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Mirandês cattle breed: genetic base and breed improvement¹

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Abstract

The "mirandês" cattle breed has had a herd book since 1913 and the agricultural service has implemented a programme of genetic improvement since the 70's. However, in spite of what has been expected, positive results weren't found on that programme and the "mirandês" cattle breed has gone into a decline.

This paper analyses the strategies of several cattle breeder types and the genetic demographic structure of cattle within a community in northeast of Portugal.

The present organization of the breed improvement, centered on cattle breeders of pure breed and on farms with a great number of cows, does not permit genetic improvement.

The alternative to the present situation consists of expanding the selection basis, integrating a conceptual level with all farmers, implementation of a process to work within the middle of a population of many breeders in the community.

Introduction

The "mirandês" cattle breed has had a herd book since 1913 and the agricultural service has implemented a programme of genetic improvement since the 70's. However, in spite of what has been expected, positive results weren't found on that programme. The "mirandês" cattle breed continues to be very heterogeneous about its phenotype and genotype. It has gone into a decline and the herd has lost more than 80% of animals in the last 20 years.

In spite of losses suffered in the last decades, the "mirandês" cattle breed still plays an important economic and social role. It has been useful as a traction animal and the carcass is famous for the quality of the "posta mirandesa", a very appreciated dish by the rich gastronomic traditions in northeast of Portugal.

The rural community selected for the study is organized in family farms systems which present a diversity of characteristics. This research aims to verify if the official breeding programme, focused on cattle breeders of pure breed, is appropriate to the strategies of producers and analysed the cattle's genetic demographic structure within a community in northeast of Portugal with the purpose to identify strategies of several cattle breeder types and propose an alternative pattern of selection for this breed in order to attain genetic improvement.

¹ This paper is supported on the empirical data from the master thesis by Sousa (1992).

There are 15 Black and White cows, concentrated in a notable way on the larger farms (type S3).

In the group of cows designed by "others", we observed 25 Mirandês crossed breed, three Brown Swiss and one charollais. These females are distributed in all of the farm types, emphasizing that the larger proportion of these females, referring to the mirandês breed, are found within small farms with one to two cows. The largest proportion of these crossed bred animals (48%) are F1 offspring of Mirandês cows with a sire of Black and White or Brown Swiss (Figure 2).

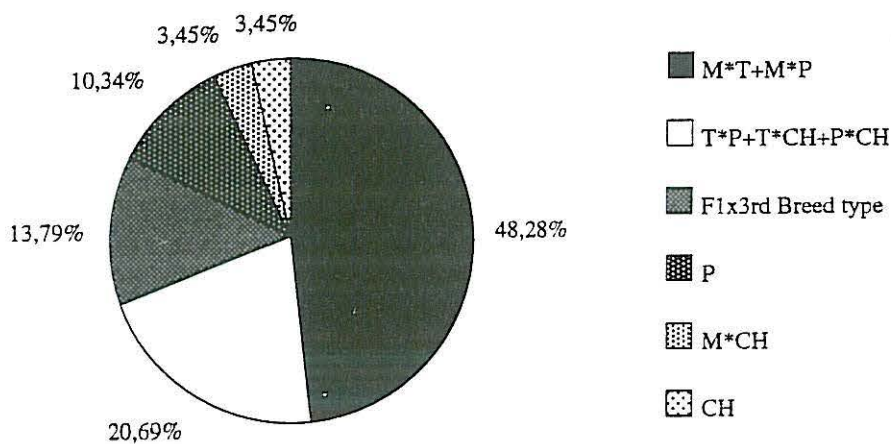


Figure 2. Paternal origin of cows with another lineage within the community of Paçó, in percentage, (N = 29). M=Mirandês; T=Black and White; P=Brown Swiss; CH=Charollais.

The productive function of the cows are the following: calving, milk and work, in addition manure production (Figure 3). In the Mirandês breed and crossed (Mirandês x Black and White or Brown Swiss) lineage, the animals are used in all activities, while the crossed Black and White x Brown Swiss are used just in calf and milk production.

