Technical organization and economic needs of the breeding programme of Latxa and Carranzana dairy sheep in the Spanish Basque Country

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Technical organization and economic needs of the breeding programme of Latxa and Carranzana dairy sheep in the Spanish Basque Country

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SUMMARY - This paper describes milk recording and breeding programmes for the Latxa and Carranzana breeds from the Spanish Basque Country, as well as the costs and benefits obtained. The total estimated cost per ewe in 1995 is 1,394 pesetas (about 11 US$). Of this amount, 48.5% goes to milk recording, 39.7% to selection, and 11.8% to scientific and technical support. The annual phenotypic increase in milk production lies, according to ecotypes, between 1.84% and 2.6%, whereas the estimated genetic progresses are between 0.8% and 1.2% per year.

Key words: Latxa sheep, technical organization, economical needs, results

RESUME *- Dans ce travail sont décrits les programmes de contrôle laitier et de sélection pour les races Latxa et Carranzana du Pays Basque espagnol, ainsi que les coûts et les avantages obtenus. Le coût total estimé par brebis en 1995 est de 1,394 pesetas environ 11 US$). 48.5% de ce montant est destiné au contrôle laitier, 39.7% à la sélection, et 11.8% à support scientifique et technique. L'augmentation phénotypique annuelle pour la production de lait est, selon les écotypes, entre 1.8% et 2.6%, tandis que le gain génétique estimé est de 0.8% jusqu'à 1.2% annuellement.*

Mots-clés*: brebis Latxa, organisation technique, besoins économiques, résultats.*

Introduction

The Latxa and Carranzana are two breeds of dairy sheep, native from the Basque Country (Latxa is called Manech in France). There are two strains of Latxa sheep: Black-faced and Blond-faced, differentiated by their skin colour. Normally both strains form two separate populations. The total population of Latxa sheep is approximately 750,000 heads of which 220,000 are in the Spanish Basque Country. Of these, 140,000 are Black-faced ewes in approximately 2,000 flocks and 80,000 ewes of the Blond-faced strain in 1,300 flocks. For the Carranzana sheep there are approximately 11,000 ewes in 330 flocks.

This article describes the production systems of these populations as well as the

milk recording and selection programmes, evaluating their costs. Finally, the phenotypic and genetic progresses to be obtained are estimated.

Production systems

The flocks have on average 10 Ha of land. In winter the farmers rent more land temporarily. Furthermore, a high percentage of flocks feed on communal land in summer, usually for more than five months.

The buildings, generally old installations whose only function was to house animals (Urarte, 1989), have been reformed lately to adapt to the flock intensification and to improve the farmer's work (milking room, feeding corridor).

Normally, the shepherd is the owner of the flock. The family provides the manpower and personnel are rarely hired from outside.

Feeding has generally two periods. In summer and autumn the animals graze in high pastures of communal mountains (800-1000 m). In winter and spring, time of lambing and lactation, the feeding is based on pasture and on a minor proportion of grass silage. These products are complemented by others that are brought from outside of the farm: alfalfa hay, beet pulp, soybean and concentrated feeds.

The lambs to be slaughtered suckle for 29 ± 3 days (Arranz *et al.*, 1995). The weaning and slaughtering occur when lambs have 10-12 kg of live weight. Then, their mothers are milked. Simultaneous milking and suckling is not habitual. The replacement lambs are not weaned and suckle to feed. However, the more productive farmers separate (at night) these lambs when they are approximately 45 days old (12-15 kg of live weight). Afterwards, their mothers are milked (normally, the most productive) next morning for 15 days. After these 15 days, when the lambs have a live weight of 16-19 kg, they are fully weaned.

The milking lasts approximately 120 days and, normally, the drying-out is conditioned by the summer moving of animals to communal mountain pastures. In most cases the milking is done by hand with or without fastening. Nowadays, there are (in the Spanish Basque Country and Navarre) approximately 60 milking machines, without stripping by hand and with an efficiency of 120 ewes per hour and man.

The reproduction system is very traditional. Frequently, the rams are not separated from the ewes. The mean number is 28 ewes per ram. Furthermore, 43% of farmers do not put ewe lambs into reproduction (Urarte, 1989). The consequence is that fertility of ewe lambs is always lower than 50% and the mean age at first lambing is between 600 and 700 days. Fertility grows as the ewes are older and the maximum is obtained when the ewes are 4-5 years old. The average lambing date presents large differences between breeds and flocks (Oregui *et al.*, 1994). The average lambing date varies with the age of ewes, the younger lamb later: 27th, 23th and 17th of March, respectively for Black-faced, Blond-faced and Carranzana and 18th February, 21th and 19th January for the 2-3 year old ewes of Black-faced, Blond-faced and Carranzana.

