

# Buck Health Management

Joan Dean Rowe, DVM, MPVM, PhD, DACVPM

Department of Population Health and Reproduction, School of Veterinary Medicine, University of California, Davis, CA 95616, E-mail: [jdrowe@ucdavis.edu](mailto:jdrowe@ucdavis.edu)

## Abstract

The buck is often overlooked in health management planning for the goat herd. Proper care can promote the buck attaining his full genetic potential in the herd. Inattention to buck health may result in the introduction of infectious diseases or resistant parasites into the herd, reduced herd reproductive performance through the use of infertile or subfertile males, or shortened lifespan of the buck due to infectious disease or urolithiasis. Gynecomastia, mastitis, or mammary neoplasia are seen more frequently in goats than in rams or bulls. Screening bucks for breeding soundness and mating ability can help to prevent unexpected failures in breeding programs. The veterinarian can enhance herd productivity through health management planning for the buck herd.

## Résumé

Dans la gestion sanitaire des troupeaux de chèvres, la santé du bouc est un aspect souvent négligé. Or, avec les soins appropriés, le bouc atteint plus facilement son plein potentiel génétique dans le troupeau. Le manque d'attention apportée à la santé du bouc peut occasionner divers problèmes dans les élevages. Par exemple, le bouc peut introduire des maladies infectieuses ou des parasites résistants, réduire la performance reproductive du troupeau s'il est stérile ou sous-fertile, ou encore il peut vivre moins longtemps en souffrant lui-même d'une maladie infectieuse ou d'urolithiase (calculs urinaires). La gynécomastie, la mammite ou la néoplasie mammaire sont plus fréquents chez les boucs que chez les béliers et les taureaux. La sélection des boucs en fonction de leur vigueur reproductive et de leur aptitude à l'accouplement peut aider à prévenir l'échec des programmes de croisements génétiques. Les vétérinaires peuvent donc améliorer la productivité du troupeau par une bonne gestion de la santé des reproducteurs mâles.

## Introduction

The buck is often overlooked in health management planning for the goat herd. Proper care can promote the buck attaining his full genetic potential in the herd. Inattention to buck health may result in the introduction of disease into the herd, reduced herd reproductive performance through the use of infertile or subfertile

males, or shortened lifespan of the buck due to infectious disease or urolithiasis. The veterinarian can enhance herd productivity by initiating health management planning for the buck herd.

## Helping Inexperienced Owners with Decisions on Whether to Keep Bucks

Bucks are an important part of the breeding herd. Their care requires additional housing and consideration of seasonal odors and behaviors which may require more secure fencing and safe handling practices. Veterinarians can assist inexperienced owners by evaluating housing and management needs and matching that against owners' management resources. Client base may serve as a means of referring clients for buck service as an alternative to keeping bucks. Many small family and youth goat herd owners choose to use the breeding services of bucks from other herds or practice artificial insemination (AI) instead of keeping bucks on their premises for a small number of does. Artificial insemination techniques are easily learned by owners and equipment needed is readily available, making AI an option for small herd owners to owning multiple bucks.

## Young Buck Management

Buck kids, especially of the Swiss breeds, have more rapid development of the horn buds than doe kids. Therefore, to prevent horn or scur (horn regrowth) development, buck kids should be disbudded when horn buds are distinctly palpable, often within the first few days of life. Horn buds quickly develop a cranial ridge of horn tissue in addition to the round horn bud of the female. All developing horn tissue must be cauterized if horn growth is to be prevented. Clipping hair from horn area can help veterinarians assure that the cranial ridge of the horn bud is visualized and assure proper cautery to minimize scurs. Horns are commonly left intact on bucks of meat and fiber breeds managed under range conditions, and removed on dairy breeds and other goats managed in confinement, as well as confined meat goat wethers.

Buck kids should be separated from doe kids at weaning (or earlier if sexual behavior is observed) to prevent unexpected breedings. Bucks may be housed separately or in groups, but attention should be paid to social dominance and care taken to establish buck

groups before the breeding season (when more fighting would occur) and to monitor for potential injury of more timid animals.

