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Small Ruminant Research 44 (2002) 233–240

Small Ruminant Research

www.elsevier.com/locate/smallrumres

Carcass characteristics and meat quality of Suffolk Down suckling lambs

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Accepted 14 April 2002

Abstract

The object of this project was to study the carcass characteristics and meat quality of Suffolk Down suckling lambs as well as the effects of slaughter weight and sex on these characteristics. Thirty lambs were divided into groups by live weight at slaughter (light or heavy averaging 10.6 or 14.9 kg, respectively) and by sex. Live weight varied from 8.73 to 14.90 kg, hot carcass weight from 4.57 to 8.05 kg, commercial dressing percentage from 51.12 to 54.1%, empty body weight from 53.23 to 57.45%, ribeye muscle area from 8.69 to 12.70 cm^2, and back fat depth from 0.97 to 2.19 mm. The highest retail yields were for shoulder and leg cuts. The anatomical composition of the shoulder was 54.68, 22.98, 17.49, 2.31 and 2.53% for muscle, bone, fat, residue, and shrink losses, respectively, while the percentages for the leg were 55.97, 23.78, 16.62, 1.93 and 1.70%, respectively. The average chemical composition (%) of the fresh meat was: moisture 62.19, protein 18.30, ether extract 17.96, and ash 1.11. The moisture, protein, and ether extract contents varied according to live weight ($p < 0.05$). A sensory evaluation performed on fillet samples (*Psoas major*, *Psoas minor*, *Iliacus*, and *Quadratus lumborum*) revealed only one significant difference among groups, a difference in aroma according to live weight ($p \leq 0.05$). However, a physical analysis of loin samples (*Longissimus dorsi*) showed that water holding capacity and tenderness tended to increase with weight as well. Also, as weight increased, emulsification capacity increased in males while tenderness increased in females. The fatty acid profile from samples of the pelvic and perirenal fat showed a high percentage of saturated fatty acids. The results of the evaluations of both carcass composition and meat quality indicate that suckling lambs are a viable option as a marketable meat. © 2002 Elsevier Science B.V. All rights reserved.

Keywords: Suckling lambs; Carcass characteristics; Meat quality; Fatty acid profile; Sensory evaluation

1. Introduction

The Suffolk Down breed is found throughout central and southern Chile. Adult female weight is around 60–70 kg, and males about 100–150 kg. Lamb's birth weight is approximately 4.4–4.7 kg and these animals are sold at about 30 kg when they are 3–5 months old. Chilean sheep production is based mainly on extensive systems. Under these conditions animal feeding depends on the pasture of the natural prairies. The consumption of ovine meat has steadily declined in Chile, reaching a current rate of 0.5 kg per habitant per year (ODEPA, 2001). This situation may be related to multiple factors, including the product's organoleptic quality, its nutritive value, and its price. These factors have not been adequately addressed in this country,

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PII: S0921-4488(02)00076-7

which may affect the demand for the meat as well as its price. As a consequence, many producers suffer a loss in income as well. One way to reverse the trend of declining consumption of this meat is to improve the product's image, thus offering the market different qualities according to feeding system and weight. Another alternative is the production of suckling lambs. These animals are fed exclusively on their mothers' milk and slaughtered at 25–35 days of age, at a live weight of 10–15 kg (Sañudo et al., 1993; Chasco et al., 1995). This project was designed to evaluate the effects of slaughter weight and sex on the main characteristics of the carcass and meat of suckling lambs.

2. Material and methods

Thirty Suffolk Down lambs born during 1 week from single lambings (15 males and 15 females) and from second and third lambings were raised in permanent confinement and fed only on their mothers' milk. Dams were fed a complete pelleted ration according to NRC (1985). The lambs were assigned to four groups according to slaughter weight (10 ± 2 or 15 ± 1.5 kg) and sex (male or female). The slaughter weight was reached at 23 ± 3 and 30 ± 4 days of age, for lambs with 10 and 15 kg, respectively. The animals were transported to a local commercial slaughterhouse and fasted (only water was available) for 12 h prior to slaughter. After weighing, the lambs were electrically stunned and slaughtered according to standard procedures. Afterward, the hot carcass weight (including kidneys and perirenal fat) was recorded. The gastrointestinal content was estimated as the difference between full and empty gastrointestinal tract, and the empty body weight as live weight minus gastrointestinal content. Empty body weight was calculated as carcass weight divided by live weight, and empty body weight percentage as carcass weight divided by empty body weight (Pérez et al., 2000).

