

ABSTRACT

The region of Castelo Branco is the 4th main region of Portugal in number of ewes. Sheep production is the major important activity of its farming systems. BEIRA BAIXA MERINO is the most common breed of the region and it is used as a triple purpose: MILK, meat and wool. Now a days, milk is becoming the most important production. The new production conditions, with the accession to the Common Market, lead the farmers to change some components of farming systems. To study how this changes must occur, an inquiry was made to the farmers, that allow a characterization of production systems, as the basis of future work.

This paper results from the inquiry referred, and its an approach to the production systems of Beira Baixa Merino.

Some constraints to the development are pointed.

SHEEP PRODUCTION SYSTEM OF BEIRA BAIXA MERINO

1. INTRODUCTION

The region of Castelo Branco has a TERMOMEDITERRANEAN climate (F.A.O. Bioclimate Classification, HORTA and GOMES, 1983) with 700 mm of rain during winter and spring. In general, the soils are shallow, acid and with a low organic matter content (0.5 - 2 %).

Sheep production became an important activity in farming systems, because allow farmers to profit from those areas, where cropping systems are less and less possible. It has a special interest too, because it can be integrated with forest (mediterranean type) production. The most important breed (because the number of animals) in the region, "BEIRA BAIXA MERINO", is used as a triple purpose animal: Meat, milk and wool (REBELLO ANDRADE et al, 1987; SOBRAL et al, 1987). According to SOBRAL et al (1987), the milk (and the cheese) as the major role in the formation of the gross income from the flocks.

The expected price evolution for cheese and meat inside the E.E.C. market, lead us to the study of production systems, with the aim of establish an improvement program. This project is coo-financiated by the Luso-American Foundation for Development and Escola Superior Agrária of Castelo Branco.

The work we present, is the result of an inquiry to farmers, with the objective of a characterization approach to the sheep production systems, and it will be the basis to the referred project.

2. MATERIAL AND METHODS

The region of Castelo Branco has about 160 000 ewes (I.N.E., 1979), representing 7.9% of national number of sheep. From the 11 councils of the region, only in two (Idanha-a-Nova and Castelo Branco councils) there are 69% of total sheep. That was the reason this study was carried out over those two councils.

The inquiry to farmers was made in July-September 1988. It has 117 qualitative and quantitative coded questions. To

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Fig.1 Educational School level

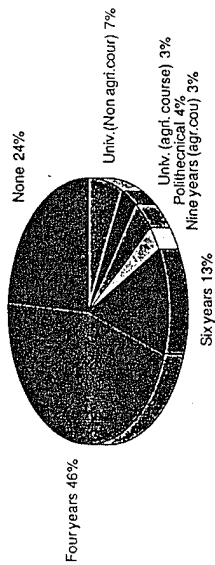


Fig.2 Farming Activities (beside sheep production)

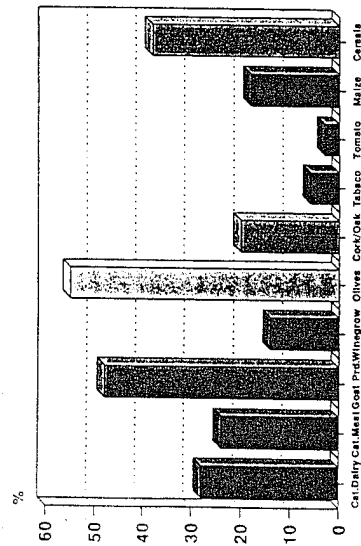
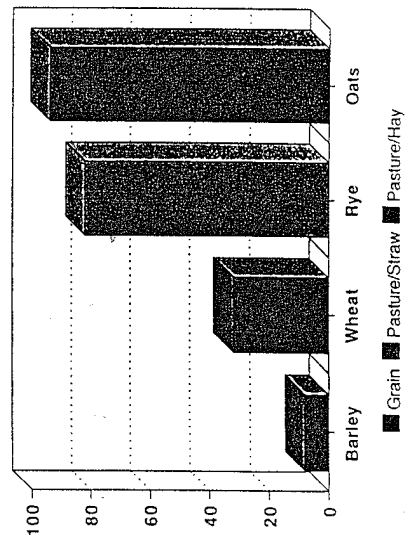


Table 1. Farm's area (hectares)

Council	Count	Average	Stnd. Error (internal)	Stnd. Error (pooled s)
Idanha-a-Nova	44	506.97727	60.642752	62.302872
Castelo Branco	45	255.64444	35.431966	61.506728
Total	89	381.31080	43.564363	43.896585

Fig.3 Cereals Production



select the farmers, a stratified sampling (CARVALHO, 1986) was made, considering the size of flocks (number of productive ewes) as the strata classes. The population was divided in 11 strata. The total farms observed was 95, representing a sampling fraction of 21%.

