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Effect of breed and feeding on the carcass characteristics of the Chilote breed lamb

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The Chilote sheep has been developed in an isolated environment, based on grazing lands with low nutritive value belonging to small-scale producers, because of which there is little information about the use of this breed for meat production. The objective of this work was to determine the effects on lamb carcasses of two breeds with different productive purposes and fed on pastures with different nutritional quality. Three groups of lambs were used. The first and second groups were composed of 13 and 11 Chilote lambs respectively, and the third composed of six Suffolk Down lambs. Lambs remained with their mothers, the first group on naturalized pasture and the rest on rangeland. Animals were slaughtered at 90 d of age. Live weight, carcass weight and yield, and several zoometric parameters were determined, as well as the weight of commercial cuts and the muscle, bone and fat ratios. Hide and hoof weights were also measured. For the effect of breed, Chilote lamb is narrower ($P \leq 0.05$) than Suffolk Down, but with a higher proportion of hide ($P \leq 0.05$) and hooves ($P \leq 0.05$). The type of pasture only affected hot carcass yield, which was higher in Chilote lamb with naturalized pasture than with rangeland ($P \leq 0.05$). There were no effects of breed or pasture type on the main characteristics of the lamb carcasses.

Key word: Lambs, pasture, carcass quality, meat yield.

INTRODUCTION

Besides being profitable for producers, sheep meat production should meet quality requirements of industry and consumers, quality being the determining factor in the agro-food chain. In the case of lamb carcasses and meat, the concept of quality can be considered differently by producers, industry and consumers, all of whom use different criteria (objective or subjective) of evaluation, resulting in a lack of homogeneity in the concepts, which produces difficulties in interpreting results among studies (Sepúlveda et al., 2011). Objective measurements are mainly used to determine carcass quality related to weight, the level of fattening and the conformation and proportion of different tissue components (muscle, bone and fat) (Rodrigues et al., 2006; Carrasco et al., 2009a). These variables are influenced by factors such as the age and sex of the animal (Barone et al., 2007), type of feed (Jacques et al., 2011) and the breed (Kremer et al., 2004).

The different feeding systems can influence characteristics of carcass quality (Priolo et al., 2002; Carrasco et al., 2009a; Jacques et al., 2011). Feeding in sheep production can be based on concentrates, grazing, or a mixed system. Lambs that receive large quantities of concentrates (creep feeding), or are fed exclusively on these (early weaning), present higher levels of fattening, whiter colored fat and reach slaughter weight in a shorter period of time than lambs grazing (Mustafa et al., 2008). However, consumers tend to prefer leaner meats (Sañudo et al., 2000), which could be obtained from grazing systems. As well, products from grazing systems are more valued by consumers owing to the general perception that they are more natural, healthier, and less contaminated, and that this method of production respects animal welfare (Hersleth et al., 2012).

The present use of specialized sheep breeds in meat production, mainly in intensive production systems, seeks to meet market requirements while also obtaining higher economic returns for producers (Rodrigues et al., 2006). However, the use of specialized breeds can result in different problems given that they are not as adaptive to the areas where they are introduced compared to autochthonous breeds (Carneiro et al., 2010). One of these native breeds in Chile is the Chilote (Ch), which was developed in the Chiloe archipelago and has a common origin to the Spanish breeds, the Churra and Castellana (De la Barra, 2008; De la Barra et al., 2011). It is raised mainly by small producers in extensive systems owing to its high degree of rusticity, high fertility rate (98%), prolificacy (125-140%), maternal ability, and resistance to dietary restrictions, gastrointestinal parasites and hoof problems (De la Barra et al., 2011; Martínez et al., 2012). Because of the isolation in which the breed has been developed, it has been produced mainly on naturalized and marginal pastures with low nutritive value associated also with low animal stocking. Consequently, there is

