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Chapter

The Goat Sector in Spain: Situation, Local Breeds, and Production Systems

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Abstract

Goats throughout history have been adapted to the different orographic and climatological conditions of diverse continents and regions, in which they have been widely spread. Consequently, this species has developed different aptitudes and specialties (meat, milk, hair, etc.) depending on the specific necessities that are covered. This specialization and its geographical conditions have created a great variety of breeds that have been adapted to different production systems. This chapter compiles the evolution and present situation of the goat sector in Spain and the perspectives for its future, describing the most important production systems currently used for different aptitudes in the country (dairy and meat) and compiling the characteristics of the main national autochthonous breeds.

Keywords: dairy, meat, census, morphology

1. Introduction

Goats are one of most antiquated domesticated species in the world, and have been associated with human settlements for at least 10,000 years [1]. The huge capacity of adaptation that the species presents to different and sometimes really harsh environmental conditions (such as desert locations) has benefited their constant increase and spread around the world, being the species (together with the dog) with the highest world diffusion [2]. This is observable from the continuing increment of its census population over the last century [3].

Due to its versatility and the possibility of being reared in different production systems, goats have different functions in developing and developed countries, being an important resource for food supply for the former and focused mainly on intensive production and elaboration of products with different qualities for the latter [4]. However, in all regions, goats have kept the function of maintaining the rural population using available local resources, being a resilient species that has become a source of income that has sustained life in rural areas, and with adequate management can help to maintain sustainability in diverse regions [5].

However, in many countries the species is highly dependent on external aids (such as economic supports) to guarantee its progress. So, the increase in information that provides the specific and current situation of the species in diverse contexts will help to design specific strategies to improve animal production and the quality of life of goat producers around the world.

2. Materials and methods: research methodology

In this chapter, documentary research was carried out to compile and analyze the main available official data regarding the goat sector in Spain. The main sources of information came from official statistical databases (the Spanish government's Ministry of Agriculture and Fisheries, Food and Environment, the Statistical Office of the European Commission (Eurostat), and the Food and Agriculture Organization of the United Nations database (FAOSTAT)). Also, technical reports from various journals and research from scientific articles and books were reviewed, as well as data generated by the authors from their professional careers and own experience.

3. An overview of the Spanish goat sector's current status

3.1 Census, distribution, and husbandry

The last available goat census shows that the world goat population in 2016 already exceeded 1 billion (1,002,810,368 heads) [3]: 55.4% of the census was located in Asia, 38.7% in Africa, 3.8% in America, 1.7% in Europe, and 0.4% in Oceania.

Spain had approximately 3,088,000 registered heads in 2016 (state official census), representing 24.9% of the total European Union (EU) goat census (12,392,000 heads), occupying the second position in the ranking of countries with the highest goat numbers in the EU after Greece (3,990,000—32.2%) [6].

From the total number of Spanish goats, the majority (74.69%) is classified as reproductive females and only 3.23% are reproductive males; the rest of the livestock census are animals younger than 12 months (771,628 heads).

With respect to census evolution, as compiled in **Figure 1**, over the last decade the number of animals has presented yearly oscillations between 1 and 7%, mainly associated with differences in the female census (**Figure 2**). The total census increased considerably from less than 1.8 million heads (previous years to 2007) to exceed the 3 million individuals in 2016/2017 [6], increasing all the cited groups, especially those from reproductive females, which increased from 1.3 million in 2006 to almost 2.2 million in 2007; the number of reproductive males is quite constant over the studied period in the figures.

Related to evolution over the last century (**Figure 3**), the census presents several cyclical oscillations, showing nowadays a similar number of heads to those registered at the beginning of the 1960s. A peak in the years that followed the incorporation of Spain into the EU (1986) can be seen; the oscillation on the census was probably related to the way the data were compiled according to the new European statistics.

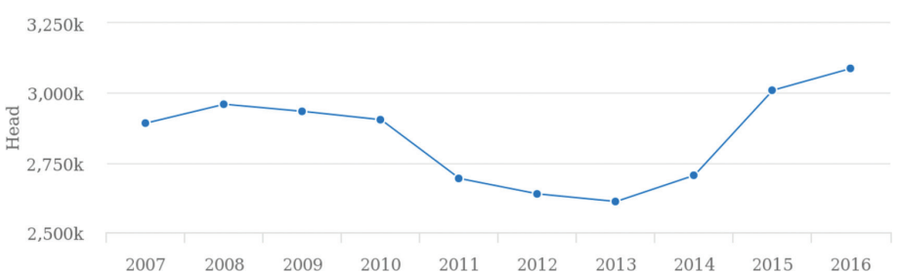

Figure 1.
Evolution of the goat census in Spain (2007–2016). Source: [3].

