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CURRENT SITUATION AND FUTURE PROSPECTS OF THE US GOAT INDUSTRY

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Abstract

The current demand for goat meat in the US outstrips domestic supply. There is great potential for industry growth in the meat and dairy sectors. Whereas fiber prices have improved, loss of animals and market resources, labor costs for shearing, and lack of animal genetic resources prevent growth in the short term. As producers age, there is opportunity for new producers to enter the marketplace. Significant challenges exist, like access to local markets and abattoirs, dewormer resistant parasites, and feed costs. Establishing goat feedlots can increase meat supply and industry commercialization. Technologies used for cattle will be expanded for use in goats with interconnected sensors collecting health and production data. The field of genetic improvement will change from current production testing to identifying superior animals at an early age using DNA analysis. A quality assurance program is needed to address animal welfare issues and promote the consumption of domestic products to consumers.

Keywords: Meat Goat Industry, Dairy Goat Industry, Goat Industry, Goat Industry Status

Introduction

The US goat industry has been strong for the last 20 years and has great potential for growth and profit in the future for meat, milk, or fiber (mohair and cashmere) commodities. The goat industry has been blessed with strong market demand, but lagging production has caused high domestic commodity prices resulting in the need to import goat products to meet demand. We need to understand how the goat industry has developed to its current state before we can predict the future of the industry.

Historically, the US meat goat industry was concentrated in the Edwards Plateau region of Texas. In 1987, that region was home to 73% of the US goat population (US Agricultural Statistics, 1987). Since then, Texas goat numbers have decreased while goat numbers have increased in other states; however, Texas still accounts for 38% of today's US goat population (USDA NASS, 2018b). Angora goats were once not only a source of fiber but also the main source of goat meat and numbered 1.4 million head from 1909 to 1915. Angora goat numbers increased to 3.6 million head in 1931 and peaked at 4.6 million head in 1965 before shrinking to 2 million head in the 1980s (Pinkerton, 1991) followed by a rapid decline to present numbers of only 150,000 head after the cessation of the Wool and Mohair act in 1993. Meat goats were not enumerated until the 2005 agricultural census. Prior to that, most Texas ranchers in the Edwards Plateau region had some Spanish goats for brush and weed control, gave them minimal management, and often had little idea of the number of goats on their ranch, but regularly marketed excess animals for meat.

The introduction of the South African Boer goat breed in 1994 rapidly changed the direction of the US meat goat industry. LandCorp Farming NZ introduced the Boer goat breed to the US and merchandised the new breed especially to non-traditional goat producers who were persuaded to pay high prices for these animals. The Boer goat has since become the most popular breed of goat for meat production in the US and has fueled the growth and expansion of the meat goat industry.

Current Production and Outlook

Total US goat numbers are estimated to be 2.62 million as of January 2018 (USDA NASS, 2018b; Figure 1) comprising 380,000 head of dairy goats (a slow increase over the last decade) and 142,000 Angora goats with the remainder being meat goats. Total goat numbers have declined by 15.3% in the last 10 years, almost all due to the 21.5% decline in meat goat numbers. Southern states, where goat numbers had grown for the previous 20 years, experienced the largest reduction in goat numbers while the goat populations in northern states increased. Speculation on reasons for the overall decrease in meat goat numbers includes sell-off of breeding stock due to the recession in 2007, the prolonged drought in the southern US, dewormer resistance increasing production costs and mortality, and hobby producers who grew tired of taking care of animals liquidating their herds.

