

SENSORY MEAT CHARACTERISTICS FROM LIGHT LAMB CARCASSES

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SUMMARY

Light lamb carcasses (9.5-12.5 Kg) belonging to 9 different genotypes, the sensorial meat quality has been studied by a group of 8 trained tasters who analyzed three samples per plate; one of them was always from the same genotype (used as standard type) and the other two belonged to two of the other types, obtaining for each of them a total of 64 observations, except for the standard type which had 256.

Extensive feed-lot in young animals and lactation up until slaughter gives a positive influence on meat quality (suckling Lacaune lambs have very juicy and tender meat with little odour and taste), also being profitable their good growth potential and a slight early development which enables a good carcass finish, this happens in weaned Lacaune, German merino, Rasa Aragonesa, Merino Precos x Merino. In general a uniform feed-lot system (early weaning finished on concentrate and straw), this tends to improve the sensorial characteristics of the carcasses. On the other hand the lambs finished on pasture (british) higher the slaughter age (5-7 months), which also added to freezing (New Zealand and Argentinian carcasses) makes the quality tend to be worse.

INTRODUCTION

Due to international increase of commercial transactions, the arrival of very diverse products on regional markets is becoming more and more frequent, sheltering the prestigious local denominations in a more or less fraudulent way, this happens to the Pata Negra de Aragón and its specific denomination of quality. All this disorients consumers who cannot find typified quality and seems to be necessary to study the carcass and specially the meat quality of these products, to find their real differences and be able to offer the consumer and the different commercialization levels, a further information, essential in a unique and developed market.

In an earlier study (SIERRA et al., 1992) the quality of different carcass types were studied showing that although they had different morphology no significant differences showed neither in their commercial value (% of 1st category pieces) nor in their technological (tissue composition), concluding in the meat is where true quality typification should be looked for, insisting upon the fact when viewing the following lamb carcass regulations of the Common Market. The study of this quality in different light lamb carcass types is the main objective of this work.

MATERIALS AND METHODS

ANIMALS: Starting off with a sample of 96 light lamb carcasses (9.5-12.5 Kg) belonging to male lambs and coming from the following genotypes or groups:

- 32 Rasa Aragonesa (RA) coming from weaned animals, with an average age of 56 days, kept on concentrate and cereal until slaughter at 80-90 days old.
- 8 refrigerated british carcasses (BRI), kept on an extensive feed-lot regimen (pasture and slaughtered at 5-6 months old).
- 8 Merino Precos x Merino (ME), bred in an extensive regimen in the south east of Spain and later, stabled and fed on concentrate and straw, in places near consuming and slaughter centers (young animals 80-90 days old).
- 8 New Zealand frozen carcasses (NZ). Imported and from extensive feed-lot farms (pasture and slaughtered at 5-6 months old).

- 8 Argentinian carcasses, frozen (AR) and under similar conditions to the New Zeland ones.
- 8 Manchega carcasses (MA). Animals weaned at about 50 days old and later kept on concentrate and cereal straw until slaughter at 70-80 days old.
- 8 Suckling Lacaune (SLA). Slaughtered in Zaragoza, immediatly after being imported from farms in the south of France (lactating and stabled, at 60-70 days old).
- 8 weaned Lacaune (WLA). Also from the south of France, but because of their lower weight, finished on concentrate and straw and stabled (65-80 days old when slaughtered).
- 8 German Merinos (GME), imported live, coming from an extensive feed-lot system and finished locally in a feedlot stable as before slaughtered at 80-90 days old.

METHODOLOGY: With a trained group of 8 tasters the tenderness, juiciness, flavor intensity and overall satisfaction were evaluated, obtaining a total of 64 observations for each carcass type, except for RA, used as a standard type in which 28 observations were gained. The comparisons made are the following:

RA - BRI -ME

RA - NZ - AR

RA - MA - SLA

RA - GME - WLA

The meat (m. L. dorsi) was grilled until reaching an internal temperature of 85°C (TOURAILLE, 1980).

The results expressed in values from 0 to 100 were analyzed by analysis of variance verifying the market type products and checking the means by Bonferroni test.

RESULTS and DISCUSSION

TENDERNESS: The tenderness in lamb has been less studied than in beef, therefore there are few issues dedicated to this subject; either to the ripening study or to the overall development and characteristics, specially to light lamb carcasses (9.5-12 Kg) and young ones.

The highers tenderness (Table 1) belongs to lactating Lacaune carcasses, that because of it's early development and high growth rates it has reached earlier slaughter age with a good finishing grade; although, on it's own, lactation does not seem to influence this quality (SUMMERS, 1978) nevertheless in our issue differences are apreciated between SLA and WLA. In a surprising way, the british carcasses show to be the tenderest, which could be due to a different ripening process: since the date of arrived at the local markets they spent three days before consumption, but to this period, the time between slaughter until their arrival should be added.

On the other hand, the toughest meat, comes from argentinian carcasses: older animals, extensive farm systems and from older carcasses.

When the farming system is similar: young weaned animals with concentrate ad libitum, the tenderness differences are attenuated; this has happened between GME, WLA, RA, ME, MA. These results are in agreement with SOLOMON et al. (1980).

