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Local Goat Breeds in the United States

D. Phillip Sponenberg

Abstract

Goat production in the United States has largely relied upon breed resources imported less than a century ago. In addition to these imported breeds that are commonly used for production are a few local breeds that have been developed over centuries in the USA and other developed more recently. These include Spanish and Myotonic goats for meat production, Lamancha goats for dairy production, and an archaic type of Navajo Angora goat that still finds a role in mohair production. Additional genetic resources reside in a few populations of feral goats, although these now persist in domestication after having been eliminated from their feral ranges. The local breeds are increasingly the target of investigations into their genetics and levels of production. Results of those investigations are finding these local breeds to be productive and valuable additions to agricultural systems.

Keywords: breed, goat, Spanish goat, myotonic goat, feral goat

1. Introduction

Goat production in the USA generally involves a variety of breed resources that are each tailored to fit different needs within goat-producing agricultural systems. Among those systems are dairy production, meat production, brush control, mohair production, a limited amount of cashmere production, and companion animals. These systems are all dominated by breeds imported into the USA since 1900, although a few breeds persist that have origins in local goats that predate these importations. In addition to the formal and controlled herds involved in goat production are a few feral goat populations that persist in various locations. Some of these feral populations are of special genetic interest due to their unique foundation and subsequent genetic isolation.

2. Methods

Investigations of local goats in the USA have been undertaken throughout the last four decades by the Livestock Conservancy (LC), a nonprofit organization working in the United States to assess and document the status of breed populations and the population structures of each of them. The LC does its assessment by a periodic census of all breeds and candidate breed populations for both privately held and institutional herds. Local populations are often encountered that have no history of formal breeder organization or breed definition. These populations are each assessed for inclusion as breeds by documenting their history, phenotype, and

any available genetic results in order to make decisions as to their validity as populations with sufficient genetic uniformity to serve effectively as genetic resources. Once accepted as genetic resources (more formally as “breeds”), each is then further supported by organization of breeders and development of conservation strategies that are appropriate for the breed based on history and cultural factors. This may involve herdbooks and individual animal registration, or other strategies for more local breeds kept in more extensive situations where individual registration is not realistic. The background factors for each breed, along with the census, allow the Livestock Conservancy to establish priorities as well as strategies for effective conservation and promotion.

3. Dairy goats

Dairy producers in the USA generally use goats from a limited array of imported breeds. These goats are either purebred or high-grade, and breeders and registries closely track the ancestry of these goats. These imported breeds include Nubian, Alpine, Saanen (and its colored derivative named Sable), Toggenburg, and Oberhasli. In each of these breeds performance recording is routine, registrations and pedigrees are tracked, and they are used for milk production as well as for exhibition and competition in livestock shows.

The Nigerian Dwarf Goat stands apart from these others. It is, as the name suggests, a small goat originally from Africa that is now used for home-scale dairy production. It is derived from imports of landrace-type goats from Nigeria in the 1950s and 1960s. Breeders organized and defined the breed from these imported sources, even though the breed is much less organized or documented in its country of origin. Its small size and modest levels of production make it a breed more fitted for home milk production than for commercial goat dairying. The record for a 305-day lactation is 798 kg [1]. The census figures for 2013 included 8589 new registrations for the year, implying a total population size of 30,000 or so.

The American Lamancha is the only dairy goat breed with a local American origin, having been developed from a foundation based on local goats in California beginning in the 1930s and gaining breed recognition in the 1950s. These original goats were reputedly of Spanish origin via the colonial period during which the region was under Spanish and Mexican control. This history has contributed the name to the breed, even though no such breed exists in Spain under this name. The Lamancha breed was deliberately developed by adding successive influences from the other recognized dairy breeds to the original genetic base of local goats. These influences are all from imported breeds, and are therefore not local in a strict sense. These additions over generations were to the extent that they now vastly predominate over that original base of local goats. The Lamancha breed is a composite of these influences, most of which are imported. The breed has now been selected for dairy production from within this discrete population, and has been relatively closed for multiple generations.