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potential for the selection, development and productive improvement of this breed to increase the productivity and therefore the profitability of pastoral systems. The meat production aptitude of the Chilote breed and the characteristics of its carcass have not been determined. Nor has it been determined if the Chilote breed carcass can fulfill the quality requirements of the industry and consumers, because of which it is necessary to define the real feasibility of the Chilote breed as a productive option to other sheep breeds introduced to the region that were developed for meat production and consequently have higher nutritional requirements, such as the Suffolk Down breed. The Suffolk Down breed represents a significant percentage (40%) of the sheep raised in the Chiloe Archipelago. The objective of this study was to determine the effect of breed (Chilote and Suffolk Down) and of different types of feeding on the main indicators of ovine carcass quality.

MATERIALS AND METHODS

Location, animals and experimental design

The selected animals were kept at the Butalcura Experimental Center of INIA (42º15' S; 73º39' W), located in the Chiloe Archipelago, Chile. The island has a mean annual rainfall of 2070 mm, with mean temperatures of 10.7 °C. The assay was carried out between September and December 2011.

Thirty offspring, 24 Chilote and six Suffolk Down, were selected from a group of 210 females (180 Chilote and 30 Suffolk Down) that were estrus-synchronized by an intravaginal hormonal device (Eazi-Breed™ CIDR®, Pfizer, New York, USA). All the lambs were from single-offspring birth and were born in a range of no more than 48 h. Only one male reproducer was used for each breed. Lambs were kept with their mothers until slaughter, which was done at an average age of 90 ± 2 d. The animals were assigned to three experimental groups according to their weight at birth, the first group composed of 13 Chilote lambs, the second of 11 Chilote lambs and the third of six Suffolk Downs lambs.

Feeding

Experimental group 1 was feed on naturalized pasture with 7-d rotational grazing and an animal load of five sheep per hectare in 1 ha paddocks. Experimental groups 2 and 3 were feed on rangeland (calafatal type) with rotational grazing on five paddocks averaging 1 ha each, with rotation every 5 d and an animal load of five sheep per hectare. Periodic analyses were made of both pasture types by soil sampling from 1 × 0.5 m exclusion cages. The botanical composition (Table 1) and chemical analysis (Table 2) of pasture samples were analyzed by the INIA Remehue Animal Nutrition and Environment Laboratory in Osorno, Chile. The botanical composition was expressed as the percentage in 100 g of sample (Table 1).

Table 1. Botanical composition of naturalized and rangeland type pasture expressed as percentage 100 g^{-1} of sample.

	Pasture	
Botanical composition (%)	Naturalized	Rangeland
Agrostis capillaris L.	8.76	12.20
Berberis buxifolia Lam.	0.00	1.06
Gaultheria phillyreifolia (Pers.) Sleumer	0.00	38.24
Holcus lanatus L.	77.68	24.33
Lolium perenne L.	4.76	0.00
Plantago lanceolata L.	2.82	6.44
Trifolium repens L.	1.65	1.42
Others	4.33	16.31

Table 2. Average ± standard deviations of the proximal chemical analysis of naturalized pastures and rangeland.

	Pasture		
Chemical analysis	Naturalized	Rangeland	P-Value
DM, %	16.3 ± 2.96b	23.77 ± 4.88a	0.002
CP, %	20.33 ± 3.69a	12.61 ± 2.52b	0.002
Dig, %	77.81 ± 10.27a	56.98 ± 10.24b	0.001
ME, Mcal kg^{-1}	2.57 ± 0.28a	1.93 ± 0.3b	0.000
NDF, %	52.11 ± 4.19	54.97 ± 2.72	0.127
Ash, %	8.51 ± 1.99	7.73 ± 1.19	0.361
EE, %	2.16 ± 0.24a	1.63 ± 0.25b	0.001
DV, %	70.48 ± 8.75a	50.93 ± 9.26b	0.000
NLE, Mcal kg^{-1}	1.54 ± 0.15a	1.19 ± 0.16b	0.000
N, %	3.25 ± 0.59a	2.01 ± 0.41b	0.000

Different letters between columns indicate significant difference ($P < 0.05$).
DM: dry matter; CP: crude protein; Dig: digestibility *in vitro*; ME: metabolizable energy; NDF: neutral detergent fiber; EE: ether extract; DV: digestibility value; NLE: net lactic energy.

