18	0.75	0.45	0.17
Chuck	0.53	1.95	1.15	0.42
Neck	0.70	3.34	1.74	0.84
Blade	0.05	0.22	0.13	0.05
Fore shank	0.75	2.25	1.42	0.39
Brisket	0.40	1.79	1.01	0.46
Lean	0.23	1.20	0.66	0.30
Fat	0.23	1.29	0.54	0.27
Bone	2.62	5.65	3.87	0.92
Total FQ cuts	7.01	18.85	13.02	4.24
Hind quarter				
Full plate	1.10	4.78	2.51	1.12
Loin	1.00	4.43	2.17	1.06
Tenderloin	0.30	1.26	0.76	0.30
Topside	0.85	3.31	1.95	0.75
Eye round	0.28	1.30	0.70	0.31
Hind shank	0.35	0.91	0.60	0.19
Thick flank	0.75	2.18	1.46	0.50
Flank steak	0.60	2.55	1.55	0.63
Rump	0.15	0.65	0.36	0.17
Silverside	0.70	2.69	1.68	0.70
Heel of round	0.28	0.72	0.46	0.14
Lean	0.08	0.18	0.13	0.03
Brisket bone	0.30	1.28	0.67	0.26
Loin bone	0.62	2.06	1.20	0.43
Hip bone	2.42	4.73	3.41	0.78
Fat	0.08	1.20	0.45	0.32
Total HQ cuts	10.64	32.13	20.06	7.11
Total cuts	56.09	93.76	68.02	8.79
Carcass percentage and tisular composition (%)				
Front quarter	35.14	55.31	39.46	4.79
Hind quarter	54	84	60.22	7.25
Meat	53.75	73.55	68.41	5.64
Bone	22.48	40.23	28.66	5.23
Fat	1.45	6.01	2.92	1.18
Meat/bone	1.34	3.27	2.48	0.58

IV. CONCLUSIONS

Results obtained for the current study not suggests an interesting potential for meat production, in fact meat from this foals are basically consumed in rural areas. In spite of this situation, these findings

represent a starting point for the promotion of this type of meat in Galicia. This research is part of a larger project that aims to assess the effect of management system (slaughter age and finishing period) to improve carcass weight and meat quality (nutritional, sensorial and physicochemical traits) and to satisfy the current consumer requirements on health and safety.

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