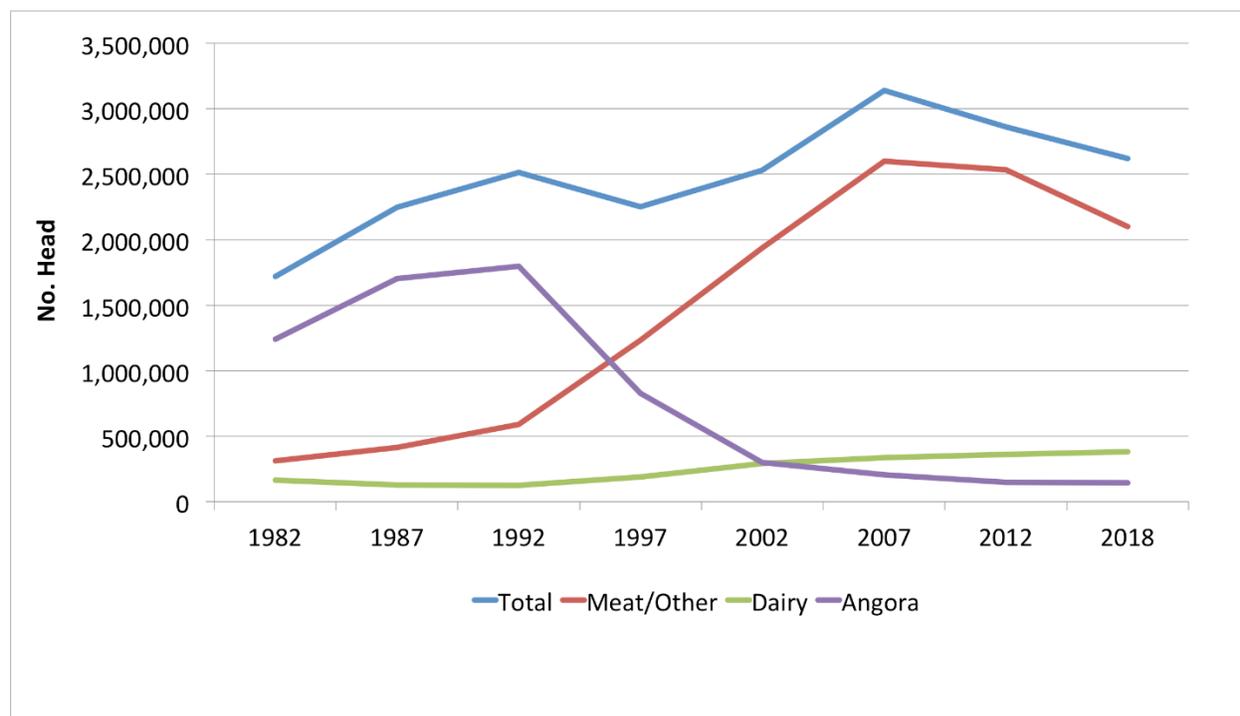


Figure 1. Numbers of goats in the U.S. (USDA NASS, 2018b).

In 2017, 488,000 goats were slaughtered in federally inspected plants and 108,900 in other plants such as state-inspected facilities; however, not all states report state inspected goat slaughter (USDA NASS, 2018a, Figure 2). There is substantial on-farm slaughter of goats but exact numbers are unknown. Pinkerton and McMillin (personal communication) estimate in addition to federal and state harvest figures, another 120,000 goats were slaughtered using data from the USDA National Animal Health Monitoring System (NAHMS) reported kid crop, replacements, and kid mortality loss. Adding this estimate to reported numbers gives a total of slaughter of 717,000 head. In 2017, goat meat imports totaled 20,952 metric tons worth \$143,737,000 (USDA FAS GATS, 2018). This equates to 1.35 million 34-pound goat carcasses. Goat meat imports provide 70.6% of the goat meat consumed in the US. This is beneficial in that imported meat feeds the demand and maintains the market from year to year. However, it also represents goats that could be produced in the US with money retained in the US. Meat goat budgets conservatively estimate a profit of \$21 per head. Assuming 6 goats can replace one cow, raising goats would return \$126 in profit as

compared to a \$38 loss as found in the most recent cow-calf enterprise budget released by Oklahoma State University (Anon, 2018).