Dry matter, ether extract, and ash were measured by the method described by AOAC (2005) and AOAC (1984). Crude protein was performed according to AOAC (1984). The remaining measurements were carried out according to Sadzawka et al. (2007).

Slaughter and carcass measurements

Lambs were weighed the day before slaughter (24 h) to obtain their live weight (LW) and then transported to a commercial slaughterhouse (MAFRISUR, Osorno, Chile) with *ad libitum* access to water. Lambs were electrically stunned and slaughter by severance of carotid arteries and then skinned and eviscerated, obtaining their hot carcass weight (HCW). Subsequently, carcasses were kept for 24 h in cold storage at 4 ± 2 °C to register cold carcass weight (CCW). Chilling losses were calculated as the difference between the HCW and CCW. Yields of hot and cold carcasses (HCY and CCY) were calculated using the respective carcass weight in relation to LW. Zoometric measurements of the carcasses were then taken *post mortem* of loin length (K), thorax width (Wr), rump width (G) and leg perimeter (D) (Figure 1) (Cañeque and Sañudo, 2000).

Subsequently, carcasses were divided into two, sectioning them along the vertebral column to obtain half carcasses (right and left) and these were jointed, obtaining leg, shoulder-rib and loin-abdominal muscle cuts (Figure 2), which corresponds to a modification of the official Chilean regulation NCh1595.Of2000 (INN, 2000).

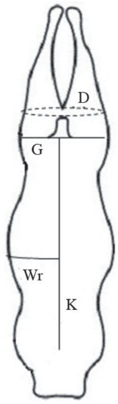

Figure 1. Diagram of the zoometric measurements taken of ovine carcasses 24 h after slaughter (K: loin length; Wr: thorax width; G: rump width; D: leg perimeter).

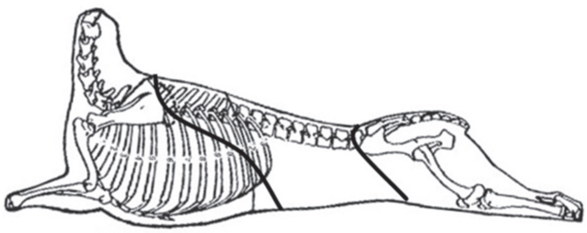

Figure 2. Cuts made to half carcasses 24 h after slaughter.

As well as measuring the carcass, following slaughter the following structural weights were registered: hide and hooves (including front and back limbs) of each animal to obtain their proportions in relation to the LW of the animals.

Statistical analysis

Three independent statistical analyses were carried out considering: (1) pasture type used as the food base for chemical analysis; (2) sheep breed with same type of feed (rangeland); and (3) type of feed as fixed effect for the same breed (Chilote) to evaluate the characteristics of carcass quality using an ANOVA with the Statgraphics Centurion XV program, version 15.02.6. The *n* by group was unbalanced in the three cases. The ANOVA statistical model employed was:

$$Y_{ik} = \mu + \alpha_i + \varepsilon_{ik}$$

where Y_{ik}: observation of the response to the analyzed variables; μ: mean global effect; α_i: effect of the treatment (sheep breed or pasture type); ε_{ik}: error experimental. A Pearson correlation was also conducted among variables LW, HCW, CCW, PE, HCY, and CCY and the zoometric measurements of the carcasses.

