

## Comparative studies of diet selection by Churro and Merino genotypes grazing on a hill shrub community

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### Introduction

Knowledge of the foraging strategy is a useful tool in the quantification of the plant-herbivore interaction, knowledge of which is essential to joint studies of grazing management and herbivore performance (Gordon and Iason, 1989). The major sheep genotypes of northern Spain are Churro and Merino and they differ in a number of characteristics which have importance in the utilization of hill pastures. There is limited knowledge about the composition and the nutritive value of roughages ingested under various extensive conditions. This is specially true with regard to the mountain areas of northern Spain where plant communities undergo significant seasonal changes.

The aim of this work was to study the seasonal variation in the diet selected by two different breeds of sheep (Churro *v.* Merino) grazing on a hill shrub community (*Calluna vulgaris*) of northern Spain.

### Material and methods

The experiment was carried out in northern Spain (Province of León). The experimental field, lay at 1540 m above sea level, 43° 03' latitude north and 01° 41' longitude west.

Heather cover averaged proportionately 0.2115, and the identified species distribution was 0.151, 0.094 and 0.754 for grass species, legumes and other families respectively.

**Table 1** Dry matter (DM) availability (O, kg DM per ha) and their leaf (L), stem (S) and twig (T) proportions

		O	L	S	T
Period	1	874	0.75	0.08	0.17
	2	1226	0.86	0.08	0.06
	3	1181	0.56	0.41	0.03
	4	691	0.76	0.14	0.10

Four oesophageally fistulated adult wether lambs of each breed were used for sampling in a delimited 100 m<sup>2</sup> area approximately, during 20 to 30 min in the morning 2 days consecutively, the last week of June, July, August and September 1990. The mean live weights of the Churro and Merino respectively were 37.1 (s.d. 3.02) kg and 45.5 (s.d. 3.11) kg. In each period two quadrats (0.25 m<sup>2</sup>) of grass, were cut to ground level to estimate the dry matter (DM) offered.

The extrusa samples were freeze dried and the grass samples oven dried (60°C for 72 h). The leaf, stem and twig were handled separately in the DM of extrusa and DM offered samples.

The selection index (*SI*) was estimated as the quotient:  $SI = D/F$ , where *D* = proportion of leaf, stem or twig in the extrusa samples and *F* = proportion of leaf, stem or twig in DM offered.

### Results and discussion

There were differences ( $P < 0.001$ ) among periods in the DM availability and in the green leaf mass proportions with a significantly lower value ( $P < 0.01$ ) for the August period (see Table 1); differences that can be explained by the climatology data and the structure of the shrub community.

There were no differences ( $P > 0.05$ ) between breed in the proportion of extrusa leaves (0.83% *v.* 0.86% for Churro and Merino genotypes respectively; see Table 2).

The effect of period was significantly different ( $P < 0.01$ ) for the leaf proportion. The leaves *SI* was higher in the Churro breed than in the Merino breed (1.44 *v.* 1.37,  $P < 0.01$ ), was affected by the sampling time ( $P < 0.001$ ) and had the highest value (1.14, 0.98, 1.49, 1.13) in the third period when the proportion of leaves and twig in the DM offered had the smaller value (Milne, Hodgson, Thompson, Souter and Barthram, 1982). The twig *SI* was only affected

**Table 2** Leaf, stem and twig proportions in dry matter of extrusa

		Leaf proportion				Stem proportion				Twig proportion			
		Churro		Merino		Churro		Merino		Churro		Merino	
		Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.
Period	1	0.85	0.025	0.85	0.016	0.06	0.011	0.09	0.017	0.08	0.028	0.06	0.011
	2	0.87	0.020	0.82	0.030	0.05	0.006	0.08	0.011	0.08	0.020	0.10	0.022
	3	0.87	0.037	0.80	0.037	0.03	0.008	0.07	0.013	0.11	0.023	0.14	0.028
	4	0.86	0.033	0.85	0.025	0.03	0.008	0.03	0.007	0.10	0.025	0.12	0.019

**Table 3** Selection index (SI) of leaf, stem and twig for Churra and Merina genotypes

		Leaf SI				Stem SI				Twig SI			
		Churro		Merino		Churro		Merino		Churro		Merino	
		Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.
Period	1	1.14	0.033	1.13	0.021	0.82	0.13	1.17	0.22	0.48	0.17	0.36	0.06
	2	1.01	0.025	0.95	0.035	0.67	0.07	0.98	0.14	1.31	0.34	1.72	0.37
	3	1.55	0.046	1.43	0.065	0.06	0.02	0.16	0.03	3.52	0.78	4.50	0.92
	4	1.14	0.043	1.11	0.033	0.23	0.05	0.24	0.05	1.04	0.26	1.20	0.19

( $P < 0.001$ ) by the sampling time (0.43, 1.51, 4.04 and 1.13, see Table 3) (Hodgson, Forbes, Armstrong, Beattie and Hunter, 1991).

### Conclusions

The seasonal variation in intensity of food selection must be considered when the estimation of intake is carried out in mountain sheep grazing systems.

Differences between Churro and Merino genotypes with a higher intensity of food selection in the Churro breed, could be explained as an adaptation response to hard conditions where the quantity of food available is low and the quality of the diet must compensate the animal requirements.

The variation in the selection index among periods and the differences between breeds can be used in

the heather shrub control, separately or not depending on the aims of the countryside conservation and the pasture utilization.

### References

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