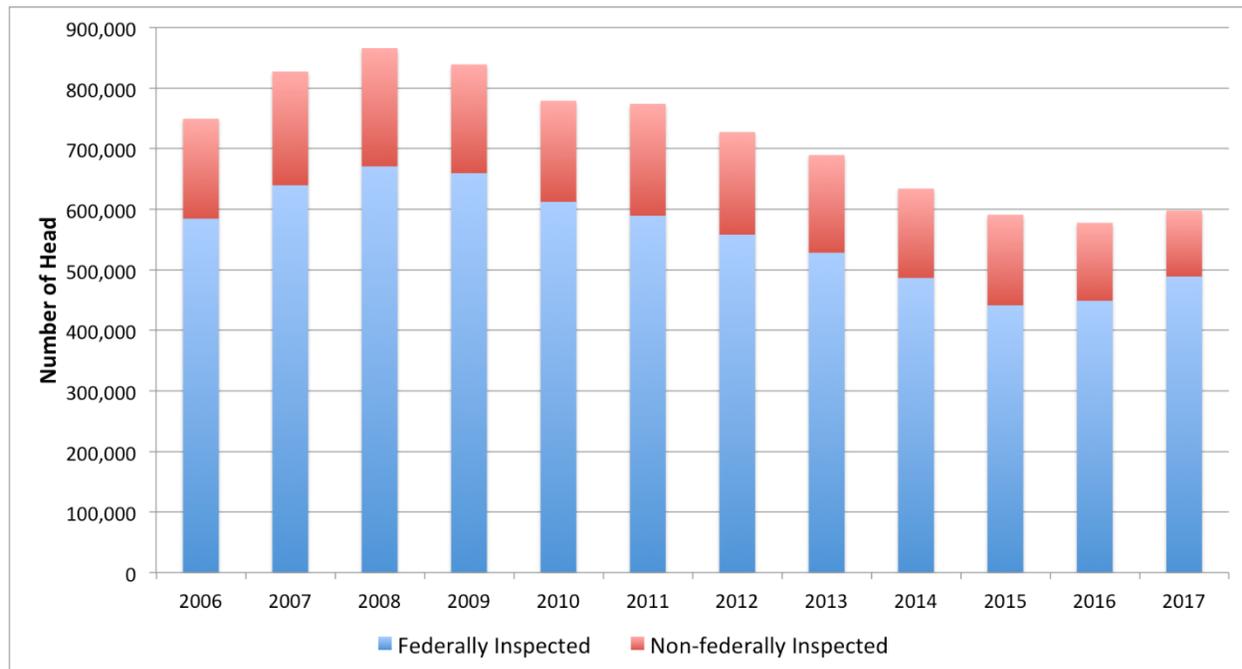


Figure 2. Number of goats slaughtered in federally and non-federally inspected facilities (USDA NASS, 2018a).

Dairy goat numbers stand at 380,000, a 5.5% increase from 2002 (USDA NASS, 2018b). In 2017, there were 504 goat herds on DHI test representing 19,919 head with an average herd size of 39 goats. Average milk production was 1,901 pounds for a 305-day lactation, a 9% increase from 1,750 pounds in 1996 (The Council on Dairy Cattle Breeding, 2018). Milk goats are concentrated in CA, WI, IA and New England due to availability of small scale milk processing facilities (2012 Census of Agriculture; Figure 3). There were 308 million pounds of goat milk produced in 2010. Unfortunately, no data is currently being collected on goat milk production. There are increasing numbers of large goat dairies, replacing small hobby and cottage industry size dairies, to provide larger quantities of milk necessary for commercial processing. The biggest problem for the dairy goat industry is the dumping of cheap frozen curd from other countries into the US market that is mixed with fresh goat milk to make an acceptable cheese product. This is estimated to reduce goat milk prices by \$2/cwt.

The dairy goat industry will increasingly migrate toward larger dairies, but cottage and hobby size dairies will remain numerous and important, providing registered stock and show quality animals. There are numerous US cheese makers that produce gourmet goat cheeses of equal or better quality than imported goat cheeses. The industry can compete with European dairy goat milk products and there is a future in domestic goat cheese production and the milk production required to support that portion of the industry. There is potential to produce a goat milk based