RESULTS

Table 3 presents the averages and standard deviations of the variables: live weight (LW), hot carcass weight (HCW), cold carcass weight (CCW), chilling losses (ChL) and hot carcass yield (HCY) and cold carcass yield (CCY), as well as the cold carcass zoometric measurements. No significant (P > 0.05) differences were found between Chilote and Suffolk Down lambs in any of the analyzed variables except on rump width (G, P ≤ 0.05). Regarding feeding, despite the differences in DM production per hectare and nutritive quality (Table 2), no significant differences were found in LW of Chilote lambs. Significant differences (P ≤ 0.05) were only found for HCY between Chilote lambs fed with naturalized pasture versus rangeland, the former being higher (Table 3). There were no significant differences (P > 0.05) for zoometric measurements between the two assessed types of feeding.

Yields by carcass cuts in relation to the CCW, expressed in kilograms and percentages, are presented in Table 4. No significant differences (P > 0.05) between

Table 3. Average ± standard deviations of carcass measurements and zoometric measurements of lambs from two breeds (Chilote vs. Suffolk Down) and the same breed (Chilote) fed on two types of pasture (naturalized pasture versus rangeland).

	Naturalized	Rangeland		P-Value	
	Chilote (n = 13)	Chilote (n = 11)	Suffolk Down (n = 6)	Feeding	Breed
Initial LW, kg	4.55 ± 0.65	4.12 ± 0.52	4.93 ± 0.69	0.087	0.054
Final LW, kg	28.20 ± 6.22	26.89 ± 3.74	29.67 ± 5.96	0.548	0.253
ADG, kg	0.263 ± 0.06	0.253 ± 0.04	0.274 ± 0.06	0.677	0.401
HCW, kg	12.12 ± 3.11	11.04 ± 1.78	12.53 ± 2.95	0.322	0.209
CCW, kg	11.54 ± 3.02	10.51 ± 1.74	11.95 ± 2.87	0.329	0.213
LC, kg	0.58 ± 0.09	0.53 ± 0.06	0.58 ± 0.08	0.149	0.127
LC, %	4.92 ± 0.75	4.81 ± 0.33	4.77 ± 0.68	0.672	0.878
WCY, %	42.60 ± 2.13a	40.92 ± 1.51b	41.98 ± 2.07	0.040	0.247
CCY, %	40.51 ± 2.27	38.96 ± 2.07	39.98 ± 2.20	0.064	0.271
K, cm	47.85 ± 4.04	46.64 ± 2.34	48.33 ± 3.98	0.390	0.280
Wr, cm	28.92 ± 2.24	28.32 ± 2.31	28.75 ± 2.81	0.531	0.743
G, cm	18.08 ± 1.77	16.86 ± 1.41y	18.58 ± 1.99x	0.081	0.044
D, cm	49.62 ± 3.84	48.55 ± 3.07	49.71 ± 4.58	0.465	0.096

a,b: Different letters between columns indicate significant differences between the pasture types (P < 0.05).
x,y: Different letters between columns indicate significant differences between the two breeds (P < 0.05).
LW: live weight; ADG: average daily gain; HCW: hot carcass weight; CCW: cold carcass weight; ChL: chilling losses, HCY: hot carcass yield; CCY: cold carcass yield; K: loin length; WR: thorax width; G: rump width; D: leg perimeter.

Table 4. Average ± standard deviation of the yields per cut (kg and percentages) of two breeds of lambs (Chilote and Suffolk Down) and of the same breed (Chilote) fed on different types of pasture (naturalized pasture vs. rangeland).

	Naturalized	Rangeland		P-Value	
	Chilote (n = 13)	Chilote (n = 11)	Suffolk Down (n = 6)	Feeding	Breed
Leg, kg	3.36 ± 0.85	3.11 ± 0.48	3.65 ± 0.78	0.404	0.096
Shoulder-rib, kg	4.55 ± 1.19	4.10 ± 0.73	4.61 ± 1.15	0.290	0.275
Loin, kg	3.66 ± 1.00	3.23 ± 0.55	3.68 ± 0.98	0.220	0.241
Leg, %	28.21 ± 7.12	26.15 ± 4.01	30.65 ± 6.52	0.404	0.096
Shoulder-rib, %	39.46 ± 0.60	38.98 ± 1.05	38.53 ± 1.36	0.181	0.454
Loin, %	31.66 ± 1.34	30.75 ± 1.23	30.66 ± 0.94	0.101	0.874

breeds were observed in any of the cuts. The cut of the highest proportion for both the Chilote and Suffolk Down lambs was the shoulder-rib cut.

