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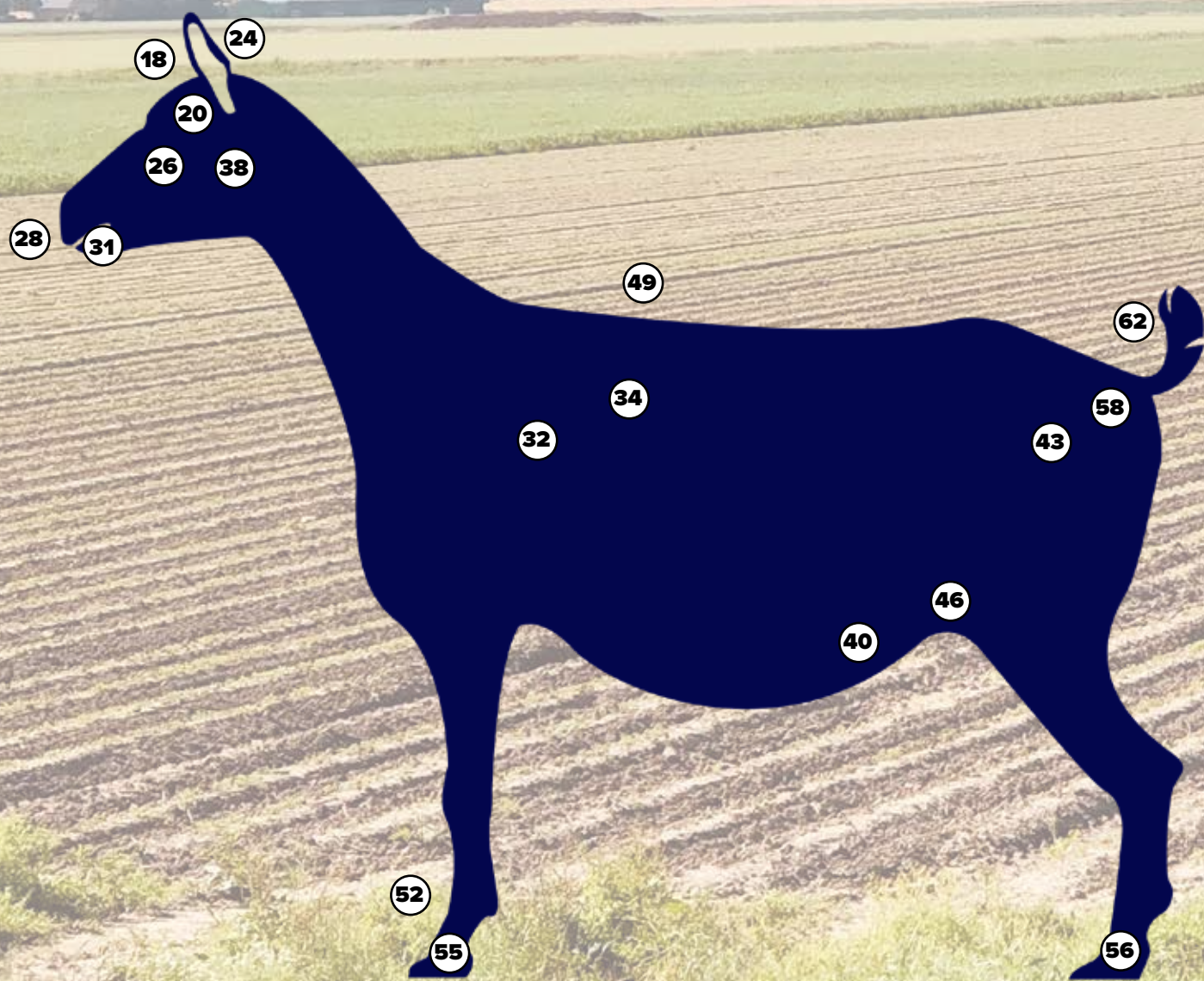


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SPECIAL ISSUE  
2020



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## goat JOURNAL

### SPECIAL ISSUE 2020

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## A ROAD MAP TO BASIC HEALTH

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Cuddling my baby Becky after losing her twin brother Todd. I wish I had known then more about pneumonia in tiny kids.

**W**HAT DO YOU WISH YOU KNEW, before you got goats? Someone asked this question in a Facebook group, and the answers varied: Coccidia, how to check for worms, how to avoid foot rot, urinary calculi, what minerals to offer. Build strong fencing. Goat math is a real thing. One group member said, "I wish I had known that they are just evil sheep."

And the group admin, Mary Casey, responded, "You will never know it all. Find a mentor, a goat vet, and prepare to forgive yourself for the mistakes you will make. In any given group of goat experts, half of us have already made the mistake you will cry yourself to sleep over."

I learned how to pull a stuck kid in the very moment when I had a stillborn baby and an exhausted Nigerian Dwarf mother. I read up on how to give a mastitis infusion right before going out to purchase the product.

How many of us fully educate ourselves before acquiring those first goats? (Very few of us.) Usually, we want goats, find ourselves in possession of them, then that first health issue arises and we realize how little we actually know. Don't beat yourself up. Good animal husbandry doesn't mean knowing all the answers, all the time. And it doesn't mean perfect execution of a solution, every time. It means doing our best to educate ourselves when they do happen, and giving our animals the best care and treatment possible in response to these situations.

Even the most thorough goat books available can't cover all the personal anecdotes that provide true life lessons for beginners.

So, where do you start?

When deciding what to offer in a special subscriber-only issue, we considered the basics: a short guide, from head to hoof, that covers common issues. Are these the only problems that can occur within brains, eyes, ears, udders, and legs? Not at all. We could create volumes of these "head to hoof" guides.

I would like to extend a special thanks to members of the Facebook group "Goat emergency help and general questions." Seeking photos of specific health conditions, I reached out, and am grateful for the response. Along with valuable photos that can help you diagnose and prevent your own tragedies, I heard personal stories of beloved goats that either overcame their syndromes or succumbed. Thank you for trusting me with your stories.

"The basics" are much broader than these 70 pages. We invite you to pair this guide with stories already written and available on *Backyard Goats/Goat Journal* to increase your knowledge of feed analyses, minerals, helminths, and anemia. We have veterinarian-written stories on goat ailments, and personal stories with lessons to learn. And we invite you to suggest stories that need coverage.

If you have questions or story suggestions, email [goatjournal@gmail.com](mailto:goatjournal@gmail.com) or use the members-only chat feature on [backyardgoats.iamcountryside.com](http://backyardgoats.iamcountryside.com)

**MAY YOUR GOATS BE HEALTHY AND  
HAPPY, FROM HEAD TO HOOF!**

*Marissa Ames*



## Homemade Goat Feed

Is there a recipe for homemade/home-mixed goat food? I don't like feeding pellets, so I'd like to buy the grains and mix it myself.

— Matt

*Are you feeding any male goats, or just females? How many of those males are wethers? There are many "homemade goat feed" recipes online, but most contain cereal grains, and those all have a high phosphorus-to-calcium ratio which can cause urinary calculi in the boys. In general, males should not eat cereal grains. You can give them alfalfa pellets and beet pulp (small pellets, not the cubes, because of choking hazards) in addition to free-choice hay, forage, and goat minerals. A hay analysis may prove that what you buy has more than enough protein, but this can vary by field and by producer. For my goats, I also buy horse treats that are nutritionally balanced to avoid calculi. To check if you can feed something to bucks and wethers, look at the phosphorus and calcium. If the calcium is at least 1.5x the phosphorus, you're good to go.*

*All-access members can view this Goat Notes to decide which foods to avoid and which to add: [backyardgoats.iamcountryside.com/goat-notes/a-quick-guide-to-goat-minerals/](http://backyardgoats.iamcountryside.com/goat-notes/a-quick-guide-to-goat-minerals/)*

*For my does in milk and those that need to put on weight, I mix grain in addition to free-choice grass and alfalfa hay plus minerals. (My area of the world has very little forage, but I throw in evergreen branches and fruits/vegetables to help.)*

*I buy a COB (corn, oats, barley) sweet feed, but you can mix your own at a 1:1:1 ratio and add molasses at a rate of 7lbs for 50 total pounds of the three grains. Keep in mind that corn and molasses provide mostly calories and not much nutrition.*

### **To 50lbs of the above mix, I add about:**

*Black Oil Sunflower Seeds: 15lbs*

*Whole Flaxseed: 5lbs*

*Alfalfa Pellets: 25lbs*

*Beet Pulp: 7lbs*

*For males, I would eliminate the corn, oats, and barley, and go easy on the sunflower seeds and flaxseed because of phosphorus. Legumes are so high in calcium that adding extra alfalfa pellets to a mix can help balance the calcium to phosphorus levels. To give my boys the extra oils that they would get with the BOSS and flaxseed, I soak those horse treats in a nutritional oil formulated for healthy coats.*

*And, no matter whether they're male or female, always have that free-choice hay available for roughage for their rumens plus that free-choice loose mineral blend to give them anything the feed might lack.*

— Marissa

**WE LOVE HEARING FROM YOU!**



## DO YOU HAVE A GOAT-RELATED QUESTION?



### WISH YOU COULD ASK A GOAT EXPERT OR HAVE A CHAT WITH SOMEONE WHO ALSO HAS GOATS?

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*While we work with veterinarian consultants, our editors are not veterinarians and cannot recommend off-label medication or products for treatment, or dosage information.*

### Kidding

I have a goat that will have babies this month. Do we need to clean her teats before babies nurse? First time goat mom.

— Vicky

Hi Vicky,

*Great question! I recommend as much hygiene as possible during kidding. The udder is generally safe for the kids but it won't hurt to wash with soap and water then thoroughly dry it. Measures like clipping hair around the udder and beneath the vaginal area, and making sure the kidding area always has fresh, clean bedding will go further toward preventing contamination than washing the udder. Be sure, if you handle her teat area, that your own hands are clean.*

— Marissa

### Goat Health

What is the most common issue with goats' health that is easily prevented rather than fixed?

— Christie

*I see so many health issues and tragedies among new goat owners, many of which would have been prevented if the goats had been fed differently. From new bottle babies that get the scours from cheap or poorly mixed milk replacer, to wethers suffering urinary calculi after the owner didn't realize wethers should never be fed grain. Listeria most commonly results from feeding moldy hay and coccidia usually comes from contaminated water or feed. Enterotoxemia comes from bacteria that flourish when the rumen has too much starch. In locations deficient in copper and selenium, owners can avoid deficiencies or overdoses simply by finding the best loose minerals for goats and ensuring they're always available. Many goat owners would deal with fewer gastrointestinal parasites by following a rotational grazing system instead of using only one pasture. Then there are the goats that get into poisonous plants, or onto clover/alfalfa while it is frosty, or eat treats that the owners didn't cut up small enough to avoid choking. Once the goat owner realizes what they did or didn't do, they often blame themselves. And that doesn't help matters. We do the best we can, and learn what we can, but I would love to shout from the rooftops: No goats CAN'T eat "anything." But they might try to. So it's our job to provide the best foods for them.*

— Marissa

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that our writers keep.



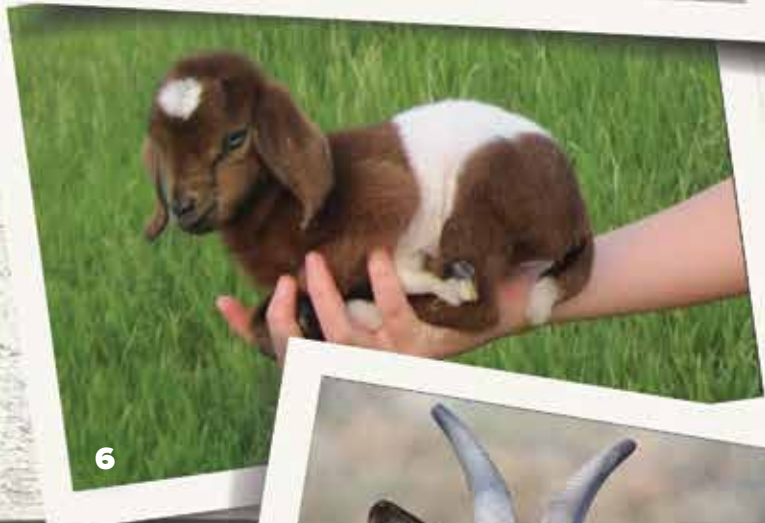


**1. 2.** The Pygora is a medium-sized goat developed using registered Angora Goats and registered Pygmy goats. The A-type fiber, shown on Lilly the white goat, is most similar to the Angora goat mohair. Pongo, the black and white goat, is a type B. His fiber is a combination of both type A and some type C, which is more cashmere-like. Follow my website [timbercreekfarmer.com](http://timbercreekfarmer.com), Facebook @TimberCreekFarm, or Instagram @timbercreekfarmandhomestead. *Submitted by Janet Garman*

**3. 4.** Meet Larry the Wonder Goat, a Facebook public figure and distinguished wether at Kopf Canyon Ranch. Larry is definitely a standout. Many wonder why we have a Saanen in our Kiko herd. Saanen were one of the breeds used to create the Kiko breed by crossing high-production dairy goats to the feral New Zealand goats. Larry came as a “bonus” goat with his twin Laura, who is part of our Kiko breed-up program, and used in our pack goat prospect breeding program. Larry does some light recreational packing for us — and lives for public appearances. You can learn more about them on Facebook: Larry the Wonder Goat, Kopf Canyon Ranch, or the ranch website [kikogoats.org](http://kikogoats.org). *Submitted by Karen Kopf*

**5. 6.** Meet Capella and Galaxy! Capella is a registered American Nubian doe in a small herd at Briar Gate Farm in Longmont, Colorado. She and her herd mates were part of the inspiration — and provide much of the milk — for my cheesemaking school, The Art of Cheese. Galaxy is a Mini Nubian who was born at Briar Gate Farm. She was the most adorable baby and so, so tiny. My book *Tiny Goat, Big Cheese* features her picture on the cover! Follow [briargatefarm.com](http://briargatefarm.com) and [theartofcheese.com](http://theartofcheese.com), or Facebook @artofcheese and Instagram @theartofcheeselongmont. *Submitted by Kate Johnson*

**7. 8.** Happy, now five years old, is our alpha goat, having recently taken over from her mother, who is now eight. She's the smallest in the herd, but the toughest and boldest, having inherited hardy genes for our damp climate from her sire of the local rare breed, Chèvre de Fossés. Her photogenic looks lead my Facebook page @goatbehaviorwelfare. *Submitted by Tamsin Cooper*







**1. 2.** Yule, one of my two herd sires, is looking dapper beside Catalina. Clementine and Paloma pose on their climbing tower. I currently have the only San Clemente Island goats in Nevada and am fascinated by the mysterious story of how these goats appeared and went feral on Catalina and San Clemente Islands in California. This year, the entire SCI goat population might top 1,000 goats globally! Follow the SCI goat breeders at [scigoat.org](http://scigoat.org) or IG @scigoatbreeders, or follow my herd on my Facebook page @amesfamilyfarm or my website [marissaames.com](http://marissaames.com).