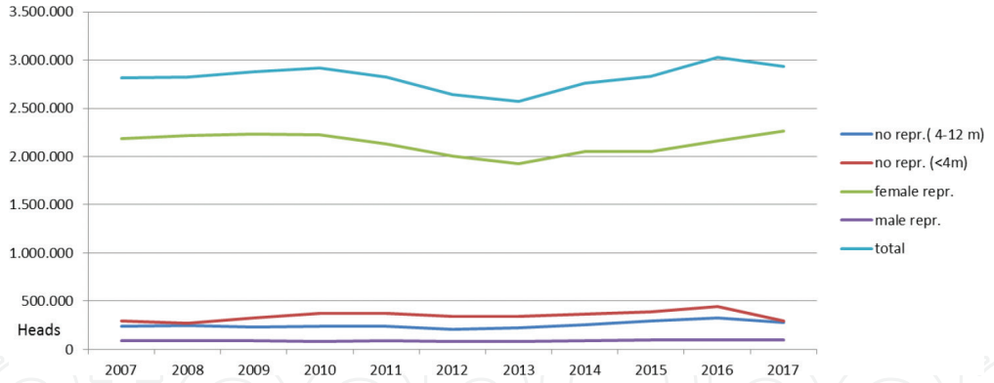

Figure 2.
Evolution of the goat census in Spain segmented by type of animal (2007–2017). Source: [6].

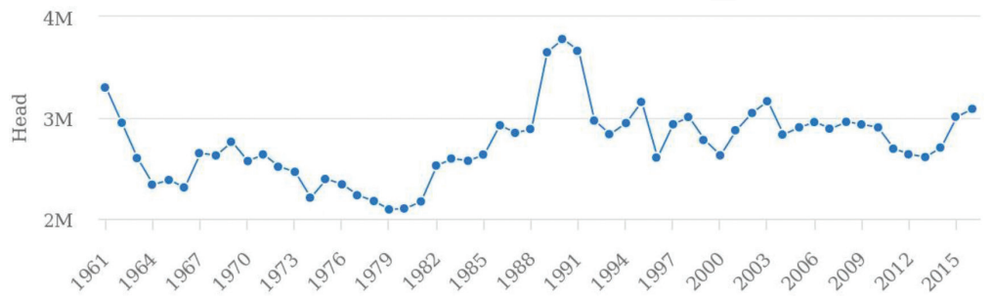

Figure 3.
Evolution of the goat census in Spain (1961–2016). Source: [3].

In Spain, the distribution of the goat census is not homogeneous throughout the country, for example the south (Andalusia) presents the higher concentration of heads (37.7%), followed by the center-east (Castilla la Mancha) (15.4%) and the west (Extremadura) (10.4%), followed by the southeast region (Murcia) (9.0%) and the Canary Islands (7.4%). Castilla la Mancha is the region with the greater increment of census during the last decade, which almost duplicates the presence of goats from 314,941 to 614,879 heads, ranking itself as the first region with the higher number of reproductive females for meat production (38.0% of the total census). However, the south is the region with the highest percentage of dairy goat females (39.0% of the total on this category) [6, 7].

There was a small decrease in the number of farms between the years 2010 and 2012, from 68,789 to 65,981, and afterwards the number of farms increased progressively until 2016, when it reached a total of 78,756. The number of goat farms at the beginning of 2017 was 77,218 [7]. The evolution of the different farms depends on their productive orientation. While the number of dairy farms has decreased by 26.4% (from 9150 to 6733), the other farm categories (meat and dual purpose) have increased (11.2% and 17.3%, respectively), where in 2017 the total number meat farms was 55,954 and those focused on dual-purpose products reached 10,071 farms. Also, the number of fattening farms has decreased by 18.1% from 776 to 635 during the period 2010–2017 [7]. In 2017, of the total number of farms, 0.82% are dedicated to fattening, 8.72% to milk production, 13.04% to double production (dual purpose), and the majority are focused on meat production (72.46%). Those percentages represent 95.04% of the total registered farms; 5% of farms are not officially classified according to their aptitude.