Three hours after slaughter, the carcasses were weighed again and then halved longitudinally with a band saw. Each carcass half was then cut in quarters between the 12th and 13th ribs. Fat depth and muscle area were measured at this level. Fat depth was measured at three quarters the distance between the hind end and a line perpendicular to the axis running through the center of the *Longissimus dorsi* muscle. A caliper was used to measure the muscle area of the *L. dorsi* muscle at 12th rib. The carcass quarters were then cut into neck, shoulder, chops, thorax and leg, according to the Chilean standard cutting procedure for lambs (Pérez et al., 2000). The cuts from the carcasses' right half were dissected, removing bones and tendons (Pérez et al., 2000). The remaining muscle and fat were ground and thoroughly mixed. Samples were taken from the mixes to determine moisture, nitrogen content, ether extract and ash using standard methods (AOAC, 1995). Leg and shoulder from the carcasses' left half were packed in polyethylene bags, frozen at −20 °C, and dissected 2–5 months later. This dissection resulted in four groups of matter: muscle, fat (subcutaneous and intermuscular), bones, and residue (lymphatic ganglia, large blood vessels and nerves, tendons, and joint capsules), as well as shrink losses.

Each component was weighed on a digital scale with a sensitivity of 0.05 g. The shrink losses were estimated as the difference between the initial and final weight of the piece. This number was then used to calculate the commercial dressing percentage of each of the components.

Sensory evaluation of the meat was performed on fillet samples (*Psoas major*, *Psoas minor*, *Iliacus* and *Quadratus lumborum*). A panel of 12 trained evaluators carried out the preference and acceptability testing, according to a method similar to that described by Sañudo et al. (1993). Before the evaluation, the fillets were seasoned with 1.8% salt and cooked at 120 °C for 45 min. The panel scored the samples according to preference, on a hedonic scale of 1–9 points for appearance, aroma, color, saltiness, greasiness, fibrosity, texture, flavor, and acceptability, and on a scale of 1–7 for tenderness and juiciness (Wittig de Penna, 1981).

The physical analysis of the meat included the following tests. (a) *Water holding capacity*: a sample is subjected to centrifuge, which extracts water intimately bound to the tissue structures, especially the proteins. Water holding capacity is expressed as a percentage of the mass lost (Fernández et al., 1997). (b) *Emulsification capacity*: a measure of the change in electrical resistance produced when the phases are inverted, indicating the maximum capacity of the proteins to maintain the emulsification of fine drops of oil during a continuous water phase. It represents the amount of oil emulsified per gram of protein (Cáceres, 1998). (c) *Tenderness*: measured in a

standard size cooked sample, using shear force tests. Warner–Bratzler blades attached to a Lloyd LR-5K machine were used (Sañudo et al., 1993).

In order to determine the fatty acid profile, random samples were taken from the perirenal and pelvic fat of three animals per group. The samples were then subjected to gas liquid chromatography to measure the metallic stearates (Metcalfe, 1960).

The data were subjected to a 2×2 factorial analysis of variance, the factors being sex and weight. Variables measured as percentages were transformed using arc-sine (Sokal and Rohlf, 1981).