*Submitted by Marissa Ames*

**3. 4.** Wednesday has attitude. We named her after Wednesday Adams, but didn't realize we were cursing ourselves. She's nosy, loud, and enjoys shoving kids over. Not headbutting them; purposefully pushing them over with her mass. She will invite herself into the house through any open door. Known hat thief. River is my favorite goat. She isn't the typical friendly, in-your-pocket type, but she has no qualms about stampeding people for a hot Cheeto. She's a princess with an edgy side. She loves her babies fiercely and has a love affair with our buck Sinatra. She's his girl. You can follow my herd on our Hughett Heritage Farms Facebook page or Instagram @hughettheritage.

*Submitted by Lacey Hughett*

**5. 6.** Who doesn't love chocolate? GCH Fir Meadow RE Timbrel 3\*M has been a love for an amazing 16 years! Milky, fancy, and best of all a sweetie who loves to give kisses and munch bananas, oranges, and apples. Timmie is now a beloved barn pet having persevered through a serious leg injury at five years old. Follow us on Facebook @FirMeadowLLC or my website [firmeadowllc.com](http://firmeadowllc.com). *Submitted by Katherine Drovda*





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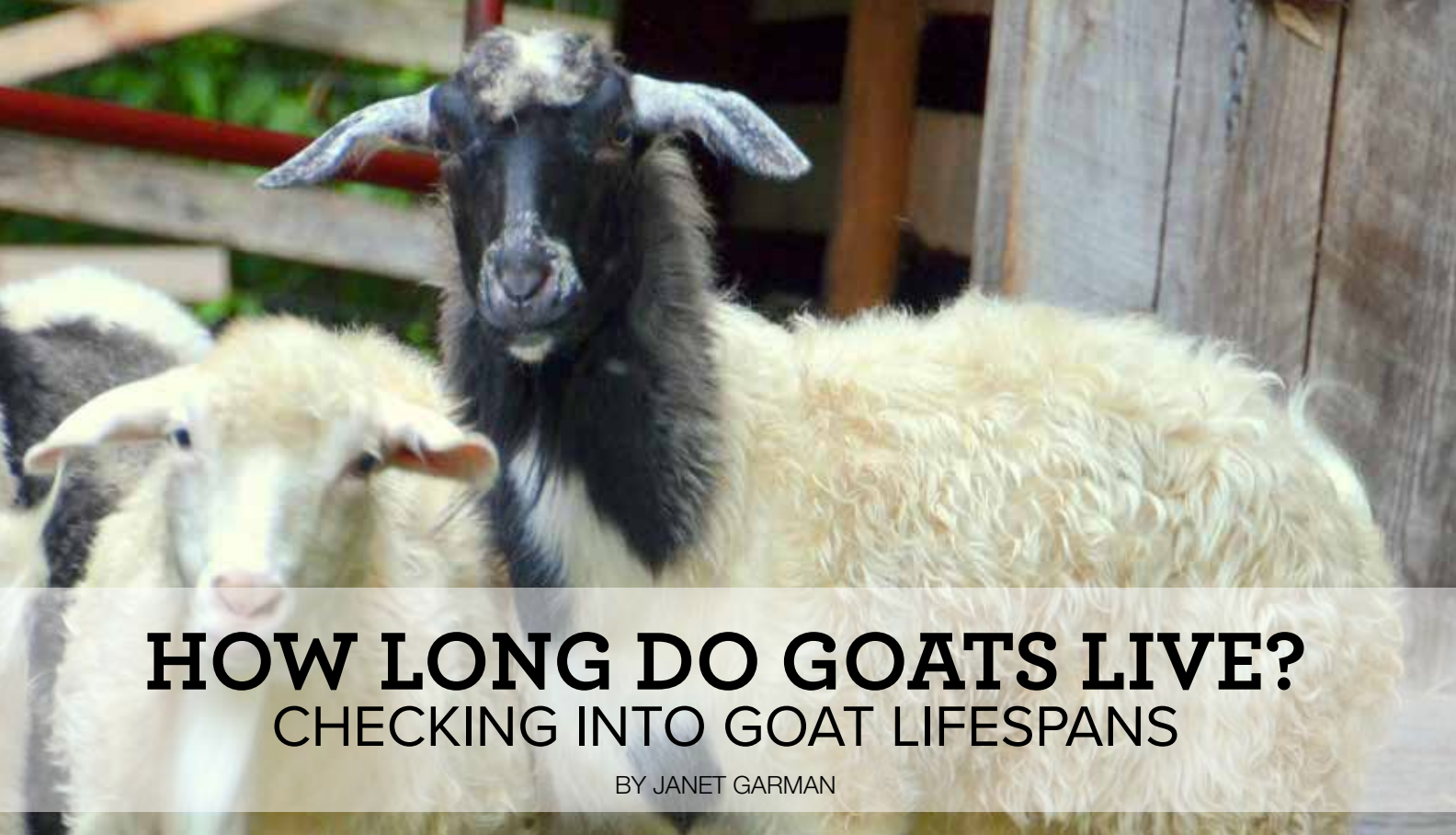
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# HOW LONG DO GOATS LIVE?

## CHECKING INTO GOAT LIFESPANS

BY JANET GARMAN

**W**HEN YOU CONSIDER ADDING GOATS to your life, this piece of information is important. Asking how long do goats live, brings answers about how to plan for your goat's lifespan. Baby goats are adorable. Often, we make impulsive decisions about bringing home cute baby livestock. When we stop and consider what the adult animal will require and how long we will need to provide for a healthy life, we set up for a good experience.

There are key factors that play into the question, how long do goats live. Proper and appropriate care for the animal is the key to a healthy long life. Not only quality feed but the right amount of feed is one factor. Goats are ruminants and require daily available forage. The forage can be in the form of grazing plants such as pasture, or rough weeds, leaves, tender branches, and wild plants. Most goats prefer to browse rather than graze on well-tended pastures.

### PROVIDING THE CORRECT ENVIRONMENT

Housing should be considered. While goats are hardy little ruminants for the most part, they do not tolerate wet weather as well as cattle and sheep. Providing shelter for all animals is important but for goats it is necessary. A three-sided run-in shelter will suffice, if a barn is not possible. If you will be breeding, investigate a shelter where you can give new mothers a chance to bond with their kids without being interrupted by other herd members. Providing shelter for your goats will help them enjoy a longer healthier lifespan.

Keep in mind that goats are herd animals. Having

one goat rarely works out happily for the goat or the humans. A solitary goat may spend much of its time trying to escape to find a herd. Be prepared to house and care for at least two and preferably three goats.

### GOAT MAINTENANCE — KEEPING THE GOATS HEALTHY AND STRONG

Routine goat maintenance is important to the health and longevity of your goat. Hoof care and proper trimming allows your goat to walk without pain, or inflammation in the hoof. If you can't perform the hoof trims yourself, you will need someone to do it for you.

Health maintenance should be carried out on a routine basis too. This may include vaccinations or health checkups. If you will be breeding, selling kids, and showing goats there are some vaccines that are mandatory. When keeping a closed herd on your own property, you may choose herbal preventatives for certain internal parasites. My recommendation for using herbal prevention is to make sure the goat is clean of a parasite load before beginning a prevention routine. Gathering a fecal sample and having it checked for parasites will give you the answers you need to get the goats healthy.

### THE IMPORTANCE OF A GOOD BREEDING PLAN

Breeding stock also determines the possible lifespan of a goat. No matter what breed of goat you choose, having a healthy doe, and a healthy buck, is the best start. Breeding only animals that exhibit a strong healthy appearance leads to healthier kids. A weak or health compromised doe is more likely to produce weak



kids. These weaker kids are more likely to have a shorter lifespan.

Quarantine is another often overlooked practice that can affect the longevity of your goats. When a new goat arrives on your property, keep the animal housed separately for 30 days. This will give any contagious diseases and parasite issues time to develop in the newcomer. Then you can treat any issues without having exposed your entire herd to a health problem. Even perfectly healthy-looking animals can carry disease to a new herd.

#### LOOKING AT THE TEETH FOR DETERMINING GOAT AGE

There are a few methods of estimating a goat's age. One method is to examine the teeth. Keep in mind that goats only have teeth along the front bottom. They do not have upper front teeth. If a goat is older than say, 10 years, it may have begun to lose a tooth here and there. A normal adult goat mouth has eight lower front teeth. As the goat ages the teeth will show signs of wearing down from eating. The teeth may begin to spread out slightly. The type of vegetation the goat eats will play a part in the wear on the teeth.

Goats younger than five will have six permanent teeth along the bottom front. After age four, the goat should have all eight permanent teeth. Estimating a goat's age by looking at the teeth may give you a ballpark range of the animal's age.

#### ANIMAL CONDITIONING SCORES CAN PROVIDE CLUES TO GOAT AGE

Animal condition also gives us an idea of animal age. Young mature animals have more muscle and are rounder in the hips and neck area. Each breed may have its own

way of assessing body condition scores based on breed standards.

([luresext.edu/sites/default/files/BCS\\_factsheet.pdf](http://luresext.edu/sites/default/files/BCS_factsheet.pdf))

If the herd generally has a good body condition score and one animal has a lower score, it may be older and not digesting grain and forage efficiently.

Admittedly, body condition scoring can be low if an animal is young but not well cared for and not receiving adequate nutrients and health care. An older animal will look aged, may be weaker, and not quick to get up. Arthritis may be present in the leg joints, causing an uneven gait.

#### AGE SPAN BY BREED

Each breed will have outliers, those goats that surpass all the expected norms of a goat lifespan.

Generally, healthy does are expected to live 11 to 12 years. If a goat is still being bred after age 10, the likelihood of a pregnancy-related death is more likely. Does that retire earlier in life can have a longer life expectancy.

**Wethers** live longer than bucks with an 11- to 16-year life span. Bucks that live past the age of ten are unusual due to the stress of rut.

**Alpine goats**, an extremely hardy and weather-tolerant breed has a life expectancy of eight to 12 years.

**Angora goats** typically live over 10 years if they receive good care. It is not uncommon to have an Angora goat live into its teens. That's a lot of mohair production!

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**Boer goats** often have a longer life due to their natural resistance to disease. Bucks have an expected life span of eight to 12 years and does have a surprising expected life span of 12 to 20 years.

**Kiko goats** are a hardy, large meat breed. Since they are disease and parasite-resistant, they often live over the life expectancy of eight to 12 years.

**LaMancha goats** are usually kept as a dairy breed. They have a shorter life expectancy of seven to 10 years.

**Myotonic goats**, or fainting goats as they are commonly called, appear fragile but are actually a long lived, hardy breed. Myotonic goats can live 15 years.

**Nigerian Dwarf goats** are found on many small dairy farms. The superior milk production and quality from this small goat makes them a frequent choice. The life expectancy is 15 years

**Nubians** are known to be a vocal breed of goat. Get the ear plugs ready for a good 15 to 18-year lifespan.

**Oberhasli goats** are a smaller breed, handy to have around for pasture cleanup! They live approximately eight to 12 years.

**Pygmy goats** are a popular breed for small homesteads. Expect to have the goats for 12 years.

**Pygora goats** are a fiber breed derived from a careful breeding system using white Angora goats and purebred Pygmy goats. The life expectancy



easily reaches into the teens so expect to have your Pygoras 12 to 15 years if they remain in good health.

**Saanen goats** are a heavy milk production breed. With that high production comes a need for increased protein. If nourished well, the Saanen goats can live past 15 years.

**Toggenburg goats** are friendly and curious often kept as both pet and dairy supplier. The life expectancy of a Togg is eight to 12 years.

## TWO FROM THE BREED WATCH LISTS

Two other breeds of interest are the Spanish goat and the Guernsey goat. The pure Spanish goat is a landrace breed. They are hardy and adaptable, often described as being long-lived. Since pure Spanish goats are rare in the United States, it is hard to find a lifespan range.

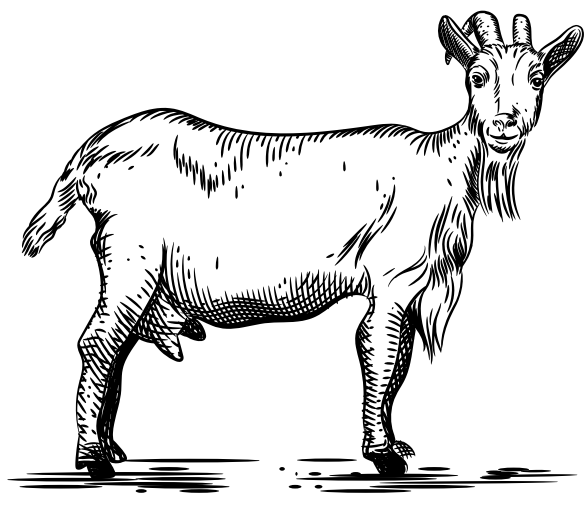
The Guernsey goat is a small to medium dairy goat breed. The breed is distinguished by its golden color and skirt of long hair. Although popular in other regions of the world, not many Guernseys populate the United States dairy goat world.

As you can see, bringing goats onto your farm is a commitment of over a decade of care. Goats offer companionship to people and other animals, milk, mohair fiber, meat, and kids for sale. These sweet animals are eager to contribute to the farm in other ways such as clearing land, cleaning up poison ivy, and don't forget the entertainment factor. Given proper care, goats will give back to your farm or family homestead for many years. 🐐



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# HEADS, HORNS, AND HIERARCHY

BY KAREN KOPF

**M**OST GOATS HAVE HORNS naturally. While horns on males are more pronounced, females also have them. They are used as tools to scratch, dig, forage, fight, and defend. Goats don't sweat, so horns are also used to dissipate body heat since the blood supply is very close to the surface.