In 2016 the number of live animals exported was 1,112,240, with the main destinations being Libya (69.02%) and France (15.76%). Related to the imports of live animals, from a total of 297,329 heads, 88.75% came from France [6].

3.2 Meat production sector

Due to the morphology the species (amyotrophic) has not a noticeable meat aptitude; however, there are some breeds with certain muscular development, and consequently they are considered as meat breeds, where their main purpose is to produce kids for slaughtering [2].

The main meat types produced in Spain are:

1. Kids or suckling kids (called *cabrito*): animals that are reared by their mothers and weaned and slaughtered between 20 and 60 days of age with live weights from 5 to 14 kg.

2. Chevron (called *chivo*): males slaughtered between 4 and 6 months old with live weights from 20 to 45 kg; comparatively, production is much lower than kids and usually the consumption of this kind of meat is limited to several ethnic minorities present in Spain.

The world production of goat meat (2016) was estimated by FAOSTAT at 5,621,333 metric tonne (Tm) [3]. The majority is produced in Asia (73.18%), followed by Africa (22.14%), and America (2.26%) according to the previous census distribution. In Europe, production was 98,934 Tm, representing 1.76% of world production. In the cited census, Russia is included by the FAO as a European country, reaching the second position on meat production (18,567 Tm—18.77% of European production) after Greece (21,785 Tm—22.02%). Values for Spanish goat meat production are located after France, Albania, and Romania, representing 9.17% of European production [3].

During the period 1990–2005 according to FAOSTAT, in Spain for each kg of goat meat, between 14 and 16 kg of lamb meat was produced [1]. Production of goat meat for that period ranged from 14,000 to −16,000 Tm versus 211,000 to 232,000 Tm lamb meat produced [3]. The evolution of goat meat in Spain over the last few decades according to a Spanish official database is compiled in **Figure 4**.

Nowadays the ratio has changed to 11.89 kg of ovine for each kg of goat meat produced, according to national data on goat and lamb meat production at 9800 and 117,000 Tm, respectively, in both species (2016). Goat meat production had an increment of 7.3% related to its production on the previous year (2015) according to

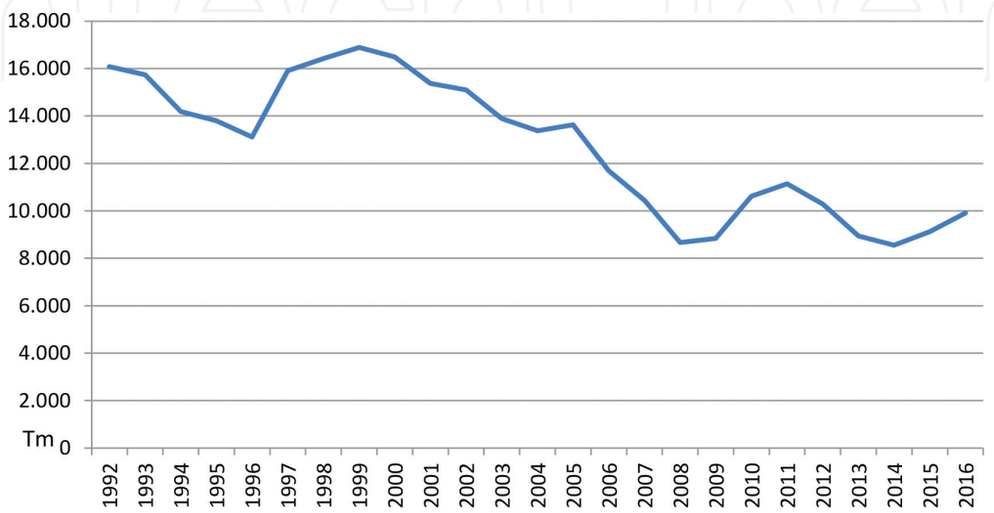

Figure 4.
Evolution of goat meat production in Spain (1992–2016). Source: [7].

a national database [7]. Eighty-one percent of slaughtered animals came from the commercial category kid, 4% from chevron, and 15% from adult animals.

South (Andalusia), Canary Islands, southeast (Murcia), and northeast (Cataluña) are the four regions where more than 60% of the total animals were slaughtered (1,296,981 heads—9842 Tm of goat meat, **Figure 4**). Almost one-quarter of goat meat produced was exported (2244 Tm) and the main destinations were inside the EU (36.7% France, 22.0% UK, and 9.4% Portugal) [6].

