INFLUENCE OF LIVESTOCK SYSTEM ON GROWTH PERFORMANCE OF GROWING CHURRA TENSINA LAMBS

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SUMMARY

The objective was to study the influence of livestock production system, extensive *vs.* intensive, on growth performance of lambs of Churra Tensina breed. In the extensive system, 18 lambs were reared with their ewes on pasture from 7 days old to slaughter, with no supplementation feed. The intensive system, 18 lambs were kept indoor with free access to concentrate, while their ewes were also indoor from 17 h to 8 h, receiving 500 g of barley as concentrate and the rest of time were given access to a pasture. At 50 days old, lambs from intensive treatment were weaned. When lambs had a liveweight of 22-24 kg were slaughtered. Lambs were weighted once a week and diet intake was controlled weekly. The lamb weights at birth, at 52 days old (weaning for intensive treatment) and at slaughter were not affected by treatment ($P>0.05$). However the time spent from birth to slaughter was greater in extensive treatment with 85 days, while intensive lambs only needed 74 days ($P<0.01$). The average daily gain was higher for intensive treatment with 281 g/day than 242 g/day in extensive. This higher performance of intensive treatment was consequence of the supplementation of 26 kg of barley/ewe and 39.3 kg of concentrate/lamb, while the extensive treatment did not received any supplementation.

KEY WORDS: production system, lambs, growth.

INTRODUCTION

The interest to study the forage-based production systems in growing lambs, similar to biological production, is a consequence to the increase of demand of traditional, healthy and safety meat products (Cocoran et al,. 2001). However, this production system can be associated to a poorer growing performance and a changes of carcass and meat quality (Blackburn et al., 1991), which can not be desired for farmer nor for consumers. When forage is included in the fattening diet, in comparison to the drylot systems, it is observed a reduction of average daily gain (McClure et al., 1995), although the effect not always is significant (Zervas et al., 1999), and carcasses had a lower degree of fatness. Nowadays, these lean carcasses (McClure et al., 1995, Ely et al., 1979, Murphy et al., 1994) can meet the desires of consumers, with more muscle and less fat depots, but with the traditional meat taste. At economical term, the forage-based production can present a reduction on total cost than dry lot, and the profitability of the system will depend mainly on the price of meat (Fernández y Woodward, 1999) owing its sensorial quality.

MATERIAL AND METHODS

A total of 36 Churra Tensina ewes were used to study the effect of livestock production system on performance of growing lambs. Ewes were selected from the flock of the Animal Production Department of Centro de Investigación y Tecnología Agroalimentaria of Aragón (Spain), located at Bescos de la Garcipollera (Huesca's Pyrennees). The ewes had a liveweight of 48.9 ± 5.44 kg and had single male lambs.

After lambing, they were divided into two treatments; each of them was uniform for lambing date and weight and had 18 ewes and its male lambs.
Two treatments were studied. One of them was conducted on mountain "meadow" (extensive) (P) and the other was conducted in a drylot (intensive) (D). In the P treatment ewes and lambs remained together from birth to slaughtering at the mountain pasture and did not have any kind of supplement. The other treatment, D, lambs remained always indoor and ewes went at pasture from 8 to 17 h everyday, and the rest of time ewes kept with their lambs to milk them. In this treatment, ewes were supplemented with 500 g/day of barley meal (11.85 %PB) and lambs had access to concentrate ad libitum: from birth to 33 days of age was a growing-concentrate (18.23% CP) and from 34 days to slaughtering was a fattening-concentrate (16.72% CP). The lambs from D treatment were weaned at an average age of 52±5 days.
Animals grazed a meadow of 1.13 ha and composed by 22% of leguminous (mainly *Trifolium repens*), 68 % of grasses (the main species were *Festuca arrundinácea* and *pratensis*, *Datylis glomerata*) and 10% of others species (*Rumex acetosa*, *Ranunculus bulbosus*...) The surface of the meadow was divided into two parts: one for P treatment and the other for the ewes of D treatment. The forage production of this meadow was always enough to assure the maxim intake by animals.
After lambs had 15 d old, ewes and lambs were weighted every week and when the lambs reached 22-24 kg of liveweight (LW) were separated and prepared to slaughter at the abattoir of Research Institute in Zaragoza.
All results were analysed by Univariate analysis by the proc GLM of SAS (1999). The model followed was $Y_{ij} = \mu + \tau_i + \xi_j$.

RESULTS AND DISCUSSION

During the first 30 days of study, the lamb's growth of the P treatment was higher than the D treatment (Table 1), which was a consequence of the higher milk production that the ewes of that treatment had during the first month of lactation (Tort et al., 2004). However after that time, D lambs presented a greater average daily gain (ADG), which could be a result of the tendency of milk production of D treatment to be greater than P as well as to the beginning intake of concentrate by D lambs. The ADG of P lambs were good until the 53 days of age (between 240-264 g/d), but from this date the growth decreased to 227 g/d, which was a moderate growth (Table 1). D treatment presented an ADG from 245 to 296 g/d during all experimental period. All differences between treatments were a consequence of the diet intake, based on concentrate and straw in D treatment, which make a diet rich in energy, while the forage from the meadow had an allowance of energy limited, producing a lower growth.

The higher growth of D treatment caused a decrease of the period time spent between birth and slaughtering, which was done at a Liveweight (LW) of 22-24 kg. The most important effect of treatment was the time spent to reach the final LW ($P<0.01$), with 85 days for P and 74 days for D lambs ($P<0.01$).
The concentrate intake was registered only in the D treatment, and was the main factor responsible of the higher AD. Lambs had an intake of concentrate of 9.3 kg from birth to 33 days of age and 30 kg from this to slaughter, and ewes ate 26 kg of barley meal from lambing to weaning lambs. On the contrary, P treatment ewes and lambs did not eat any kind of concentrate.

Table 1: Average daily gain (ADG, g/d), days spent and concentrate intake of growing Churra-Tensina lambs growth under two livestock production systems: pasture and drylot .

	PASTURE	DRYLOT	RSD	EFFECT
ADG (g/d)				
Birth-13 days	264	245	51	NS
13-27 days	263	248	64	NS
27-41 days	240[b]	311[a]	57	***
41-53 days	257	288	81	NS
53-66 days	227[b]	296[a]	43	***
Days				
Birth-weaning (53 days)	52.8	52.4	5.27	NS
53 days-slaughter	29.1[a]	18.9[b]	12.6	*
Birth-slaughter	84.6[a]	74.2[b]	10.82	**
Concentrate intake, kg				
Birth – 33 days		9.3		
33 days- slaughter		30.0		
Birth-slaughter		39.3		

Although the growth was slightly low, the pasture system can be considered one of the systems more economic to produce meat (sustainable systems) and pasture lambs are able to reach the liveweight aim, 22-24 kg, in a period lower than 90 days, which is the goal date to slaughter lambs of *Ternasco* commercial category for the Spanish market.

These results are important when it is necessary to make decisions about the production systems to develop in mountain areas, where the meadows are easy to keep in good conditions, have a good forage production and they need a low inversion and the annual cost also is low. The production must be based on grazing pastures during the major part of year and the supplementation must be done during short periods to reduce alimentation costs. The pasture livestock production for rustics animals, as Churra-Tensina breed, can be a good option for mountain areas, which can guarantee a good incomes and it allows to keep the meadows surfaces (Casasús *et al.*,1996).

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