### **Buck Nutritional Considerations and Urolithiasis**

Bucks require a balanced diet with the same considerations for feed bunk management afforded the female herd. Bucks fed entirely alfalfa hay or excessive concentrates (grain) are at higher risk of urolithiasis. The type of stone formed varies by diet and mineral status of region. The diet should be balanced in calcium and phosphorus, and should provide adequate energy to maintain body condition through the breeding season. Because their odor and long hair coat may discourage handlers from palpating body condition on a frequent basis, bucks may be surprisingly thin or excessively fleshed when examined.

Salt intake should be maximized to prevent formation of urinary calculi. Free choice loose salt should be provided at all times; salt intake will be higher when salt is offered loose as opposed to blocks. Commercial diets or supplements may be available with ammonium chloride or anionic salts for urine acidification; salt or anionic salt solutions can be sprayed in hay to maximize dry matter intake, promote water intake, and/or acidify urine.

Clean fresh water supply must be available at all times. Contamination of water with urine-soaked beards during breeding season, ice formation in water buckets, and other factors which decrease palatability and access to water may lead to clinical urinary obstruction. Frequent turnover of fresh water will minimize clinical urolithiasis.

Zinc responsive dermatitis (alopecia, hyperkeratosis) is frequently seen in dairy bucks, especially in winter months. Many mineral and nutritional supplements are available, but care should be taken to evaluate the calcium and phosphorus content of the commercially available buck supplements, as widely distributed supplements may have excessive calcium or other nutrients, depending on region and other feed components in the diet.

### **Buck Infectious Disease Control and Routine Health Management**

Quarantine and testing strategies should be developed for new herd introductions or bucks returning into the herd after breeding does on another farm. Goat herds commonly lease bucks to other farms by purchasing non-virgin bucks and offering stud service to outside females. Purchased, leased or shared bucks may introduce contagious pathogens, such as *Corynebacterium pseudotuberculosis* (caseous lymphadenitis),

caprine arthritis-encephalitis virus (CAEV) or *Mycobacterium paratuberculosis* (Johnes), into a susceptible herd. Similarly, bucks harboring anthelmintic-resistant internal parasites may spread resistant populations of *Haemonchus contortus* and other gastrointestinal parasites between herds and premises. Safeguard the female herd by establishing quarantine procedures for new buck introductions (and returns from outside use) and testing for infectious diseases and anthelmintic-resistant parasites. Additional risk is posed by males exposed to females from herds with contagious abortion diseases.

Routine hoof trimming, vaccination, deworming, and external parasite control for bucks residing in herds should be conducted on the same schedule as for does. Prevention of acute and chronic diseases such as caseous lymphadenitis (abscesses), CAEV, and Johnes disease will promote a long and productive life for the buck. Often routine health care practices for the buck are overlooked when doe health care is scheduled around kidding events.

For bucks with long hair coats (as needed by breed), routine clipping in warm weather will prevent heat stress and maximize fertility of the buck. Clipping also assists in removing matted hair, assists in assessment of body condition, and aids detection of abscesses, external parasites, and other dermatologic conditions.

Routine examination of the reproductive tract to detect swelling or other abnormalities and routine semen evaluation are recommended to assure fertility of the buck. The prepuce should be examined for inflammation and ulceration (pizzle rot, balanoposthitis), which can be treated if necessary with topical antiseptics and reduction in protein in the diet, thereby reducing the growth of urea-splitting bacteria. Severe swelling of the prepuce may lead to discomfort and impair breeding. Preputial abscesses and penile hematomas are less frequent in bucks than in the bulls.

### **Gynecomastia, Mastitis, and Mammary Neoplasia**

Inappropriate lactation is a relatively common occurrence in dairy goats. Bucks may exhibit gynecomastia without apparent consequence. These conditions are hypothesized to be associated with hyperprolactinemia. While these conditions are usually incidental findings, it is important to rule out more serious underlying conditions such as mastitis or neoplasia (in the adult animal). Bacterial mastitis is uncommon in males, but should be ruled out by culture if the mammary gland is hot or painful. Gynecomastia in the buck is not usually directly associated with any changes in fertility; however, mammary gland enlargement in the buck should be monitored for changes in size and consistency that would accompany mastitis or mammary gland neoplasia.