Unlike antlers, which are made of bone alone, the horn has two parts: bone and keratin.

Horns on goats develop from a bud of horn cells under the skin, over the skull, called ossicones. From this bud, a bony core develops, and a sheath of keratin grows around it.

Keratin has the same composition as fingernails. While antlers are shed and regrown every year, horn is not shed but continues to grow for the lifetime of the goat.

While not as reliable an indicator as teeth, a goat's age can be approximated by horn growth. Nutrition has a significant influence on growth, however. Weak or slow

horn growth in goats can be a sign of mineral deficiency, but not always. Kid goats have soft keratin that is prone to flaking during early growth. Horn damage is not necessarily nutritional. Kids will chew each other's horns, and adults can chip or wear their horns when clashing with objects or rubbing.

Horns can also be great "handles" to manage goats. They can be trained to be held and led by the horn. Training a goat to lead by the horn is progressive,

beginning by leading with the head, and touching the horns, until the horns are fully developed. When goats are young, the horns are not fused to the skull and can sometimes get knocked or even pulled

Kid goats have soft keratin that is prone to flaking during early growth. Horn damage is not necessarily nutritional. Kids will chew each other's horns, and adults can chip or wear their horns when clashing with objects or rubbing.



off. As they begin to fuse, an injury can result in a “loose horn.” Most loose horns will heal as the goat grows and the bony core fully fuses to the skull.

If a fused horn breaks from the skull, it will result in significant bleeding and expose the sinus cavity. It requires medical attention to minimize blood loss and prevent infection. On occasion a goat will crack or break a horn closer to the end. If the blood supply is not involved, the damaged part of the horn tip can be removed. If there is bleeding, precaution must be taken to minimize blood loss.

There are goats that genetically do not grow horns. The hornless trait is called “polled.” Most hornless goats are not polled, but disbudded. It is common practice to disbud dairy goats, and often required to enter goats in shows and fairs. Some people find it easier to manage goats without horns. Hornless goats may be less likely to get caught in fences, and will not cause horn-related injuries to other goats or handlers.

To prevent a goat’s horn from growing, the ossicones, or horn buds, are burned in a process called disbudding, using a disbudding iron when the goat is very small — usually within a few days of birth. If disbudding is delayed too long, the chances of success diminish. Because of the anatomy of the skull, caution must be taken during the disbudding process as the sinus cavity and brain are very vulnerable and can be easily injured.

If the ossicone is not fully cauterized, areas of the horn can regrow abnormally, resulting in scurs. Scurs range in size and shape — some are loose, others are not — depending on how much horn tissue survived. If scurs are loose, they can get knocked off, which often results in significant bleeding. If they have an attachment, they can curl as they grow and press into the head. Because scurs are an abnormal growth, they do not always follow the anatomical diagram and can bleed very close to the tip. Scurs must be carefully managed throughout a goat’s life to prevent injury to the goat.

There are other methods suggested to prevent horn growth, but none are as widely used, and have not been shown to be as reliable as disbudding. All methods carry significant risk. Some producers suggest using a caustic paste made for cattle; others inject clove oil.

Once horn growth is fully established it is difficult

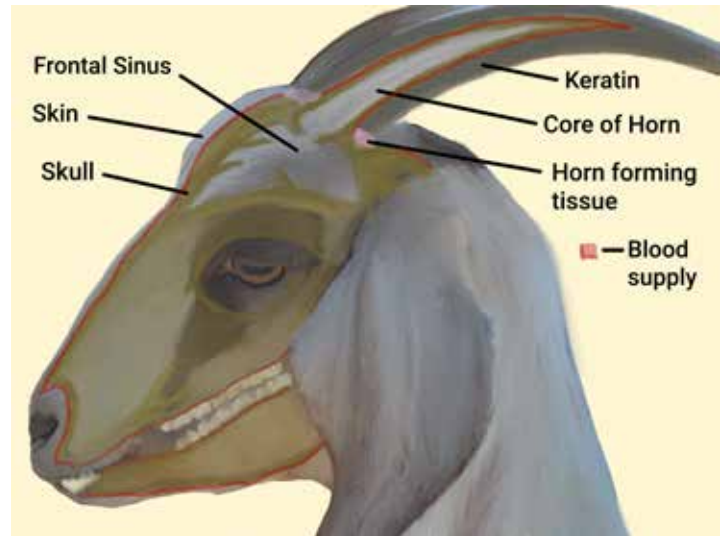


Illustration by Lacey Hughett.

to reverse. Banding has been demonstrated to remove horn over time, but the success rate of preventing regrowth has not been determined. A dehorning surgery can be done to remove the mature horn, but is not a simple procedure or recovery process, and just like with traumatic injury, involves the removal

of part of the skull, exposing the sinus cavity. Both methods are prolonged and painful.

In a herd setting, horned goats and hornless goats can live together. All herds have a hierarchy, and very likely the horned goats will find themselves near the top, the horns giving them an advantage. Hornless goats are not without

defense, and will very often be seen biting ears to put other goats in their place.

Ultimately, personal preference and management style determine whether one should have goats with horns or without. 🐐

Because scurs are an abnormal growth, they do not always follow the anatomical diagram and can bleed very close to the tip. Scurs must be carefully managed throughout a goat’s life to prevent injury to the goat.

KAREN KOPF and her husband Dale own Kopf Canyon Ranch in Troy, Idaho. They enjoy “goating” together and helping others goat. They raise Kikos primarily, but are experimenting with crosses for their new favorite goating experience: pack goats! You can learn more about them at Kopf Canyon Ranch on Facebook or kikogoats.org.





# What's Going on in Their Heads?

BY TAMSIN COOPER

## GOAT PSYCHOLOGY: THE IMPORTANCE OF MENTAL HEALTH

**A** HOLISTIC VIEW OF HEALTH is a powerful weapon for ensuring a long productive life. The mind is a key player: emotions have been shown to affect growth, productivity, and the immune system. Distressed animals are difficult to handle, perform poorly, and heal slowly. Positive emotions promote resilience and help animals to cope with challenges.

Goats can suffer from a number of issues due to traditional management system designs that are biased towards hygiene and efficiency. Enclosures devoid of structures offer no stimulation for goats' active minds, no hiding places for those seeking privacy, and no escape from the aggression of dominant animals.

Boredom can lead to frustration and depression. While this does not stop animals gaining weight and reproducing, health and longevity will be affected. Abnormal repetitive behaviors may result, some of which may be destructive, such as crib-biting, over-aggression, and excessive rubbing or biting of self or others.

In their natural environment, goats roam mountains

in taxing conditions. Consequently, they are curious, active, social individuals who thrive on solving challenges. In the easy conditions of the farmyard, this cognitive need may easily go unrecognized. Recent research recommends enrichment of animal enclosures. We can buy brushes and climbing frames to enhance pens. Platforms and partitions enable goats to control their social contacts and take refuge when desired.

Communal troughs require vulnerable animals to compete for feed with stronger herd members, leading to the former missing out. A common social issue in modern system is bullying. A look at goats' natural social environment throws light on this frequent problem. In the wild, does form small social groups based on family membership, while young bucks leave the family to range with others from their nursery group. Goats have evolved to cooperate with close family members, but compete aggressively with strangers. They are also used to having plenty of space to avoid aggression. They keep their society stable by respecting the hierarchy and keeping their distance





Goats seek out high places for safety and fun.

from dominant members. When confined to quarters, it is harder for them to maintain the expected personal space. Subordinates may get trapped, dominants become frustrated, and the order becomes unsettled when members leave or new goats are introduced. Frustration can lead to bullying, and bullied goats can become tyrants as they grow and ascend the ranking.

Competition can lead to poor nutrition for some, and these goats can go on to form anxieties over getting enough food. Goats will target higher quality feed naturally, as they evolved where forage was scarce. Undernourished goats may

overeate when circumstances change for the better, leading to obesity, ingestion of unsuitable feed, and aggression around feed-racks.

A stable upbringing is required for goatlings to learn and develop all the social and foraging skills that they need. This means being raised by the dam in a familiar group of adult and same-age herd members. In this way they learn the manners of the hierarchy. As domestic goats often change hands or are separated early from their mothers, they miss this essential learning and can develop problematic behavior. Hand-raised kids become over-attached to humans, sometimes to



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the point of irritating clinginess or persistent butting for attention. Kids raised with little caprine contact find it difficult to integrate with other goats. Some lack the ability to defend themselves, while others become over-aggressive. Raising kids with access to their mothers, older relatives, and other kids would resolve most of these issues. However, it is not too late to socialize disadvantaged animals, given plenty of surveillance, space, and ample facilities to hide and escape aggression.

In some cases, fear of humans can be a serious welfare issue: when every handling experience is frightening and distressing. Gentle and regular handling from a very young age eliminates this natural anti-predatory fear, even in dam-raised kids. Goats will readily adopt humans into their family circle if they have positive experiences of





Goat playground at Buttercups Sanctuary for Goats, UK

humans from early life. Frightening or punitive experiences can leave emotional scars, inducing phobias that are hard to shift. Goats are naturally wary animals due to their need to avoid predators. New places, people, equipment, and procedures should be introduced very gradually, letting goats approach in their own time, so they know that they are safe.

Goat psychology is all about whether they feel secure, comfortable, and meaningfully occupied. Certain behaviors have evolved to be necessary, even if you are providing for the physical need in an alternative way. For example, even if enclosures are predator-proof, goats need places to hide and escape so that they feel safe.

For a healthy mind, goats need a degree of control over their environment, so that they can find ways to meet their biological and psychological needs. This can be as simple as providing options so that goats have the choice of where to be, what to do, and who to be with. There must be adequate facilities so that the whole

herd gets a chance to meet their needs while remaining together. Examples are access to shelter and outdoor space, raised and hidden rest places, hard surfaces to climb upon, warm bedding to cozy up within, and separate areas for rest, feeding, and play.

Predictability is also important to a species that is vulnerable to predators. This is why goats feel safer with routine and are fearful of change. On the other hand, their active minds require some degree of novelty. When ranging, goats maximize safety by sticking to known routes, while they remain engaged in foraging and social activities. We can provide a familiar but complex environment by providing climbing structures, hanging up different types of forage, such as branches, and rotating pastures that include brush and trees. Variety is key, and toys should be changed frequently to avoid boredom. When handling, we can gently habituate goats to our routines and incorporate positive reinforcement training.

This enhances trust and bestows a degree of control over interactions.

Goats are emotional animals, and they communicate their feelings through voices, postures, and facial expressions. If a goat is distressed or excited, nearby goats will read this emotion and be affected by it. Fear or anticipation can quickly spread through the herd this way. We can also spread a little happiness throughout the herd by encouraging positive emotions. Regular happy events help our goats to pull through tough times. Similarly, a harmonious herd of bonded animals make a wonderful emotional buffer, as they give each other moral support through life's ups and downs. 🐐

TAMSIN COOPER is a smallholder and goat keeper in France. She follows the latest research on behavior, welfare, and sustainability, and mentors on animal welfare courses. Find her at [goatwriter.com](http://goatwriter.com).



## HOW TO HOUSE GOATS HARMONIOUSLY

By Tamsin Cooper

We all want to live in peace. Goats naturally compete when feed and resources are centralized. Enriching housing and outdoor runs, and providing the means to escape aggression, enhances their well-being and reduces stress for you and your goats.

### SOCIAL LIFE

Goats form long-term relationships. When new goats join herds along with two familiar goats, they suffer less stress, and each receive less aggression than one goat introduced alone. Make introductions in a large arena, where they have space to settle their hierarchy and still find access to forage.

### SPACE FOR EATING

Keep goat groups stable with companions that have grown up together. Build solid partitions between feeding stations to allow subordinate goats to feed closer and remain out of sight to more dominant goats.

Open palisades enable goats to remain vigilant and quickly exit if a dominant animal approaches. Avoid diagonal or horizontal bars, as they allow neighbors to sideswipe one another and reduce horned animals' exit speed.

If subordinates are still reluctant to approach the manger while dominants are present, provide equal quality forage regularly, so that subordinates can take their turn once dominants leave.

### HOW DO GOATS FEED?

Mangers should be at least four inches (10 cm) above the ground to allow a natural eating position. Goats pull on foliage, which results in waste waste from traditional hay racks. Use mangers where the goats' heads enter the feeder or a shelf is provided below the hay rack.

### HOW DO GOATS RELAX?

Partitions and platforms allow subordinate goats to find peace by hiding out of sight or jumping up out of the way. Provide at least 51 inches (1.3 m) between walls or partitions to avoid goats being trapped.

Despite conflicts, goats do not like to be apart from the herd, unless they are about to give birth. Individuals separated for health issues suffer stress unless they maintain visual and auditory contact with the herd.

### MAKE A DIY GOAT HOUSE

Budget solutions use wood and pallets to construct hay racks, palisades, platforms, and partitions. Add platforms to existing walls to increase floor space and improve the quality from a goat's perspective. Goats prefer to rest against a wall, so add partitions to increase rest space as well as hiding places. Position hay racks to divide up space and provide barriers.

### COMFORT FOR GOATS

- Make barns light with high visibility and easy escape routes. Use wide openings or provide two entrances.
- Goats prefer a home base. Provide a permanent shelter, close to your house, and rotate alternate pastures adjacent to the home turf.
- Dryness is crucial. They need a rain-proof, windproof, well-ventilated shelter with dry floor and bedding. If you have a lot of rainfall, construct a hard surface,

such as concrete, around the shelter to avoid mud and foot-rot.

- Provide a variety of surfaces and bedding. Beds can be wood, plastic, or rubber and generally don't need straw, unless it is very cold. Goats usually urinate on straw or other absorbent material.

### HOW GOATS SPEND THEIR TIME

Goats prefer enriched, spacious, sheltered outdoor runs. Their rest is less interrupted within well-structured housing.

### GOATS NEED:

- Plenty of time lying down to ruminate and digest vegetation.
  - To range and forage to maintain their exercise levels and fulfill their natural behavioral needs.
  - To groom by rubbing against trees and rocks, but fence posts, walls, brushes, and people will also do rather well.
  - To socialize, make bonds, confirm their rank, and maintain their personal space.
  - Shelter from rain, wind, and sun.
- Fulfill most of these needs by providing varied pasture, adequate shelter, and a stable social environment. Understanding how to house goats when space is limited, by enriching their housing and outdoor runs, and providing the means to escape aggression will enhance their well-being and reduce stress for you and your goats.