No significant differences (P > 0.05) were found in yields by cut for Chilote lambs feed on different types of pasture (Table 4). With both experimental groups the highest proportion cut was the shoulder-rib, followed by the loin-abdominal muscle and then the leg cut. This is due to the way in which the carcass is cut up, which results in the shoulder-rib cut including a major part of the carcass.

Table 5 shows the weights and proportions of the hide and hooves in relation to the LW. There were no significant differences (P > 0.05) between the two breeds in the weight of these structures, but there were in the percentages that hide and hooves represented of the live weight of the lambs. For both structures, Chilote lambs presented higher percentages.

No significant differences (P > 0.05) were found between the pasture types for the weights and proportions of the hide and hooves (Table 5). The values for the hooves did not differ based on the types of feeding and only the parameter of hide was slightly higher (but without statistical significance) with animals fed on naturalized pasture.

Table 6 presents Pearson correlation coefficients of zoometric measurements (K, Wr, G, and D) and variables CCW, HCY, and CCY, with data of all animals.

DISCUSSION

Breed effect

The Chilote breed has the same origins as the Spanish breeds Churra and Castellana (De la Barra et al., 2011), which are used mainly for milk production (Cappelletti et al., 2006). Traditionally, offspring are destined to lamb meat production. They are fed on lactose substitutes and/or concentrates (Joy et al., 2008; Miguélez et al., 2008) and slaughtered with low weights (De la Barra et al., 2012), which gives special characteristics to the meat of these animals. In contrast, the Suffolk Down breed has been widely distributed around the world because of the characteristics of its meat, associated mainly with more precocity, using it as a pure or terminal breed in different productive systems (Rodrigues et al., 2006). Owing to the differences in breeds, differences in the characteristics of the carcasses could be expected. Comparing various autochthonous breeds to Suffolk Down, Dal Prà et al. (2009) did not find significant differences in LW, CCW, and CCY between Bergamasca and Suffolk Down lambs slaughtered at 90 d of age. In contrast, Rodrigues et al. (2006) found that Suffolk Down breed showed higher LW, HCW, and CCW than the breed Churra Galega Bragançana at different levels of maturity. The same authors reported significant differences for HCY and CCY. Likewise, other authors have reported differences among sheep breeds with distinct aptitudes for HCW and CCW (Macfarlane et al., 2004; Kashan et al., 2005; Ekiz et al., 2009). In the case of HCY and CCY, studies have found differences among breeds (Kremer et al., 2004; Rodrigues et al., 2006; Ekiz et al., 2009). These differences would be higher in a comparison of breeds with different productive purposes and characteristics, with meat breeds having lower yields (Rodrigues et al., 2006), although this cannot be confirmed by this research given the similarities in the results obtained. In the aforementioned studies, carcass yields border on 50%, which is higher than the values obtained by the breeds studied in this work. Nevertheless, the yields in carcass of Chilote and Suffolk Down lambs were similar to those found by Kremer et al. (2004) in sheep from the Hampshire Down, Suffolk Down, and Texel breeds, among others.

