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Characterization of Majorera goat production systems in the Canary Islands

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Abstract. In order to preserve and to improve small ruminant systems it is necessary to recognize precisely how they work and what actions can be taken in order to improve them. The objective of this work is to characterize the Majorera goat production systems in the Canary Islands, to contribute to their promotion and improvement. Data were collected through a survey among 38 farmers. To establish a typology of the goat keepers, data were analysed utilizing descriptive statistics and correlation between variables. All calculations were made using IBM SPSS, version 19.

Keywords. Dairy goats – Typology – Indigenous breeds.

Caractérisation des systèmes de production de chèvres Majoreras dans les îles Canaries

Résumé. *Afin de préserver et d'améliorer les systèmes d'élevage de petits ruminants, il est nécessaire premièrement de connaître leur fonctionnement et ainsi pouvoir prendre des mesures d'amélioration. Le but de cet article est de caractériser les systèmes de production des chèvres de race Majorera dans les îles Canaries afin de contribuer à leur développement et à leur amélioration. Une base de données a été constituée à partir de 38 éleveurs interrogés. Pour définir la typologie, les données ont été analysées à l'aide de statistiques descriptives. Tous les calculs ont été effectués avec la version 19 du logiciel statistique SPSS IBM.*

Mots-clés. *Caractérisation – Chèvres laitières – Races.*

I – Introduction

Majorera goat is an autochthonous Spanish breed from Fuerteventura Island (Canary Islands); its high milk production and excellent adaptation to the environment have widened its population over the entire Canary archipelago with more or less considerable census. The actual population is in continuous growth, which reflects the adaptation of the breed to the arid environment of the Islands. Moreover, its exceptional qualities have resulted in the expansion of the breed out of the Islands, being exported into tropical regions of America such as Venezuela, into African countries like Green Cape, and into some southern areas in the Iberian Peninsula. Besides, Majorera goat extension has been driven thanks to the creation of different Denominations of Origin (DO) of cheeses made with its milk. The official recognition of the breed, as a consequence of the disaggregation of the Agrupación Caprina Canaria into three independent populations, was obtained in 2003, being approved by the Comité Nacional de Razas and was recorded within the Spanish Official Catalogue BOE (BOE, September 5th 2003).

Currently, Majorera breed represents approximately 70% of the goat population of the Canary Islands. The social, economic and environmental importance of this breed in its region of origin,

make it necessary to analyze the production systems aiming to generate information that allow establishing promotion and improvement measures. Thus, this article presents an actual diagnosis of the specific characteristics of the local production systems. From a general spread sheet derived from the survey, a number of variables were selected to find the basic and most representative information over these production systems. Likewise, criteria for the selection of analysis indicators followed the recommendation of Ruiz *et al.* (2008) from their characterization study of the extensive production systems of dairy goats in Andalucía (Spain), due to the similarity to the productions systems in the present study; the set of indicators suggested by the FAO-CIHEAM sub-network for sheep and goat production systems was also considered because they have been working over the years to establish comparisons among diagnostic studies on sheep and goats (Toussaint, 1999; Toussaint, 2002; Toussaint *et al.*, 2009).

This study is part of a research project financed by the Canary Islands Government (Consejería de Educación Cultura y Deportes, Dirección General de Universidades e Investigación del Gobierno de Canarias; 2006 research projects subvention) aiming to diagnose every production system for small ruminants in the Canary Islands. The present investigation shows the results referring the characterization of the Majorera breed of dairy goats.

II – Materials and methods

The information required to establish the characterization of goat production systems was obtained through a survey applied to the owners of the farms. The sample was chosen utilizing a stratified sampling criterion (Azorín and Sánchez, 1986; Aparicio, 1991). Surveys were applied over 2009, and the starting census was prepared from the farmer's records provided by the General Livestock Services, Government of Canary Islands, consulted for research purposes. In this way, 38 goat farms were surveyed, most of them located on Fuerteventura and Lanzarote Islands. The number of heads (reproductive females) in all 38 farms reaches a total of 16,747 animals, which amounts 6.2% of the total census on the seven Islands conforming the Canary Autonomous Community (current census estimates a total of 270,000 goats of the Majorera breed).

The different variables for analysis extracted from the survey and considered for this article refer to the following information groups: (i) technical indicators related to the flock and the reproductive management; (ii) technical indicators related to the territorial base and the implicated labour; and (iii) productive and economical indicators. The design of the survey was based on the most recent progress obtained in the methodology established by the FAO-CIHEAM sub-network on production systems for sheep and goats, related to the utilization of technical-economical indicators for the analysis of small ruminants' production systems (Toussaint *et al.*, 2009). Descriptive statistical analysis was carried out using the IBM SPSS Statistics package version 19.