# LISTEN UP:

## *Ear mites are common parasites that require strict control*

BY JODI HELMER

**W**HEN A GOAT RUBS ITS ears, shakes its head, or shows signs of crusting in the ears, ear mites could be to blame — and if one goat has ear mites, chances are good that most, if not all, of the herd is infested.

Ear mites are common, fast-spreading parasites that can infest 80-90% of a herd, according to the *Merck Veterinary Manual*, and goats can have hundreds of mites in a single ear. Infestations are most common in colder months but climate change might be making the problem worse: Research shows that a warming planet is increasing the numbers of vector-borne pests, including mites, and contributing to their spread; warmer conditions might also make it easier to goats and other livestock to transmit disease.

Both burrowing and non-burrowing mites can infest goats. *Scarcoptes scabiei* (scarcoptic mange mites) and other burrowing mites

start in hairless (or almost hairless) areas of the body such as the face and ears and burrow into the skin, causing crusty patches and hair loss; non-burrowing mites such as *Psoroptes cuniculi* (psoroptic mange mites) latch onto hairy areas of the body and wriggle up to the ears, leaving crusty patches of hair loss along their route.

### UNDERSTANDING MITES

Some goats will show no signs of infestation but, for most goats, ear mites will make cause discomfort. You might notice goats rubbing their ears or shaking their heads to control the itch and those unusual behaviors might be the first signs

that something is amiss. A closer look at your herd might reveal hair loss, crusty patches of skin in the ears, or foul odors and small insects crawling around their ears and bodies. The more mites that are present in the ears, the more likely goats

are to exhibit symptoms.

Several species of mites can infest goat herds. The most common, according to Oklahoma State University, include goat follicle mite (*Demodex caprae*), scabies mite (*Sarcoptes scabiei*), psoroptic ear mite (*Psoroptes cuniculi*), and chorioptic scab mite (*Chorioptes bovis*). Each species of mite affects goats in a different way and may cause distinct symptoms.

Treatments for ear mites are as common as the mites themselves.



Goat follicle mites get trapped under the skin, blocking hair follicles, which causes scabs under the skin. As the mites reproduce, the lesions get larger. In extreme cases, several thousand mites can be trapped under a single lesion. The scabs are most common in the face and neck but can also affect the ears.

Scabies mites burrow under the skin. Most goats show no signs of infestation but severe cases can lead to crusted lesions and hair loss. These mites are often found in and around the ears but the muzzle, inner thighs, hocks, and underside can also be affected.

The chorioptic scab mite is the main cause of mange in goats but it is rare in or around the ears; the most common areas of infestation are the legs and feet.

As its name suggests, the psoroptic ear mite is the most common ear mite. Infestations lead to classic responses like head shaking, ear scratching, foul odor, and hair loss; severe cases can also cause loss of balance and spasms of the neck muscles and chronic infestation can cause anemia and weight loss.

Psoroptic ear mites are troublesome because they can survive without a host for up to three weeks at low

temperatures and high humidity (their lifespan without a host is shorter in conditions of high temperatures and low humidity).

Kids are more apt to be infested with psoroptic ear mites than adults; infested does transfer mites to their offspring. In a study published in the *Australian Veterinary Journal*, 21% of goats sampled had ear mites and the youngest goat diagnosed with the parasite was just 14 days old.

LaManchas experience more issues with ear mites because their small ears don't provide the same protection as longer ears.

## TACKLING TREATMENT

Treatments for ear mites are as common as the mites themselves.

Hot lime sulphur sprays or dips treat all mite species, including ear mites. Treatments should be repeated every 12 days as needed.

Oral ivermectin is another common treatment but the *Merck Veterinary Manual* warns that single doses, while shown to reduce the number of mites over a 24-hour period, are not sufficient to cure an infestation and additional doses may be required. The University of Kentucky recommends six milliliters per 25 pounds of body weight; a 100-pound goat will need 24 ml of ivermectin.

You also can use mineral oil to smother mites. Other topical treatments can be applied to the inside of the ears to kill mites and soothe irritation in the ear canals.

With all treatments, it's important to treat the entire herd, not just the goats with obvious signs of ear mites as the pests can jump between goats; a second treatment will kill all of the eggs that hatched after the initial treatment. Left untreated, mite populations will multiply, potentially leading to serious health issues in your herd.

Prevention is also essential. You can prevent the spread of ear mites by isolating any new animals for at least two weeks, providing enough time to diagnose and treat potential infestations before they spread to the rest of the herd. Goats that have been transported off-farm for events such as livestock shows or sales should be quarantined, too, to ensure that close contact with other goats did not expose them to the parasites.

Ear mites are blood-sucking parasites that commonly attack goats. Keeping a watchful eye on your herd (and checking their ears for signs of mites) can help you catch —and treat—the problem early, keeping your goats healthy and itch-free. 🐐

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Pink eye in a one-week-old kid. Photo by Amie McCormick of Oregon.

# IDENTIFYING AND TREATING GOAT PINK EYE

*What Antibiotics Treat  
Pink Eye When It  
Presents in Your Herd?*

BY MARISSA AMES

**G**OAT PINK EYE, FORMERLY CALLED infectious keratoconjunctivitis, refers to inflammation of the both the cornea and conjunctiva. It can be the scourge of an otherwise healthy herd during summer months, when flies cluster around eye tissue, but is a highly contagious and communicable eye infection in goats at any time of the year. Caused by several different bacteria, goat pink eye usually leaves no long-term damage.

All may seem well with your goats: You survived kidding season and babies now bounce happily around your paddock. It's joyous to watch, but one day you see one of your does squinting. Or you lead another to the milk stand and notice that the area around her eye socket has swollen as if she had been butted right in the face. Perhaps you catch a buckling that you haven't held in a while, only to see that one eye has completely clouded over.

You have a breakout of goat pink eye in your herd. It's extremely contagious, and it's probably going to spread fast.

Completely unrelated to pink eye in cattle, goat pink eye can spread from several different bacteria, most commonly *Chlamydia psittaci ovis* or *Mycoplasma conjunctivae*. These are the same bacteria that most commonly cause pink eye in sheep. It can also be a secondary infection after debris irritates or injures the eyes.

Where does pink eye come from? Though flies and other insects may serve as vectors, goat pink eye comes from other goats. It often shows up after shows, where goats may contract the disease then become more susceptible due to stress from transport. Or it may break out within a herd during kidding season. Crowded barn conditions exacerbate problems. Goats rub against each other at feed troughs and contact the same bedding, so separate affected animals to avoid further transmission.

Early goat pink eye signs include squinting due to increased light sensitivity, frequent blinking, swelling of tissue around the eyes, watery discharge from the eyes, and reddening of the sclera (white of the eye.) Later symptoms include cloudiness within the cornea which looks like a white or bluish milky film over the iris and pupil. Blood vessels may grow across it and the entire cornea may appear red. In severe cases, the pupil may develop a pitlike ulcer, which will cause blindness if it ruptures. This can then spread infection, and the blood may turn septic, which is quickly lethal.

There is no vaccine available, for any strains of the causative bacteria. A goat that contracts pink eye may get it again from the same bacterial strain, as any acquired immunity is not long-lasting. Goat

There is no vaccine available. Goat pink eye persists usually one to four weeks, and it often resolves on its own. But avoid the “wait and see” approach, having products ready when you first see symptoms.



Maggie, owned by Sandrine of New South Wales, Australia. She was fine after Sandrine sprayed pink eye treatment several times.

pink eye duration is usually one to four weeks, and it often resolves on its own. But avoid the “wait and see” approach, having products ready when you first see early pink eye symptoms.

Pass up that Neosporin for pink eye in goats. Neosporin contains bacitracin, neomycin, and polymixin b, but North Carolina State University recommends oxytetracycline ointment or injections of either tetracycline or tylosin. Most injectable antibiotics are used off-label, so if you use Tylan 200 for goats, consult a veterinarian for the most specific dosage information. NCSU also states that LA-200 and similar medications (oxytetracycline injectable solution) don’t work nearly as well as the ointment placed directly within the eye. Recently available ophthalmic products such as gels and sprays contain hypochlorous acid and greatly decrease irritation.

Using clean fingers, apply ointment starting at the corner, ensuring it contacts the goat eyeball itself instead of the outer lid. Do this several times daily, and be sure to wash your hands before touching any other goats. Supplying ample shade, or eye patches, can relieve discomfort during healing time.

If a goat has lost her eyesight due to advanced

infection, lead her to a small shelter where she can easily find food and water. And, if you feel your goat needs a subconjunctival injection (thin membrane around the eyeball), do not attempt to do this yourself. Consult a veterinarian.

Flies crawl into those tears from weepy, infected eyes then land on healthy eyes, so use gloves as you gently wash tears off your goat’s face. Hoods, such as the types used for horses, can also prevent transmission to other goats.

How can you avoid pink eye in goats? First, be vigilant of the symptoms. Be aware that introducing new goats from auctions or sale yards may also introduce an unwanted outbreak. Avoid overcrowding or undue stress within your herd. Treat fly-prone areas, such as manure buildup or wet bedding, to discourage insects from bringing the disease from other herds. Keep a fully stocked goat medicine cabinet, including ophthalmic sprays and ointments, as many of these can be difficult to find or too expensive when you need them most.

Though that milky bluish-white eyeball may be alarming, goat pink eye can be handled with the right antibiotics and some timely care. 🐐





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# Roy's Victory Over Sore Mouth

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BY THERESA MILLER  
PHOTOS BY SARAH ODOM

**S**ORE MOUTH IN GOATS goes by many names: scabby mouth, contagious ecthyma, contagious pustular dermatitis (CPD), and orf disease. The parapoxvirus, also called the orf virus, causes sores painful sores on the skin of sheep and goats. They can appear anywhere but usually show up on the lips or muzzle, or the teats of nursing does. Orf is zoonotic, meaning it can be transmitted to humans.

To understand sore mouth in goats, we follow Roy, a nine-year-old Nigerian Dwarf

buck show goat from Odom Family Farm in Lakeport, California. Roy contracted the disease in June of 2019.

## FROM EXPOSURE TO FIRST SYMPTOMS

Sarah believes Roy got exposed at a show on June 1st. When they returned, she isolated the goats who had been to the show. Whenever any goat leaves her property, Sarah isolates to prevent the accidental spread of goat diseases. Five days later, Sarah's son called to tell her that Roy had

some small sores on his mouth. When he described them, she decided it sounded like urine scald pimples. When in rut, bucks pee all over themselves, including their faces, to attract females. Sometimes that urine can cause a rash. Roy's had problems with this before and was headed into rut.

"He's very talented with his ability to whizz all over his face," Sarah says. "I asked my son to please check and see if any other bucks had the same sores. He said no. That's how we missed the initial outbreak."



60-grit sandpaper to raise a raspberry on a buck.

According to Dr. Berrier at the Colorado Serum Company, in less than a week after exposure, the goat starts showing lesions, usually around its mouth. The first sign most people see is the scabs, as they are more visible. Sometimes they notice redness and small fluid-filled swellings called vesicles.

### DISEASE PROGRESSION

Eleven days later, Sarah's son told her Roy's sores were much worse. The other four goats quarantined with Roy, as well as two from an adjacent pen, now presented with sores. Sarah sent a text to her vet with a picture of Roy's face, saying, "What the heck is this?"

The vet asked questions, determined it was sore mouth, and told Sarah she needed to vaccinate the rest of her herd.

Once a goat shows clinical symptoms, normal sore mouth in goats lasts one to four weeks. It progresses from vesicles to pustules to scabs, then the scabs fall off leaving no further signs. In some cases, complications arise from secondary infection or severe weight loss, especially in kids as the lesions make it painful to eat. Sometimes dams refuse to let kids nurse when lesions transfer to their teats. Sore mouth treatment may include softening ointments, soft foods, and antibiotics for secondary infections.

Although sores appear most often around the goat mouth and on the lips, they can be anywhere on the body. Roy got them both on his lips and eyes.

### VACCINATION

Sarah set about vaccinating the 43 unexposed

goats. "It's not an injectable, it's a live vaccine," she said. "So you actually have to physically give them a wound and put the live virus in the wound and then rub it in with a brush. You have to raise up a raspberry, kind of like road rash, but you don't want it to ooze or bleed, because that pushes the virus out." She soon discovered the tool that came with the kit was made for orf in sheep and didn't work on goats. The Odoms experimented until they settled on using 60-grit sandpaper.

The instructions recommend vaccinating under the tail, in the ear, or on the inner thigh. On Sarah's show milkers, none of these were good options. Nobody wants sores in their faces while milking, and identification is tattooed in the ears. She ended up using a Bic razor to shave inside their front legs and applied the vaccine there. After vaccinating, you need to check for thick scabbing at 48 and 72 hours. No scabbing, no take. At 48 hours, 12 goats lacked sufficient scabs, so Sarah ordered more vaccines. She re-checked at 72 hours and six of the twelve showed the right kind of scabbing. All the goats that needed re-vaccinating were originally vaccinated before they discovered the sandpaper method.

### SEVERE PERSISTENT ORF IN GOATS

Dr. John Walker, Professor and Resident Director of Research at Texas A&M Agrilife Research and Extension Center, introduced me to a new serious form of sore mouth in goats called severe persistent orf (SPO), malignant orf, or severe sore mouth. In 1992, the first reported cases of SPO appeared in Malaysia. Forty





kids developed the disease with 65% mortality. In 2003, SPO was recorded in Boer kids in Texas.

Dr. Walker wrote, "While typical orf causes scabs on the lips and nostrils, severe persistent orf causes widespread scabs on lips, nostrils, ears, eyes, feet, vulva, and potentially other places including internal organs. This severe form of sore mouth can last three months or longer and results in 10% or higher mortality." He and his team worked to collect goat sore mouth scabs from both the normal and severe types and get the genome sequenced to see if the viruses themselves differ. They also collected DNA from the goats to check for any genetic defect causing the goats to be more susceptible. "We never got that done," he told me. "You need a couple hundred samples to do those sorts of analyses, and we were never able to get enough to do it. But if you look at the literature, almost all of the reports of severe sore mouth in goats are related to animals that have been stressed in some way."