In 2016, goat meat represented 2.9% of the total commercial value of exports and imports of small ruminants (which included live animals and fresh and frozen meat from goat and ovine). The values of exportations reached 8.61 million euros and importations represented 1.98 million euros [7].

Total production of 5.6% (519.6 Tm) is commercialized as organic production certification, 66% coming from Andalusia and 26% from Castilla la Mancha. Also, the incorporation of new logotypes as "autochthons breed" (**Figure 5**) is a current initiative applied in the sector to improve commercialization and consumer information [7]. In this sense, there are two types of labels: one common for any species and another label specific for each species.

Spanish data concerning only goat meat consumption is not available because in the national reports values are presented with ovine meat. The consumption of small ruminant meat has declined progressively during the last decade, decreasing from 2.67 kg/person/year in 2006 to 1.55 kg/person/year in 2016 [6].

For a promising future for the goat sector in Spain it would be necessary to implement consumer education using awareness campaigns [9]. Those activities would have as foal increase sensibility about goat species and encourage the consumption of this type of meat, which currently is frequently associated with special occasions. Effective strategies to promote the national goat sector would be to transmit to the general public the characteristics, social values, and functions that this species has on national territory, as well as the development of diverse national or international strategies, along with the support and promotion of different products according to their quality, characteristics, and origin.

3.3 Dairy sector

Related to milk production, the situation is very different to meat production. Thus, there are some really specialized breeds with remarkable milk yields.

Figure 5.
Logotype "autochthonous Spanish breed: for goat and general". Source: [8].

Fresh whole milk around the world was estimated by the FAO at 1,526,211,600 ton in 2016 [3]. Again, the majority of production is found in Asia (52.7%) and Africa (25.7%). Europe represents the third continent (with 2,537,787 Tm; 16.63%), an important value compared to the lower census of other regions such as America. This reflects the great potential and production of European dairy breeds, as will be shown in the followig paragraphs.

At the European level, France was first with goat milk production at 603,040 tons, representing 23.76% of European production, followed by Spain (410,977 tons; 16.19%) and Greece (384,903 tons; 15.17%).

According to data from the FAO summarized in [1], goat milk production in Spain in the period 1990–2005 was higher for goats than ewes with 473 versus 320 million liters in 1990; in 2005 it was 469 versus 409 million liters. For each liter of goat milk produced there were between 0.67 and 0.87 liters of ovine milk. This shows the traditional good milking aptitude and use of goats in the country. Estimated milk production by lactation for some dairy Spanish breeds is shown in **Table 1**. Currently, national data on goat and ewe milk production show that in 2016 there were 480 and 560 million of liters, respectively, for those species, which modified the previous ratio to 1.16 liters of ovine milk for each liter of goat milk. It was in the year 2009 when the production of ovine milk exceeded goat milk yields, due to restructuring of the systems, replacing in large scale autochthonous ovine dairy breeds with other more productive breeds such as Assaf or Lacaune, and modifying the productive profile [7]. However, since 2012, as shown the **Figure 6**, goat milk production has increased.

South (Andalusia: 41%), center-east (Castilla la Mancha: 17%), Canary Islands (12%), and southeast (Murcia: 9%) are the four national regions where goat milk is produced. It is remarkable to see that the volume of goat milk obtained from farms from the center-east during the last 5 years has been doubled [7].

As indicated above, the quantity of goat milk production is increasing in the country; however, the number of producers in this sector has progressively decreased. Farms tend to be more technologically advanced and specialized, with a higher number of heads with improved productive efficiency [10].

The value of goat milk produced in 2016 was 305 million euros, 7% lower than the previous year due to the decrease in the price of this kind of milk, although production continued to progressively increase [6, 7].

The price of goat milk has a seasonal behavior, reaching a maximum during winter season where there is a productive deficit on farms [7]. In 2016 the average prize of goat milk in Spain was 0.64 euros/liter, 7.25% lower than the average of the previous year [7].

