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Introduction to the situation of the goat sector in the Murcia region (Spain)

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SUMMARY – This study aims to make an analysis of the most important characteristics of the goat sector in the region of Murcia so as to carry out a diagnosis of the present situation and in turn reflect on the possible steps to be taken for its improvement. The data was analysed through descriptive statistics. Ninety-five surveys were carried out following random stratified criteria. The average size of the herd is 200 female. The breed is predominantly Murciano-Granadina. The sale of milk, followed by the sale of kids are the main source of income in the dairy farms and very few livestock farmers gain income from reproduction sales (4.2%). The average age of farmers is 47 years. An increase in the use of milk control is considered a useful tool for improving a considerable number of key aspects in the profitability of the farms, as are a pure breed livestock and improvements in feeding.

Keywords: Goat, Murcia, characterization.

RESUME – "Introduction à la situation du secteur caprin dans la région de Murcie (Espagne)". Le présent article se propose d'analyser les caractéristiques plus saillantes du secteur caprin dans la Région de Murcie. Une méthode d'enquête a été proposée pour évaluer ces caractéristiques et les données ont été analysées à l'aide de la statistique descriptive. La taille moyenne des troupeaux est de 200 animaux. La race Murciano-Granadina est prédominante. La vente du lait, suivie par la vente des chevreaux, sont les principales sources de revenus des exploitations laitières, mais il n'y a que très peu d'éleveurs qui obtiennent des revenus à partir des ventes dérivées de la reproduction (4,2%). L'âge moyen des éleveurs est de 47 ans. L'utilisation croissante du contrôle laitier est considérée comme étant un outil d'utilité pour améliorer un grand nombre d'aspects déterminants pour la rentabilité des exploitations, tels que l'élevage en race pure et une meilleure alimentation.

Mots-clés : Chèvre, Murcia, caractérisation.

Introduction

The most important goat breed in Murcia Region is Murciano-Granadina. It is a dairy breed and milk is used to make cheese. Since 1985 the Consejería de Agricultura de Murcia (the Agricultural Council) has been developing new political ideas for improving the cheese industry and increasing economic activity in this area. This effort was consolidated in 2001 with the approval of the regulation of the Designation of Origin "Cheese from Murcia" and "Murcia Cheese cured with Wine" and the constitution of the Regulating Council. Also, it highlights the existence of the Murciano-Granadina goat Breeder Association (ACRIMUR), whose main activity focuses on the registration and control of the genealogical register of the breed. There is also the Milk Control Nucleus of the Murcia Region (NUCOLEMUR), which is in charge of carrying out the control of individual production of about 6000 females. Another goat breed present in Region of Murcia is the Blanca Celtiberica, which is for meat purpose. Although its census in the region is lower, these goats are more predominant in areas with poor vegetation, as in the case of the Northwest district, where they are mostly located. In 2003, the Regional Association of Goat Breeders Blanca Celtiberica was constituted, with 8 founder partners, which is an initiative that demonstrates the interest in preserving and encouraging the development of this breed in the Region of Murcia.

The above mentioned explains the important role of this sector in Murcia Region, and it is due to this that there is now an interest for carrying out research which may diagnose the present situation and establish measures for improvement.

The aim of this study is to present the basic characteristics which define the system for goat production in the Region of Murcia and in this way to make a diagnosis of the present situation which allows us to reflect on the possible measures for improvement in the sector.

Material and methods

Ninety five surveys were carried out from June 2001 to October 2002. The surveys were distributed into two groups. The first group included three herd sizes: 25-100, 100-200 and > 200 adult goats. The second group differentiated the six areas of the Region of Murcia: "Altiplano", "Campo de Cartagena", "Noroeste", "Río Mula", "Valle del Guadalentín" and "Vega del Segura". The samples followed a proportional stratified random criteria (Aparicio, 1991). The questionnaire was based on the methodology of the Community program for "surveys on the structure of agricultural farms" from the Instituto Nacional de Estadística (INE, 2003) (The National Institute of Statistics). Likewise, the guidelines of questionnaires published in articles with similar objectives were also followed and considered of interest (Vallerand, 1987; Falagán, 1988; Gallego *et al.*, 1993; Álvarez Funes and Paz Mótola, 1997; Láinez and Torres, 1999).