The nomenclature of dairy goat breeding in the USA can become confusing and warrants some explanation when discussing the American Lamancha. The tracking of registered breeds of dairy goats in the USA takes a form of companion sections in the registries. One of these sections is for purebreds, and goes by whatever breed name is appropriate. A second section is for goats that have been graded up to relatively high levels of the breed from an original base of ordinary goats. In this section the goats are referred to as the breed name preceded by “American” as a modifier. In this system a “Toggenburg” is a purebred Toggenburg tracing back to the original imports in all lines of descent. In contrast, an “American Toggenburg”



Figure 1.
The American Lamancha is characterized by short ears. Photo by J. Beranger.

is a grade goat, although in most cases one that has very little breeding external to the imported lines. American goats, regardless of how small that outside influence is, can never be moved over into the purebred section. The case of the American Lamancha is therefore slightly different, because it is a breed that was formed in the USA, and as a result the only herdbook section is “American.” Therefore upgraded goats are fully included into the registry in this single section, and can participate fully within the breed.

The most distinctive feature of Lamancha goats is their short ears, which pass along generation to generation as a dominant genetic trait. Homozygotes have shorter ears that are nearly vestigial, while heterozygotes generally have a more obvious remnant of the pinna. The “gopher ear” is the shorter of the two, up to 2.5 cm but preferably shorter. The “elf ear” is up to 5 cm long.

Originally Lamancha goats were especially prized for their ability to milk continuously through several years after a single kidding. This trait is used less now than in years past, with most Lamanchas currently being mated for annual kid production and then milked for the subsequent lactation that is generally standardized at 305 days long. Milk production in the breed includes a record of 2770 kg in 2017 [1]. Also in 2017 the breed leader in butterfat produced 100 kg (8.1%), and the breed leader for protein production had a record of 58 kg (3.3%). Lamancha does should weigh at least 59 kg, and bucks 70 kg. The breed comes in a wide variety of colors. The hair coat is short, and the conformation is a typical dairy type. The census figures for 2013 included 11,518 new registrations, implying a total population in the range of 50,000 or so (**Figure 1**).

4. Fiber goats

Mohair production in the USA is all from Angora goats, and the Edwards Plateau in Texas is one of the main regions in which this international breed is raised. The Angora goat does not qualify as local by virtue of its importation early in the 1900s. A distinct archaic type does persist in the USA, mainly among breeders of the indigenous Navajo nation. This is a type close to that represented in the early importations and distinct from the more modern type. The Navajo Angora has a flatter lock type in contrast to the more pencil locks favored in modern Angoras. In addition the horns tend to twist upward or outward rather than having the lower pronounced curl of the modern Angora.

An increasing number of breeders, especially among artisans and hand-crafters, are concerned that this type of goat with its distinctive fiber is in danger of being completely absorbed by the more modern type. In response there is increasing



Figure 2.
The Navajo Angora goat is often colored, and has different fleece and horn structure than the more typical commercial modern Angora type. Photo by D.P. Sponenberg.

interest in organizing the breeding and recognition of this type which has generally persisted outside of the registries. In the early days of the formation of the Colored Angora Goat Breeders' Association most of the goats accepted into the registry were of the Navajo type, which often includes colored goats. However, in this Association the past decades have seen increasing use of the colored goats that rarely segregate from registered white Angora herds and tend to be of the more modern type. This breeding strategy has changed the overall breed type within the colored Angoras from the original Navajo type towards the more modern type. The colored goats have become increasingly fine-fleeced, which is the goal for most breeders of modern Angoras. As a reaction to this the breeders that prefer the Navajo type are beginning to organize breeding programs targeting this archaic type. There are no current estimates on population size for this type of Angora goat, but it is likely to number no more than 1000 head (**Figure 2**).

Goats used specifically for cashmere production are rare in the USA. A few breeders have imported cashmere-producing goats from international sources, but these continue to be present in very low numbers. Some specific bloodlines of Spanish goats have been used for cashmere production, and in this case the cashmere production is secondary to the usual meat-producing role of this breed. A few breeders of Spanish goats do specifically put emphasis on cashmere production, but the economics of this in the USA make it secondary to the income produced by meat production.

5. Meat goats

Local landraces in the USA have long been used for meat production. Production of goat meat has been very much a local enterprise throughout most of history, but has more recently emerged as a main focus of goat production for many breeders. Local breeds have met this demand but face increasing competition from the imported Boer and Kiko goats that are broadly considered to be more specific for meat production. Despite this popular opinion, research evidence points to advantages of the local breeds over the imported breeds [2, 3].

5.1 Spanish goat

The Spanish goat has a long history in the USA, having been brought to North America early in Spanish domination of both the southwest and the southeast. Due

to long residence in these challenging environments the Spanish goat today has a high level of adaptation. In the southwest this adaptation is to arid environments and extensive production systems. In the southeast the numbers of these goats are very much lower, but their adaptation to a humid subtropical environment makes them an important target for documentation and conservation.

