

# Watch out for the bottleneck: Management and disease in small ruminant operations that limits production

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## Abstract

Sheep and goats differ from cattle with respect to the diseases that infect them. In general, the common small ruminant diseases are chronic and incurable. There are a multitude of diseases that decrease production and efficiency of feed conversion, while increasing cull rates and death loss. The main disease issues in goat dairies in the US are caprine arthritis encephalitis virus (CAEV), contagious lymphadenitis (CL), Johne's disease, and *Mycoplasma* spp infections. On a large-scale operation, these diseases must be prevented in order for a farm to be economically viable. In this article, we discuss how to successfully manage large herds and prevent future spread or introduction of disease into the herd.

**Key words:** small ruminants, mycoplasma, Johne's, CAEV, lymphadenitis

## Résumé

Les chèvres et les moutons diffèrent des bovins en ce qui concerne les maladies qui les affligent. Généralement, les maladies des petits ruminants les plus répandues sont chroniques et incurables. Il existe plusieurs maladies qui réduisent la production et l'efficacité de la conversion alimentaire tout en augmentant le taux de réforme et les pertes reliées à la mortalité. Parmi les situations de maladies les plus accablantes dans les élevages de chèvres laitières aux États-Unis on retrouve le virus de l'arthrite et de l'encéphalite caprine, la lymphadénite caséuse, la paratuberculose et les infections à *Mycoplasma* spp. Dans les grands élevages, ces maladies doivent être enrayerées si la ferme veut demeurer économiquement viable. Dans cette présentation, nous regarderons comme régir avec succès les grands élevages et prévenir la propagation ou l'introduction de maladies dans le troupeau.

## Introduction

Veterinarians are generally called out to large herds to assist in disease outbreak control or to diagnose the cause of illness. A disease-causing organism can either enter the herd through the purchase of new stock or be spread within the herd via carrier animals. In a large

herd setting, owners are more likely to buy animals on a regular basis and they are at greater risk of having a positive goat or sheep that can act as a herd source for disease transmission. A proactive approach to herd health management may come across as a novel idea to many producers, but convincing herd owners that a veterinarian should be involved from day 1 will benefit the owner, the animals, and the bank account of the producer.

## Management of Diseases

Veterinarians have access to a vast network of professionals and breeders to assist in purchasing negative-status youngstock. A herd ideally grows from youngstock, either raised replacements or purchased kids. The longer an animal lives at the farm of origin, the higher the risk of becoming positive for a given disease. Although youngstock should only be purchased from 'negative' herds with annual testing data, it is always best to assume all purchases are positive and treated as such. Testing generally includes a CAEV and a Johne's ELISA, a CL-SHI test, and possibly a milk culture from the tank or individual does. Unfortunately, any of the previous tests listed can be falsely negative. In addition, mycoplasma is not shed in milk regularly. There is no live animal mycoplasma test in healthy goats. For this reason, a quarantine area must be established.

All suspect animals must be tested and culled if they test positive. Generally, a premium is paid for 'negative' goats or sheep. As a veterinarian, monitoring this aspect of the transactions is invaluable. Credibility and professionalism are tools that can benefit your clients on a daily basis. Do not forget to use them!

Newly purchased animals must go into quarantine for 3 to 4 weeks. Milking does should be milked last after the resident herd has been milked. These are the same practices done on cattle operations. The important difference is that after the isolation period, all purchased animals will live together for the entirety of their time at the farm. It is important to consider the social aspects of goats. Goat families travel together. Goats that grow up together will live together as adults. Reducing stress is essential in a production setting where large groups of goats are housed together. Goats will go dry and even starve and die in pens after they have been removed from their social group.



The key to herd health is to assume that the herd is positive for any and all transmissible diseases. As a veterinarian, constant education and reminding the owners that tests are not always accurate is very important. Best management practices should always be employed. Without a veterinarian, producers often buy goats or sheep from a negative herd on a handshake deal, then use it as an excuse not to perform herd disease surveillance themselves because all their stock are 'negative'. It only takes 1 false negative test to ruin a great herd of animals. As long as disease control is in place, the herd can suffer a positive popping up periodically. It can be dealt with in an efficient manner and not effect the whole-herd health status. The main bottleneck in purchasing animals is the lack of an effective quarantine. New arrivals are generally commingled immediately. This simple practice can be stopped with good client education, and should occur as a standard practice.

The other main area to manage is string size and pen count. Over-crowding is a major issue with many goat and sheep dairy operations, with a direct limitation on productivity. I like to see 12" (30.5 cm) of bunk space per doe or ewe for milking or adult small ruminants; 18 to 20" (45.7 to 50.8 cm) for close-ups. Many herds I have visited grossly limited production by over-crowding both feed bunks and bedding areas. Disease expression becomes much more prevalent when animals are stressed in their environment. Incidence of caseous lymphadenitis (CL) abscesses is a great indicator of stress, and can be used as a 'litmus test' when evaluating a herd. In a developing herd, keeping pen size in check with growth is extremely important. According to Langston University, mature goats require 20 sq ft (1.86 sq m) of covered shelter with 25 sq ft (2.32 sq m) of exercise yard. In conditions with barns only, I encourage 36 sq ft (3.34 sq m) per doe.