The zoometric parameters K, Wr, and D (loin length, thorax width, and leg perimeter, respectively) presented higher averages in Suffolk Down lambs, without establishing significant differences. Peña et al. (2005) with lambs of the Segureña with carcass weights between 10.1 a 13.0 kg obtained higher K values (52.8 cm) for Chilote and Suffolk Down. However, Wr and G were 22.5 and 16.8 cm, respectively, lower than those obtained in the present study, like those found by Díaz et al. (2004) in Manchego lambs. The differences among studies could be associated with the lower carcass weights reported by Díaz et al. (2004). The importance of carcass evaluation lies in the economic impact it can have on productive systems through the selection of better quality carcasses of higher economic value. One of these measurements is G, an indicator of the leg cut. Because this indicator is higher in the Suffolk Down breed, owing to its characteristics as a meat production breed, its carcass can obtain a better classification, depending on the final market.

Table 5. Average ± standard deviations of the weights and proportions of hide and hooves in relation to the live weight of lambs of two breeds (Chilote and Suffolk Down) and of the same breed (Chilote) fed on different types of pasture (naturalized pasture vs. rangeland).

	Naturalized	Rangeland		P-Value	
	Chilote (n = 13)	Chilote (n = 11)	Suffolk Down (n = 6)	Feeding	Breed
Hide, kg	4.49 ± 0.94	4.15 ± 0.64	3.92 ± 0.78	0.321	0.514
Hooves, kg	0.67 ± 0.12	0.66 ± 0.07	0.67 ± 0.11	0.879	0.893
Hide, %	16.02 ± 1.19	15.51 ± 1.68x	13.24 ± 0.82y	0.389	0.007
Hooves, %	2.40 ± 0.19	2.47 ± 0.16x	2.27 ± 0.15y	0.312	0.020

x,y: different letters between columns indicate significant differences between the two breeds (P < 0.05).

Table 6. Pearson correlation coefficients of the zoometric measurements (K, Wr, G, and D) and main variables related to the carcasses (CCW, HCY, and CCY) of the evaluated lambs s (n = 30).

	K	Wr	G	D
CCW	0.868**	0.844**	0.868**	0.887**
HCY	0.586**	0.650**	0.746**	0.815**
CCY	0.633**	0.685**	0.767**	0.837**

**P < 0.001; CCW: cold carcass weight; HCY: hot carcass yield; CCY: cold carcass yield; K: loin length; Wr: thorax width; G: rump width; D: leg perimeter.

Different cuts tend to be used in every country or region, because of which it is difficult to compare carcasses based on cuts. Nevertheless, the leg cut is one of the most valuable cuts (prime cut) (Rodrigues et al., 2006). Dal Prà et al. (2009) obtained lower weights, of leg the leg cut, with Bergamasca lambs than those obtained for Chilote and Suffolk Down lambs. However, they did not find significant differences between the breeds at 90 d of age, whereas Purchas et al. (2002) did. Rodrigues et al. (2006) found differences between the Churra and Suffolk Down breeds for the percentage of leg cut in relation to CCW, favoring Suffolk Down. The values for the Chilote and Churra breeds obtained by these authors were similar.

In relation to weights and proportions of hide and hooves, the Chilote breed showed higher proportions of these structures than did the Suffolk Down. Macit et al. (2002) compared three sheep breeds based on lambs slaughtered at 70 d of age and did not find significant differences among proportions in relation to LW. The values for hooves were similar to those of the present study, but were markedly lower for hide (between 6.2 and 7.0%). Mostafa-Tehrani et al. (2006) obtained average hide weights of 7.85 kg and hoof weights of 1.31 kg for lambs with 24 kg average weight at slaughter. Differences in LW percentages between ratios for hides ($P \leq 0.05$) and hooves ($P \leq 0.05$) could be associated with the development of each of these structures. Mohouachi and Atti (2005) noted that organs with less metabolic activity or a higher proportion of bone develop more rapidly than the rest of the organism. In turn, Peña et al. (1989), in Segureña breed, suggested that a higher proportion of hide to LW is associated mainly with wool growth of the animal. These results show that Chilote lamb develops more rapidly than the meat production breed (Suffolk Down) but that this is not reflected in weights or yields of the analyzed carcasses. De La Barra et al. (2012) obtained results that indicate that Chilote has a more rapid develop up to approximately 127 d, after which the growth rate decreases. Because of this, slaughter after this age only increases fatty deposits that reduce the commercial value of the carcass.