With the Black and White cows the farmers are trying to meet their needs for milk for their children and the old folks and to have a continuous income source from the sale of milk to the neighbours.

For a large part of the farmers, the crossed cows such as " Mirandesa x Black and White or Brown Swiss" are quite similar to the Mirandês breed and used accordingly for their traction or work ability, being well adapted to the mountainous conditions as well as having an advantage of calf birth weight and a higher weight at weaning with calf production.

Material and methods

The material and methods involved the following: comprehensive inquiry to the family-farm systems of a representative rural community in the "mirandês" breed area; case study of the global operation in the family-farm system; inquiry into the farmer's practices regarding the husbandry management of Mirandês cattle; and an open inquiry as to the owner's sire.

Results

Systems

The study identified four different types of cattle systems: Type S₁ - Small farm size of elderly retired farmers with 9 ha of Agricultural Surface (SAU) and a productive orientation to chestnuts and cattles: they raise feeder animals permanently in a stable, or they have one or two cows; Type S₂ - Medium farm size of 16 ha SAU with productive orientation to rye and cattle: they have three to five cows; Type S₃ - Large farm size of 33 ha SAU with a strong community and generational interest of farming by son/daughter, oriented to cattles-chestnut-rye: the average number of animals is 12 cows; Type S₄ - Farmers with sheep, large family, 29 ha SAU, orientation to sheep-cattles-rye and/or chestnut production: they have three to five cows.

The heterogeneity of ethnical groups

The cows of "mirandês" breed constitute the major ethnical group exploited in the community of Paçó: 114 females (72%) with the age over one year in a total of 158, distributed over all the family farm systems, concentrated in farms of type S₂ and S₃ (Figure 1).

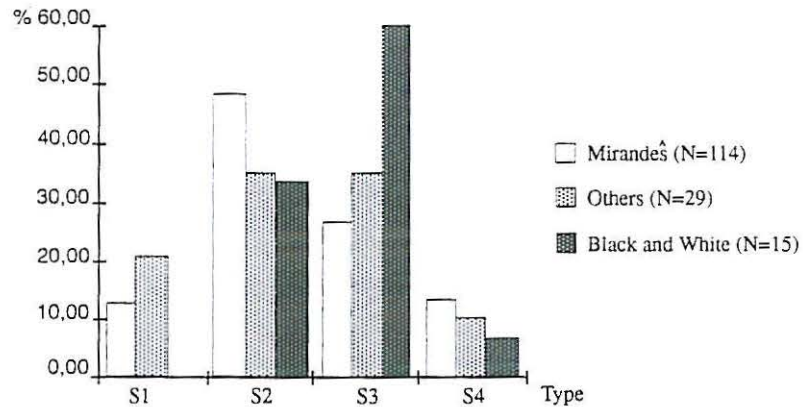


Figure 1. Paternal origin and cattle females distribution of the community of Paçó through different types of family farm system, in percentage, (N = 158); S₁ - Aged with cattle; S₂ - Medium farmers; S₃ - Big farmers; S₄ - farmers with sheep.

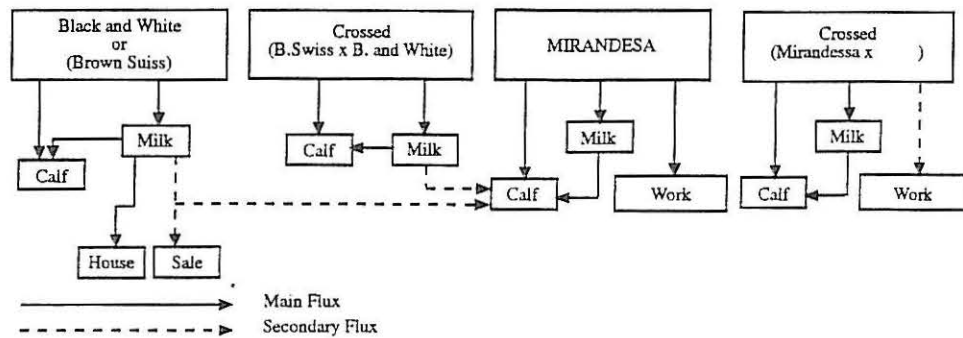


Figure 3. Cows productive function and milk management according to ethnic groups.