The average prolificacy is of 1.32 in Black-faced, 1.22 in Blond-faced and 1,25 in Carranzana. The prolificacy also grows with the age of ewes, with a maximum around 7 years old.

Mortality is low (2-4%) and the youngest ewes have the highest mortality rate for lambs.

The number of living lambs per ewe (numerical productivity) is 0.97, 0.96 and 0,75 for Black-faced, Blond-faced and Carranzana, respectively. The weight of lambs at birth is 5.1 kg for single born and 4.2 kg for twins. The lamb growth rate is 250 g per day during their first month of life (Arranz *et al.*, 1991).

Milk recording programme

The milk recording programme started in 1982. Since 1985 the AT method (am-pm) is followed (Gabiña *et al.*, 1986) and only milk yield is recorded. The standardized lactations to 120 days are calculated using the Fleischmann method. The conditions to calculate the lactations are a minimum of 2 test days for 1 year old ewes and 3 test days for older ewes, a maximum interval of 78 days between lambing and first test day and a maximum interval of 66 days between two consecutive test days.

The number of ewes in flocks where milk recording is practised (Table 1) represents 26% of the total population of dairy sheep of the Spanish Basque Country being 33% in Black-faced, 12% in Blond-faced and 47% in Carranzana.

Table 1. Figures for milk recording of the Spanish Basque Country in 1994

	Black-faced	Blond-faced	Carranzana	Total
Number of ewes present in flocks under milk recording	45,897	9,787	5,191	60,875
Ewes lambing	29,363	6,686	2,668	38,717
Estimated lactations	18,147	4,745	1,514	24,406
% of ewes with estimated lactations	39.5	48.5	29.2	40.0
Number of flocks	153	30	25	208

It is worth mentioning that the percentage of ewes in which lactations are estimated is small (from 29.2% in Carranzana to 48.5% in Blond-faced Latxa) due to the low fertility and to the fact that not all the ewes lambing are milked.

Genetic improvement programme

The selection programme started in 1985 with the selection by ancestry of 35 males to be tested by Artificial Insemination (AI), always done with fresh semen (Hanocq *et al.*, 1993). The selection criterion is the standardized milk yield to 120 days. Presently, the choice of male lambs to be incorporated to the selection and insemination centre is made by selecting lambs of the 10% genetic best ewes of each strain. The lambs are incorporated to the selection centre approximately at three months of age to be trained for the AI, being progeny tested the following year after elimination and selection based on growth and external appearance which is carried out by a breeders commission. The number males incorporated into the selection centre and AI done since 1984 can be seen in Table 2.

Table 2. Activity of selection and artificial insemination centre

Year	Males incorporated	Males progeny tested	Ewes inseminated
1984	35		
1985	67	16	1,993
1986	74	33	4,373
1987	77	33	5,238
1988	121	38	9,394
1989	96	60	7,964
1990	103	50	10,014
1991	118	54	11,379
1992	95	46	11,141
1993	126	47	10,099
1994	134	50	11,424

In 56% of the AI done in 1994, the semen used was from proven rams, already progeny tested and evaluated as improvers, and 44% used semen from rams under progeny testing. AI was carried out in 163 flocks, where 65% of replacement ewe lambs are daughters of AI rams.

The genetic evaluation is made using the BLUP methodology with an animal model with repeatability. It is made with the BLUPMA programme (Jurado, 1990). Details for genetic evaluation can be seen in Ugarte *et al.* (1994).

Organization

Table 3 shows the distribution among the different bodies of the tasks inherent to the milk recording and selection programmes in the Latxa and Carranzana sheep in the Spanish Basque Country.

Table 3. Distribution of tasks inherent to the milk recording and selection programmes

	Breeders Associations	Selection Society (ARDIEKIN)	Public Research
Milk recording	FR[1]		
Data processing	Milk recording Replacement subsidies	Artificial Inseminations	Pedigree Control Genetic Evaluation
Purchasing of selected lambs	FR		
Production of AI doses		FR	
Hormonal treatments and AI application	FR		
Biochemical pedigree control	Obtention of samples		Analysis

[1] FR - Full responsability

Costs of milk recording and selection

The cost has been divided into 3 sections:

1. Milk recording cost
2. Selection and artificial insemination cost
3. Technical and scientific support

Milk Recording Cost

Milk recording is carried out by the breeders' associations which act at a provincial level. The member farmers pay a quota per head and flock. Furthermore, they pay a quota per AI and other different services offered by the breeders association such as feeding, design of buildings, etc.