Roy suffered a more severe case than normal, but luckily he did not seem to have SPO. He recovered fully in just over six weeks.

#### STIGMA SURROUNDING SORE MOUTH

Sarah worries about the level of stigma and shunning she sees connected to sore mouth. One woman confided about sore mouth in her herd. "She made me get super close to her and whispered it to me like it was some kind of evil thing." The night that she realized Roy had it, Sarah was scheduled to pick up a new buck. She called the seller to tell him she couldn't pick the goat up that night, but still wanted him. The man told her, "I don't want you on my property. I don't want you anywhere near my house. I could meet you in town. No, I can't even meet you in town because I would touch you." This seems an odd reaction for one of the most benign of goat illnesses. Sarah says, "I just wish people would stop whispering about it. I mean, for goodness sake. It's not fatal. It's just a really big inconvenience."

As for Roy, he doesn't care what people say about him. He isn't concerned about the need for open and honest communication, especially about more serious cases. He just wants what he has always wanted — treats and cuddles. 🐐

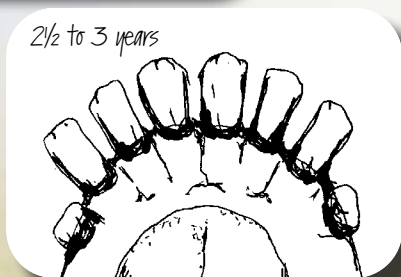
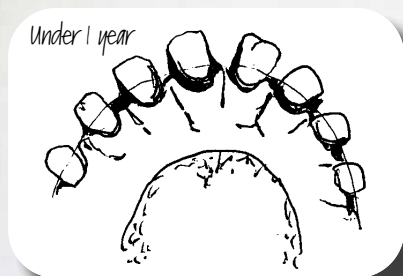


To see more of Roy's story, visit [facebook.com/A-Journey-through-Sore-Mouth-109116993780826/](https://facebook.com/A-Journey-through-Sore-Mouth-109116993780826/)

# USING TEETH

## to Determine Your Goat's Age

BY TAMSIN COOPER



**DECIDUOUS INCISORS** generally erupt one pair per week from birth, so you can reckon a kid's age as follows:

- 1st/2nd pair erupted: 0–2 weeks old;
- 3rd pair erupted: 2–3 weeks old;
- 4th pair erupted and growing: 3–4 weeks old;
- Starting to spread: 3–9 months old;
- Spread and wearing down: around 1 year old.

**THE FIRST TWO MIDDLE PERMANENT INCISORS** emerge as a yearling approaches 18 months old, quickly followed by the second pair by two years old. In the following year, the third pair erupt, while the outer pair are replaced by four years old. Adult teeth are noticeably wider and may differ in color from baby teeth, which will be showing considerable wear at this stage. We can estimate age from when adult teeth replace deciduous teeth and their subsequent wear:

- Central pair: 1–1.5 years old;
- 2nd pair: 1.5–2 years old;
- 3rd pair: 2.5–3 years old;
- 4th pair: 3.5–4 years old;
- Signs of wear: 4+ years old;
- Spreading: 5+ years old;
- Lost or broken: 6+ years old.

As growth is continuous during the first four years, and wear is dependent on circumstances, your goats may quite normally be in advance or lag behind this ready reckoner. My own goats were a case in point when I photographed them just after their birthdays. My two-year-old had her third set already growing. My hardy four- and five-year-olds showed very little wear, despite their high-fiber diet. Goats with lost or broken teeth are retired from production and need softer feeds, such as pellets and specialty products, to maintain their nutrition.







# NORMAL GOAT TEMPERATURE

## and Goats Who Don't "Follow the Rules"

BY KATHERINE DROVDAHL MH CA CR CEIT DIPHIR QTP

**M**y goat has normal goat temperature!" you smugly declare.

"So, what is it?" I ask.

"Oh, it's always 101.5."

Maybe for a goat in a padded cell, but real-life goats in the real-life world have fluctuating temperatures. We like to say that goats read the goat health books and then purposely do the opposite! Temperature is one of those!

Normal goat temperatures should range from about 101.5 to 103.5 degrees F. If my caprines temp below or above, I start investigating for an issue in progress. Things that may affect temperature include sounding air temperature, age, illness, toxicities, stress, and exercise (or lethargy).

My yearlings and older tend to run temperatures around 102.5 during the moderate-temperature times of the year. On a really hot day, they may go to 103 before I start watching them closely, and during the cold months they may sit around 101.5. Paying attention to the weather will help determine if your goat's temperature is out of range. Some goats also vary a little from "normal" and that may be normal for it or

its family line. Kids tend to run warmer temperatures than adults, which is common in all mammals. I expect my kids to be ½ to 1 degree warmer than the adults that are in the same situation, stressors, and temperatures. Kids will often range about 102-104.

Bacterial and viral issues certainly can cause increases in temperatures. Some, such as listeriosis, can command a dangerously high temperature in the 107-108-degree Fahrenheit range. Knowing the temperature of your goat is one of the clues that you or your vet can put with the list of their symptoms to sleuth out what may be challenging your beloved barn buddy. The immune system knows what temperature to run for each type of challenge, to speed up the immune system macrophage production so that it can annihilate invaders faster.

Toxicities can often cause normal goat temperature to decrease to a hypothermic mode. Ingesting toxic plants or overeating on too much of a nontoxic feed that causes enterotoxemia can cause hypothermia as their body becomes stressed with the toxins and start to sustain kidney damage. Bug and creature poisons may cause an initial hyperthermic episode as toxins begin circulating, followed by a hypothermic stage

once a lot of damage has been done and the goat starts slipping away.

Stress from shipping, exhibitions, herd management procedures, or veterinary procedures often will also cause an increase of temperature. For the most accurate temperature, take it after the goat has been quiet for 30 minutes, not right after some stressful situation. Playing and other activity causes muscle movement which also generates heat and could make you think you have a high temperature when in fact you just had an active goat. As long as the goat otherwise looks healthy, I personally would retemp them again in about a half hour after they mellow out.

Whenever a goat appears abnormal, I take their temperature. Those include: feeling hot to the touch, feeling sweaty, panting, hunched up, hair sticking out, crying, dull eyes, lethargic, picky with feed or off feed, coughing, and sometimes even just looking at me "sideways" or acting in a way that would be abnormal for goats or that goat.

I use a human digital thermometer to check for normal goat temp. To do that, we restrain the goat on a milkstand as I do not want to injure anal tissue by unnecessary movement. I also lubricate the tip by dipping the end into room-temperature olive oil. Then I carefully insert the thermometer into the anal area so that the entire metal sensor is in the anus, but no further. After one to three minutes, depending on how much you spent on your thermometer, you can have a readout. I write these down on a record sheet, also noting the time, any other of the above situations I think may be involved, and the air temperature. The second reading I like to get in 30 minutes and after that I go hourly, then every two to three hours depending on

how closely I need to watch the situation. By all means, if you have other symptomology, be sure and start some type of protocol to help them overcome their problem. If you call for veterinarian assistance (and you should if you aren't comfortable handling the situation), they will want to know the temperature first, so please have that and list any other symptoms or situations you notice.

If my goat is hypothermic, I definitely want to get them warm. I coax (or carefully drench) some hot water with blackstrap molasses into them for minerals, B vitamins, and energy, and I give them a large pinch of cayenne to help their body bring core temperature up faster. I also get them in an area protected from wind, with deep and warm, comfortable bedding (I like straw for this), and a goat coat on. If it's cold outside, I throw a wool blanket over that and put gallon jugs of hot water under it to make a nice, warm heat tent for them. I also begin to work on the problem that is causing the hypothermia. Of course, being me, I'm going to choose herbal methods.

If my goat is hyperthermic (too hot) what I do is going to depend on the cause. If it's a day with temps over their body core temperature, they can overheat just as a person can. So, days in the upper 90s and hotter (and lower if you have humidity causing a 90 or higher heat index) I watch for goats that are lying around panting. A panting goat, if it's hot out, is a goat emergency as they are quite overheated. In those cases, while watching that I don't overheat, I carefully hose each hot goat down to help them lower their temperature faster. I usually start by running water on the feet and legs and then moving up to the body. I've had to hose off goats as much as three times a

day in over-110-degree-F weather. I also provide coconut water for them to top off electrolytes and make sure each one is drinking water. Any weak animals may have to be brought into the barn and have water brought to them.

If my goat is hyperthermic because of a health condition, or a bite or sting, then along with giving them specific products and care for their condition, as long as it's not above 90-95 degrees F (watch your goats temperature and keep them in the shade) I blanket them. What? Yes. A goat with a very stressed system will not regulate their body temperature and can move into hypothermia. In these situations, it's imperative to monitor their temperature hourly to see when you can remove the blanket.

When I've had a goat with an abnormal temperature and I've needed to blanket them, I need to be careful about when I remove the blanket. I prefer to remove them after they are quite on the mend with a good attitude and appetite AND usually about midmorning on a nice, sunny day. This gives their body the rest of the day to adjust back to being without a coat. Having said that I sometimes will recoat them come evening for a few days. I'm currently coating newborn dairy goat kids at nighttime (our night temperatures are in the fifties even in the summer) until they are a few days old and then removing them in the mornings for the day.

May your goating adventures always be healthy and happy! Blessings All! 🐐

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# RUMINATE ON THIS!

## HOW MANY STOMACHS DOES A GOAT HAVE? AND WHY?

BY MARISSA AMES

**T**HROW OUT THAT OLD WIFE'S TALE that goats can eat anything. Many health problems start within the goat digestive system.

Aside from kidding complications or losses due to goat predators, many fatalities among new goat owners stem from a lack of understanding about goat anatomy. Specifically, the goat rumen and bacterial balance within. Learning how rumens work and how to help maintain that healthy balance can prevent terrifying problems such as goat bloat and enterotoxemia.

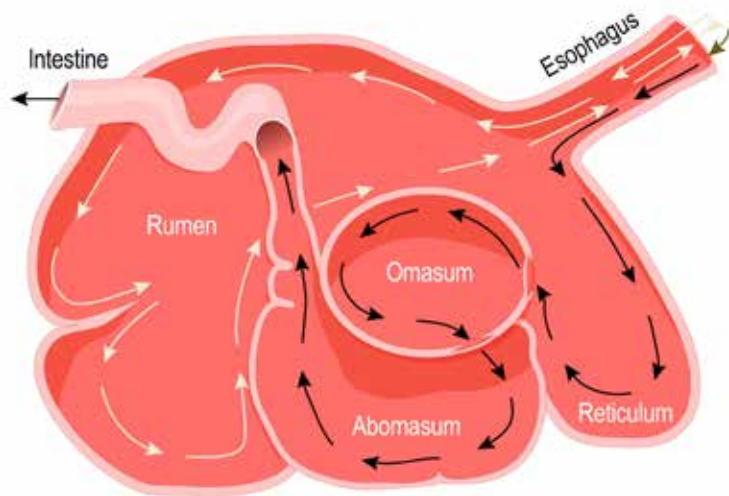
How many stomachs does a goat have? Four, just as cows do. Food first travels from the mouth into the rumen, then to the reticulum, omasum, and finally the abomasum.

### THE RETICULO-RUMEN

Both the reticulum and rumen combine to serve as the part of the goat digestive system where most microbial digestion occurs.

When a kid is born, the rumen, reticulum, and omasum are undeveloped to allow absorption of antibodies from colostrum. Milk then travels to the abomasum, where rennet (yes, the type used to coagulate cheese), a collection of enzymes, curdles casein in the mother's milk. Curdling allows the milk to stay longer in the intestines, where babies can better absorb the nutrients within. As the kid matures and starts eating fibrous plant material, microbes become established.

# Ruminant digestive system



Microbial action serves several purposes within the goat digestive system: it breaks down solid food, it synthesizes B vitamins, and it helps create heat for homeostasis.

While our parents may have told us to completely chew our food, goats and other ruminants eat quickly, a behavior that developed in the wild where the areas containing the best food may also be in the most dangerous locations. Once safe and rested, ruminants then regurgitate the food and chew it again as cud before it travels back into the rumen to be broken down further.

A goat's rumen is located on the left-hand side. Many people who have kept bottle babies recognize this, as they have often held a kid upright while patting the bulging area to release gas and avoid bloat.

## OMASUM AND ABOMASUM

Within the omasum, further digestion occurs, including absorption of water

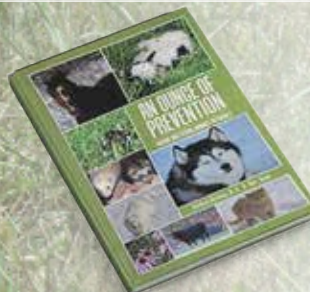
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Highly lethal enterotoxemia, also called overeating disease or pulpy kidney disease, is caused by the toxin created when bacteria *Clostridium perfringens* types C and D flourish, and they can only flourish under certain conditions such as elevated starch and sugar within the goat stomach.

and inorganic minerals. Then food travels to the abomasum, where acidic digestion performs the same function that it would within a human's single stomach, breaking down proteins. Food and the microbes produced within the reticulo-rumen then undergo digestion within the small intestine before passing to the large intestine and out the body.

## ACIDOSIS AND ENTEROTOXEMIA

The goat digestive system needs specific microbes, in a specific balance. And tragedies happen if that balance upsets.

In order to keep bacterial levels high, goats need a diet high in crude fiber. If healthy, they eat enough fiber to keep bacteria high enough to metabolize potential toxins like tannins found in oak leaves. That is why you will see them gnawing on bark or twigs, which may seem otherwise inedible. Goats often forage for enough crude fiber, or they consume it from eating hay with thick stems, but they may not receive enough of this fiber if they have high-grain diets.

Acidosis is when the rumen's pH goes from too low, often from lack of bacterial action. An overload of carbohydrates can cause it. Acidosis in goats, also called lactic acidosis or toxic ingestion, can be either acute (sudden, from a sudden change in feed) or chronic (from a consistent supply of the wrong feed.)

Highly lethal enterotoxemia in goats, also called overeating disease or pulpy kidney disease, isn't directly caused by overeating. It's caused by the toxin created when bacteria *Clostridium perfringens* types C and D flourish, and they can only flourish under certain conditions such as elevated starch and sugar within the goat stomach. Avoid enterotoxemia in goats by providing the CD&T toxoid vaccine according to the correct goat vaccination schedule. Though the CD&T vaccine protects against both *Clostridium C* and *D* and tetanus within one shot, a *Clostridium perfringens* antitoxin and a tetanus antitoxin are two separate products and cannot be interchanged.