Formal, organized conservation of Spanish goats became necessary after the breed began to be used for upgrading programs following the introduction of the Boer goat in the last decades of the 1900s. Several breeders of Spanish goats became alarmed that numbers of purebred landrace Spanish goats were dwindling, the does having been used for crossing with Boer goats with little or no purebred breeding occurring in most herds for recruitment back into the Spanish goat populations. A later challenge was a similar strategy used with the introduced Kiko goats. As is typical of many local genetic resources, little documentation of the productive potential of the Spanish goat was available, and this combined with the notoriety and high prices of any imported breed created an incentive for breeders to use Spanish does with the imported breeds rather than in pure breeding.

Fortunately, some breeders of Spanish goats had undertaken long-term selection programs to enhance to productivity of these goats without sacrificing their level of adaptation. This occurred mainly in Texas, where herds of up to 1500 head of Spanish goats can still be encountered. Breeders that were committed to the local breed generally started their herds with does that were about 35 kg mature weight. Through selection over decades they were able to increase weights, in some cases up to 70 kg. At this point breeders in some environments noticed that adaptation and general productivity began to suffer, but also noted that when mature doe weight was capped at about 57 kg it was possible to have productive, efficient goats that were also well-adapted to the dry and challenging West Texas environment [4].

Breeders tended to select from within their large herds, and rarely or never resorted to introduction of animals from outside their own lines. When they did add in new genetic material, bucks were chosen to be as similar in type as could be had. As a result of these breeding practices, several distinctive bloodlines have emerged, all of which have phenotypic similarities to one another. Importantly, this phenotype is distinct from other breed resources available to these breeders. The wisdom of conserving this type and selecting it for production have been proven by this breed's increased acceptance as a valuable component of commercial goat meat production, both as a purebred and as a base for crossbreeding.

The locally derived Spanish goat fortunately has a distinctive phenotype that has been the focus of breeders and conservators. This phenotype is easily disrupted by crossbreeding to other resources commonly available, including Nubian, Boer, Kiko, Angora, and the Swiss Dairy breeds.

The local Spanish goat has a rangy body. The ears are horizontal and carried forward up alongside the head. The horns tend to be long and have a distinctive twist to them. The facial profile is straight or slightly convex. This is the most distinctive phenotype, and was chosen as the one to conserve because it tends to quickly reveal crossbreeding. While phenotype in Iberian breeds is more variable, some of those phenotypes would fail to reveal crossbreeding. While they may indeed be purely Iberian they were not the target of conservation for this reason (**Figure 3**).

The approach of evaluating goats by this external phenotype has been validated by DNA testing, revealing that this phenotype, which occurs throughout the Americas, does reflect an underlying genotypic similarity. This indicates that the history and development of this type of goat traces back to a common foundation centuries ago [5, 6].

The status and history of the Spanish goat in the USA illustrates several important aspects of the conservation of local breeds of livestock. These goats very much



Figure 3.
These are young Spanish bucks from different bloodlines showing the consistent horn and ear carriage of the breed. Photo by D.P. Sponenberg.

fit into the framework of a landrace population that had a specific foundation followed by long-term genetic isolation and exposure to a selection environment imposed both by natural influences as well as human owners. This resource, in both the southwest and southeast, continued as a local resource that was not much changed due to geographic and cultural isolation. The only real threat to its integrity for most of its history was Angora goats in Texas, and the final fiber and general phenotype is so different in that case that there was little incentive for such crossing.

In such a situation, the goals of production and the relative isolation provide an environment that favors conservation of the traditional type with little need to impose organization or direction upon the breeders. This static but effective situation changed in the final decades of the 1900s, because the numbers and economic strength of various ethnic and cultural minorities increased, and many of these had a strong preference for goat meat. As a result the market changed from one that was primarily local to one that was national. In addition a few breeders imported Boer, and then later on Kiko, Savannah, and other exotic genetic resources. As is typical of most situations with imported breeds, these arrived with promotion from powerful economic forces that touted superior performance, while the local resource had never been truly evaluated. The assumption is that the imported resource offers significant advantages, even in the absence of documentation of the local resource.

Local producers found that they could take advantage of the promotion of these exotic resources by crossing to them, and gaining a premium in prices over the base price of goat meat as a commodity. This worked to erode the genetic resource of the local Spanish goat. Many breeders of Spanish goats no longer used Spanish bucks on their doe herds. The result was plummeting breed numbers.