It was determined the frequency of qualitative questions, average and standard deviation from quantitative questions. Some parameters were studied by crosstabulation, contingency tables and correlation matrix. The multiple regression analysis was used to fit an explicative model to observed STOCKING RATES.

The software "statgraphics" was used to statistical analysis.

3. RESULTS AND DISCUSSION

3.1. The Farmer

42 percent of farmers have more than 25 years in the activity. The fact of 15 percent observed having less than four years, it can mean that a new interest on sheep farming is growing. The frequency according to the educational school level is a sign too of this evolution: 70 percent of farmers with less than four years in school (primary), corresponding to the oldest people in this profession (Fig.1). Perhaps the investment conditions allowed by the E.E.C. policy, is the main reason for this observed fact.

The "familiar type" farms is high: 30% with no employees.

The Shepherd's age is quite high (53 percent have more than 50 years old) and there is no young people in this profession (1 percent with less than 20). This is one of the biggest constrain to actual production systems.

3.2. The Farm

There are significant differences ($P < 0.01$) between the average area of sheep farm's in the studied councils (Table 1): Idanha-a-Nova has an average of 506.98 ± 62.07 hectares and Castelo Branco 250.71 ± 60.71 hectares.

In Fig.2 is represented the farming activities, beside sheep production. Olive and Goat production has an important role in the gross income of one half farms.

Dairy cattle production is an activity with low perspectives in the future, inside the E.E.C. market. Meat cattle production represents an alternative, in some areas, to sheep production. Even with a lower gross income it can have a higher profit because of a lower cost production, and it is not dependent from shepherds as actual sheep production system is.

The "cash-crops" (tobacco and maize) are more frequent

Fig.4 Pastures Production

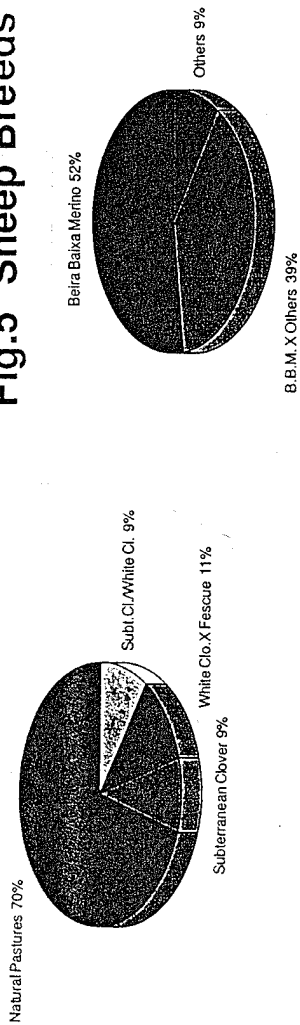


Fig. 6 Mating Season
(Percent of flocks in Mating)

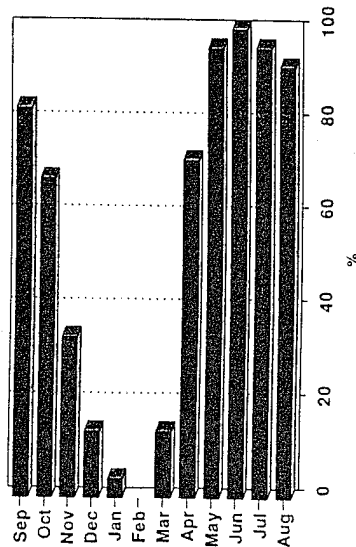


Table 3. Model fitting results

Independent variable	coefficient	std. error	t-value	sig. level
Crop area	0.68278	0.069317	9.8494	0.0000
Cork area	1.32388	0.132823	8.4615	0.0000
Irrigated area	2.410556	0.559143	4.3112	0.0000
Production objective	90.533369	20.118372	4.5000	0.0000

R-SQ (ADJ.) = 0.9886 SE = 217.633013 MAE = 156.541849 DurbinWat = 1.847
90 observations fitted.

