

NUTRITIONAL AND SENSORY CHARACTERIZATION OF PATAGONIAN LAMB

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INTRODUCTION

Patagonian lamb meat is well know by its high sensory quality. It is produced in natural grassing conditions in Patagonian, one of the less world contaminated regions. Recently some sectors related to lamb meat want to increase its product value by means of a better definition of the product. The aim of the present paper is to communicate the results of a 3 years survey on the characterization of Patagonian lamb carcass and meat. Data collected could be useful to establish baseline nutritional and sensory attributes for patagonian lamb meat.

MATERIALS AND METHODS

Corriedale and Merino lamb carcasses were selected as representatives of patagonian lamb production in the main five geographic areas C, IV, SM, EM and M (three rural farms in each) during 1994, 1995 and 1996 years. Half carcasses (n=200) were transported to the Instituto Tecnología de Alimentos, CICV, INTA for dissection, chemical analysis and sensory measurements. Half lamb carcasses were subjected to dissection in order to determine the percentage fat, lean, bone and connective tissue. Semimembranosus (SM), Semitendinosus (ST), Bicep femoris (BF), Rectus femoris (RF), Gluteos (G) and Longissimus dorsi (LD) muscles were extracted with the Folch et al. (1957) technique. Aliquots samples from the chloroform extracts were used for the determination of total intramuscular fat (IMF%), saturated, monounsaturated and polyunsaturated fats and cholesterol content (García et al. 1995 a,b). Chops and roasts used for sensory evaluation were cooked in an electric oven according to the American Meat Science Association rules (AMSA). Each sample was rated on an eight-point scale from 1 (ext. tough, not aromatic, mild, dry and abundant) to 8 (ext. tender, strong, intense, juicy and none) for overall tenderness, flavor, aroma, juiciness and connective tissue. The data were analyzed using a General Linear Model Procedure (SAS Institute, 1987)

RESULTS AND DISCUSSION

The average percentages for total carcass, and leg, shoulder, rack, breast, loin and neck cuts separable lean, fat, bone and connective tissue are presented in Table 1.

No statistical differences ($p < 0.05$) were detected in intramuscular lean fat among geographical regions or muscle. The average values are presented in Table 2. The CV% are also very small.

The cholesterol content shows same differences among muscles or areas and the average CV% was close to 25%. The values according to the different muscles are given in Table 3. The average cholesterol content was 52mg/100g. The average values for saturated, mono and polyunsaturated fats (lean tissue only) were respectively 2.2, 1.1, 0.9 and 0.3 g/100g. In Table 4 and 5 are shown the results for SM and BF muscles.

All cuts received moderate to high ratings with respect to flavor, aroma, juiciness, tenderness and connective tissue (Table 6). The CV% for flavor (11, 11, 11, 23 and 14), aroma (12,14,12,22 and 13), juiciness (10,15,10,16 and 12), tenderness (13,15,13,12 and 13) and connective tissue (7,6,3,9, and 5) for C, VI, SM, EM and M respectively were very low.

CONCLUSIONS

The results of the present study could set up the baseline for patagonian lamb meat definition. The patagonian lamb meat lean could be characterized as a product with an average of 2.2 g of fat discriminated in 1.1 g of saturated, 0.9 g of monounsaturated and 0.3 g of polyunsaturated and 52 mg of cholesterol in 100 g of lean. Also is a meat with moderate to high ratings with respect to flavor, aroma, juiciness, tenderness and connective tissue.

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Table 2. Intramuscular fat (g/100 g lean). Average all six muscles in each regional areas. Mean±SD and CV%.

	AREA					Average
	C	VI	SM	EM	M	
n	270	240	180	270	240	
Mean±SD	2.2±1.17	2.2±0.05	2.1±0.24	2.4±0.21	2.7±0.31	2.3
CV%	8	2	11	8	11	

Table 1. Separable lean, fat and bone + connective tissue as a percentage of total carcass weight

	Lean M±SD	CV%	Fat M±SD	CV%	Bone M±SD	CV%
Total	52.4±9.77	19	17.2±6.59	38	22.9±4.04	18
Leg	60.4±11.32	19	13.0±4.40	34	22.7±4.40	19
Shoulder	57.7±10.13	18	14.1±5.62	40	22.9±3.37	15
Rack	47.2±10.73	23	15.9±7.66	48	29.4±9.20	31
Breast	41.6±9.20	22	31.5±12.89	41	25.2±5.52	22
Loin	50.5±11.42	23	21.3±11.42	54	18.5±5.71	31
Neck	46.7±12.40	27	22.3±9.92	44	23.6±7.44	32

Table 6. Ratings for flavor, aroma, juiciness, tenderness and connective tissue for patagonian lamb meat according to geographical area. Mean±SD

	C	VI	SM	EM	M
Flavor	4.9±0.56	5.0±0.56	4.9±0.55	4.5±1.01	4.9±0.70
Aroma	5.3±0.62	5.2±0.71	5.3±0.62	4.9±1.07	5.4±0.70
Juiciness	4.8±0.49	4.4±0.66	4.7±0.49	4.8±0.77	4.6±0.53
Tenderness	5.6±0.75	5.8±0.86	6.0±0.76	5.7±0.67	5.9±0.76
Connective tissue	7.4±0.50	7.4±0.44	7.7±0.25	7.2±0.64	7.4±0.39

Table 4. Total intramuscular fat, saturated fat (SFA), monounsaturated (MUFA) and polyunsaturated (PUFA) of Semimembranosus muscle in each geographic area.

Fat g/100g lean	C (n= 45)	VI (n= 40)	SM (n= 30)	EM (n= 45)	M (n= 40)	TOTAL
Total	2.0	2.2	1.9	2.3	2.1	2.1
SFA	1.0	1.0	0.9	1.0	1.0	1.0
MUFA	0.8	0.9	0.7	0.9	0.8	0.8
PUFA	0.3	0.3	0.3	0.3	0.3	0.3

Table 5. Total intramuscular fat, saturated fat (SFA), monounsaturated (MUFA) and polyunsaturated (PUFA) in Biceps femoris muscle in each geographic area.

Fat g/100g lean	C	VI	SM	EM	M	TOTAL
n	45	40	30	45	40	200
Total fat total	2.1	2.1	1.9	2.0	2.9	2.2
SFA	1.0	0.9	0.9	0.9	1.4	1.0
MUFA	0.8	0.8	0.7	0.8	1.1	0.9
PUFA	0.3	0.4	0.3	0.2	0.4	0.3

Table 3. Cholesterol content (mg/100g of lean) in the studied muscles. Mean±SD CV%

	MUSCLE						Average
	SM	ST	BF	RF	G	LD	
n	200	200	200	200	200	200	
Mean±SD	51.6±13.9c	43.7±10.9 ^a	54.4±10.7d	47.3±13.3b	56.6±10.9d	51.5±12.9	51.5±12.9
CV%	27	24	19	28	26	19	25

^{a,b,c} Means with different letters are significantly different (p<0.05)