As is also typical of landraces, an important group of breeders held on to the local resource and kept selection programs going. These breeders lacked formal organization, and most had herds of at least several hundred head. As a result, exchange of breeding stock was of minimal importance in the genetic management of the resource. Many breeders operated in isolation from the others. Especially among the breeders of large herds, selection has varied enough for color and amounts of cashmere that distinctive strains have emerged, all fitting under the unifying aspects of the general conformation of the Spanish goat. These differences are the reason for breeders avoiding a tightly prescriptive breed standard, and instead opting for a descriptive approach that encompasses the variations in the breed.

Efforts at organization began as a low-level effort that encouraged documentation and participation in nothing more than a list of breeders indicating that they had pure Spanish goats and were committed to the breed. The candidate herds were

evaluated for overall type, and those that fit a general history of good isolation and attention to the traditional type were included. The phenotype was assessed by a matrix of characteristics that evaluated the various conformational details outlined above. This loose level of organization allowed new breeders to have access to genetic material that would be accepted as purebred. The result was a loose structure of foundation lines, generally from large traditional herds but also including a few smaller herds. From these a second generation of breeders that purchased animals from these foundation lines began their own breeding programs.

Research is now documenting that Spanish goats are generally superior to Boer goats in overall productivity measured on a herd-wide basis, and are on a par with Kiko goats [5, 6]. This documentation points to the need to carefully evaluate local resources before replacing them with exotic resources, because local resources may indeed be equal or superior due to environmental adaptation.

The current stage of development within the breed is an increasing move towards individual registration of animals, with pedigrees and single-sire mating. This brings with it a subtle but important move from the original landrace concept for this breed, especially because the traditional approach has long been one of large herds raised extensively on vast ranges. Multi-sire breeding precludes accurate pedigrees, although the large herd sizes do offer insurance against high levels of inbreeding that could lead to inbreeding depression. Coordinating this traditional approach with a registry system that caters to smaller more intensively managed herds is a challenge in many landrace situations, and meeting it effectively and constructively is an important issue.

The census figures for 2018 included about 18,000 goats. This high figure is at least somewhat misleading, because of a handful of very large herds (over 1000 head each). A second tier consists of relatively large herds (100 to a few 100 s), and then finally herds numbers around 10 to 50 or so. Each of these herd sizes has different needs for validation and documentation. Importantly, the very large herds give an overall census value that is quite high and therefore seemingly secure from threats. Some large herds, however, are in the hands of elderly breeders and if these herds cease breeding, then the influence on the census will be very quickly felt and numbers will plummet precipitously and with little warning. This census value is therefore not as secure as it might seem to be on first thought, although the breed definitely does benefit greatly from the selection pressures put on it in those very large herds managed under extensive conditions. That selection environment is nearly impossible to duplicate outside of that specific situation.

Within the Spanish goats are a few foundation strains from the Southeast. These include goats from Mississippi, Florida, and South Carolina. These are all adapted to humid subtropical environments, which is distinct from the more numerous Texas goats. These southeast goats have a very similar phenotype, if a somewhat smaller average size. A few breeders are dedicated to the conservation of this subtype within the breed in order to not lose its distinctiveness (**Figure 4**).

5.2 Myotonic goat

Another local landrace for meat production is the Myotonic, or Fainting, goat. This goat is very much local, and has the medical condition of *myotonia congenita*. This condition is caused by changes in ion channels in skeletal muscle that make it impossible for rapidly firing muscles to relax rapidly after contraction [7]. This causes the goat's muscles to stiffen if it moves suddenly, usually in response to a surprising stimulus. A consequence of this trait is a visual appearance of increased muscle mass, which leads to a common citation of a meat-to-bone ratio of 4:1



Figure 4.

This Spanish buck from the Florida Partin strain has phenotypic features typical of the general breed. Photo by R. Wright, used by permission.

instead of the more common 3:1 of most goats. However, this value has not been substantiated by controlled research results and is therefore suspect.

Myotonic goats arrived in Tennessee in the 1880s in the care of an itinerant worker. The earlier origin of the goats is cloaked in mystery and similar goats have not been documented in other areas. Once introduced to Tennessee they were used as a local source of meat due to their muscular conformation. The *myotonia congenita* has other advantages because it impedes the goats as they try to climb or jump, so they are easier to fence in than other goats. This, along with the meat-to-bone ratio, was one of the reasons producers favored this goat over others. These goats served local purposes for most of their history.