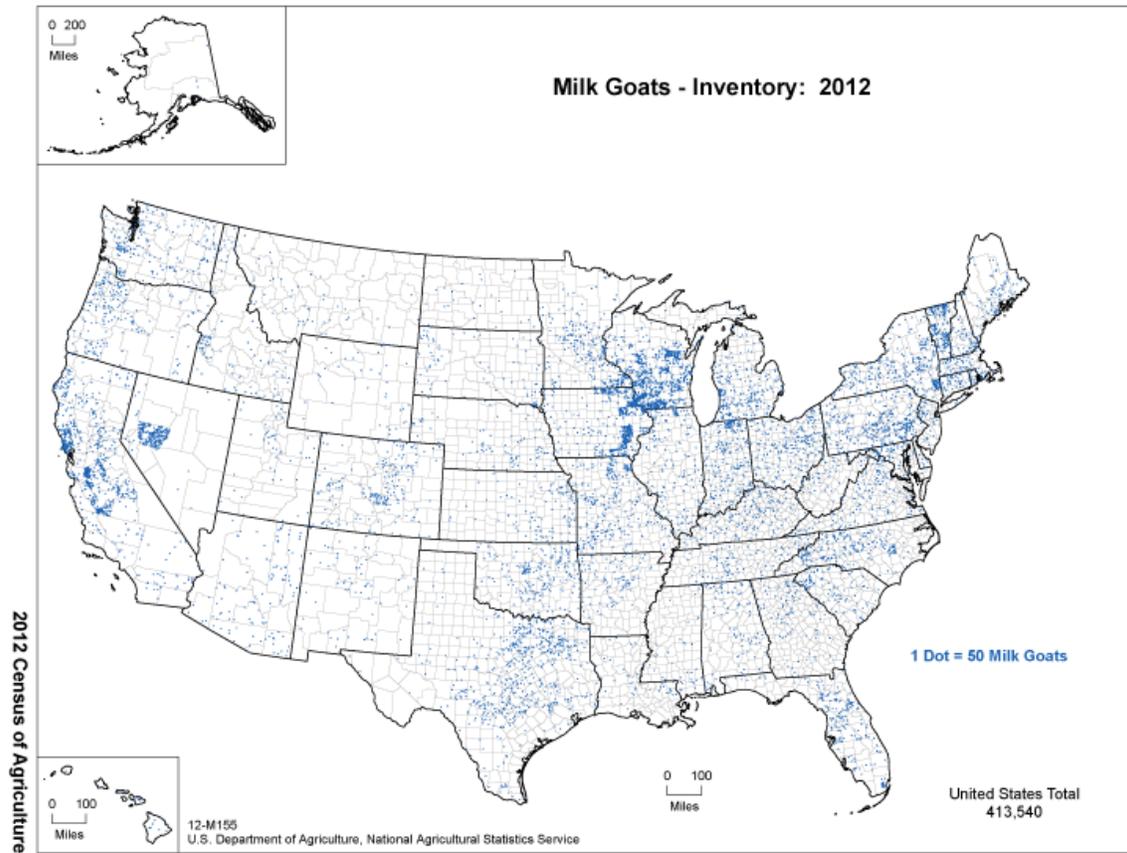


Figure 3. Dairy goat inventory, 2012.

infant formula that would create a tremendous market for goat milk and the industry should pursue development of such a formula. Dairy goat producers are learning how to raise male kids to profit from the strong goat meat market. One problem both the meat and dairy goat industries must address in the future is Johne's disease.

The price of mohair has been in excess of \$8/pound, (USDA FSA, 2018) a price that makes mohair production economic, but the loss of infrastructure and difficulty of finding shearers will likely prevent much growth in the industry. Cashmere is selling for \$25 to 35 per pound; however, there is little interest in producing cashmere because goats need to be sheared when the weather is cold and harvest of the fiber is labor-intensive. Genetics for high levels of cashmere production are scarce in the US.

Who Will Raise Goats in the Future?

According to the US Ag Census of 2012, the average age of a sheep or goat producer was 55 years old. About 75% of sheep and goats were raised on farms of less than 49 acres and small ruminants were not the main source of income in those households (USDA NASS, 2015). Approximately two-thirds of US goats are raised in herds of less than 100 animals and an estimated 29.7% are in herds of less than 20 animals, accounting for 80% of all goat operations (USDA APHIS VS, 2017). Contrarily, Ostia et al. (2016), surveyed goat producers who were more commercial in nature and showed an average of 62 goats per meat goat farm, still a much smaller scale of production than seen in the beef and swine industries.

The advancing average age of livestock producers will open opportunities for younger operators to enter the business. However, economic barriers of land and facility lease or purchase, cost of stock, and health care and feed costs will prevent many new producers from establishing large goat herds, particularly meat goats. Thus, the current small ruminant raising situation will likely continue where the majority of US goats are raised on small farms. A six-year goat market study conducted by Texas A&M AgriLife found producers received little to no premium for meat goats sold in lots above 6 to 12 animals, underscoring the appeal of goat raising for small scale producers (Byrns, 2016).

The demographics of who farms and raises livestock in America are also changing as more minority groups begin or expand farming activities. For example, from 2007 to 2012 the number of Hispanic principal farm operators increased by 21% (USDA NASS, 2014). Sheep and goat farming was the principal commodity on 6% of those farms. The diversity of goat producers is expected to increase in the future along with the shifting demographics of the US population and the growth of foreign-born US residents (Passel and Cohn, 2008).

Increasing Current Productivity

The US currently imports a substantial amount of goat meat due to inadequate domestic supply. This offers opportunities for US goat producers to increase production. Production can be increased by adding animal numbers or increasing productivity per animal. Additional goats raised can come about either by increasing herd size of existing producers or by increasing the number of producers. Producing more meat, milk, or fiber per animal can be done through a variety of means with technologies and recommendations already present. This includes improvement in management, herd health, use of selection indices, etc. In the arena of meat production, simply selling meat goats at a higher live weight would be beneficial. A heavier animal would produce more meat; however, current market preferences for whole carcass purchase would have to be adjusted. Should acceptance of supermarket cuts of goat meat such as chops, roasts, leg, or ground product grow, an increase in live weight of slaughter goats would be warranted. Such cuts could also be used in precooked meats or as part of “meal kits” for consumers to cook at home. Research funded by the industry on consumer acceptance, taste, cooking methods, and the like would support this growth.