Mastitis may occur secondary to injury in bucks with gynecomastia. Severe and persistent enlargement of the mammary gland(s) of bucks may impair the thermoregulation of the testes, resulting in impaired fertility.

### **Management Considerations During the Breeding Season**

Bucks should enter the breeding season in peak body condition, as they normally show increased physical activity and decreased feed intake during the breeding season. It may be difficult to assess body condition visually in bucks with long hair coats, so bucks should be routinely handled to determine degree of fleshing, and nutrition should be adjusted accordingly.

Increased odor from scent glands and urine spraying behavior are normal aspects of seasonal buck activity. Urine spraying of the face and front legs may result in hair loss and skin lesions which spontaneously resolve after the breeding season ends. Ulcerative dermatitis may be severe enough to cause lameness (from scalding of the legs). These are best treated with hydrotherapy and application of soothing barrier creams or ointments, but treatment is often unrewarding and the condition self limits with the end of the breeding season.

Bucks often become more aggressive during the breeding season. Care should be taken to socialize bucks early in life, and adequate facilities and equipment are necessary to safely handle bucks during the breeding season. Secure fencing is needed to prevent unexpected matings. Normally gentle bucks may show increased aggression or simply increased difficulty in handling during the breeding season; this requires greater attention while handling bucks for breeding to prevent injury of owner or other animals.

Depending on whether bucks are being used under confinement or range conditions, bucks may be hand-mated to individual does or breed does in groups. Breeding records are necessary to monitor fertility and document pedigree in herds with selected breeding programs. Obviously clearly visible unique ID for does and bucks is essential if record systems are to be used. Marking harnesses are helpful for determining breeding dates in pen/pasture bred animals; estimated breeding dates are useful during ultrasound exams to enhance accuracy of projecting kidding dates.

### **Breeding Soundness Examination of the Buck**

Assessment of breeding soundness in bucks is essential to maximize reproductive performance of the herd. Even in herds where complete semen evaluation of bucks is impractical, all bucks should have a general physical assessment and palpation of the reproductive tract, including scrotal circumference measurement

if possible, to detect and remove unsound males from the herd. Additional testing, such as serologic testing for CAEV or caseous lymphadenitis, may prevent the introduction of infected bucks into a susceptible herd. Breeding soundness examinations in the individual buck are often requested for young animals for public sales or for older animals with questionable fertility. However, many young males are sold before breeding soundness examination is possible. Written breeder policies relating to breeding guarantee for young animals sold as service sires will help avoid misunderstandings at a later date.

Elements needed for successful natural service include high libido or willingness to serve, functional mating ability, desirable semen quality, and successful ability of spermatozoa to fertilize the ova. The breeding soundness examination is only able to evaluate physical soundness and semen quality of the buck. Satisfactory breeding soundness examination findings cannot guarantee the buck's ability to produce live offspring. Libido may be influenced by age or social hierarchy, but has a significant heritable influence. Mating ability may vary by season, with some deep-bodied bucks unable to penetrate does (due to abdominal size) when unprimed for out-of-season breeding. Mating ability may be also compromised by poor general health, musculoskeletal injury or defective conformation, or genital conditions such as penile deviation or injury to the penis or prepuce. The ability to fertilize could be evaluated by *in vitro* tests using specialized procedures, but would rarely be economically justified in small ruminant species.

The routine breeding soundness examination is a screening procedure using parameters judged to be reliable indicators of fertility when carried out under varied field conditions. Rams or bucks are categorized as Satisfactory Potential Breeders, Questionable (or Deferred Status), or Unsatisfactory based on the evaluation of physical examination, scrotal circumference measurement and semen quality. Bucks found questionable on initial examination should be re-examined two months later, allowing time for a complete spermiogram cycle. Juvenile males and males with recent febrile events or with exposure to prolonged environmental heat may have temporary spermiogram abnormalities.