3. Results and discussion

The effects of sex and slaughter weight on the main carcass characteristics and proportion of commercial cuts are presented in Table 1. There were no significant effects of sex on any of the carcass characteristics ($p > 0.05$). There were significant differences ($p \leq 0.05$) between the 10 and 15 kg groups which were expected. These results are consistent with those reported by Sañudo et al. (1997) and Cañeque et al. (1999). The hot carcass weights were also consistent with those measured by Ruiz de Huidobro and Cañeque (1993a) and Lauzurica et al. (1999) in Manchega suckling lambs slaughtered at the same weight. The commercial dressing percentages and empty body weight percentages followed similar tendencies, i.e., the rumen was minimally developed and a larger proportion of offal was present (Cañeque et al., 1999). The empty body weight percentage was lower than that found by Lauzurica et al. (1999) but similar to that reported by Pérez et al. (1993) for Manchega lambs with live weights similar to those studied here. The average ribeye muscle area was 8.69 cm^2 for females of 10 kg live weight and 12.70 cm^2 for males of 15 kg, values similar to those reported by Rodríguez et al. (1988) in lambs from different breeds and fed on of natural prairie pastures slaughtered at an average of 30 kg. The back fat depth varied from 0.94 mm in females slaughtered at 10 kg to 2.19 mm in males slaughtered at 15 kg. These results are similar to those obtained by Cañeque et al. (1995) for Manchega suckling lambs, and slightly greater than those reported by Rodríguez et al. (1988) for lambs slaughtered at 30 kg.

The proportion of commercial cuts, as with the carcass characteristics, showed significant effects of slaughter weight ($p \leq 0.05$), and the chops also varied by sex. In all groups the leg cuts constituted more than 35% of the carcass, a value similar to that reported by Cañeque et al. (1999) and Ruiz de Huidobro and Cañeque (1993b). The shoulder made up approximately 20% of the carcass weight, which is consistent with the findings of Cañeque et al. (1999) and Alcalde et al.

Table 1
Means ± standard deviation of carcass characteristics and proportion of the commercial cuts of the suckling lambs according to sex and weight[a]

Characteristics	Males (kg)		Females (kg)		Grand mean (kg)	
	10 ($n = 7$)	15 ($n = 8$)	10 ($n = 8$)	15 ($n = 7$)	10 ($n = 15$)	15 ($n = 15$)
Slaughter weight (kg)	10.64 ± 2.30	14.90 ± 1.25	8.73 ± 2.09	14.25 ± 2.00	9.63 ± 2.33 a	14.60 ± 1.61 b
Dressing, live weight (%)	53.50 ± 1.76	54.12 ± 4.32	52.12 ± 1.55	56.14 ± 1.77	52.70 ± 1.77 a	54.93 ± 3.45 b
Dressing, empty body weight (%)	54.9 ± 11.85	55.85 ± 4.10	53.23 ± 1.71	57.45 ± 1.61	53.85 ± 1.86 a	56.67 ± 3.24 b
Hot carcass weight (kg)	5.70 ± 1.51	8.05 ± 1.25	4.57 ± 1.17	7.98 ± 1.10	5.05 ± 1.40 a	8.02 ± 1.01 b
Muscle area (cm^2)	9.67 ± 2.40	12.70 ± 1.52	8.69 ± 1.22	12.19 ± 2.49	9.15 ± 1.86 a	12.46 ± 1.97 b
Fat depth over *L. dorsi* (mm)	1.57 ± 0.79	2.19 ± 0.53	0.94 ± 0.18	2.07 ± 0.73	1.23 ± 0.62 a	2.13 ± 0.61 b
Leg (%)	38.24 ± 2.76	35.42 ± 1.00	37.32 ± 3.80	36.64 ± 1.46	37.75 ± 3.27 a	35.99 ± 1.35 b
Shoulder (%)	22.89 ± 2.93	19.72 ± 0.36	21.85 ± 1.47	19.49 ± 1.10	22.34 ± 2.24 a	19.61 ± 0.77 b
Thorax (%)	16.28 ± 3.32	21.63 ± 1.73	15.71 ± 3.14	20.39 ± 2.18	15.98 ± 3.12	21.05 ± 10.99 b
Chops (%)	15.67 ± 2.38	13.47 ± 1.81	17.48 ± 2.29	15.18 ± 2.43	16.64 ± 2.43 a	14.27 ± 2.22 b
Neck (%)	5.68 ± 0.47	8.60 ± 0.86	6.26 ± 1.46	6.89 ± 1.40	5.99 ± 1.12 a	7.08 ± 1.40 b
Tail (%)	1.21 ± 1.20	1.11 ± 0.13	1.41 ± 0.24	1.41 ± 0.25	1.32 ± 0.24 a	1.25 ± 0.24 b

[a] Means followed by different letters are significantly different at $P < 0.05$.