	MG (1)	MA (2)	FL (3)	MJ (4)	PA (5)	GU (6)	Source
Milk yield (kg) (lactation days)	530 (250)	503 (268)	—	—	416 (210)	—	[14]
	513 (210)	541 (210)	593 (210)	530 (210)	432 (210)	325 (210)	[2]
Fat (%)	4.8	5.6	—	—	4.2	—	[14]
	5.5	5.4	5.3	3.9	4.2	4.6	[2]
Range estimated by breed (kg)	450–550	400–500	450–550	400–600	300–450	300–400	[13]

MG: Murciano Granadina; MA: Malagueña; FL: Florida; MJ: Majorera; PA: Payoya; GU: Guadarrama.

Table 1.
Milk production of Spanish goat breeds.

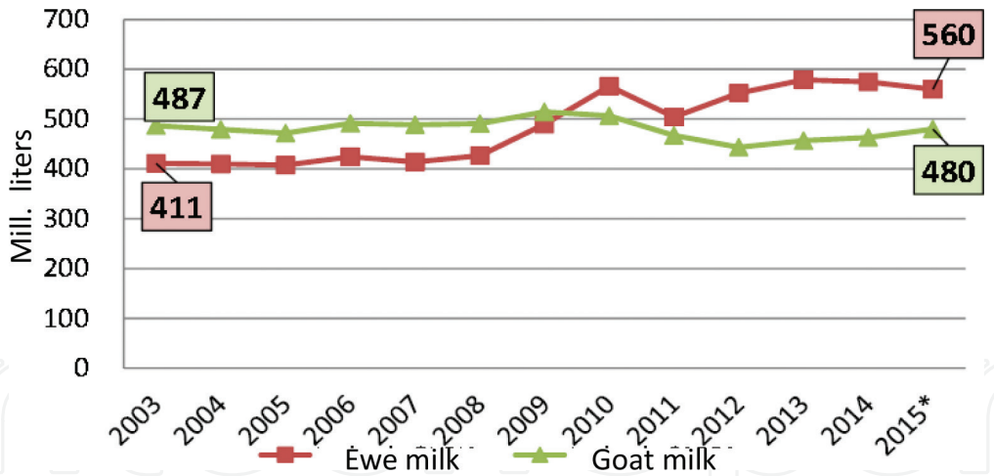

Figure 6.
Evolution of goat and ewe milk production in Spain (2003–2015). Source: [10].*

The main destination of goat milk is the transformation of cheese (pure or mixed with sheep milk). Spain has more than 150 varieties of cheeses from small ruminant milk, and many of them are produced under quality labels such as Protected Geographic Indication or Protected Designation of Origin. From the different types of cheeses consumed in Spanish homes, 12.7% belong to the category pure goat breeds, versus 17.6% of ewe, with respect to total cheese consumption [7]. Cheese consumption by person and year is estimated to be 280 g for goat cheese and 380 g for sheep cheese.

Globally, it could be said that the goat processing sector in Spain is characterized by the presence of a small number of different large industries that are involved in the main national industrial production, and a large number of small regional industries that produce more specialized products, which are frequently produced in small artisan cheese factories and sold in local markets [11].

The future and stability of the milk sector is very dependent of the price of milk and its global offer/availability on the national market, therefore some experts see exportation as a possible strategy to improve the sector. Thus, the sale of fresh milk to France or powdered milk to China to supply the demand of these markets would be favorable for the future of the sector [11].

Summarizing, the goat sector presents a good potential in the European and international markets, related to quantity and quality. Spain has a high variety of breeds that are appreciated in different countries, which are vital and strategic for Spanish rural development [9].

4. Goat breed characterization

4.1 Global approaches

Officially in Spain, following the Spanish Ministry of Agriculture, Food and Environment (Orden APM/26/2018) [12], there are 22 different breeds, all of them autochthonous, which means that the country is in fifth position in genetic variability in the world, after Italy, China, Pakistan, and India. The breeds are divided into two groups: breeds with a "no-conflictive" census (called foment breeds) and breeds with a "limited" census (called endangered breeds).

In the first group, three breeds are included, all of them dairy breeds. Two (Florida and Malagueña) have their origin from the south (Andalusia region) and one (Murciano Granadina) is spread all over the country. Also, they have some presence in Hispano-America and in North Africa countries.

In the second group, 19 breeds are included: 10 that could be considered as dairy or mainly dairy aptitude and nine meat or mainly meat aptitude breeds.

4.2 Breed characterization

In this chapter we will describe some of the Spanish goat breeds, indicating their geographical origin and main distribution (represented with a number in **Figure 7**), some of their morphological and coat characteristics, and productive qualities. They have been classified according to their main aptitude. Information on breeds has been extracted from research and published sources, articles, and books from [2, 13, 14].