Physical examination of the buck should include assessment of body condition and musculoskeletal soundness. Acquired ocular problems such as severe corneal scarring or heritable defects such as entropion or ectropion should be noted, and evidence of *C. pseudotuberculosis* or other contagious disease recorded, as this may shorten the life of the buck and pose risk of infection for the doe herd. Genital conditions such as severe balanoposthitis ("pizzle rot"), preputial abscess, or evidence of penile hematoma would interfere with the mating ability of the buck.



The scrotal contents, including spermatic cord, testes, and epididymis, should be carefully palpated. The scrotal contents should be evaluated for symmetry, consistency, and the presence of abnormal structures. Scrotal hernias may present as reducible palpable enlargement of the dorsal scrotum. Once manually reduced, the hernia may not again be apparent until the buck mounts a doe (due to the increased intra-abdominal pressure during mounting). Abscessed lymph nodes may be palpable dorsally in the scrotum. Congenital defects, such as unilateral cryptorchidism, would be discovered by palpation of the reproductive tract. Epididymitis may be palpable unilateral or bilaterally as firm enlargements of the head, body or tail of the epididymis (sperm granulomas), or as soft indistinct demarcation of the epididymal border, suggestive of edema. Orchitis may present as testicular enlargement, while small firm testes are suggestive of testicular degeneration.

Scrotal circumference is influenced by age, breed, and season. Heritable influence of large scrotal circumference in young males and its association with age at puberty in related females warrant the use of scrotal circumference as a selection trait all ruminant livestock breeding programs. Guidelines for scrotal circumference size have been reported in sheep, but remain less defined for goats. Dairy goat bucks may be used for breeding as early as five to seven months of age; scrotal circumference in these bucks is often about 28 cm. Yearling and older bucks may have a smaller scrotal circumference than rams (34 to 36 cm is typical during peak breeding season); testicular consistency and clinical judgment must be used in evaluating goats.

Semen may be collected by either electroejaculation or by use of an artificial vagina (AV) with the aid of a doe in estrus. Most dairy bucks will serve an AV with no prior experience (AV supplies are available from livestock supply companies). Electroejaculation is the simplest means of collecting semen from the buck for routine breeding soundness examination in the absence of a doe in estrus. Consideration should be given to the likelihood of vocalization or distress if an electroejaculation is used. During the collection of semen, the buck should be observed for abnormal penile conditions, such as penile deviation or persistent frenulum, penile lacera-

tions or scarring, as well as their ability to extend the penis and ejaculate normally. Sloughing of glans penis or urethral fistulas may be seen in bucks with prior history of urolithiasis.

Semen should immediately be examined for individual and gross motility, morphology, and presence of inflammatory cells. Normal bucks have a small volume (0.5 to 1.5 mL/ejaculate) of highly concentrated ( $3\text{-}6 \times 10^9$  sperm/mL) semen. Several absolute cutoffs of individual motility have been reported, and clearly  $>50\%$  individual motility is satisfactory. Semen should also be examined using New Methylene Blue stain for the presence of white blood cells. Finding greater than five leukocytes per high power field would render a buck as questionable; these bucks should be re-evaluated in 30-60 days.

Semen morphology is best examined using phase contrast microscopy. However, morphology can be satisfactorily evaluated by examining semen stained with Society for Theriogenology morphology stain. The percent abnormal spermatozoa and specific defects should be recorded. Bucks should have at least 70% normal spermatozoa. Common defects are similar to those observed in bulls and rams. To be rated a satisfactory potential breeder, the male must have satisfactory physical examination findings, scrotal circumference, semen motility, and morphology ratings, although no definitive standard by breed and age has been developed for goat bucks. Males rated as questionable in any area should be re-examined at a later date.

### Conclusion

The buck is often overlooked in health management planning for the goat herd. Proper care increases the likelihood of the buck attaining full genetic potential in the herd. Inattention to buck health may result in the introduction of disease into the herd by the male, reduced herd reproductive performance through the use of infertile or subfertile males, or shortened lifespan of the buck due to infectious disease or urolithiasis. Taking the time to incorporate health management protocols for meat or dairy bucks into a herd health plan can contribute years to the life of service sires, providing both economic and genetic benefits to the herd.