New goat producers may be established livestock herdsman who switch from another species to raising goats, add goats to their existing species, or people with little to no livestock experience. In all cases there will continue to be a need for producer education. Increasingly producers turn to on-line resources for information. A number of “apps” are available that can assist farmers with inventory, drug treatment, management, etc. On-line education programs, such as those of Langston University (goats.langston.edu under Training), offer information and may provide a means of receiving “certification” that some producers use as a marketing tool. No matter the on-line information source, it must have correct and current information. New educational or training programs will be needed that deal with emerging topics addressed elsewhere such as increased use of genomics in animal selection. New advances in genetic and other technologies will call for training not only of producers but also those persons supporting the US goat industry, i.e., extension personnel, veterinarians, other farmer educators, and university personnel.

Industry Challenges

An industry survey in 2013 identified 4 important challenges to goat production: high cost of goat production, lack of clear marketing system for goats, lack of goat meat processor close to areas of large production, and internal parasites (Gillespie et al., 2013). Higher goat prices and reduced corn prices since then have alleviated the first problem. Goats, because they are such a small market as compared to other meat-producing species, will always have market problems. However, when goat numbers increase in an area, goat buyers will come. It is worthwhile to investigate goat marketing options in an area. There has been a reduction in the number of small scale abattoirs for all animal species as demand for their services has decreased. Some states allow home slaughter that facilitates direct farm sales to consumers who wish to do their butchering or purchase of animals for religious or other festivals. The majority of goats are processed in states near large urban centers having great demand for goat meat, primarily along the east coast and upper Midwest. Approximately 25% of all goats slaughtered in federally inspected plants are processed in New Jersey, necessitating transporting goats from distant production areas (USDA NASS, 2018a; Figure 4). Parasites have become a major problem as goats have moved into more humid areas conducive to parasite survival. There is a consortium (American Consortium for Small Ruminant Parasite Control) conducting collaborative research and developing educational materials to address the parasite problems of goats.

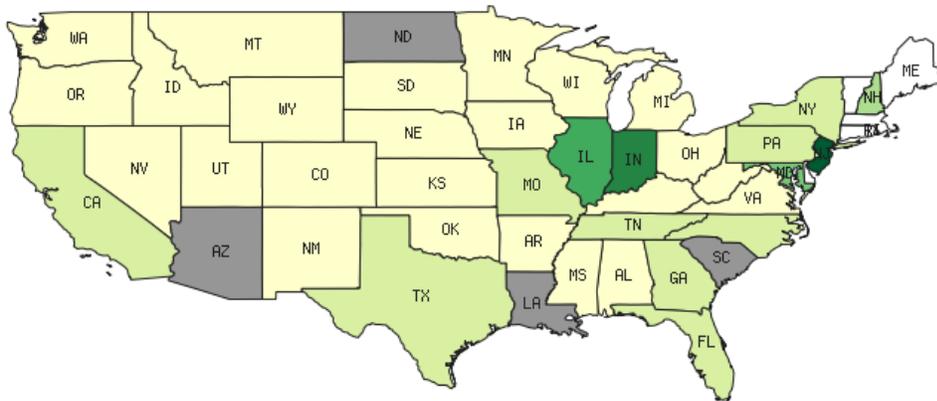


Figure 4. Distribution of federally inspected goat slaughter measured in head, 2017. Darker green color indicates greater slaughter numbers. Gray indicates no data available. (USDA FAS GATS database)

Integrating Goats with Other Livestock

Goats will continue to be integrated into many other enterprises to efficiently utilize natural resources or increase monetary returns. One of the best known and publicized use of goats is for vegetation management. Private companies, government agencies, and local municipalities all have used goats to economically control weeds and brush to reduce machinery costs or herbicide use due to public pressure. In many situations, goats may be the only economically viable method. There have been few rent-a-goat operations in the US with labor costs, fencing, and predator losses being major constraints. Some operations herd goats with experienced hired shepherds from Peru, for example, but entry into the US for such work has become much more difficult and limited the economic viability of these operations. In some areas, portable electric fencing is suitable but large expanses of territory or difficult terrain can prevent its use. Management and daily electric fence monitoring and maintenance may also be cost-prohibitive. However, when fencing is needed,

portable electric fencing may be the only viable option because the cost and labor needed to establish a conventional fence are four times greater than that required for electric fencing.