(1999) in lamb carcasses whose weights varied from 9 to 15 kg. The chops varied from 13.47% in males weighing 10 kg to 17.48% in females weighing 10 kg, while the rib meat represented nearly 20% of the carcass weight. These results are similar to those reported by Cañeque et al. (1999) and Ruiz de Huidobro and Cañeque (1993b) for Manchega lambs. The neck varied from 5.68 in males weighing 10 kg to 8.60 in males weighing 15 kg, results similar to those found by the authors cited above. The tail showed significant differences ($p \leq 0.05$) by sex, varying from 1.11% in the males of 15 kg to 1.41 in females of the same weight, however, from a commercial and culinary points of view this cut is of marginal importance.

Table 2 shows the effect of slaughter weight and sex on the anatomical composition of the two main carcass cuts of suckling lambs. The muscle percentage varied between 53 and 56, and 52 and 56% in the shoulder and leg, respectively. Aparicio et al. (1986) found a greater proportion of muscle tissue in the shoulder, leg, and chops of Merino lambs. Ruiz de Huidobro and Cañeque (1994) reported 61% muscle in the shoulder cuts and more than 60% muscle in the leg. These figures are slightly greater than those reported here, which may be due to different dissection techniques or to the different muscle growth rates of each breed. There was an effect of slaughter weight on bone percentage in both cuts ($p \leq 0.05$), while sex affected percent bone in only the leg cut ($p \leq 0.05$). Bone percentage varied from 20 to 24% in the shoulder and 20 to 25% in the leg. These percentages are similar to those obtained by Ruiz de Huidobro and Cañeque (1994) and slightly greater than those found by Tabilo (2001). Tabilo reported 18.2% bone for the shoulder cut and 22.7% bone for the leg in Suffolk Down × Corriedale suckling lambs. The fat percentage in both cuts showed an effect for slaughter weight ($p \leq 0.05$), while sex only affected the fat content of the leg ($p \leq 0.05$). There was also a significant interaction effect between weight and sex for leg cuts ($p \leq 0.05$). The fat percentage varied from 15.04 to 22.13% in the shoulder and 13.99 to 17.18% in the leg. These results suggest differences among breeds in body fat distribution and fat distribution in the meat cuts (Sañudo et al., 1997). For Manchega suckling lambs, Ruiz de Huidobro and Cañeque (1994) reported values of 13.09% for the shoulder and 10.91% for the leg, and similar percentages were obtained by Pérez et al. (1993) in lambs of the same breed but at greater slaughter weights. The carcasses studied showed fairly high fat levels, which may be due to the breed's precocity and the high number of calories provided by the maternal milk. Residue varied from 1.67 to 2.72% in the shoulder and from 1.43 to 2.85% in the leg. Only slaughter weight produced significant differences ($p \leq 0.05$). These values are lower than the 3.9% reported by Sañudo et al. (1997) for suckling lambs of different breeds, which may be due to different dissection techniques.