Goat bloat (ruminal tympany), another problem when the goat digestive system is unbalanced,

kills quickly. Sudden access to excess grain, or overconsumption of lush or frozen legumes such as alfalfa and clover, can cause frothy bloat while esophageal blockage that prevents belching can cause free gas bloat. Another cause, sudden food changes, upsets the rumen's bacterial balance so much that it cannot effectively digest. Recommended goat bloat treatment includes addressing the cause (dislodging an obstruction), massaging the rumen area, or drenching with mineral oil for frothy bloat. However, do not administer the mineral oil without a feeding tube, as this can drain oil into the lungs.

If excess acid causes bloat, acidosis, and enterotoxemia, should you provide an alkaline product for goats to eat during moments of discomfort? That's a palliative method used by many people, providing a tub of baking soda for goats. But Karen Kopf, of Kopf Canyon Ranch, says it's not necessary or recommended.

"Sodium bicarbonate ( $\text{NaHCO}_3$  — baking soda), an acid buffering agent, is a source of sodium — or

salt,” says Karen. “Goats naturally produce buffering agents to regulate their rumens in their saliva and may exceed the need for buffering seeking salt, upsetting the balance. A goat’s appetite for salt is the limiting factor in mineral uptake, which determines the number of trace minerals a goat ingests. The salt in minerals is NaCl, which is non-buffering. If their need for salt is met, they will not seek salt from their trace minerals.”

That isn’t to say you shouldn’t keep a supply of baking soda for goats. Experts at [goats.extension.org](http://goats.extension.org) recommend administering sodium bicarbonate by mouth to neutralize acute acidosis. They also recommend magnesium hydroxide (Milk of Magnesia) or magnesium oxide. If a goat suffers from acidosis, they may soon suffer from polioencephalomalacia (thiamin deficiency). If treating goat acidosis, contact a veterinarian in case severe complications occur. Provide probiotics after a rumen crisis to replace those beneficial microbes as soon as possible.

Providing adequate, fibrous hay, woody browse, or feeding whole, un-hulled grains instead of finely ground grain can prevent acidosis. Administering CD&T shots prevents enterotoxemia. Keeping the goat digestive system healthy is one basic step toward responsible and caring husbandry. 🐐

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# MANAGING CAE AND CL IN GOATS

BY KATE JOHNSON

**W**hen it comes to goat health, there are many concerns that owners of these loveable ruminants might have. CAE and CL in goats just might be on the top of the list of dreaded goat diseases. Many goat owners know all about these diseases and take active steps to avoid having them become a problem. But if you're new to goats or you've never heard of them, here is some useful information.

## WHAT ARE CAE AND CL?

These are two separate diseases that are common among goat herds worldwide. CAE is caused by a virus and CL by a bacterium. They are very different diseases, so let's look at each separately:

**CAE = Caprine Arthritis Encephalitis:** a viral infection often manifested as arthritis in adult goats and, less commonly, as progressive inflammation of the brain (encephalitis) in kids. It is most often found in dairy goat breeds and sometimes in sheep.

**CL = Caseous Lymphadenitis:** a chronic, contagious bacterial infection characterized by abscesses near the lymph nodes, usually on the neck or near the udder. It is commonly found in goats and in sheep, and sporadically in horses,

cattle, camelids, swine, fowl, and even people. There are two forms of the disease: The external (skin) form and the internal (organ) form.

## HOW PREVALENT ARE CAE & CL IN GOATS?

**CAE** — It is estimated that between 38% and 81% of dairy goats in the United States test positive in CAE blood screening tests, but only 20-30% of these infected goats develop symptoms. It is uncommon in meat or fiber goats.

**CL** — CL is not as prevalent as CAE in North America, only infecting about 8% of the goat population. However, that rate increases to around 22% in older goats. Once one animal in a herd is infected, it is likely to spread to the majority of the herd.

It is estimated that between 38-81% of dairy goats in the United States test positive in CAE blood screening tests, but only 20-30% of these develop symptoms. CL only infects about 8% of the nation's goat population, but that increases to around 22% in older goats.

## HOW ARE CAE & CL IN GOATS TRANSMITTED?

**CAE** — The most common way that CAE is transmitted is from infected dams through their

colostrum and milk-fed to their kids. However, the disease can also be spread through direct contact and can even happen through exposure to contaminated clothes or utensils used for feeding, watering, and milking, as well as through contaminated needles.

**CL** — CL is most commonly transmitted from one infected animal to another through breaches in the skin. Contaminated milking machines, shearing and grooming equipment, and flies are all pathways for transferring the disease. Occasionally, it can enter across mucous membranes from inhaling the bacteria. The bacteria can live for months to years in the soil, even in dry climates.

## WHAT ARE THE SYMPTOMS?

**CAE** — The most common symptom in adult goats is arthritis, particularly in the knee but also in other joints. Kids as young as six months may show signs of arthritis, too, but this is not as common. The onset of arthritis may be gradual or may be sudden, but it is almost always progressive and results in lameness. Goats that are affected will also have poor hair coats and declining conditioning, and adults may develop pneumonia. The encephalitis symptoms, most often

seen in kids two to four months old, will include weakness, loss of bodily control, head tilting, paddling, and blindness. Does infected with CAE may develop mastitis or “hard bag” and decreased milk production.

**CL** — The external form first begins as enlarged lymph nodes, growing to one to two inches in diameter. Eventually, the node may rupture, releasing a very contagious greenish-white pus. The internal form involves the enlargement of lymph nodes deep within the body that may impinge upon the surrounding organs. The most common sign of internal infection is weight loss or slow to minimal weight gain in younger animals.

There is no treatment that will cure CAE in goats, and CL is not considered a curable disease.

## WHAT ARE YOUR TREATMENT OPTIONS?

**CAE** — There is no treatment that will cure CAE in goats, so culling affected animals from the herd or at least isolating them from the rest of your goats is recommended. Regular foot trimmings, additional bedding, high-quality feed, and administration of pain medications can help affected animals feel more comfortable.

**CL** — CL is not considered a curable disease and culling of infected animals from the herd is recommended. However, if an animal has a strong economic or emotional value, there are several treatment options that can prolong the animal’s life and provide comfort while minimizing the transmission of the disease to other animals. Lancing and draining the abscesses, flushing with an antiseptic solution, and packing the cavity with gauze is a common treatment. Surgical removal of infected lymph nodes and, more recently, the injection of antibiotics into the nodes are other options. Sanitizing all

materials that come into contact with the infected animal is crucial to avoid spreading the disease.

## HOW DO YOU PREVENT CAE & CL IN GOATS?

**CAE** — Keeping CAE out of your herd is the best approach. You can do this by keeping a closed herd, meaning you run a blood test on all your animals annually and only allow contact with goats that you know have been tested and received a negative test result. Require a negative CAE test result before purchasing a new animal or before bringing any outside animal onto your property.

Once CAE is found in your herd, there are several steps you can take to keep it from spreading:

Separate kids from infected dams immediately upon birth and either pasteurize and bottle feed the colostrum and milk or only feed them milk from uninfected dams.

Quarantine infected animals and keep them completely separate from your herd. Disinfect any items that have been in contact with the infected animal before they come in contact with uninfected animals including water buckets, milk stands, and equipment, feed tubs, etc. Cull infected animals from the herd.

**CL** — The best way to prevent CL in a disease-free herd is to keep the herd that way. Carefully screen

any new animals before you buy a goat, looking for enlarged lymph nodes. Once CL is found within a herd, the following methods will reduce the likelihood of it spreading to other animals:

- Keep infected animals separate from the rest of the herd.
- Disinfect all equipment and materials that come in contact with the infected animal.
- Practice aggressive fly control.
- Vaccinate healthy and infected animals to minimize the spread of the disease. Vaccinations will not eliminate the disease completely and are not generally recommended for healthy herds with no infected animals.
- You can screen for CL by conducting a blood test. Vaccinated animals will test positive on a blood test since they will have developed the antibodies needed to fight the disease.

While CAE and CL are not curable, they are treatable but it’s imperative that once found, steps are taken to minimize the spread of disease. The old saying, “An ounce of prevention is worth a pound of cure,” is certainly true here. Annual CAE testing and CL screening, as well as avoiding contact with infected animals, are the best ways to keep these dreaded diseases out of your beloved herd. 🐐

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And thank you to Dr. Jess Johnson from Mountain Rose Veterinary Services for additional information.





# EMERGENCY!

## Urinary Calculi in Goats

BY JANET GARMAN

**U**RINARY CALCULI IN GOATS AND SHEEP is a common and mostly preventable livestock health issue. While it is slightly different in each species, it has many similar causes, symptoms, and prevention. Goats will be discussed here but know that much of the information pertains to both species. Other names for this condition are urolithiasis and water belly.

The recognized cause of urinary calculi in goats is feeding an improperly balanced diet. When grain is heavily fed, forage is limited, and minerals are out of balance, the perfect scenario is set up for stones and blockage to form in the urethra. The stones can be big enough to completely block the urethra or still allow a trickle of urine to pass through. This is what we experienced when a case of urinary calculi presented in our wethered sheep.

### OUR FARM STORY

We acquired Ranger from a nearby farm that had mistakenly over-bred and ended up with too many lambs for the property. They very generously gave

us three lambs. Urinary calculi problems began one day when the wether was six years old. Fully grown, large, and not particularly friendly, it was hard to get him into the barn for an exam. We could tell something was very wrong. He was in pain and had urine dripping. Instead of trying to ram me, he had an oddly elongated stance. He appeared to be straining.

### WHAT COULD BE DONE?

At the time, I was not educated about urinary calculi. We had fed a small amount of grain every day to the animals, mostly in hopes that they would come to us when exams or medical treatment were necessary. Unfortunately, in Ranger's case, even a little grain each day was too much. He had almost a complete blockage. He did not survive, although we called the vet and they administered a relaxant and pain reliever. We knew the prognosis was grim and Ranger passed the next morning. If I had that call to make again, I would opt for euthanasia to end the animal's suffering. A urinary calculi diagnosis is that serious. It is an emergency.

## SIGNS AND SYMPTOMS OF URINARY CALCULI

Straining and making sounds of distress

Standing in an elongated stance

Drips of urine that may be bloody

Teeth grinding (a common sign of pain in animals)

Swollen penis

Dark urine

Restlessness and tail twitching (other signs of discomfort)

Abdominal pressure and distension

Urinary tract blockage from stones is an emergency. If you notice any of these symptoms, call a veterinarian right away. The progression can be quick, and it is very painful. Untreated, the bladder may rupture, spilling urine into the abdominal cavity.

## THE RELATIONSHIP OF GOAT GRAIN AND URINARY CALCULI

If we look at why food has a relationship to urinary calculi, we see the importance of a balanced ration when feeding grain. Simply tossing together different grains you might have on hand can lead to nutritional deficiencies and death. Grain-rich diets fed to goats must have a good calcium to phosphorus ratio of 2:1. The ratios of each nutrient should be clearly printed on the feed bag tag.

Feeds high in cereal grains such as corn, wheat, and barley are high in phosphorus and can easily set the calcium-phosphorus ratio out of balance. In addition, feeding less expensive mixtures intended for other animals can be the wrong mixture for goats. Do not feed horse feed or general livestock feed to your goats unless you are sure the formula is balanced for goats.



"This is our boy Mayo. We lost him at only about six months old due to this. He was genetically prone to stones so there was nothing we could have done. The vet is inserting a catheter here after another vet clipped his pizzle."

Photos by Aurora Beretta of Texas





"Our four-month-old Boer, Bandit. He didn't make it; he went into shock while attempting to snip his pizzle. It was definitely a hard lesson learned for us." Submitted by Cindy Waite of Illinois

## THE BEST FOOD FOR MALE GOATS

Browse and hay should be the primary diet for bucks and wethers. Adding a small amount of well-balanced grain will be acceptable but should be carefully monitored. Fresh water should always be available, as prevention of urinary calculi requires that the goat be well hydrated.

## THE CASTRATION COMPONENT

Castrating goats at an early age has been debated as a cause of urinary stone buildup. Hormones produced as the male goat reaches puberty contribute to the full growth of the urethra. Castration before puberty is discouraged by veterinarians and is especially risky before the first month of growth. Many breeders are heeding this advice and waiting longer before castrating the bucklings.

The male goat urethra is longer and narrower than the female urethra. That is why urinary calculi is rare in female goats. There quite possibly is a genetic side to the occurrence too, with certain lines carrying a gene sequence for a smaller, narrow urethra.

## WHAT IF YOUR GOAT HAS URINARY CALCULI?

In some instances, with goats, surgery can be performed. Unfortunately, no surgery comes with a guarantee of success. There is a good chance that another episode of urinary calculi will occur. In some cases, snipping off the pizzle at the end of the penis will allow the stones to pass. You can do this yourself, but if you have a vet available, I recommend bringing the vet on to do the procedure.

Some responses and remedies include flushing

with ammonium chloride or adding apple cider vinegar to the goat's water. Raising the acidity of the urine is the goal with prevention, and possibly offers a remedy. The thought process is that ammonium chloride acidifies the urine and may help dissolve the stones blocking the flow.

## PREVENTION AND MAINTAINING A HEALTHY URINARY TRACT IN GOATS

Add some herbs to your goat's diet that can possibly help with maintaining health. Chickweed is a common green plant and contains a high content of vitamins and minerals. Plantain also grows freely in most areas and contains a wealth of healthy properties. Allow the goats to browse on all the wild raspberries they can find. The leaves are great for maintaining urinary tract health. You can feed them dried raspberry leaves, too. A varied diet of browse in addition to good quality hay will help your goats avoid many health problems.