Grazing goats with cattle is economically viable because goats consume brush and weeds that cattle do not, which helps producers realize additional savings on herbicide, burning or mechanical weed control no longer needed. One farmer practicing intensive rotational grazing uses one wire on pigtail posts to control his cattle but only has the perimeter fence built to hold goats. He rotates his cattle among pastures but lets the goats go wherever they wish to locate weeds and brush. Several cattle operations in Kansas are using goats to control sericea lespedeza to utilize this unwanted plant and rehabilitate pastures. Other forage species that can be controlled by goats include salt cedar, poison ivy, and red cedar, among others. Cattle producers can modify fences to control goats by adding 3 strands of barbed wire, adding low net wire labeled 8-32-12 having a 12" spacing of vertical wire strands, or adding two strands of electric wire in front of a conventional barbed wire fence (Hart and Potraz, 2015). Goats can be used to consume cover crops, especially on homesteads or vegetable production farms with small acreages, converting the forage to manure and reducing the need for tractor operations to kill the cover crop and prepare the land for planting. The number of small farms for local food production is increasing and cover crops are very useful to condition the soil. The small size of goats fits well with homestead production of milk or meat.

Feedlot Goat Meat Production

Most meat-producing livestock and poultry in the US are raised in some form of intensive feeding operation, such as dry lots for cattle and some lambs and other feeding facilities for swine and poultry. However, large-scale feedlot or dry lot production of goats, while being done in other countries, has not been practiced in the US. Feedlot finishing of goats has great potential to increase meat production while reducing the investment required for land; however, management and nutrition concerns need to be addressed. For economic viability, low-cost feedstuffs such as byproducts or crop residues must be utilized.

Feedlot operations could purchase weaned stock directly from farmers for finishing, purchase from producers who buy kids and "background" them in a manner similar to the beef industry, or could raise does and produce their own kids in a vertically integrated concept. In the latter system, early weaning and creep feeding are essential to reduce feed costs. It is very important to have a cheap source of feed, such as feed byproducts, for the economic success of the feedlot. Intensive reproduction management is possible, facilitating genetic progress through artificial insemination and progeny testing as well as the ability to time kidding to meet holiday market demand. There should be lower kid losses, especially due to predators and parasites. Close confinement increases the potential for disease spread, requiring a good health program. Goats are not as well adapted to intensive production as other food species, being susceptible to acidosis, enterotoxemia, polioencephalomalacia, and urinary calculi. However, several generations of selection could produce an animal better adapted to this production system. Information could be gleaned from cattle dry lot production systems to increase the chances of success with this production system.

Animal Welfare and Quality Assurance

Animal rights and welfare concerns have had a significant impact on production practices in the swine and poultry industries and similar effects are expected for the goat industry. Goat producers need to be proactive in identifying and correcting potential animal welfare problems or issues.

Procedures causing pain and discomfort such as dehorning and castration would be initial concerns. Current FDA regulations require analgesics to be administered under the direction of a veterinarian, which has the potential to significantly add to production costs. Australian scientists have successfully reduced pain during castration by developing an anesthetic that is topically applied by a producer to the spermatic cord using a gun applicator prior to cutting the cord (Lomax et al., 2010). Australian scientists have also developed a gel administered orally that is rapidly absorbed through the roof of the mouth to alleviate the pain of castration in lambs (Small et al., 2014). The latter has greater potential for approval for use at the producer level.

Another area of welfare concern is suffering caused by parasites, poor nutrition, disease occurrence, etc., all of which are issues relating to poor management. The industry should work as a whole to educate producers on how to prevent these problems from occurring. Practice judicious sharing of videos of sick animals or other problems on YouTube or other social media. The general public is far removed from agriculture and may not be aware of some of the management techniques normally used on farm livestock. This can lead to misunderstanding of many benign, safe procedures, such as artificial insemination, that can lead to persons feeling offended or wishing to place additional regulations on livestock producers.

A growing segment of consumers wants to have input on how their food is produced. This has become evident in various fast food chains sourcing eggs and meat from cage-free production systems, pork from farrowing stall-free production systems, or purchasing organic or grassfed products. Still, other consumers have different concerns regarding how goats look, needing to be unblemished, intact, etc., for use in religious holidays or festivals. However, all consumers want animals to be raised humanely, following standards requiring adequate care, nutrition, and management. To assuage those public concerns, most major food animal industries have a quality control program in place. Currently, there is no goat industry quality assurance program to let the public know how producers care and raise their goats. Serious consideration should be given to creating a goat quality assurance program before one is forced on the industry.

Presently, the goat industry has three certification programs available: Animal Welfare Approved by A Greener World, Certified Humane by Humane Farm Animal Care, and American Humane Certified by the American Humane Association. These three organizations have established their lists of acceptable and unacceptable practices for welfare certification; bear in mind these lists are debatable and not necessarily science-based. The Sheep Safety and Quality Assurance Program involves certification for training, certification for developing a farm production program that meets criteria in the training program, and then implementation of the program on the farm with audits to assure compliance. Will the goat industry develop a quality assurance program? Where will the money come from to finance development and audits and maintain the program? Other livestock species have used a checkoff program to finance the development and implementation of a quality assurance program.