Crowding in kid and lamb pens is another bottleneck in dairies. Forecasting pens that will be required before each kidding or lambing season starts is very important. Small ruminants are seasonal breeders so kidding is not a year round event. There are many different kid rearing systems, and many reasons why they are implemented. If the goal is to maximize rate of gain and minimize morbidity, pen size must be small (under 10 kids per pen). Within a group, there are always weaker kids. In larger pens, these kids fail to thrive and often die. To raise the small triplets and weaker neonates, they must be housed in smaller groups. Optimal housing density is 3 to 4 sq ft (0.28 to 0.37 sq m) per kid or lamb. As a cattle veterinarian, it is safe to manage kids and lambs like Jersey calves, keeping in mind that they are group housed so diarrhea causing organisms and viruses like Contagious Ecthyma (Orf or Sore Mouth) are easily spread within a group where they can be amplified and then spread throughout the barn. Kids and lambs scour

from the same infectious organisms as cattle. *E. coli*, rota and corona virus, cryptosporidia, and coccidiosis are common on goat dairies.

A pasteurized rearing program should be in place on every goat dairy. Oftentimes, large herds find this to be difficult to maintain. Alternatives are to feed a colostrum replacer or cow colostrum, followed by milk replacer. Kids cannot nurse the does in a successful program. Kids raised in this manner should be free from CAEV, CL, Johne's, and *Mycoplasma* spp organisms. Goats can become infected with Johne's disease or *Staph aureus* from drinking raw cow colostrum. This should be a consideration when choosing what kind of colostrum to feed.

The common mycoplasmas that affect goats can be devastating to herds. It is a very common pathogen in goat dairies. Veterinarians often do not get called until it has spread from a few animals to a large portion of the herd. Education regarding how mycoplasma infections begin in a herd, as opposed to how it looks once the epidemic has set in can also be valuable. Early mycoplasma infections present as recurrent or very severe pneumonia. The goats will respond to antibiotics only to relapse in 1 to 3 weeks. Sometimes, producers will comment on does with swollen painful joints (which they mistake for CAEV) and fever. The infectious arthritis associated with mycoplasma is extremely painful and tends to be recumbent, whereas CAEV arthritis is not painful. Once an epidemic has set in, the chief complaint is acute death, sometimes with severe pneumonia symptoms. The key is to catch the initial infection, and have owners well educated in how to effectively isolate suspect animals until further testing can be done.

One of the greatest hurdles for any business is matching labor to the needs of the operation. Utilizing labor efficiently in any herd, regardless of species, is a challenge. Owners often start with a set number of employees, train them to their jobs, and then add work responsibilities as the herd grows. At some point, labor must be retrained to new systems as needs change within the dairy operation. It may be necessary to add new employees also. When these issues are not addressed, corners are cut and errors made due to the inability to 'get it all done'. For instance, at some point, it becomes necessary to add another milker in the milk barn. This depends on the size of barn and size of strings. Once the goats are standing for more than 1 hour per string, production will suffer. Keeping track of milking times is essential. If the machines are hanging on the goats for too long, teat damage occurs which leads to mastitis and teat sores. Goat dairies do not generally use automatic take-offs, and employees must take time to ensure proper milk-out without overmilking. Large strings require multiple milkers for maximum efficiency and animal throughput.



On the same note, when the kid feeder has too many kids to feed, hygiene generally suffers, which results in more neonatal morbidity and mortality. At some point, additional kid-barn employees become necessary to maintain herd health. As a consulting veterinarian, you can monitor the workload and labor force and help keep jobs in line with the herd's demands. Standard Operating Procedures (SOPs) are a great tool where each job is clearly defined. The employee has a clear definition of what is expected of them. Management can monitor the SOP versus the employee performance, and also edit the SOP or add SOPs as more tasks become necessary.

### **Conclusions**

Large herds generally grow from small herds, and maintaining the dairy structure is a simple and neces-

sary requirement. Failure in large herd settings usually comes from abandoning the management framework, or never creating it from the start. A well-defined goal with a plan for upcoming growth will help maintain order throughout the stages. As a management consultant or veterinarian, you can help the producer forecast the future and prepare for the workload and cost while limiting risk. Management of disease and maximizing production through proper housing are areas where veterinarians are trained to be experts. Use your skills to make a lasting partnership with your clients. You are an integral part of the success of your clients' dairies. Make sure they know it!