Table 1. TENDERNESS¹

Suckling Lacaune (SLA)		British Carcasses (BRI)		German Merino (GME)		Weaned Lacaune (WLA)		Rasa Aragonesa (RA)		New Zeland Carcasses (NZ)		Me.Precoz x Merino (ME)		Manchego (MA)		Argentinian Carcasses (AR)	
x	σ	x	σ	x	σ	x	σ	x	σ	x	σ	x	σ	x	σ	x	σ
73,2	14,8	70,4	18,4	70,3	13,3	67,6	13,6	65,1	16,9	63,8	16,4	62,2	22,6	61,6	18,0	53,4	17,9
a ²		ab		ab		b		b		b		bc		bc		c	

¹ evaluated from 0 to 100 (F= 7,80; P<0,01)

² different letters indicate significant differences between the means

NESS: The absence of problematic meat, because of alterations in the pH evolution, means that in this species the juice
 are less than in beef and pork and it is linked to the fat state of the animal, this being a sensorial characteristic, to
 tenderness.
 Table 2 the juiciness results are shown, in which, more clearly than in the tenderness ones we can see how stabled animals
 on concentrate and slaughtered very young (WLA, GME, RA, MA and ME) offer juicier meat than that from extensive farm
 animals finished on pasture and that are also older (BRI, NZ and AR), these results coincide with TOURAINE et al. (1984)
 HAWKINS et al. (1985).

Table 2. JUICINESS¹

German Merino (GME)		Weaned Lacaune (WLA)		Rasa Aragonesa (RA)		Manchego (MA)		Me.Precoz x Merino (ME)		British Carcasses (BRI)		New Zeland Carcasses (NZ)		Argentinian Carcasses (AR)	
x	σ	x	σ	x	σ	x	σ	x	σ	x	σ	x	σ	x	σ
11,3															
71,0	12,2	69,4	13,4	68,3	12,2	67,4	13,9	67,3	15,0	64,0	14,7	63,7	13,3	58,8	14
ab		ab		b		b		b		bc		bc		c	

rated from 1 to 100 (F= 8,06; P<0,01)
 ent letters indicate significative differences between means

WOR: On european mediterranean markets in general, and in particular on the aragonés market lamb a soft taste and odour
 preferred. This preference is determinated by consumer habits: young animals and cooking methods (roasted and fried) that
 to preserve and higher natural aromas.
 Table 3, within the results shown, the more intensive aroma of british carcasses stands out, this coincides with previous
 (SAÑUDO et al., 1989). Lactating lamb carcasses have less aroma.
 though the differences are not statistically significative a tendency has been observed in which animals with high food regimen
 (concentrate) have less aroma (CROUSE et al., 1981) than lambs on pasture. Merino animals traditionally with more intensive
 as, occupy different positions depending to their origen: less in Merino precoz cross than the german ones.

Table 3. FLAVOR¹

Manchego (MA)		Me.Precoz x Merino (ME)		Weaned Lacaune (WLA)		Argentinian Carcasses (AR)		Rasa Aragonesa (RA)		German Merino (GME)		New Zeland Carcasses (NZ)		British Carcasses (BRI)	
x	σ	x	σ	x	σ	x	σ	x	σ	x	σ	x	σ	x	σ
13,4															
65,9	13,6	66,9	14,0	67,2	12,7	68,3	12,1	69,2	12,9	69,5	12,3	70,5	14,9	75,3	13,4
a		a		a		ab		a		ab		ab		b	

rated from 0 to 100 (F= 4,13; P<0,01)
 ent letters indicate significant differences between the means

ALL SATISFACTION: The overall palatability is slightly linked to tenderness/juiciness, but influenced by flavor or some
 non defined sensation.
 what seen on Table 4, the best palatability can be found in young animals lactating up until slaughter (SLA), this is because
 milk diet apart from allowing a higher fat level and good growths, it transmits better sensorial characteristics (fatty acid
 position, etc). On the contrary we see how WLA gets close to our standard type's (RA) characteristics, weaned and finished
 similar way.
 good compensating growth is also profitable using a rich finishing diet which corrects the extensive start, allowing a good
 grade (GME and ME). When this is not adequate (MA) for being a late breed without compensating growth or when
 term conditions are extensive (BRI, NZ, AR) the quality gets worse, specially if we also add on freezing.

Table 4. OVERALL SATISFACTION¹

Suckling Lacaune (SLA)		German Merino (GME)		Weaned Lacaune (WLA)		Rasa Aragonesa (RA)		Me.Precoz x Merino (ME)		British Carcasses (BRI)		Manchego (MA)		New Zeland Carcasses (NZ)		Argentinian Carcasses (AR)	
x	σ	x	σ	x	σ	x	σ	x	σ	x	σ	x	σ	x	σ	x	σ
73,1	13,5	71,5	11,5	69,0	11,4	67,3	12,5	67,2	16,6	64,2	14,5	63,1	13,7	58,9	16,0	53,9	14,4
a ¹		ab		abc		abc		abc		bcd		cde		de		e	

¹ evaluated from 0 to 100 (F= 13,27; P<0,01)

² Different letters indicate significant differences between the means

CONCLUSION

The different light lamb carcass types that are commercialized on Spanish markets and in particular on Aragon markets offer very different sensorial qualities. These differences, apart from the genetic type, are mainly influenced by the type of feed, farm, slaughter age and carcass conservation system. The younger animals being the ones with the highest quality, produced in intensive systems and not frozen, this should be reflected on a higher market value.

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