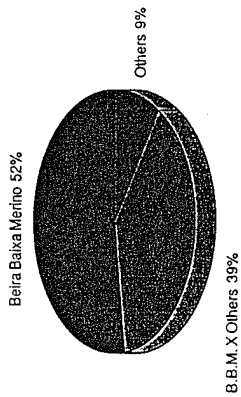
Analysis of Variances for the Full Regression

Source	Sum of Squares	DF	Mean Square	F-Ratio	P-value
Model	33760832.	4	8440208.	378.298	.0000
Error	4033390.	66	61111.9		
Total	37833222.	70			

Standard Error of Est. = 217.615
Standard Error for F = 6.66226

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Fig.5 Sheep Breeds



in Idanha-a-Nova council (artificial irrigated region), and that's the reason why we observed a more extensive sheep production system with a less important role for the gross income of farms, comparing with the other council.

The cereals crop production (Fig.3) is a decreasing activity. Before the accession to the Common Market the grain prices were subsidized; this fact allow farmers good profits, even with low yields. Now a days, the most frequent crops are oats and rye. The first crop is to conserve as HAV; the second, is the winter "PASTURE" for sheep.

The most part of farmers use natural pastures for feeding sheep (Fig.4). This pastures are annual legume-grass mixtures and the fertilization is made only in 16 percent of farms. In some cases farmers use Subterranean clover (9%), Tall fescue-White clover (11%) or both sward types (11%).

The main forage production was regional varieties of maize (88%), *Lupinus luteus* L. and the *Vigna sinensis* (L) Endl. & *monachalis* (Brot.) (both 72%). This crops are directly pastured by sheep during the lambing summer-autumn season.

3.3. The Sheep management system

The main production is the milk for 64 percent of farmers, milk and meat for 28 percent of farmers and the meat for only 8 percent.

The "purebred" BEIRA BAIXA MERINO represents 52 percent of observed animals (Fig.5).

The average stocking rates have significant differences ($P < 0.05$) between studied councils (Table 2): Idanha-a-Nova 1.5 ± 0.176 sheep per hectare and Castelo Branco 2.1 ± 0.172 sheep per hectare. Some variables have a high correlation with stocking rate: Total farm area (0.84), crop area (0.67), cork area (0.56), irrigated area (0.62) and coded main production objectives (0.27). A model was fitted ($P < 0.001$), explaining 88% of stocking rates variability (Table 3):

$$ST = 0.6827 A + 1.1238 C + 2.4105 I + 90.5333 O$$

where:

- ST - stocking rate
- A - crop area
- C - cork area
- I - irrigated area
- O - coded main sheep production objectives

The average size of flocks are 580.95 ± 520.46 in Idanha-a-Nova council and 363.64 ± 323.40 in Castelo Branco council.

In 40 percent of farms, the males are together with ewes all over the year. In the rest, the more important mating season is spring (Fig.6). Concentrate supplementation during

g.7 Fecundity Rate/%

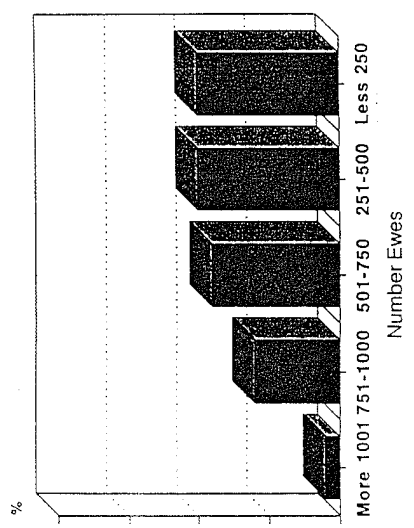


Fig.8 Slaughther weights (liveweight)