The cost of the milk recording programme is reflected in Table 4.

Table 4. Milk recording cost

Concept	Cost (pesetas)[1]
Personnel	
Technical personnel (5 persons)	11,325,000
Milk recording officers (6 full time, 4 part time)	25,675,000
Computing	1,750,000
Technical material	1,900,000
Other costs	3,765,000
Total	41,165,000

(1) Current rate: 1$US - 130 pesetas

Public organisms finance 80% of the cost, the rest being financed by the farmers belonging to the breeders' associations.

Selection Programme Cost

The selection and AI centre is located on some premises belonging to the Spanish Basque Country Government in Arkaute, near Vitoria-Gasteiz. This State is the owner of the three buildings (two houses for animals and a laboratory) that are used by the centre. It is also the owner of land used for ram feeding. The legal identity of this breeding and AI centre is a limited company called ARDIEKIN whose partners are the Latxa breeders associations of the Basque Country and Navarre.

At present (February 1995), there are 265 rams in the centre. Of these rams, 53 have been progeny tested and declared as improvers, 117 are lambs waiting to be selected before May 1995 by the breeders commission upon growth and external appearance and subsequently progeny tested and 95 are waiting for their genetic evaluations based on the performance of their progeny. Next month, approximately 120-150 lambs will be incorporated for testing next year. The cost of this selection and AI centre evaluated for 1995 is shown in Table 5.

Technical and Scientific Support

This point refers to the salaries of technicians of the Basque Government that work directly in the breeding programme (1 coordinator and 2 technicians). This quantity represents 10,000,000 pesetas for 1995.

Total Costs of the Milk Recording and Selection Programme

The total estimated cost of these programmes in 1995 can be observed in Table 6. From these results one can deduce that the main costs are those associated with milk recording. The total annual cost per ewe is 1,394 pesetas (around 11 US$).

Table 5. Selection programme cost

Concept	Cost (pesetas)
Personnel (1 technician and 2 shepherds)	11,000,000
Purchase of selected lambs	2,600,000
Production of AI doses	400,000
Hormonal treatments	5,000,000
Personnel from breeders associations for purchasing selected lambs and application of hormonal treatments & AI	11,000,000
Feeding of rams	1,500,000
Pedigree control (biochemical polymorphisms)	500,000
Drugs and vaccines	1,200,000
Administration	300,000
Other costs	500,000
Total	33,700,000

80% of this cost is financed, more or less directly, by public organisms.

Results obtained - phenotypic and genetic trends

222.955 lactations of the Black-faced strain of 71.388 ewes of the Spanish Basque Country and 49.056 lactations of the Blond-faced strain of the Spanish Basque Country and Navarre have been used to evaluate the phenotypic and genetic trends on these populations.

From Fig. 1 it can be seen that the phenotypic improvement of Black-faced Latxa has been of 17.8 litres for 120 days typified lactation. This represents an increase of 2 litres per year which is the 1.8 % of the phenotypic mean of 1985 (108.3 litres). The

increase has been higher in the Blond-faced strain with an increase of 22 litres that supposes 2.7 litres per year, that is, the 2.6 % of phenotypic mean of 1985 (100,7 litres).

Table 6. Total estimated cost in pesetas of milk recording and selection programmes for 1995

	Total	Per head	% of total
1. Milk recording	41,165,000	676	48.5
2. Selection and AI	33,700,000	554	39.7
3. Technical and scientific support	10,000,000	164	11.8
Total cost	84,865,000	1,394	

Fig. 2 shows the genetic trend of ewes. The increase has been of 6.7 litres in Black-faced, that is the 0.8 % of phenotypic mean of 1985. As in the phenotypic trend, the genetic improvement has been higher in the Blond-faced strain with an improvement of 9.3 litres, that is, 1.2% of the phenotypic mean of 1985. However, if we look at the 1991-1993 period, where the percentage of ewes born from proven AI rams is relevant, the genetic progress is much more evident with an increase of about 2.4 litres per year in the Blond-faced and 1.5 litres per year in the Black-faced.