The questionnaire is structured in a total of nine information blocks, from which 152 variables were taken.

A series of basic questions were chosen for this present study (a preliminary study) as a first approach to becoming familiar with the situation of the sector: *herd* (size, breed, replacement), *production* (milk, meat, manure and reproduction), *territorial base* (farms without land, dry lands and irrigated land), *installations and infrastructure* (milking machines and age of installations), *workers* (age of owner, education, own and salaried employees), and *handling practises* (feeding, reproduction and health). All the data were analysed with SPSS (13.0) statistics package through descriptive statistics.

Results and discussion

Herd size, breed and replacement

The average herd size is 200 goats and 7 males. The standard deviations in both cases are high, which indicates greater variability (Table 1).

Table 1. Herd size

	N	Means	SD [†]	Interval
Goats	95	200	184	25-1450
Males	94	7	8	1-75
Goats/male	95	31	14.0	6-75

[†]Standard deviation.

The 41.1% of farms surveyed belong to the 101-200 goat group, followed by 31.6% in the > 200 goat group. Both groups include 72.7% of the total number surveyed (Table 2), and only 27.4% of the herds have less than 100 animals. In recent years a considerable change has taken place in the size of herds. According to Falagán (1988), the percentage of livestock farmers with less than 100 goats was 77%. This high increase in the average size of herds could be due to the use of mechanical milking and subsidies from so-called livestock bonuses.

Breed

The predominant breed is Murciano-Granadina. The 29.5% of those surveyed belong to the Asociación Nacional de Criadores de raza Murciano-Granadina (ACRIMUR) based in the town of

Jumilla, so the pure breed of these farms can be guaranteed (Table 3). There are 57 livestock farmers in total (59.9%) who own a herd of Murciano-Granadina goats, but they are not pure breed.

Table 2. Number of farms and goats per herd size

Number	Number of herds (%)	Goats mean \pm SD [†]	No. goats/male mean \pm SD [†]
25-100	26 (27.4)	56.6 \pm 25.4	24.5 \pm 10.7
101-200	39 (41.1)	158.3 \pm 32.7	31.3 \pm 14.21
> 200	30 (31.6)	342.1 \pm 219.0	36.0 \pm 13.9

[†]Standard deviation.

In the mountainous area of the Northwest, we can find livestock farmers who exploit the Blanca Celtibérica breed for meat.

Table 3. Breeds present in farms

	Frequency	%	% Accumulated
Murciano-Granadinas pure (belonging to ACRIMUR)	28	29.5	29.5
Pure Celtibérica	7	7.4	36.9
Mix Celtibérica/Murciano-Granadina	3	3.2	39.2
Murciano-Granadina with different degrees of purity	57	59.9	100

The average annual replacement rate is 28.03%, which is similar to the rate in the survey carried out by Falagán (1988), where the average replacement rate in 1988 was 24%

The 96.8% of those surveyed carry out replacement of females with animals from the herd itself, (Table 4). There are very few cases where females are brought from other farms for replacement (3.2%). This is not the case for males, where the percentage is higher (46.3%)

Table 4. Origin of breeding animals

	Frequency	% Accumulated
Replacing females from own herd alone	92	96.8
Replacing males from own herd alone	51	53.7
Borrows males for breeding	6	6.3

Production

The main economic profit for 84.3% of livestock farmers is the sale of goat's milk (Table 5).