Shrink losses did not differ significantly in either cut according to slaughter weight, sex, or sex–weight

Table 2
Means ± standard deviation of anatomical composition of shoulder and leg[a]

Anatomical composition (%)	Males (kg)		Females (kg)		Total mean (kg)	
	10	15	10	15	10	15
Shoulder						
Muscle	55.73 ± 2.43	56.79 ± 2.22	54.54 ± 3.73	52.26 ± 1.99	55.13 ± 3.06 a	54.35 ± 3.09 b
Bone	23.77 ± 2.01	23.11 ± 0.71	24.08 ± 2.48	20.97 ± 1.97	23.92 ± 2.10 a	21.96 ± 1.84 b
Fat	15.11 ± 3.83	17.06 ± 1.46	15.04 ± 5.50	22.13 ± 2.86	15.08 ± 4.52 a	19.79 ± 3.45 b
Residues	2.72 ± 1.08	1.67 ± 0.57	2.66 ± 1.18	2.03 ± 0.76	2.69 ± 1.08 a	1.86 ± 0.68
Losses	2.8 ± 1.54	1.37 ± 0.76	3.68 ± 3.40	2.61 ± 2.00	3.18 ± 2.57 a	2.04 ± 1.63 b
Leg						
Muscle	56.19 ± 2.94	57.09 ± 1.58	54.54 ± 3.73	52.26 ± 1.99	55.13 ± 3.06 a	54.35 ± 3.09 b
Bone	25.71 ± 2.06	23.07 ± 1.57	25.32 ± 1.91	20.48 ± 1.64	23.92 ± 2.10 a	21.96 ± 1.84 b
Fat	14.80 ± 3.76	16.27 ± 1.80	13.99 ± 4.16	21.08 ± 2.16	14.39 ± 3.81 a	18.86 ± 3.15 b
Residues	2.01 ± 0.97	1.44 ± 0.24	2.85 ± 2.16	1.43 ± 0.53	2.43 ± 1.65 a	1.44 ± 0.40 b
Losses	1.29 ± 0.67	2.14 ± 0.48	1.69 ± 0.97	1.71 ± 0.81	1.49 ± 0.82 a	1.91 ± 0.68 b

[a] Means followed by different letters are significantly different at $P < 0.05$.

interaction. These results are similar to those described by Pérez et al. (1993) for lambs at 24 kg live weight as well as those reported by Tabilo (2001) for Suffolk Down × Corriedale hybrid suckling lambs of the same weight as those studied here.

Table 3 presents the main ratios among the anatomical components of the shoulder and leg cuts. There were no significant differences ($p \leq 0.05$) among groups for weight, sex, or sex × weight interaction. The muscle/bone ratio varied from 2.28 to 2.51 in the shoulder and from 2.19 to 2.69 in the leg. These results are similar to those found by Cañeque et al. (1999) in Manchega suckling lambs. However, Alcalde et al. (1999) reported higher muscle/bone ratios, from 2.8 for lambs from Argentina to 3.3 for Merino lambs. The muscle fat/bone ratios found in this study are consistent with those reported by Tabilo (2001). This finding is significant in terms of the possibility of commercializing suckling lambs. The muscle/fat ratio for shoulder and leg cuts averaged 3.46 and 3.63, respectively, indicating that the product is low in fat. These results are similar to those reported by Spanish researchers for Manchega suckling lambs (Ruiz de Huidobro and Cañeque, 1994; Cañeque et al., 1999).

The chemical composition of the meat of the suckling lambs is presented in Table 4. The variables showed significant effects of slaughter weight ($p \leq 0.05$), and the ash content also showed a significant weight × sex interaction effect. The average moisture content among all groups was 62%. These results are consistent with those obtained from British lambs with live weights from 16.96 to 65.86 kg (Crouse et al., 1981). The average protein content (18%) was similar to that observed in low-weight British lambs and slightly greater than that observed in higher weight lambs. The average ash content (1.11%) was lower than that found in the British lambs.