## OTHER HELPFUL PREVENTIONS

Because adding ammonium chloride can help prevent stones, it is often offered as a top dressing on the grain. It is already included in some commercial feeds. Be sure to use only a good quality goat ration for your herd. The recommended ratio for ammonium chloride is 0.5% of the feed. Always provide plenty of fresh water and check that the goats are drinking it. If your herd is fed the right nutrients in the appropriate quantities, you will help them maintain good health and reduce the chance of urinary calculi. 🐐

# DIFFICULT PRESENTATIONS

## What To Do In A Kidding Emergency

STORY AND ILLUSTRATIONS BY LINDA CARSON

ORIGINALLY PUBLISHED IN DAIRY GOAT JOURNAL MARCH/APRIL 2017

The vast majority of births in the goat barn proceed in a normal and healthy manner, but it is good to know what to do in an emergency. The most important thing to remember when trouble comes is that your doe needs you to be calm and gentle.

If you have small goats, you will need small hands in order to intervene. Extend your hand and try to compress the fingers as much as you can. If your hand is about the same size as a normal kid's head, you should be able to go in to the straining doe's birth canal to try and sort things out or provide assistance. Note that your hand will pass through the very bony construct of the pelvis, and will be heavily constricted. This means that you must work gently, but quickly, before the blood supply to your fingers is cut off.

You must secure the doe, preferably with a gentle handler at her head and shoulder, or tied to an immovable object, so that you don't have to chase her around. When entering the doe's reproductive tract, your hand must be **CLEAN**, well **LUBRICATED**, and move slowly and steadily.

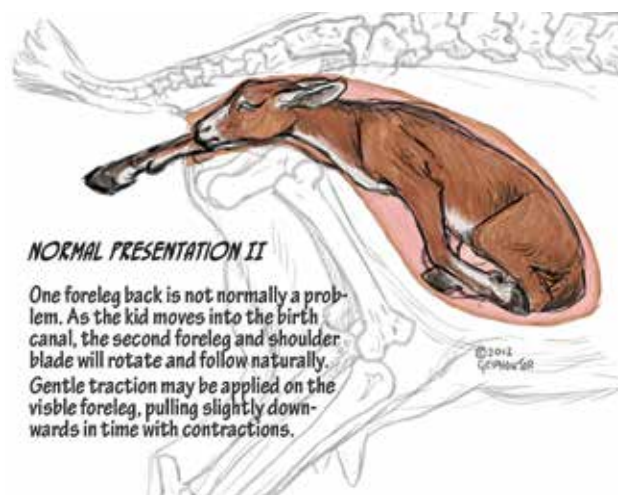
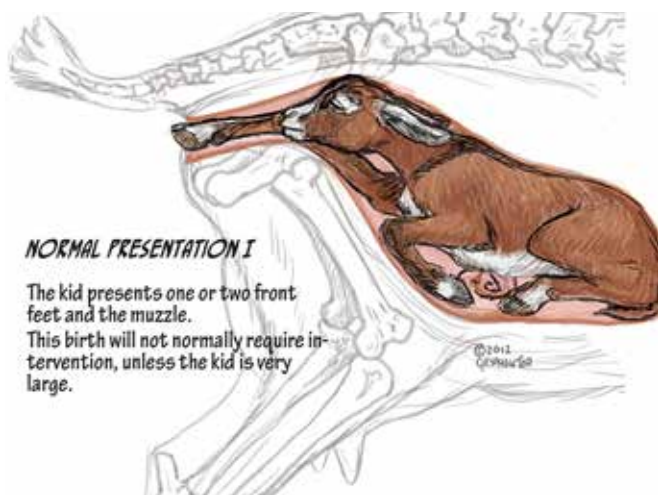
It can be extremely difficult to determine what you are feeling with your fingertips. A pointy little rump can feel like a muzzle, for instance. I find it easier to visualize what I am touching by closing my eyes while I feel around.

Danger signs — **STOP** and call the vet if: the kid is really stuck, if you note bleeding (bright red blood), any prolapsing of the uterus, if a kid has died some days previous and has become necrotic ("off-smelling," pieces come off when pulling — sorry, I know it's gross, but it can happen), or any signs that the doe is in extreme distress. Know when to call. She is worth it. The kids are worth it. You are worth it.

Now, a series of drawings that I've done to illustrate various presentations that you may encounter, and a few ways that I have dealt with problematic presentations.

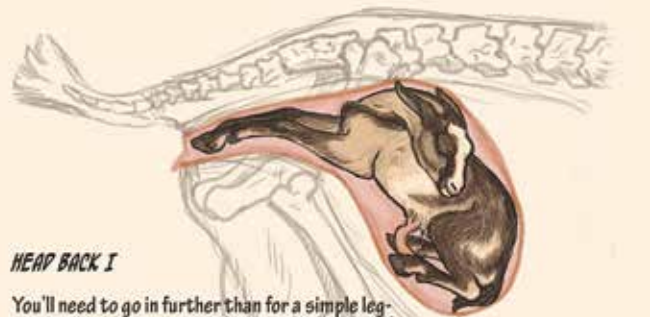
**NOTE:** *I am NOT a veterinarian, and you must use my suggestions at your own risk. Again, do NOT risk the health of your does and kids — call a vet right away if things get rough.*

### NORMAL PRESENTATION





## HEAD BACK

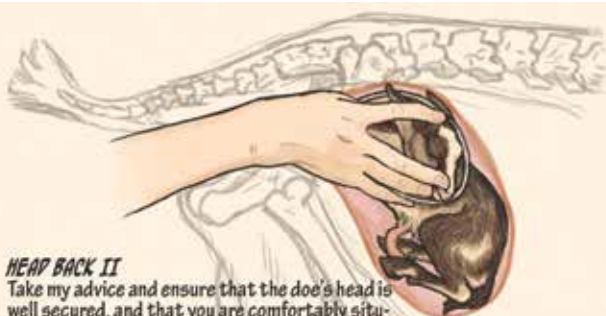


### HEAD BACK I

You'll need to go in further than for a simple leg retrieval, and it is going to be quite unpleasant for the doe. If there are additional kids behind this one, things will be very tight indeed.

The head acts as if on a spring-loaded neck, and always wants to return to its original position. This is a case where a lambing snare (or thin rope) is useful, but you may have to guide the muzzle and head back into the birth canal...while pulling.

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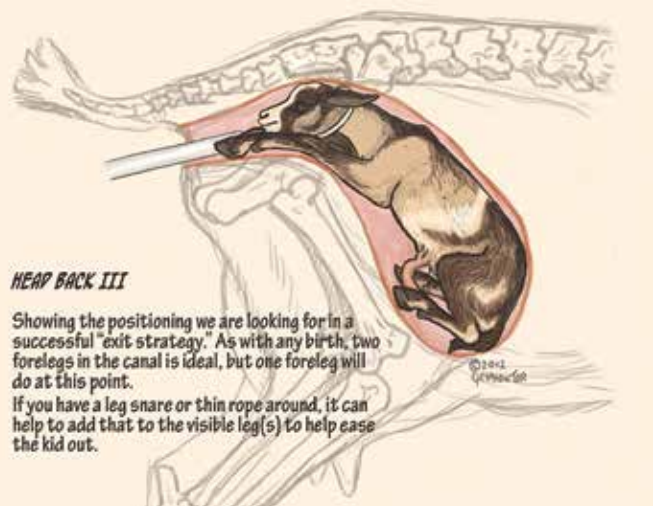


### HEAD BACK II

Take my advice and ensure that the doe's head is well secured, and that you are comfortably situated, because both of your hands will be busy.

Because of the tendency for the head to flip back the wrong way, it is a good idea to use a thin rope or snare to loop around the head. After you turn the head, you can keep it pulled around in the right direction with gentle traction on the rope/snare with your external hand while you use your fingertips to guide the muzzle into the birth canal.

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### HEAD BACK III

Showing the positioning we are looking for in a successful "exit strategy." As with any birth, two forelegs in the canal is ideal, but one foreleg will do at this point.

If you have a leg snare or thin rope around, it can help to add that to the visible leg(s) to help ease the kid out.

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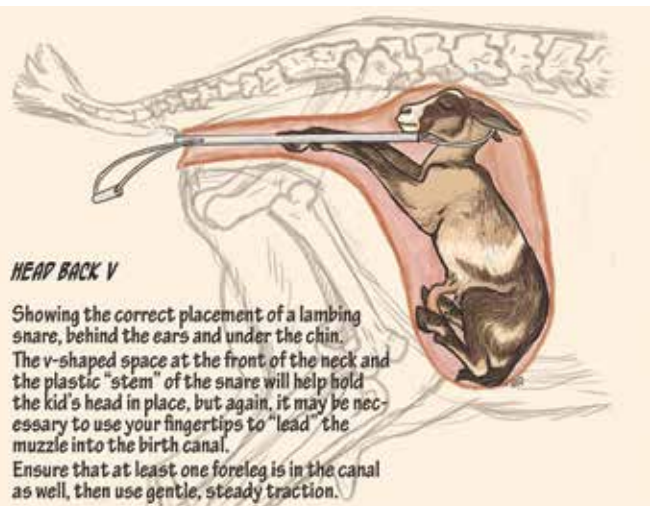


### HEAD BACK IV

Ok, technically it is "head down," but either way, this kid really has it in for you. It is going to take a lot of work to raise this kid's chin up. Patience!

In most cases, I end up having to gently push the kid well back in, then use a snare or thin rope to help me guide the head and at least one foreleg back into the birth canal. In this case, the snare's handle under the chin helps a lot. You will still wish you had three hands!

©2012 Gynvader



### HEAD BACK V

Showing the correct placement of a lambing snare, behind the ears and under the chin. The v-shaped space at the front of the neck and the plastic "stem" of the snare will help hold the kid's head in place, but again, it may be necessary to use your fingertips to "lead" the muzzle into the birth canal.

Ensure that at least one foreleg is in the canal as well, then use gentle, steady traction.

©2012 Gynvader

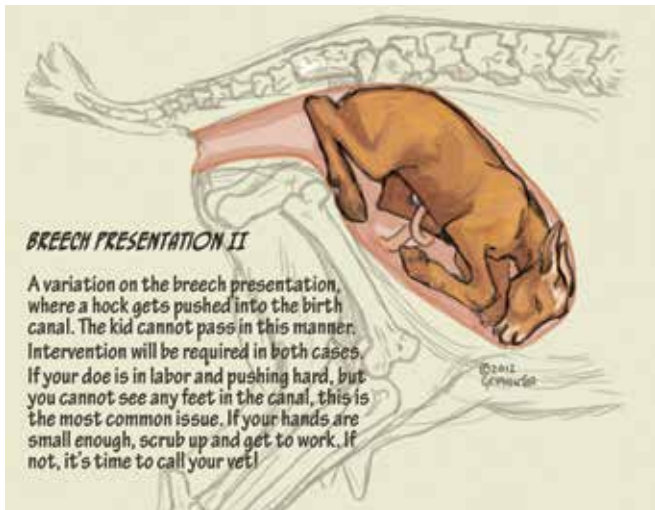
## BREECH



### BREECH PRESENTATION I

This kid is very unlikely to come out without assistance unless he is incredibly TINY and the doe is huge.

When feeling around manually, that pointy rump really does feel like a nose (the tail is usually tucked under, making it even worse). Feel farther up and you'll feel the relatively flat rump and hips instead of a dome head shape. Feel down and you should encounter the recognizable leg structure.



### BREECH PRESENTATION II

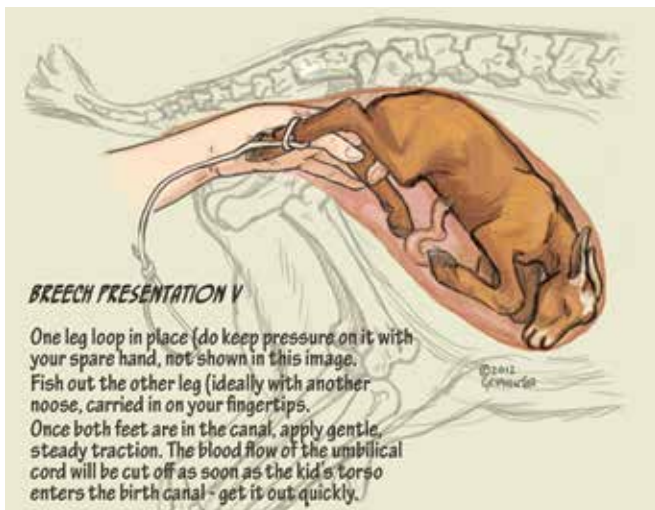
A variation on the breech presentation, where a hock gets pushed into the birth canal. The kid cannot pass in this manner. Intervention will be required in both cases. If your doe is in labor and pushing hard, but you cannot see any feet in the canal, this is the most common issue. If your hands are small enough, scrub up and get to work. If not, it's time to call your vet!



### BREECH PRESENTATION III

The first step is to push the kid gently back into the womb as you slide your hand down to a hock. Hook your index or middle finger around the hock and slide it down toward the fetlock (next image).

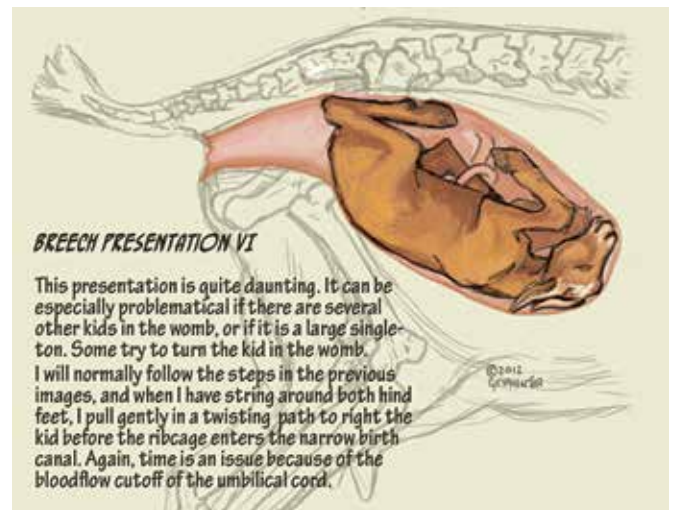
If you can, loop a thin rope noose (or commercial leg snare) over your fingertips, to work around the fetlock. This takes some practice, but the key is to be patient and keep calm as you learn.



### BREECH PRESENTATION V

One leg loop in place (do keep pressure on it with your spare hand, not shown in this image). Fish out the other leg (ideally with another noose, carried in on your fingertips).

Once both feet are in the canal, apply gentle, steady traction. The blood flow of the umbilical cord will be cut off as soon as the kid's torso enters the birth canal - get it out quickly.