III – Results and discussion

The mean size of the Majorera goat flock is 440 reproductive she-goats (Table 1), so most farms are medium or large, as compared to the flock size in other regions of the Iberian Peninsula where production of goat's milk is important; this is the case of Murcia region where flocks have an average of 200 she-goats (Navarro and Fernández, 2006), or the Palmera goat breed in the Canary Islands that shows a mean flock size of 122 nannies (Escuder *et al*., 2006).

Mean prolificacy and replacement rate showed positive values for a convenient reproductive management, although the reproductive proportion of 49 she-goats per buck will only be positive if several kidding seasons are established along the year, since the proportion in this species is advised to be of 25 nannies per buck when the breeding season is planned (Navarro, 2005).

Table 1. Technical indicators relative to goat type, flock size and reproductive management (mean and SD)

Indicators	N	Minimum	Maximum	Mean	SD†
Farm size	38	60	1500	440	350.18
Female per male	38	11	140	49	24.62
Replacement rate	38	10	50	26	10.68
Prolificacy	38	1.3	2.8	1.74	0.75

†Standard Deviation.

As shown in Table 2, the indicator of available area per goat (0.05 ha/goat) is well under the value obtained by Ruiz *et al*. (2008) on the goat systems for milk production under grazing in Andalucía (0.73 ha/goat). This is then a good indicator of the Majorera goat production system in the Canary Islands Community, and it is possible to say that the production scheme has a tendency to steer into intensification because grazing is not common as the feeding regime. This result is rather outstanding since the geography where most of these farms are located is characterized for offering a great availability of arable land and grasslands; however, only five of the surveyed livestock producers did grow some kind of pasture (alfalfa) or grazed their livestock on natural grasses, which is evident by the reduced figure of 13,16%. As it can be expected, farmers in the survey were identified for utilizing a great amount of grass held in reserve (mainly hay) in order to cover the required volume in the diet of their animals. A great deal of the hay does come from the Iberian Peninsula and reaches the farmers by means of a large subvention, which can explain their lack of interest to undertake on-farm cultivation. This is why it should be pondered if measures like this are damaging the environmental and social benefits that the goat sector could be offering, and if it would not be more appropriate to carry out actions to promote endogenous provision of feedstuffs –subsidizing its cultivation– thus influencing the foundation of more stable and adaptable operational structures in order to obtain quality and market-differentiated products.

Table 2. Technical indicators relative to area size, animal count and labour (mean and SD)

Indicators	N	Minimum	Maximum	Mean	SD†
Total area (ha)	38	0.00	700.75	23.88	113.17
Total area per goat (ha/goat)	38	0.00	1.17	0.05	0.19
Cultivated area (ha/goat)	38	0.00	0.67	0.02	0.11
Sows per goat	38	0.00	0.51	0.03	0.09
Sheep per goat	38	0.00	1.22	0.13	0.25
Total labour (YWU/100 goats)	38	0.24	3.33	0.84	0.58
Proportion of family labour (%)	38	2	100	78.68	32.39

†Standard Deviation.

Likewise, indicators on the amount of labour required at the goat farm show that Majorera goat farm are run by the family but they can hire some help outside the domestic unit, especially on those smallholdings where, besides livestock, there exists a cheese-making facility, or when the number of animals is high.

From the total number of farms in the survey, direct milk sales are assumed as the main source of income[1] reaching a proportion of 49.94%, except in the case of livestock owners that make

[1]Income derived only from goat production, not considering subventions from the Government.

cheese using all or part of their milk production, in which case the proportion of income from milk sale diminishes and the income from cheese sales increases.

Half of the goat owners make cheese and all the required milk is produced within the farm. Besides, as an average, the income derived from the sale of cheese at the farm is 35.11% of the total income generated from selling milk and/or meat (Table 3). If only the producers that make cheese are considered, then the percentage of income coming from the sale of cheese increases the total income up to 84.45%.

Table 3. Technical and economical indicators relative to the systems (mean and SD)

Indicators	N	Minimum	Maximum	Mean	SD†
Milk produced (l/goat/year)	28	24	730	453	192
Cheese produced (kg/goat/year)	16	11	204	62.81	48.55
Kids sold for meat (kids/goat)	30	0.1	1.71	0.62	0.41
Milk price (€/l)	20	0.48	0.85	0.56	0.08
Milk income (€/goat/year)	19	3	416	241.10	130.51
Meat income (€/goat/year)	23	5	80	23.52	17.89
Cheese income (€/goat/year)	38	0	1519	146.74	297.19
Milk income (%)	35	0	100	49.94	47.79
Meat income (%)	35	0	100	14.91	28.79
Cheese income (%)	35	0	100	35.11	45.14

†Standard Deviation.

It was confirmed in this study that, as compared with other regions in Spain where autochthonous breeds of dairy goats are raised, the Canary Islands Community is characterized for having a high percentage of livestock owners that make their own cheeses, this being their main source of income. This is different to other production systems in Spain where goat keepers are not involved in the transformation of milk into cheese, as it was reported by Navarro (2005) for the Murciano-Granadina goat in the Murcia region, or by Ruiz *et al.* (2008) for the Payoya goat breed in Andalucía. This has been quite strengthened by the great acceptance of cheeses made from Majorera goat breed, which has a Denomination of Origin (DO) known as "Queso Majorero" which has great commercial demand (13% of goat farms in the survey were members of the DO).