Table 5. Main income for goat farms

	Frequency	%	Accumulative %
Milk and meat	76	80.1	80.1
Milk, meat and animals	4	4.2	84.3
Meat	15	15.7	100.0

Only 4.2% of livestock farmers sell animals for reproduction. They are prestigious goat farmers who belong to ACRIMUR and have productive data about the progenitors. They also offer a health guarantee for the animals sold. Only 35% of goat farmers who produce milk belong to a milk control nucleus. The 37% of the owners sell all the manure generated on the farm and 31% use it all on the farm. Those who do not sell manure are always farmers who own cropland and they use it on their land. 32% sell part of the manure and the other part are used on their own cropland. The 78% of goat farmers said they gained income through the sale of waste animals. The remaining 22% does not receive any type of economic profit.

Territorial base

Farms without land

The 14.7% of the cases surveyed (14 goat farmers) are farms without land. All of them are goat milk farmers and have installations, running water and electricity. The 71.4% have a telephone on the farm and 87.7% have a milking shed. On the other hand, although they are all goat milk farmers, only 14.3% belong to a nucleus of milk control and the same percentage belong to ACRIMUR.

Irrigated land

Only 39% of goat farmers have own irrigated land for livestock. The average surface is 33.42 ha, with a high standard deviation, which indicates heterogeneity (Table 6).

Table 6. Irrigated land (ha)

	N	Minimum-Maximum	Mean \pm SD [†]
Irrigated land	37	1-360	33.42 \pm 77.16

[†]Standard deviation.

More than 48% of the 37 farms with irrigated lands have not more than 6 ha and only 24% of all goat farmers have more than 15 ha of irrigated land.

Unirrigated lands

The 61.6% of goat farmers have unirrigated lands and 38.4% do not. The average surface of unirrigated land available is 103.42 ha, with a standard deviation of 220.94. This once again indicates the marked heterogeneity of the group as was the case with irrigated land.

The average surface used for pasture in the case of goat milk farmers is quite low (0.12 ha/goat), even lower results than those found by Mena *et al.* (2005), in the study of goat milk systems for the Malagueña breed (0.31 ha/goat). This indicates an important level of intensification of this type of goat farmer.

Workers

The average number of workers per farm is 1.74 UTA (unit of annual work), the lowest is 0.5 and the highest is 8 UTA (Table 7). The 76.8% of goat farmers do not employ paid workers, while 8.42% of those surveyed have full time employees and 15.79% contract casual workers.

With regard to employment, 95.79% are family businesses, 32.6% of which are formed by married couples who have an equal share of the work on the farm. In only 34.7% of cases is it the owner alone who takes care of everything involved in the activity and in 10.5% it is the owner and his/her children. There is also a farm without workers because it is an export business. In 44 cases (46.3%) the women work full time on the farm as wife of the owner or as the owner.

Table 7. Workers

	N	Minimum-Maximum	Mean \pm SD [†]
Total UTA	95	0.5 - 8	1.74 \pm 0.91
Family UTA	95	0 - 4	1.56 \pm 0.63
Full time salaried UTA	95	0 - 4	0.16 \pm 0.59
Casual paid UTA I	95	0 - 0.44	0.04 \pm 0.10

[†]Standard deviation.

The average age of the owner is 47, which is similar to the age given by Bermejo *et al.* (2000) for goat farmers in Ánaga (Tenerife), which in this case is an average of 46. With regard to the level of education of the surveyed owners, a high percentage (87.3%) had either a basic education or nothing at all.

Installations and infrastructure

Extensive systems are meat farms and it is not possible to find milking machines or a refrigeration tank among their installations. However, intensive or semi-intensive farms are oriented towards milking, as Daza *et al.* (2004) indicated. Therefore, intensive farms have an average age of 23, while extensive farms are 47 years old.

Handling practices

Food

The 24.2% of farmers do not differentiate food by lots (60.9% of them are oriented towards milking and 39.1% towards meat) (Table 8). This is mainly due to the precariousness of the installations which make it difficult to separate the lots or there is not enough space in the covered sheds which are insufficient for the size of the herd. The lot that is least considered is the one in the final stages of gestation. This, however, is one of the most delicate stages the animal goes through and where it is fundamental to adjust feeding to their needs, especially in intensive milking farms, when according to Fernández and Bacha (2004) overfeeding at the end of gestation can cause serious problems during the birth.