Following the departure of the original itinerant worker, the goats were left with the landowner in Tennessee, and from that origin the goats developed as a local genetic resource. Subsistence production and use entailed very little selection along with very little promotion. This selection environment worked to produce a resource well-adapted to the local environment.

The long-term selection of these goats in Tennessee and other neighboring states with a humid subtropical or warm temperate climate has resulted in a high degree of resistance to parasites, which is a distinct advantage to the breed [6]. The goats also have good mothering ability and a quiet demeanor. Most of the goats within the breed are nonseasonal breeders making accelerated production schedules possible.

The development of the breed was strictly local up until the 1950s, with little to no organization of breeders. In the 1950s a few of the goats were brought to Texas, partly as a novelty and partly as production animals. During this time many Texas ranches were importing exotic wild hoofed stock from around the world. This was both for conservation as well as sport-hunting purposes. In this system the Myotonic goats were used to distract predators from the more valuable exotic stock, and many large ranches with exotic hoofed stock also ran herds of Myotonic goats.

Both the Tennessee and Texas portions of the breed remained unorganized as local landraces up until about the 1980s, when a variety of organizational efforts began. These involved the development of breed associations and breed standards. This was largely a response to a broadly based cultural phenomenon at that time for interest in novel and exotic varieties of domesticated breeds. The *myotonia congenita* of the goats fit that description quite well, and selection began to diverge in a few

different directions. Selection for the goats as companion animals emphasized small size, extreme degrees of stiffness, and good temperament. At the other extreme, selection for meat purposes preferred larger goats that could navigate the environment well and produce meat in low-input systems. In general the more exotic small form became the preferred selection target, and deliberate selection for meat production lagged.

A few different registries have been established for the breed. Most registries focused on the muscle condition and not on the underlying uniformity of the breed's overall phenotypic package. The one muscular trait became confused with the identity of the entire breed. The condition of *myotonia* is fortunately recessive so that crossbred goats usually do not exhibit the trait. While this helps to reduce the influx of outside breeding, when the focus is only on the *myotonia*, this threat is not completely eliminated. Different breeders have gone in different directions with this breed, and to an extent so have the registries and breeder associations. Selection for small, very stiff goats resulted in a high level of expression of the *myotonia*, but with little utility in commercial meat production. Others have selected for success in the show-ring, which tends to reward extremes of width and muscular development along with smooth conformation. Other breeders have selected for odd colors, blue eyes, or other conformational details such as the form of the ear and freedom from supernumerary teats. Yet others have favored selection for the goats as practical meat-producing goats under low-input management. An independent direction for selection is for small goats with silky long hair. These have now become "Mini Silky Fainting goats" and are the target of a selection process that is independent of the main breed.

The breed still encompasses a large range of sizes and overall styles. Each of these has advocates, with some of the groups having very strong opinions over what the original goat looked like and functioned like.

The main features that unify the breed are a quiet demeanor as well as the heavy muscling that comes directly from the *myotonia congenita*. In addition, many of the goats are resistant to the effects of *Haemonchus contortus* [6]. The relative sizes of the breed are difficult to ascertain because they are so variable. Does go up to about 75 kg pounds, and bucks sometimes over 100 kg, but these are usually animals that have been heavily fed and are fat. The more usual larger goats of the breed are about 50 kg does and 70 kg bucks. Most of the breed matures slowly, not achieving full mature weight until about three or four years old. The breed is generally nonseasonal for reproduction, although this varies individual to individual. Prolificacy varies widely, with most producing singles or twins but with triplets and quadruplets routine enough to not be all that unusual. The smallest examples of the breed are at the miniature end, and some does are only about 25 kg.

Coat color is variable, although black and white spotted is common. Many breeders consider this combination to be the original color pattern for the breed and they therefore avoid other colors. This combination is recessive in this breed, and once fixed is fairly repeatable. Other breeders refer back to early photographs of the breed that showed a broader range of colors, and do not discriminate against colors that vary from the common black and white. Eye color also varies. The light gold color common to most goats is the most common within the breed, although many breeders specifically select for blue eyes which seem to pass along as a dominant trait within the breed.

Hair length varies. Most of the breed has short sleek hair in summer, and many grow a heavy coat of cashmere in the winter that is shed out in spring. A minority of the breed has long hair over most of the body, while a slightly greater number has longer hair along the topline, backs of thighs, and lower legs. Some animals are polled, although most are horned. Horns, when present, are usually long and have an outward and upward twist in mature bucks, although the relative length and character of the horns is quite variable.



Figure 5.
These young Myotonic bucklings show the stout conformation and heavy muscling typical of the breed, as well as a portion of the range of colors. Photo by D.P. Sponenberg.