4.2.1 Dairy breeds

4.2.1.1 Murciano Granadina (1, pictures 1 and 2)

This breed is in census and geographical distribution. It is the most important goat breed in the country, and has been exported to other European, American, and African countries. In 1975 it was recreated by the union of the Murciana (mahogany colored) and Granadina (black coat) goats, and was associated in 1997. It has typical milk morphology with a fine skeleton, good development of the mammary system,

Figure 7.
Geographical distribution of Spanish goat breeds.

	Cold carcass weight (kg)	Muscle (%)	Fat (%)	Bone (%)
Blanca Celtibérica (13)	6.56 d	60.6 a	16.7 b	21.4 a
Negra Serrana (17)	5.83 cd	63.0 ab	12.3 a	23.0 b
Moncaina (16)	5.32 bc	64.2 b	12.2 a	21.8 a
Murciano-Granadina (1)	4.38 a	62.2 a	11.9 a	23.7 b
Pirenaica (9)	4.71 ab	64.0 b	13.0 a	21.3 a
Milk lamb (Churra breed)	5.49 bc	61.3 a	11.9 a	25.0 c
SED	0.12	0.12	0.44	0.20

Source: [17]; percentage of tissue composition calculated on the shoulder. SED: standard error deviation. Letters mean statistical differences between breeds in the same column ($P < 0.050$).

Table 2.
Carcass weight and tissue composition of some Spanish goat breeds.

skin, and hair little developed and ears in "V" disposition, existing animals polled and horned. See productive performance in **Tables 1** and **2**. Some comparative studies have demonstrated the high consumer acceptability of this breed, together with others like Moncaina and Blanca Celtiberica [15], qualities that could be partially related to differences in fatty acids [16].

4.2.1.2 Malagueña (2, pictures 3 and 4)

Placed mainly in Malaga (in the Andalusia region), the breed, which has Maltese blood, has an important geographical distribution. It has a sandy to red coat and some variability in its morphological characteristics, but with a tendency, in the improved variety, to be similar to the most important world dairy breeds, such as the previous one or the Saanen. Malaga cheese ("Queso de Cabra de Málaga") is one of its more known milk products.

4.2.1.3 Florida (3, picture 5)

Situated mainly in Sevilla, in the south of Spain, this breed has its origin in crosses (Nubian blood and autochthonous animals) in the 1920–1930s, having its herd established in 2003. It has a nice red and white speckled coat and, as the previous ones, a milk aptitude morphology.

4.2.1.4 Majorera (4, pictures 6 and 7)


This breed is included in the Canary Islands breeds, together with Tinerfeña and Palmera (*Agrupación Caprina Canaria*—ACC in Spanish). The Majorera breed is placed mainly in the east islands, and shows some traces of Nubian and Maltese influence. It often has a pied coat and saber horns, good milk performance destined to make "majorero" cheese, and good rusticity.

4.2.2 Dual-purpose breeds

4.2.2.1 Payoya (5, pictures 8 and 9)


Payoya is a dairy and meat goat from the mountainous areas of Cadiz (Andalusia). It is well adapted to the extreme humidity and fluctuating temperatures of its local environment. The coat of the breed is very variable: mainly a combination of white, red, black, brown or cream, and it has a large size.

4.2.2.2 Guadarrama (6, picture 10)

Placed in the center of the Iberian mountain system, near Madrid, this breed has been influenced by hair breeds. The breed presents four varieties, with a long coat, mainly black or dark with white or clearer face stripes on the lower legs and feet. It is very rustic and known for its good health, prolificacy, and milk product quality, such as cheese and yoghurt.

4.2.3 Meat breeds

A comparative carcass composition of some of these breeds is presented in **Table 2**.

4.2.3.1 Azpi Gorri (7, picture 11)

Placed in the north of Spain, in Basque country, the breed has small numbers with around 1000 heads; its name reflects its red color. It has a medium size, horizontal ears, and short coat, deep red and gleaming black with chestnut face stripes, legs, abdomen, and the underside of the tail. Its main use is for kid meat production, though it is also to a certain extent milked.

