EFFECT OF STOCKING RATE AND SUPLEMENTATION ON LAMBS GRAZING *LOTUS CORNICULATUS* CV. INIA DRACO DURING SUMMER IN URUGUAY

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1 ABSTRACT

The biological and economical benefits of using different technological alternatives for lamb fattening in intensive and extensive production systems of Uruguay, has been demonstrated. Under grazing of a high quality pasture, lamb meat quality attributes were not affected by stocking rate and supplementation, considering plant processor requirements (pH) and consumer preferences (meat tenderness and colour). The meat produced by the Uruguayan Corriedale lambs would be accepted by the most demanding external markets.

3 METHODS

- Animals: 108 Corriedale lambs (3-4 months of age).
- Design: Split-Plot using 2 blocks, being the main plot arranged in 2x3 factorial structure, where the main plot was stocking rate (SR; 9 and 18 lambs/ha) and the split plot was supplementation (S; 0, 0,75 and 1,5% of live weight).
- Concentrate: grounded mix of corn (72%) and soybean (28%).
- Slaughter : Age, 8-10 months - $\bar{x}$: 35 kg. of live weight.
- Variables measured *in vivo*: live weight gain (LWG), final live weight (FLW), rib eye area (REA) by ultrasound scanning.
- Carcass and meat quality parameters were measured: hot and cold carcass weight (HCW and CCW), fat cover (GR), frenched rack weight (FR) and boneless leg weight (BLS), meat parameters colour, tenderness, and meat temperature (T24) and pH (pH24).
- The pH and temperature was measured at 24 h *post mortem* in *Longissimus thoracis* (LT) between 12-13th rib using a thermometer (Barnant 115) with type E thermocouple and pHmeter (Orion 210A) with gel device. 2 steaks (2.54 cm) were vacuum packaged and aged 10 days at 2 - 4 ºC for toughness determination. The LT steaks were cooked in a water bath until an internal temperature of 70ºC was achieved. Three 1.3 cm prisms were removed from each steak parallel to the muscle fiber orientation. A single peak shear force measurement was obtained for each prism using Warner Braztler (WB model 2000D) and an average value was calculated. Meat colour was measured at 10 d of aging in L*, a*, b* colour space using a colorimeter (Minolta C10) after 1 h of blooming.
- The results were analysed by GLM SAS procedure, Also, some variables were adjusted by co-variates. LSM means and differences among treatments were estimated.

5 CONCLUSIONS

In this study, in general, under grazing conditions with adequate feeding levels, lambs meat quality attributes were not substantially affected by SR and S, particularly when it is considered plant processor requirements (pH and T) and/or consumer preferences (meat tenderness and colour). This study and those provided by Montossi *et al.* (2003) in a national sheep meat quality audit may suggest that the meat produced by these Uruguayan Corriedale lambs would be accepted by the most important external markets.

2 INTRODUCTION

Several research studies carried out by INIA showed the potential biological and economical benefits of using different technological alternatives for fattening heavy lambs in the main intensive and extensive regions of Uruguay (Montossi et al., 2003). New forage options, released by INIA, highly adapted to the Basaltic soil conditions of the northeast region of Uruguay, are now available for the summer, which is a critical period to deliver early heavy lamb to accomplish the requirements of the international market. The potential use of high nutritive value legumes during summer appears as an alternative to produce early heavy lambs. There is lack of information of the potential of using Lotus corniculatus cv. INIA Draco during summer and the influence of its carrying capacity and supplementation with concentrate on fattening lamb performance and carcass and meat quality

4 RESULTS

Table 1 – Effect of SR and S on animal performance and carcass quality traits

Variable	Stocking rate (SR)			Supplementation (S)				SR x S
	9	18	P	0	0.75	1.5	P	
LWG (g/d)	123a	106b	**	93c	116b	135a	**	ns
FLW (kg)	36.6a	34.5b	**	33.1c	35.8b	37.9a	**	ns
REA (cm^2)	12.5	12.3	ns	12.3	12.4	12.4	ns	ns
HCW (kg)	14.5a	13.7b	*	12.4b	14.5a	15.4a	**	*
CCW (kg)	14.0	13.4	ns	11.7c	14.1b	15.2a	**	ns
GR (mm)	6.7	5.7	ns	4.6b	6.4a	7.6a	**	ns
FR (g)	344	340	ns	342	338	346	ns	ns
BLS (kg)	1.360	1.330	ns	1.300b	1.340b	1.400a	*	ns

References: ns: not significant (P>0.05), *: P<0.05 and **: P<0.01.
a, b, c: means with different letters within each variable are statistically different.

Table 2 - Effect of SR and S on tenderness, temperature, pH and muscle colour parameters.

Variable	CF	Stocking rate (SR)			Supplementation (S)				SRxS
		9	18	P	0	0.75	1.5	P	
SF (kgF)	NI	2.32	2.25	ns	2.63b	2.05a	2.20a	**	**
T24 (°C)	1/NI	4.4a	4.2b	*	4.4	4.3	4.3	ns	ns
pH 24	1/NI	5.6b	5.7a	*	5.7	5.7	5.7	ns	ns
L*	NI	37.7	38.1	ns	38.1	37.7	37.7	ns	ns
a*	R^3	17.7	17.9	ns	17.9	17.9	17.7	ns	ns
b*	R^3	8.8a	9.4b	*	9.1	9.2	9.0	ns	ns

References: ns: not significant (P>0.05), *: P<0.05 and **: P<0.01. CF = Correction factor. a, b: means with different letters within each variable are statistically different.