The organoleptic characteristics of the meat of the suckling lambs are presented in Table 5. The only significant difference between groups was for aroma ($p \leq 0.05$), which varied according to slaughter weight. These results are different from those reported by Sañudo et al. (1993), who found that the juiciness of the meat increased with slaughter weight. The results of sensory evaluation suggest that the meat from Suffolk Down suckling lambs has an acceptable appearance. The texture was better than fair. All of the samples received scores of around 5 for color, as expected. The 15 kg group received slightly higher scores for aroma. The samples also received a score of around 5 for saltiness, indicating that 1.8% salt is an appropriate concentration level to prepare suckling lambs for sensory testing. The samples were judged to have good lamb flavor, and they received high scores for fibrosity. The meat was given an acceptable score for tenderness, which is a good index. Greasiness was rated light to moderate. Juiciness scores were typical for this type of meat. The data from the sensory evaluation performed for this study are similar to those reported by various Spanish researchers (Sañudo et al., 1993, 1997; Alfonso et al., 1999), indicating that this meat is of optimum quality.

Table 6 presents the results of the acceptability ratings of the suckling lamb meat. This variable showed effects of slaughter weight alone ($p \leq 0.05$). The high acceptability ratings of the meat are noteworthy, indicating that consumers can be expected to respond

Table 3
Means ± standard deviation of main ratios between anatomical components of shoulder and leg

Main ratios	Males (kg)		Females (kg)	
	10	15	10	15
Shoulder				
Muscle/bone	2.36 ± 0.21	2.42 ± 0.18	2.28 ± 0.17	2.51 ± 0.24
Muscle + fat/bone	3.00 ± 0.28	3.14 ± 0.20	2.92 ± 0.35	3.58 ± 0.47
Muscle/fat	3.90 ± 1.02	3.34 ± 0.35	4.21 ± 1.97	2.39 ± 0.30
Leg				
Muscle/bone	2.19 ± 0.16	2.39 ± 0.33	2.23 ± 0.20	2.69 ± 0.27
Muscle + fat/bone	2.78 ± 0.28	3.07 ± 0.43	2.72 ± 0.37	3.71 ± 0.33
Muscle/fat	4.04 ± 1.14	3.55 ± 0.45	4.29 ± 1.23	2.65 ± 0.32

Table 4
Means ± standard deviation of chemical composition of meat (fresh basis)[a]

Chemical composition (%)	Males (kg)		Females (kg)		Total mean (kg)	
	10	15	10	15	10	15
Humidity	63.84 ± 5.27	63.32 ± 0.51	64.55 ± 7.24	57.70 ± 2.15	64.17 ± 5.99 a	60.04 ± 3.32 b
Protein	18.93 ± 0.94	17.88 ± 0.50	18.87 ± 1.27	17.49 ± 0.89	18.91 ± 1.06 a	17.65 ± 0.75 b
Ether extract	16.34 ± 5.90	17.88 ± 0.50	14.75 ± 1.72	22.32 ± 3.58	15.61 ± 6.55 a	20.51 ± 3.60 b
Ash	1.11 ± 0.05	1.06 ± 0.09	1.27 ± 0.22	1.00 ± 0.08	1.18 ± 0.17 a	1.02 ± 0.09 b

[a] Means followed by different letters are significantly different at $P < 0.05$.

Table 5
Sensory score evaluation of meat

Characteristics	Female, 10 kg	Male, 15 kg	Female, 10 kg	Male, 15 kg	Ideal score
Appearance	6.58	6.50	5.91	6.50	5.5–9
Texture	6.25	5.92	6.67	6.17	5.5–9
Color	5.08	4.92	5.00	4.92	5
Flavor	4.75	8.83	5.50	5.17	5
Salted	5.17	4.75	4.83	5.08	5
Taste	5.50	5.33	5.33	5.58	5
Fibrous	5.33	6.17	4.92	4.75	5
Tenderness	3.75	3.92	3.42	3.58	3–4
Fattiness	4.50	4.25	4.50	4.08	3–4
Juiciness	3.67	3.50	3.58	3.58	2–4

well to the product. These results support the findings of Tabilo (2001).

In terms of the physical characteristics of the Suffolk Down suckling lambs, the samples showed extremely high shear force values that varied significantly ($p < 0.05$) according to slaughter weight. These results differ from previous findings because of both the lambs' age and their breed. Sañudo et al. (1997) reported Warner–Bratzler shear values of 4.33–3.43 for suckling lambs of other breeds, using a different protocol. The samples were handled differently prior to analysis, in that they were frozen, which probably shortened the muscle fibers (Kinsman et al., 1994).