Figure 6.
Hair length and quality varies in the Myotonic breed. Photo by D.P. Sponenberg.

Census figures from 2015 include 3500 new registrations. When mature stock is also considered, the final numbers of goats within the breed are likely to be around 10,000 or more. This was a rare breed 30 years ago, but has now become more popular and these population figures indicate that the breed is now secure from threats of extinction. Only a few large herds exist (100 head or more), and consequently the breed is exposed to many different breeding programs, each with a different selection goal. This helps to maintain diversity within the breed (**Figures 5 and 6**).

6. Feral goats

Feral goats are not common in the USA. A few strains do occur on islands, and some of these have a history of long-term isolation after a foundation event. These few have been targeted for conservation efforts due to their status as legitimate genetic resources. The long-term isolation provides for genetic adaptation to local conditions as well as for the development of a repeatable genetic package that is predictable. Populations with consistent introduction of new animals fail to achieve this.

6.1 San Clemente goat

The San Clemente goat hails from the island of that name, having been introduced long ago from the neighboring Santa Catalina island. These islands are off the coast of California. The San Clemente goat was determined to have adverse effects on its island environment, and as a result was targeted for removal. After removal, a small representative group of these goats became the focus of a conservation effort in order to not completely lose the strain.

The majority of San Clemente goats have a specific color pattern that is basically tan on the rear half of the body, and black on the front half. There are tan facial stripes, and also black stripes on the fronts of the legs. This pattern is so common among these goats that when other color patterns arise they are usually targeted for elimination, even though early photographs of the goats from the island did show color variation. This pattern, though typical of San Clemente goats, also occurs in numerous other breeds worldwide.

The San Clemente goat is a small goat, with does about 30 kg and bucks about 45 kg. They have horns, and the character and shape of the horns does vary among the goats of the breed. Teat conformation has been a target of some selection, with breeders culling any that have extra teats or split teats. In a rare breed this may be overly harsh because this action removes entire genomes from the conservation effort.

Genetic studies on the San Clemente goat have not been all that helpful in untangling its relationship to other geographic sources of goats [2, 3]. This is likely due to genetic drift following long isolation after a founding event of relatively few goats. They have a few phenotypic similarities to Spanish goats, but are distinct enough to warrant their own independent conservation effort.

The most recent census figures for San Clemente goats are from 2015, when there were 229 males registered and 425 females registered. These resided on 79 different farms, indicating that the breed is generally found in relatively small herds which contributes to reasonably broad variation in the use of breeding males (**Figure 7**).

6.2 Southeast Islands goat

The barrier islands off of South Carolina and North Carolina include a few with small populations of feral goats. The few of these with decent histories of isolation are generally a phenotype that fits within the Spanish goat, and these are included in the conservation efforts for that breed. A few others show influences of Nubian or other recent introductions, and are therefore not included as conservation priorities.



Figure 7.
San Clemente goats generally come in variations on a single color, although other variations do occur occasionally and were also typical of goats originally from the island. Photo by D.P. Sponenberg.

The goats from the barrier islands face a host of challenges, not least of which is the relatively recent introduction of feral hogs onto some of the islands. These can prey upon young kids, so recruitment in these populations is now falling below replacement levels.

No census figures are available for these goats, but the total is unlikely to be over 50 total.

6.3 Hawaiian goat

Hawaii also includes some feral goat populations. These are usually of a Spanish phenotype, but have been fairly poorly characterized or studied. As is typical of island feral populations they are controversial for their impact on native flora and fauna, while at the same time being of at least some conservation interest due to their long-term genetic isolation and adaptation. These are both legitimate concerns but tug in opposite directions, and a long-term solution is yet to be achieved.

No census figures are available for these goats.

7. Conclusion

The United States has only a handful of local breeds of goats that have a history of long standing. These few have been important contributors to goat production in the country, which has generally been at a fairly low level but is now increasing dramatically. These breeds, especially Spanish and Myotonic goats, are now finding acceptance and use in commercial goat production, which has worked to secure their numbers as well as the genetic structure of the breeds. This has depended on research into the true productive potential of these breeds, which is likely to be overlooked as increasing numbers of exotic resources are imported into the country. Fortunately research has documented the role that Spanish and Myotonic goats can play in rational production systems. As these breeds move from local resources to more broadly distribute, it will change their overall popularity and status among the genetic resources available to American goat producers.

Conflicts of interest

The author declares no conflict of interest.

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