Nevertheless it is necessary to point out that, according to a recent study by Álvarez *et al.* (2009) on the marketing of Majorero cheese with Origin Denomination, it is established that even if a cheese is appreciated and consumed locally, most consumers do not associate it as a quality product. Besides, they showed great ignorance about the importance of the quality that the Origin Denomination guarantees and also they had low acquaintance with the OD badge and its significance.

Another important aspect regarding the promotion of cheese, with or without a quality badge, is the type of marketing, where direct sale is the preferred choice since 38% of farmers did sell all or part of their production directly to the consumers. This is even more significant when only farms under the Origin Denomination are studied, since 100% of them had direct sales as the marketing method; this agrees with Álvarez *et al.* (2009) as they mention that 75% of farms under the "Majorero cheese" Origin Denomination carried out total or partial direct sell. This indicates the relationship that exists between this type of selling and the farmers utilizing the quality badge, and it could be also related to their higher education and understanding of the importance to engage in the production of cheeses with differentiated quality, as compared to farmers that sell their products without a quality badge. Marketing with a quality badge has additional advantages: one is the possibility to obtain larger profits, and secondly that it could be

utilized as a formative action within the Majorero Cheese "Consejo Regulador de la Denominación de Origen", in a way that the producers themselves explain to the consumers the importance of the quality badge. This approach would encourage the producers to launch campaigns to familiarize the customers and to promote the quality badge locally; utilizing direct advertizing could even serve to stimulate those farmers that are not under the Consejo Regulador to register, thus increasing the low number of members.

It is to be considered that, any promotion campaign of quality cheeses must go together with actions to improve the production systems, looking into any problems that are acknowledged in the sector (health, husbandry, feeding, etc.). It is essential to begin with sound conditions, both technical and economical, before engaging with promotion strategies, as it is pointed out by Dubeuf *et al.* (2010) regarding the analysis of initiatives undertaken to promote of local cheeses in the Mediterranean area. Only in this way the results of promotion campaigns can be guaranteed, along with an optimization of the invested economic resources. After analyzing the situation, it is considered that the viability of such production systems will greatly depend upon the degree of success reached by the sales of cheeses made with milk of this autochthonous goat breed; the Majorera breed could turn into an important asset in the policies of local development, both environmental and social, in the Canary Islands Community.

IV – Conclusions

According to the results of the present study, it can be concluded that milk farms of the Majorera goat breed in the Canary Islands, are livestock units under semi-intensive production having a strong relationship with the production of cheese by the owners. These producers have no problems with the goat keepers that do not make cheese and sell all their milk production to the local cheese industry or within the Canary Autonomous Community.

This leads to think that the promotion of cheese sales with an acknowledged quality having a Denomination of Origin and great market demand, as "Queso Majorero", would be an appropriate target in order to maintain an adequate level of profitability in the sector. However, only 13% of the goat keepers in the survey belonged to the Denomination of Origin "Queso Majorero", which suggests that an effort should be made to establish promotion, sensitization and technical advisory actions in order to increase the number of goat farmers producing cheeses with such recognized level of quality in the region, without forgetting the endorsement campaigns designed for the consumers so they acknowledge and appraise the advantages and attributes of a product with certified and recognized quality, and that they can identify at the selling places.

The results of the present study offer a preliminary characterization. The high variability of the findings for most of the analyzed indicators reveals the need to undertake a deeper analysis that helps to explain the sources of such variability. It would be interesting, under the light of the findings of the present study, to run a separate characterization of milk producers without a cheese-making facility and those who have it, and also to take into consideration the geographic aspects (differences among the islands); multivariate analyses could prove the origin of the high variability in the results, and also if these factors (the product to sell: milk or cheese) and/or the geographic aspects (differences among the islands) will help to explain the differences.

The production systems for the Majorera goat breed in the Canary Autonomous Community are based on an appropriate mean flock size to think in a professionalized sector under the social conditions that they belong to, along with positive indicators on prolificacy, and competitive milk yield and meat sales. However, it is necessary to promote actions to encourage the sector to organize through more self-sufficient management systems, and better acquisition of inputs related to the feeding of animals, in a way that the sector becomes more adaptable to high-quality productive strategies (e. g. ecologic) looking for quality and differentiated products in the market.

Both efforts to promote the quality of the products and to improve the structure and the production systems must go along together, if an effective optimization of the resources to impulse the sector is sought. The Majorera goat sector has a lot to offer towards the endogenous development of rural areas of the Canary Autonomous Community, on its three components (social, economical and environmental), and the breed can become (if it is not there already) a prominent cultural reference to the inhabitants of these Islands.

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