Role of Technology

Genetics and Genomics

Performance testing and genetic evaluations are proven methods for identifying genetically superior animals; however, the number of producers and animals involved in performance testing is decreasing year after year (ADGA, personal communication). Genomic selection (GS) is a

quickly evolving field and one that may soon revolutionize the identification of genetically superior individuals and selection for breeding purposes (Goddard, 2009; Goddard and Hayes, 2007). GS has the capability of transforming selection within the goat population if embraced by the industry.

According to Meuwissen et al. (2016), GS involves the estimation of the genetic merit of an individual based upon its DNA – its single nucleotide polymorphisms (SNP). A principal component of GS is the genus-specific identification of SNPs. Initially, a genome-wide association study (GWAS) must be undertaken to determine the influence of each SNP to the trait(s) under selection, such as milk production, milk fat or protein content, average daily gain, cashmere yield, etc. This involves evaluating an initial animal group that has both phenotypic and genomic data, often called the reference population. Then for GS, the SNPs of an individual will be compared to the reference population. The size of the reference population required depends upon the heritability of the trait and the desired accuracy (Goddard, 2009). This reference population does not exist in meat or fiber goats but is being constructed for dairy goats (Carillier et al., 2013; Mucha et al., 2015).

SNPs can also be used for parentage. Rodriguez Y Ramirez (2015) developed a SNP panel for parentage testing and, using 143 AI bucks that were sons of 48 AI bucks, concluded 15% of assumed pedigrees were incorrect. Talenti et al. (2016) used a SNP panel for parentage testing of 154 animals from producer herds and concluded 40% of the pedigrees were incorrect.

IoT (Internet of Things)

IoT is a network of electronics, software, and sensors that process data and communicates information from or to the user. Gartner Research recently estimated that by 2020, there will be 20.4 billion IoT applications (van der Meulen, 2017). The vast majority of these IoT applications will involve smart homes, smart cars, and smartphones. A very small but growing sector of IoT involves agriculture and row-crop farming leads in adopting IoT technology. According to a USDA survey, using technologies such as yield monitors, auto-guidance systems, and variable-rate application has enabled farmers to become more profitable through higher yields per acre but lower fuel and fertilizer expenses (Schimmelpfennig and Ebel, 2011).

Livestock producers have also adopted smart farming techniques but not to the extent of their row-crop counterparts. A recent review of electronic sensors used in the dairy cattle industry analyzed a total of 126 publications between 2002 and 2012 describing 139 sensor systems (Rutten et al., 2013). These studies investigated the detection of estrus, locomotion problems, mastitis, and/or metabolic problems with some studies investigating more than one aspect of dairy cattle management. In the future, IoT will change the way livestock are managed. As sensors are developed in other livestock industries, they will be adapted for use in goats.

As sensors evolve, it is important to ask what the sensors should monitor. The simplest condition to monitor is identification. Electronic identification monitoring of livestock had its impetus with a two-fold objective of permanent identification and of implementing traceability. Studies examining various formats for passive radiofrequency identification (RFID) have deduced rumen boluses have a much higher retention rate than RFID ear tags or other forms of external tags with a higher than acceptable loss rate (Carné et al., 2011, 2010; Kluever et al., 2012). In a partnership

with the University of Barcelona, Langston University was one of the first to study the effect of size and specific gravity of rumen boluses upon retention (Carné et al., 2009).

Studies in dairy cattle found an increase in core body temperature is an early indicator of disease occurrence (Schutz and Bewley, 2009; Timsit et al., 2011) and the onset of estrus (Bewley and Schutz, 2010; Suthar et al., 2011). Core body temperature will elevate just before ovulation (Kyle et al., 1998; Piccione et al., 2003). In goats, this corresponding elevation in temperature was also noted in rectal and vaginal temperature (Fakruzzaman and Akter, 2012).

As important as core body temperature is for detecting illness or estrus, rumination seems to be even more important for determining animal wellbeing. Soriani et al. (2012) noted a nearly 50% decrease in rumination time during dairy cow calving followed by a quick return to pre-parturition level; however, this response rate was slowed considerably in cows with disorders associated with parturition. In a study examining the effect of estrus upon rumination time in cattle (Reith and Hoy, 2012), a nearly 20% decrease in rumination time at estrus was noted. Remote sensing hardware and management software could be developed to help identify animals in estrus.