4.2.3.2 Bermeya (8, picture 12)

This endangered breed with around 2500 animals included in its herd book is placed in the Cantabrian coast and mountains of the north of Spain, having its herd book registered in 1999. It has a fine, mainly short coat; some animals have pantaloons and a variable intensity red coat (harsher and longer in males) and horizontal ears and arched horns. It is bred mainly for meat but also for milk for local cheeses such as "Cabrales."

4.2.3.3 Pirenaica (9, picture 13)

This breed is located in the French and Spanish Pyrenees. On the Spanish slopes the breed shows a predominant meat aptitude; however, in France the aptitude is more focused on milk production. In Spain, the coat (usually long) is preferred black or dark brown, with paler abdomen, lower legs, and face stripes. The breed has high prolificacy, very good adaptation to the high mountain production systems, and good potential for milk production.

4.2.3.4 Retinta Extremeña (10, picture 14)

The breed is located in the west of Spain. The coat is short and variable red, mainly dark, and it has twisted horns. Dedicated to meat it is also milked and characterized by being well adapted to extreme conditions. It has a quiet temperament.

4.2.3.5 Verata (11, picture 15)

The Verata breed is mainly located in the area called "La Vera." The coat has different colors: chestnut brown, black, blackish brown, or gray, frequently with the muzzle clearer, presenting big twisted horns. As with many other breeds, it has meat and milk aptitude, so could be considered as a double aptitude animal.

4.2.3.6 Blanca Andaluza (12, picture 16)

This breed is mainly placed in the mountains of the northern region of Andalusia. It has a characteristic convex profile, with long twisted lyre-shaped horns, and a white coat. It has a noticeable sexual dimorphism. The breed has very high rusticity "live with the deer" and a clear meat aptitude. In some areas it is also milked, as are many other rustic breeds.

4.2.3.7 Blanca Celtibérica (13, pictures 17 and 18)

This old breed is quite similar to the previous one, but it has a wider diffusion, and it is slightly smaller presenting a less convex profile. Its main use is for producing meat; the females are rarely milked. "Tronchón" cheese is associated with the Blanca Celtibética breed. Exceptionally, it is supplemented due to its enormous adaptation and rusticity.

4.2.3.8 Blanca de la Rasquera (14, pictures 19 and 20)

Closely related to Blanca Celtibérica [14], this breed lives in the mountains near to the Catalonian coast. It has a white color, but frequently has black spots on a white coat and very twisted horns that sometimes look like ovine ones. Also, rusticity and kid meat are their main productive characteristics.

4.2.3.9 Mallorquina (15, picture 21)

This breed lives in the higher steep areas of the Balearic Islands, 800 m above sea level in the "Trasmontana Hills." In the past they have even been hunted, although nowadays they are included in conservation programs, living in semi-extensive production systems. The breed resembles the Markhor, with long horns, beards in both sexes, and a red and black coat. Associated with the diet and genotype, these meat aptitude and feral animals have darker, but tenderer, meat than milk lambs [4].

4.2.3.10 Moncaina (16, pictures 22 and 23)

Placed in a mountain area in the Aragón region ("Moncayo"), this breed has genetic connections with the Pirenaica y Guadarrama breeds. It was recognized as a breed in 2002. It has arched horns and a black or chestnut long coat with clearer areas. Meat is its main production, although the breed has been recognized as an acceptable milk producer.

4.2.3.11 Negra Serrana (17, picture 24)

This black, sometimes with a mixture of black and white hairs, breed lives between the Andalusia region and its north border areas with Castilian la Mancha. It has a convex profile, large weight, and a morphology that could be compared with the Boer breed. A peculiarity is a noticeable lop skin under the gorge. It has a clear meat aptitude, and low milk production, which could generate a low maternal instinct in young females [13].

5. Goat production systems in Spain

5.1 Introduction

Spanish goat systems show a great diversity of farms, although there are several common aspects, such as their familiar character, the lack of technical-economic management, and the lack of a clear structure of the sector [18]. Spanish goat breeds are farmed under different extensive, semi-extensive, semi-intensive, or intensive systems, depending on their productive aptitude and performance.

Thus, in general, those breeds with a high milk production, which can be classified as dairy breeds, are reared under the most intensive systems, in plain geographical areas, with high forage availability to cover their nutritional demands. Sometimes kids are considered as a by-product in these farms. On the other hand, those breeds with a lower milk potential used to be reared in marginal mountainous areas, under extensive or semi-extensive models, following traditional pastoral systems, where kids are the main product (meat breeds). When a particular breed is also milked, it is considered as a dual-purpose goat breed, whose characteristics have been previously defined.