Age structure of cows

The medium age of Mirandês cows in the various types of family farm systems is the following: 12 years of age for the type S₁, 9 in type S₂, 7 in type S₄ and 6 years of age for type S₃. In this way, the proportion of females at one to two years of age in the total number of females is equal to 5% (type S₁), 7% (type S₂), 22% (type S₃) and 21% (type S₄).

The small size of the herd, the reduced autonomy of feeding sources and the weak economic resources for farm S₁ and S₂ make it impossible for the raising of replacement animals. For these type farms, it is economically difficult to maintain more one unproductive female, with similar needs as an adult, during three years. The alternative choice for these smaller farms of type S₁, consists of buying an adult cow for a reduced price, which is considered marginal by farmers who sell them.

Big farms, type S₃, are source for the substitution of cows for the smaller farms, type S₁ and S₂. Indeed the structure of ages of their cows suggest that the selection may be done on these farms when the cows attain an age between 3 and 6 years.

Twenty seven percent of the non-Mirandês cows with at least two years age (Figure 4) for replacement assumes not only a significant rate of substitution within the group of "other", but also an eventual substitution of the Mirandês cow with other genotypes within the farm types S₁, S₂ and S₄.

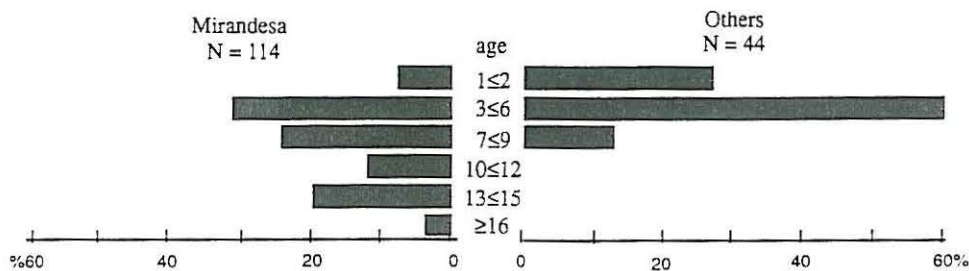


Figure 4. Comparison of the structure by ages of cows existing in the community of Paçó, in percentage.

In this way, the total of 8% of Mirandês replacement heifers up to 2 years of age which exist in the community, instead of representing the replacement rate, they could be associated to the regression of the breed due to the competition of other ethnical groups.

Choice of the sire breed

The farmers use a Mirandês bull to breed their cows in the following circumstances: a) to avoid birthing problems with heifers: the mirandês bull in general produces calves with lower birth weight than others breeds; b) to raise a replacement heifer for substitution within their herd; in this case, they select their best cow for the substitution.

Farmers that are more oriented to meat production during the last few years have chosen to cross-breed with sires from Black and White, Brown Swiss and more recently with Simmental. The higher birth weight to weaning of these animals compared to the Mirandês and the greater demand by growers and butchers for meat production, constitutes a strong incentive in general to cross-breed.

Conclusion

The association of ethnical diversity and the age structure of the animals shows that there does not exist in the community producers which specialize in raising pure breed Mirandês dams.

The aims of selection of the farmers are oriented to improve the reproductive and maternal abilities. The cows make use of various foods produced in the farms and the farmers sold the calves at weaning (7 months). The herd size for each farm is of small dimension and there is a diversity of farmer option in relationship to the choice of the sire in the breeding of the cows.

On the other hand, the goals of selection of the official breeding program are: a) to improve the conformation of animals for meat production; b) to improve the daily gain of

live weight, with high rate of growth, making use of food not traditionally produced at the farm.

The present organization of the breed improvement, centered on cattle breeders of pure breed and on farms with a great number of cows, does not permit genetic improvement of the "mirandês" cattle breed.

The alternative to the present situation consists of expanding the selection basis, integrating a conceptual level with all farmers, implementation of a process to work within the middle of a population of many breeders in the community, with a structuring of farmers into elementary units of production, and with the result that each one has its characteristics, potential, and restrictions.

References

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