Feeding effect

For the carcass measurements of the Chilote lambs fed on two types of pasture, Joy et al. (2008) obtained lower LW values (23 kg) with Churra Tensina breed lambs slaughtered at 85.5 d of age and fed on pasture composed mainly of grasses. Although the HCW and CCW values in this study were around 1 kg heavier among lambs fed on naturalized pasture than those fed on rangeland, the difference was not significant. Priolo et al. (2002) and Jacques et al. (2011) found differences in the HCW between Ile de France and Dorset lambs in function of the type of feed. Animals fed on concentrates or raised in confinement presented higher HCW than those fed by grazing. Jacques et al. (2011) obtained a carcass yield of 43.2% in pasture-fed Dorset lambs, which was similar to the yield for Chilote lambs in this work. However, they were lower than those obtained by Carrasco et al. (2009a) in animals fed by grazing (47.3%). Borton et al. (2005), Carrasco et al. (2009a) and Jacques et al. (2011) found differences in yields between animals fed by grazing and those with different levels of concentrates, which could be due to the diets (Borton et al., 2005; Carrasco et al., 2009a). In the case of this study, this could be associated with the lower nutritive quality of the rangeland, resulting in a lower HCY.

In relation to the zoometric measurements, Carrasco et al. (2009b), in Churra Tensina light lambs, obtained values of 23.0, 18.2 and 51.8 cm for Wr, G, and D, respectively, in lambs after 76 d of feeding by grazing. In the case of Wr, results are lower than what was obtained in this work for both pasture types, while for G the values are higher. The zoometric parameter, D, was higher, which could be associated with methodological differences related to carcass weights and the methods of obtaining zoometric measurements.

Several studies have found differences in the proportions of the cuts, especially when comparing grazing vs. concentrates feeding (Joy et al., 2008; Carrasco et al., 2009b). Better results are obtained for shoulder-rib cuts with animals fed by grazing, which can improve the profits of producers. In the case of leg cut, Carrasco et al. (2009b) did not find difference owing to the feeding system (pasture and concentrates) and in the case of pasture-fed animals this cut represented 33% of carcass weight. Joy et al. (2008) only found differences for the leg cut, representing a higher proportion of the carcass in pasture-fed animals. Grazing as the feeding mechanism also resulted in higher proportions of leg cut according to Borton et al. (2005). Grazing animals present more development of areas related to movement such as the legs.

For the weights and proportions of the structures (hide and hooves), Joy et al. (2008) did find differences between animals fed on grazing and on concentrates in weights (hides) and proportions (hooves) of components not associated with carcass. The grazing group presented values of 3.06% for hooves and 11.1% for hides, which were higher and lower, respectively, than those obtained with Chilote lambs fed on naturalized pasture and rangeland.

Pearson correlation coefficients indicate a strong relationship between zoometric measurements of the carcasses and the weights of cold and hot carcass yields. From this, we infer the utility of zoometric measurements, especially D as predictors of carcass and yield weights.

CONCLUSION

The results obtained with Chilote and Suffolk Down lambs slaughtered at 90 d of age indicated that there are no effects of the breed on the characteristics of the carcass. The only significant differences observed were in the percentages of hide and hooves in relation to live weight, where Chilote lamb had a higher ratio. Despite the differences in the origin and selection of the two breeds, there was no corresponding difference in carcass quality. In relation to the effect of pasture type, there were significant differences only in hot carcass yield. The naturalized-type pasture, although has better nutritional quality than the rangeland, did not result in significant differences in the measurements undertaken. This study shows the possibility of obtaining carcasses without major differences among breeds with different productive purposes in extensive production systems in Chiloe.

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