Currently, the only monitoring device for rumination time is a collar worn by cattle. This collar system has been used in studies on dairy cattle (Schirmann et al., 2009; AMbriz-Vilchis et al., 2015) and on beef cattle (Goldhawk et al., 2013) with conflicting results. Other methods have been devised to measure eating/ruminating behavior (Penning, 1983) using a pressure-sensitive noseband device (Braun et al., 2013; Kononoff et al., 2002; Ungar and Rutter, 2006). Recently, the HOBO Pendant G data logger has been used to gather movement behavior (Dalton et al., 2016; Mattachini et al., 2014; Zobel et al., 2015). The HOBO Pendant G logger measures acceleration and angular displacement in three axes allowing the collected data to be translated into rumination patterns.

Future Role of Livestock Extension

The role of livestock extension will change in the coming years. Extension personnel have already become increasingly proficient in electronic communications and social media. As technology gains importance in the goat industry, extension personnel will collaborate with scientists and professionals having a wide array of expertise to develop practical applications. However, extension personnel cannot lose sight of the continued importance and need for traditional, face-to-face exchange of information and the hands-on teaching of management techniques. This is particularly true considering that 1 in 5 adults in rural areas do not use the internet for a variety of reasons (Anderson et al., 2018).

As mentioned, the background of goat producers is becoming more diverse. This will drive change in who conducts traditional extension activities and the information presented. Language and cultural differences must be taken into account when adapting current information and when creating new content. There may be a larger role for producer groups having specific language abilities as content providers or to conduct training. These persons can work with traditional extension personnel to receive training and educational materials.

Conclusion

What is the future of the goat industry? There is no doubt the meat goat industry has strong product demand, good prices, and the potential for great profitability; the services of goats are needed to

control various invasive plants that have seriously degraded grazinglands. However, profitability has been insufficient motivation to attract producers into raising goats. While small producers have been the backbone of the goat industry, there is a need for many large producers to significantly increase goat meat production, lessening the need for imported goat products. Cattle producers could capitalize on goats as a second species to control weeds and brush. There is great potential for running large herds of goats to control invasive species and reclaim grazing lands. Other benefits of grazing goats include fire prevention and reduced herbicide use.

There is a growing interest in confinement production of goats. Confinement production is not new to the industry, but has not been profitable in the past in part due to health problems. Hopefully, strong goat prices and new knowledge will help this segment of the goat industry be profitable and contribute to meat production. Goat markets will develop where there are sufficient goat numbers. Marketing has always been important for profitability and goat numbers will attract goat buyers and competition for goats.

There is a potential long-term danger that second and third generations of traditional ethnic consumers may not consume as much goat meat as their ancestors. If this does come about, demand will slowly decline and the industry will address this problem through alternative markets such as promoting healthy aspects of goat meat consumption to new consumers and increasing upscale restaurant goat products.

Fortunately, new internal parasite control and mitigation strategies developed and promoted by the ACSRPC have somewhat reduced the problem posed by problematic intestinal nematodes. Still, many producers suffer lost production due to a lack of implementation of these strategies. Dewormer resistance will continue to get worse, especially for producers not using the FAMACHA[®] system and Targeted Selective Treatment. Genomic selection will increase in importance in the goat industry; however, the application of genetic selection may be hindered by the different production goals of segments of the meat goat industry. Some producers will want to stress hardiness in range conditions while others will want animals selected for high rates of gain adapted to confinement. Some producers will want to stress maternal characteristics while others will prioritize show animals. The industry needs to develop a quality assurance program before one is forced on them.

The dairy goat segment is on the way to success in working to develop goat cheese markets here in the US and capitalizing on cheese markets with premium quality cheeses. An infant formula developed using goat milk could greatly increase demand and the industry should pursue this area through supporting research and market development. There will be more large goat dairies as larger quantities of milk are required for economical processing into cheese and other products. The industry should also pursue research on goat milk for persons having cow milk allergies or are lactose intolerant because this may also provide a viable market for goat milk and goat products.

Electronic technologies developed for dairy cattle will gradually migrate over to the large goat dairies. Genomic selection could have great application in the industry but must be developed. Although the economic dumping of frozen curd on the dairy goat industry is illegal, the Federal Government is very unlikely to address the problem for such a small segment of US business.

However, the industry could develop a quality stamp for products produced with 100% American goat milk and promote its use. Research is needed with the veterinary industry to develop methods to reduce pain for dehorning and castration.

Mohair production will not likely grow. Although it is economically viable, the lack of shearers is a limitation not likely to be overcome. There are significant numbers of farms with few animals used to produce mohair for spinners and hair for dolls and these will likely shrink as handicraft hobbies fade away. Cashmere is produced by small groups of goats for hand spinning markets and demand is unlikely to grow in the future.

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