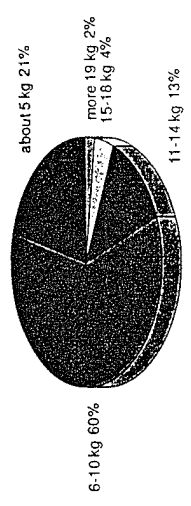


Fig. 9 Dairy Season (Percent of flocks "milking")

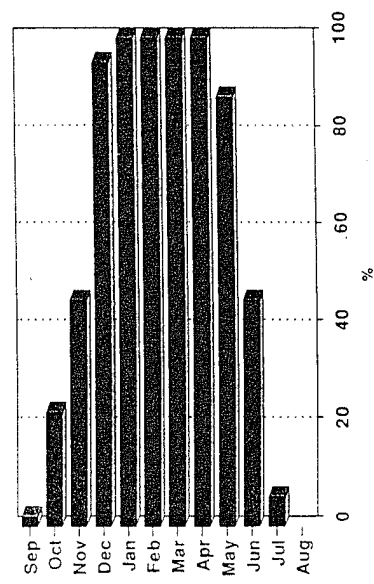
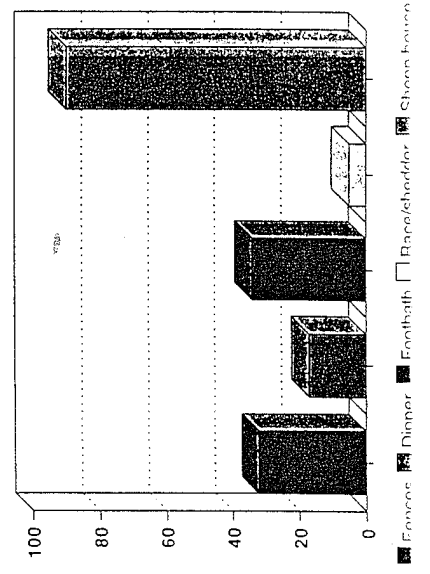


Fig.10 Housing and Equipment



mating season is made by only 14 percent of farmers. The average fecundity rate seems to be correlated with size of flocks (Fig.7) and it has values between 81% and 92%.

Lambing occurs at autumn and at end of winter-spring. Concentrate supplementation during lambing is made by 76 percent of farmers. The major part of farmers (42%) make the weaning at 1.5 months lambs age, and only 10 percent make it when lambs have more than 2 months. The slaughter weights (Fig.8) are low, 81 percent with less than 10 kg liveweight, not only because of weaning age but also because of bred characteristics and selection traits used.

The "dairy season" begins in autumn and ends near summer (Fig.9). All the farmers milk the sheep twice a day (morning and evening) and 99 percent hand stripping.

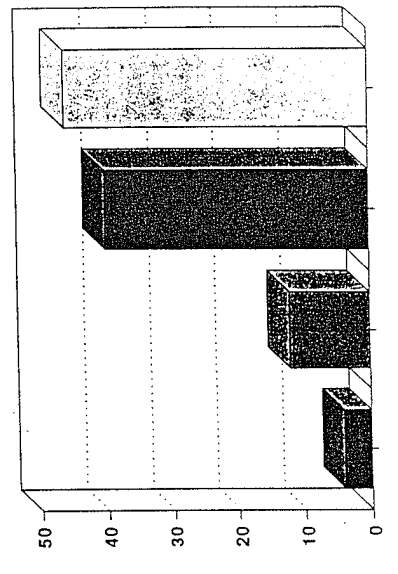
Figure 10 represents the housing and equipment of farms. Although 91 percent of farms have a sheep house, are places only to sheep stripping, with no environment health conditions. Race and shedder, dipper and footbath exists in few farms. Even fences is the same, and it seems that they are utilized only because of shepherds problems, with no correlation with management variables.

4 FINAL CONSIDERATIONS

Analysing the evolution intended by farmers (Fig.11), we can conclude that sheep production is an activity in development. And if we consider that almost one half of farmers want to increase the number of sheep, we can expect that some problems connected with the intensification of production system can occur. So, we can conclude that efforts must be made on the following points:

- Health and disease prevention
- Improvements on pasture management
- Supplementation of sheep to face annual variability of pasture growth and quality according to physiological production cycle
- Reproductive management
- Housing and equipment
- Selection programs (breeders associations)

Fig.11



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