Table 6
Acceptability score of meat

	Female, 10 kg	Male, 15 kg	Female, 10 kg	Male, 15 kg
Average score	6.75	6.71	7.58	6.83
Acceptability (%)	87.5	87.5	95.8	87.5
Indifference (%)	4.20	12.5	0.00	8.30
Rejection (%)	8.30	0.00	4.20	4.20

Wheeler et al. (1997) pointed out that different institutions had obtained highly divergent Warner–Bratzler shear values for bovines, and emphasized the importance of adhering to a standardized protocol. Boleman et al. (1997), in addition, studied the correlation between Warner–Bratzler force values and consumer tenderness perceptions of bovine meat and concluded that this method is capable of distinguishing between different texture categories. This would explain the discrepancy between these results and the sensory evaluation performed in the same animals.

Emulsification capacity differed significantly between males and females of both slaughter weights ($p < 005$) (Table 7). The standard deviation was greater for higher weight animals. These results, consistent with those reported by Tejada et al. (1987) for bovines in equivalent experimental conditions, suggest that the meat proteins can be expected to have good emulsification properties. Values reported by Hill (1986) for proteins of different origins indicated that meat proteins generally have a moderate emulsification capacity. It is difficult to compare emulsification properties because of the lack standardized procedures for preparing the

Table 7
Means ± standard deviation of effects of slaughter weight and sex on texture, emulsification capacity (EC) and water holding capacity (WHC) of meat

	Female, 10 kg	Male, 10 kg	Female, 15 kg	Male, 15 kg
Texture (kg/cm^2)	13.67 ± 1.96	11.86 ± 5.52	6.34 ± 2.67	8.46 ± 1.52
EC (g)	88.27 ± 3.59	97.93 ± 2.60	83.35 ± 19.87	97.98 ± 8.59
WHC (%)	11.45 ± 1.41	11.82 ± 3.11	10.02 ± 1.87	9.94 ± 1.74

Table 8
Fatty acid profile of pelvic and renal fat depot

Fatty acid (%)	Mean	S.D.
Capric 10:0	0.22	0.14
Lauric 12:0	1.14	0.44
Myristic 14:0	8.74	1.28
Pentadecanoic 15:0	0.55	0.20
Palmitic 16:0	22.60	1.93
Heptadecanoic 17:0	1.12	0.34
Stearic 18:0	18.63	4.89
Eicosanoic 20:0	0.55	0.20
Myristoleic 14:1	0.48	0.27
Palmitoleic 16:1	2.31	0.71
Oleic 18:1	34.13	2.37
Hexadecadienoic 16:2	0.68	0.30
Linoleic 18:2	5.58	0.86
Linolenic 18:3	1.39	0.53

emulsion, inconsistencies in the terminology used, and the lack of available control materials (Hall, 1996).

The water holding capacity was relatively constant among groups, and tended to increase slightly with slaughter weight. The values obtained are within the expected range for animals of the age and species studied and are consistent with results obtained by Sañudo et al. (1997) using the same methodology.

The fatty acid profiles of pelvic and renal fat deposits of the suckling lambs showed no effect of slaughter weight (Table 8). The fat deposits had high levels of saturated fats, especially palmitic and stearic acids. These results are consistent with those reported by Chasco et al. (1995). In terms of unsaturated fatty acids, the highest levels were for oleic acid, linoleic acid, and palmitoleic acid, in proportions similar to those described by Sañudo et al. (1993).

4. Conclusions

The carcasses studied showed high empty body weight percentages and commercial dressing percentages, and these characteristics varied only for slaughter weight. The meat of the suckling lambs received high acceptability ratings and the composition of the fat deposits indicated a high level of desirable fatty acids.

Acknowledgements

This research was funded by Fundación para Innovación Agraria (FIA), Chile, project C-97-2-P-008.

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