In addition to the genetic base, there is also great heterogeneity in terms of other characteristics of the systems, as are the management of food and reproduction, and the degree of technification, which determines the type of system. Ultimately goat production systems in Spain are mainly determined by the aptitude of the breed such as farm facilities, housing systems, and feeding strategies.

5.2 Milk production

Both semi-extensive and intensive farms are focused on milk production as the main economical resource. The main differences between the two opposite poles lie, in general, in the number of goats (small-medium farms in the most extensive systems, with 250–450 heads, and large intensive farms, with 700–1500 heads), and the reproductive system (from one kidding to three to four kidding seasons per year, respectively). Under this perspective, semi-extensive farms present periods of total absence of milk production; meanwhile intensive farms, with a planned reproductive schedule, are theoretically able to offer milk all year round. However, despite the intensification process of some farms, milk production continues to be seasonal, with maximum production in spring and minimum at the end of summer and beginning of autumn, which is opposite to milk prices, which are lower in spring and higher in autumn and early winter.

5.3 Intensive systems

Most of the farms under this system can be considered as dairy farms. These farms follow a permanent housing of the animals, generally in communal yards that have uncovered areas. Feeding used to be indoors. Different paddocks keep animals in the same phase of lactation or with the same level of production.

The minimum number of heads is around 300, with a mean milk production of 400 liters per lactation. They have milking parlors, usually with electronic identification systems to record individual milk production.

From a reproductive point of view, these farmers are integrated in a breeders' association, under a genetic improvement plan, where artificial insemination with semen from the best bucks is usual.

Kids are like a by-product, and they contribute to around 20% of the income of the farm. Colostrum is provided by esophageal cannulas and kids are fed by automatic milk feeders.

5.4 Semi-extensive systems

These farms are based on the production of kid meat, but goats are also milked for up to 5–7 months, so that they use dual-purpose breeds. Kids are reared by their mothers, and after weaning start manual or mechanical milking.

The reproductive calendar follows in general one kidding per year, although some farmers try to reach three kidding seasons in 2 years.

Traditionally, farms under this semi-extensive program are located in two different geographical areas: mountains and valleys. Goat farms in the mountainous areas have a higher number of heads (>100) and grazing in communal pastures. Animals receive an energy supplement at the end of pregnancy and during lactation. Milking used to be manual. Lowland farms are smaller (25–50 females), using in general by-products from the industry as a supplementary feeding to grazing [19–20].

5.5 Extensive systems

Extensive farms are based on a natural land use, with a low amount of external income and with grazing as the main food resource for the animals. In general, farmers rear autochthonous breeds, well adapted to these areas [9].

The main goal of these farms is the production of young animals as described in Section 3.2. However, sometimes, very traditional farmers milk their goats for 1–2 months to manufacture small amounts of cheese.

This system includes small farms (150–200 goats), located in mountain areas, with limited/old facilities. Usually, housing is only overnight in rustic/old buildings. The flock is accompanied by the shepherd, with around 0.5–2 goats/ha.

The reproductive system is limited to one kidding per year.

6. Conclusions

In Spain, the goat sector has the potential to continue growing. At a national level the development of several certified products with quality trades/labels on meat or on elaborated products such as cheeses would allow increases and improvements to production, the value of the products and globally breeders recognition, profitability, and income. Also exportation of Spanish goat milk or meat to other countries together with higher and more common or traditional goat consumption would be a possible growth strategy.

The high genetic variability of breeds has been identified and characterized in the Spanish goat population. Each one has been adapted to the conditions of the rearing region and specific production systems according to their main aptitude (meat, dairy, dual purpose) and environmental resources.

Versatility of the species lets them adapt to different orographic and technical conditions, presenting adequate performance since extensive rural areas to on the newest specialized and intensified farms.

Institutional support from the government, from the small ruminant sectors and breeders' associations is essential for the progress of the species. Also, the increase in studies of the characteristics, possibilities of production of different breeds, and goodness of their products would be desirable. It is essential to transmit such knowledge to the population, which needs to be sensitized, informed, and educated about nutritional, environmental, social, and economic virtues of this species.

Acknowledgements

The authors thank the Spanish Goat Breeders' Associations and individual breeders that have collaborated on the diverse departmental projects developed over the last few decades.

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