Table 8. Distribution feeding frequency

	N	Frequency	%
Differentiated feeding carried out for replacement lot	94	65	69.1
Differentiated feeding carried out for lot at end of gestation	94	38	40.4
Differentiated feeding is not carried out with any lot	94	23	24.2
Differentiated feeding carried out for milking lot	80	63	78.8
Differentiated feeding carried out for non milking lot	80	53	66.3

Only 25.9% of goat milk farmers use artificial lactation and 11.1% are thinking of using it soon. This percentage can be considered as low if consider the advantages for management and finances – being able to sell more milk at a higher price than the cost of milk substitution - which several authors attribute to this type of feeding (Sanz Sampelayo *et al.*, 1990; Argüello, 2000; Caro, 2004).

Reproduction

The males begin to cover at 9 months and are used for continuous breeding in 14.9% of cases in contrast to 85.1% who establish kidding period (Table 9).

Table 9. Aspects related to reproduction management

	N	Frequency	%
Continuous breeding carried out	94	14	14.9
Kidding period are established at different times of the year	94	80	85.1
A harness is used	95	19	20.0

At present only 20% of goat farmers use the harness as a measure for controlling breeding in contrast to 78% who did so in the mid eighties (Falagán, 1988). On the other hand the practice of separating males at present has increased, since it has gone from 18% according to the abovementioned study to 56% at present.

Health

The 20% of farmers surveyed do not belong to any type of ADS ("Asociación de Defensa Sanitaria", Health Protection Association) and 9.9% do not use any type of vaccination on their herds.

The 85.3% eliminate parasites in contrast to 14.7% who never do it. Regards to incidence of miscarriage in herds, only an average of 2.97% of females miscarries of the total number of pregnant females per year. There are farms where no miscarriages occur and the farm with the highest number of miscarriages is 20% of the females covered. The most used vaccination is enterotoxaemia (77%) followed by brucellosis (62.6%).

Preliminary diagnosis and reflection on improvement measures

Although the Murciano-Granadina breed is autochthonous with a high potential milk production, many herds in this region are not oriented towards pure breed selection. This is considered to be a negative factor that directly affects productivity. One solution would be to extend the possibilities of controlling the milk production of farmers who are not in the genealogical register through competent organizations and therefore offer an objective tool which will give farmers the incentive towards a better genetic selection of their herd.

Feeding is not very efficient, which is also a key aspect of productivity for the farm. Milk control, in this case, is also considered a valuable tool which would permit better preparation of feed. We believe that the preparation of feed could be managed through cooperatives which supply feed to their members or rather as an assessment tool by feed factories.

We have found that workers have a low level of education which could be improved significantly. We agree with Ortuño and González (1999) that the lack of education has a direct influence on the difficulties of managing the farms from a business point of view and therefore limit the possibilities for progress. We consider that to improve this situation a well established service of continuous training should be offered in order to educate workers about the correct management of the farm.

Conclusions

In the Region of Murcia, the goat sector is an economic – social activity of great interest because we can find autochthonous breeds which are perfectly adapted to the environment. They also have productive potential, especially in the milk breed Murciano-Granadina, whose milk production is in great demand. However, after a first analysis of how this activity functions, we can see that performance is inadequate and in many cases the money received from European subsidies is responsible for the exploitation's increase in profit, but this should not be considered as real profitability. Because of this situation we consider it to be of enormous interest to offer proposals aimed at a real improvement of productive results, with emphasis on the "key" aspects for better performance, such as improving the livestock, by increasing pure breed animals of the herd (more productive than mixed breed), and improved feeding management. In both cases, the application of

milk control is considered to be a highly useful tool. Furthermore, another measure considered as improving production results is a service of further training for educating workers in correct farm management.

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