These results show that the breeding and the milk recording programme have improved the production and genetic levels of these strains. Comparing Black-faced and Blond-faced, the larger phenotypic increase coincides with the larger genetic increase.

The comparison of these genetic and phenotypic trends with those obtained in other dairy sheep programmes, such as in Lacaune or Manech (Sanna *et al.*, 1994) show lower increases in the Latxa breed. This is probably due to an earlier start in these programmes (1965 in Lacaune and 1970 in Manech in 1985 in Latxa) and, also, because their selection organizations are better established with a much higher number of ewes and flocks under milk recording and selection programmes.

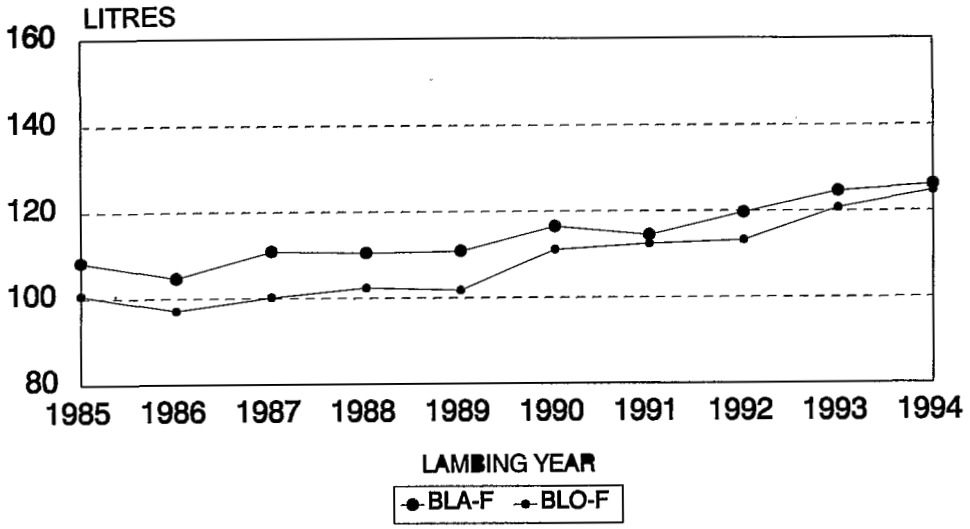

Fig. 1. Phenotypic trends for lambings from 1985 to 1994 for 120 typified lactations in Black-faced Latxa (BLA-F) and Blond-faced Latxa (BLO-F)

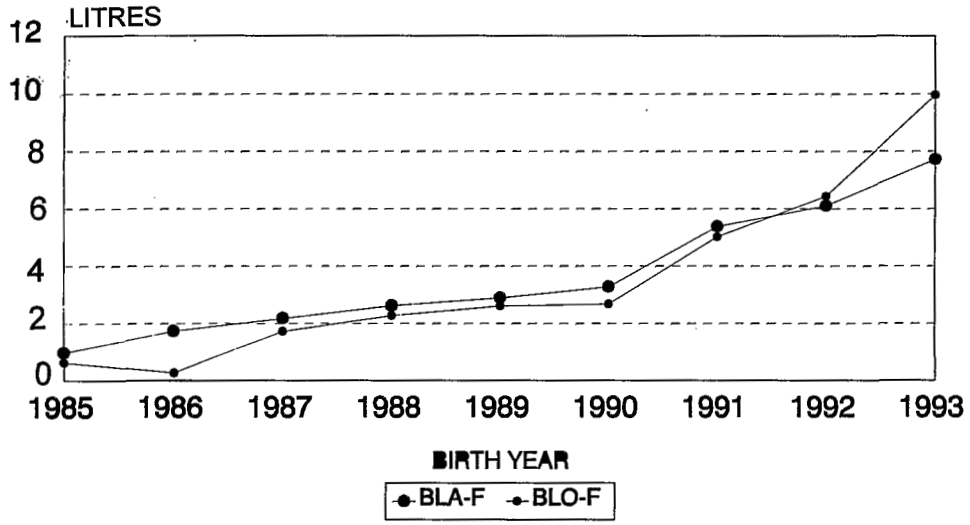

Fig. 2. Genetic trend for ewes born from 1985 to 1994 for 120 typified lactation in Black-faced Latxa (BLA-F) and Blond-faced Latxa (BLO-F).

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