### BREECH PRESENTATION VI

This presentation is quite daunting. It can be especially problematical if there are several other kids in the womb, or if it is a large singleton. Some try to turn the kid in the womb.

I will normally follow the steps in the previous images, and when I have string around both hind feet, I pull gently in a twisting path to right the kid before the ribcage enters the narrow birth canal. Again, time is an issue because of the bloodflow cutoff of the umbilical cord.





# UDDER DESPAIR: Mastitis in Goats

BY KATE JOHNSON

**I**F YOU OWN DAIRY GOATS, chances are you are eventually going to encounter a case of mastitis. Knowing how to diagnose this infection as early as possible, as well as how to treat mastitis in goats, are crucial if you want to maintain the long-term udder and overall health of your doe and to keep your milk production losses to a minimum.

## WHAT IS MASTITIS AND HOW DO GOATS GET IT?

Mastitis is simply an inflammation of the mammary gland. It can be clinical, meaning the doe is displaying symptoms, or it can be less obvious as in subclinical cases. Mastitis in goats can be caused by an injury, by stress, or by a bacteria or virus infecting the mammary gland. Weaning kids too abruptly from a doe that is still producing heavily can also cause it. Additionally, mastitis in goats can occur as a result of CAE infection.

## HOW DO I KNOW IF MY GOAT HAS MASTITIS?

In clinical cases, both acute and chronic, the udder will become swollen and warm and may be painful to the touch. There may be clots or flakes in the milk as well as discoloration and decreased production. Does may go off their feed and become depressed and possibly have a fever. They may even hold a hind leg up in the air as if they are lame.

In subclinical cases, you may not notice any symptoms at all and the only way to detect that the doe has a mild case of mastitis is through somatic cell counts. I had a Nubian goat that never showed symptoms and was a great producer, but when a routine milk test showed an elevated somatic cell count, I realized she did, in fact, have subclinical mastitis. The easiest way to detect these cases of mastitis is by using the California

Mastitis Test (CMT). This inexpensive testing kit can be purchased through many dairy or veterinary supply stores and is a good way to detect and treat mastitis in goats before the symptoms progress.

## HOW TO TREAT MASTITIS IN GOATS:

In cases of subclinical mastitis or when symptoms appear to be relatively mild and limited to the udder itself, the first step is to milk out the affected side of the udder. If this is difficult to do, it is possible to administer two IU of oxytocin to assist in the removal of the milk. Next, infuse the udder with a commercially prepared intramammary infusion product. If using a bovine mastitis medication, half a tube is sufficient.

In cases where the infection has spread beyond the udder and is throughout the goat's body, give a common goat mastitis treatment, penicillin, or one of several other antibiotics intramuscularly.

## CAN I DRINK THE MILK FROM A GOAT WITH MASTITIS?

This is an interesting question and there are several things to consider when deciding whether or not to consume the milk. In subclinical cases, you are unlikely to even know that the goat has mastitis unless you are doing a somatic cell count or CMT regularly. In these cases, drinking the milk is probably not harmful, especially if the milk has been pasteurized. But as my veterinarian, Dr. Jess Johnson of Mountain Rose Veterinary Services states, "That is basically the equivalent to drinking pus/purulent discharge — a collection of white blood cells and bacteria. Pasteurizing it would kill the bacteria but not change the fact that you are drinking pus." While this does not make drinking the milk sound very appealing,



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Shery Goodman, Sunspring Ranch, Provo, Utah.



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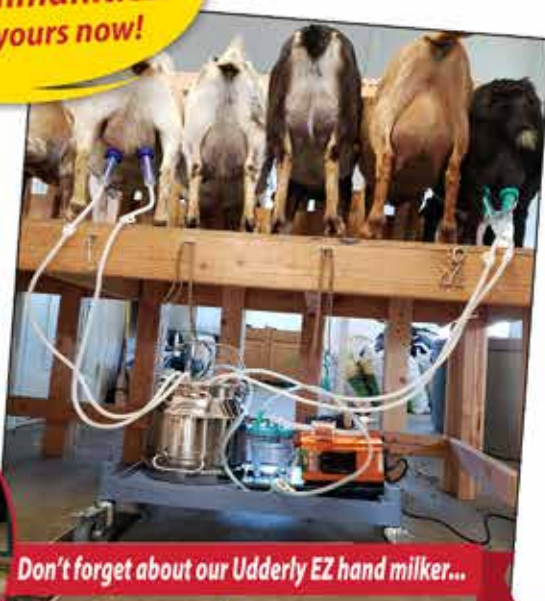


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according to a guide to the dairy industry from a Penn State University site, as long as the milk is filtered thoroughly and enters the bulk tank before the animal is treated with antibiotics, it is fine to drink.

[sites.psu.edu/rclambergabel/tag/mastitis/](https://sites.psu.edu/rclambergabel/tag/mastitis/)

## HOW CAN I PREVENT MASTITIS IN MY HERD?

Since prevention is the best way to control mastitis in your herd, here are some suggestions you should follow as you learn how to milk a goat that will greatly reduce the incidence of mastitis in your does:

- *Keep the barn, milking area, and other areas where the goats are residing as clean as possible.*
- *Dehorn goats and keep feet trimmed to prevent injury to the udder.*
- *Keep the hair on udders clipped to avoid an accumulation of dirt and excess moisture.*
- *Use a wash on the goat teats and udder before milking and a teat dip or spray afterward.*
- *Milkers should have clean and dry hands.*
- *Perform CMT on all lactating does at least once a month.*
- *Wean babies gradually or continue milking once kids are no longer nursing.*
- *Cull chronically infected does from the herd.*

## WHAT IS GANGRENOUS MASTITIS?

This is a particularly bad version of mastitis caused by *Staphylococcus aureus*. This can begin as subclinical mastitis and then becomes acute. Eventually, it causes a toxin to destroy the tissue of the mammary gland and it becomes cold and blue in color. This often results in death within 24 hours but survival is possible with anti-inflammatory drugs, antibiotics, and possibly even udder amputation. I once knew an old Saanen doe who had half of her udder amputated due to this form of mastitis. She went on to freshen

several more times and produced an abundant supply of milk from the remaining half of her udder!

## WHAT IS HARD UDDER?

Hard udder, or hard bag, is another name associated with mastitis in reference to the lumps or scar tissue that occur over time. Once this is observable, it means that the mastitis has gone undetected over time. Hard udder is often used to describe viral mastitis caused by CAE.

## WHAT IS CONGESTED UDDER?

Congested udder is not the same as mastitis and is not as serious, either. It is not an infection but rather an issue with the teat not allowing milk to flow. It often occurs when the doe produces so much milk, so quickly, that it becomes overly full. It is uncomfortable but is relatively easy to treat and fix. Cutting back on grain, using hot compresses, and helping to express the excess milk are good remedies. The milk from a congested udder is perfectly fine to drink.

Mastitis is common among dairy goats so keeping a close eye on things and responding quickly when problems do occur is the best bet to ensure the long-term health and top production of your milking does. 🐐

## SOURCES

[merckvetmanual.com/reproductive-system/mastitis-in-large-animals/overview-of-mastitis-in-large-animals](https://merckvetmanual.com/reproductive-system/mastitis-in-large-animals/overview-of-mastitis-in-large-animals)

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[sheepandgoat.com/mastitis](https://sheepandgoat.com/mastitis)

[uvma.org/mastitis-in-goats.htm](https://uvma.org/mastitis-in-goats.htm)

[sites.psu.edu/rclambergabel/tag/mastitis/](https://sites.psu.edu/rclambergabel/tag/mastitis/)



# SHE'S GOT THAT SHINE:

## Maintaining Healthy Goat Coats

BY LACEY HUGHETT

ONE OF THE COMMONLY ASKED questions I hear from non-goat owners is “What do goats feel like?” A better question would be, “What are they supposed to feel like?” My very first goat, back when I knew absolutely nothing about the animal, was a raggedy old doe I got from someone who really didn’t want her anymore.

Even to my inexperienced eyes, she was thin, but at the time I assumed that her rough hair was simply what goats felt like. We fattened her up and read some livestock books on goats and gave her some minerals and supplements that goats are supposed to need. About a year later, she was a completely different animal. Goats are supposed to have soft, clean, shiny coats. In winter they are thick and luxurious, and in summer they shed to a thinner, but still soft coat.

Different goats have different kinds of coats. Some breeds, like Saanens and Toggenburgs, have longer hair. Their coats need to be brushed out often. Owners in warmer regions will also shave their goats over the warmer season for ease of keeping, milking, or showing. There are also fiber goats, such as Angora or Cashmere goats, whose hair we use for clothing and fabrics. All of these breeds will feel and look a little different than the average short- or medium-length coat varieties.

A goat’s coat is a great overall health indicator. If an animal has a dull, thin coat, there is a good chance it’s not getting enough of something it needs.

Visually check your goat’s coat condition whenever you’re around them so you notice any changes. In addition to that, about once a month, owners should complete a comprehensive health exam.

The health exam should coincide with other necessary interventions, so you can provide hoof trimming, any medications that need to be given, and samples that may need to be collected at one time. For the coat part, examine your goat’s hair closely. Pull it back in the opposite direction of growth and look for bugs. Take note of any hair loss, bald patches, skin flakes, or any signs of skin infection such as redness, boils, sores, or white patches. If you shave or brush your goats, now is a great time to do so. Make sure to give them treats for their trouble.

Many common skin and coat conditions plague goats, but I’ve grouped them loosely into three categories: parasites, deficiencies, and skin infections.

### GOAT PARASITES

If you come across a small, tan bug while examining your goat, it may be goat lice. Goats with lice will have a dull, scruffy coat and will scratch on things more often than normal. You may be able to find grey eggs on your goat’s back, but you’ll need a magnifying glass to see them well. You may want to speak with your vet if you have dairy animals, but lice can be treated with louse powder. Treat all your animals at once to kill all the lice.

Mange is another parasitic disease caused by





ABOVE: An abandoned French Alpine goat was taken in by Tamsin Cooper. She was emaciated, with a shabby coat and fishtail. The same goat, after some TLC, is shown on the previous page.

MIDDLE: A shabby coat in need of nutrients.

FAR RIGHT: A shiny, healthy coat.



microscopic mites. Signs include dandruff, hairless patches, sores, and thickened white patches of skin. Animals need to be quarantined, but the entire herd should be treated, including any guard animals. Your vet can help recommend the best treatment options for your herd.

## MINERAL DEFICIENCIES IN GOATS

Copper is the main mineral deficiency noticeable from the coat alone. Goats need this key mineral to survive, so if they become deficient, owners need to intervene. The signs of a copper deficiency are bleached coat color, fishtail, and even balding around the eyes and nose. The goat's hair turns a shade (or several) lighter than what it should be. Black goats begin to look rusty red, red goats start to look cream-colored, and so on.

Copper deficiency can lead to multiple problems, including premature kidding, miscarriages, or even death of the goat. It affects their overall health and makes it harder for them to fight off any diseases they may contract. Luckily, the deficiency is easy to treat with copper boluses, which are given to each goat and calculated by body weight.

It is important to note that owners may have to bolus their goats more often than the package states. My brand recommends bolusing every eight to 12 months, but I have to do it more often. My water is supplied by a well, and we have hard water. Commonly, well water is high in calcium, which acts as an antagonist to the copper the goats could be getting from their feed or minerals. This means the calcium binds to the copper and makes it so the goat's body can no longer use it. In situations like this, it is key to spend

time with your herd and bolus them at the sign of a deficiency instead of doing it on a schedule.

## SKIN INFECTIONS

Skin infections should become apparent during coat inspections. With most skin infections, a veterinarian has to examine and diagnose your goat. Look for any ringworm scabs, boils, pus, or excessive itching.

Ringworm is a well-known fungal skin infection. Goats present a ring of hair loss, with flaky and irritated skin. A zoonotic disease, ringworm can spread from goats to other animals and humans. Preventing ringworm in goats is the best bet, and this can be done by keeping the housing and living space dry and clean. Goat ringworm can be treated with topical cream or spray, but can also be left to run its course. It clears up in about eight weeks, but animals can become reinfected by others.

If your goat appears healthy overall and is not deficient in anything, but they still have a dull coat despite brushing and maintenance, don't feel bad. Some animals are naturally a little more scruffy despite our best efforts. I have one little brown doe who consistently looks like a raggamuffin, regardless of getting brushed out and extra feed and minerals. Fortunately for my goat and my sanity, *Goat Journal* editor Marissa Ames suggested Healthy Coat to me.

Healthy Coat is essentially an oil supplement to help animals with dry skin. It has easily digestible fatty acids and vitamin E, and I give a little bit to my girl each day. She has completely turned around and grown in a shiny, thicker coat in the last few weeks. I have read of other goat keepers recommending





pouring a small amount of vitamin E oil over their goat's feed as well to achieve the same effect.

Coats can tell you a lot about your goat's overall health and maintenance level. If you notice any signs of sickness or disease, consult with your local veterinarian or animal husbandry expert. Keeping your goats properly fed, bolused, brushed, and trimmed will allow you to not only tell your friends what goat's hair feels like, but what it's supposed to feel like as well. 🐐

#### EDITOR'S NOTE:

Since it's impossible in this space to discuss all causes of shabby coats with the depth necessary for maintaining optimal herd health, we invite you to read on these separate issues: "Goat Lice: Are Your Goats Lousy?" by Karen Kopf, *Goat Journal* January/February 2019 "Back from The Vet: Mineral Intake in Goats" by Dr. Katie Estill DVM, *Goat Journal* November/December 2019 "Finding the Balance: Maintaining Herd Health with Minerals" by Karen Kopf, *Goat Journal* November/December 2019 Many of these stories are free at backyardgoats.iamcountryside.com and Backyard Goats members can enjoy access to all of them.

— Marissa Ames, Editor

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# SELENIUM DEFICIENCY: THE CAUSE OF WHITE MUSCLE DISEASE IN GOATS

BY REBECCA SANDERSON

**W**ITH KIDDING SEASON IN FULL SWING, it's time to talk about selenium deficiency. Selenium deficiency can cause white muscle disease in goats, also known as nutritional muscular dystrophy. However, a deficiency in vitamin E can cause the same symptoms. Often, because vitamin E and selenium are interrelated in body functions, your goat may be deficient in both at the same time.

## KNOW YOUR SOIL

Many parts of the United States have a deficiency of selenium in the soil. If the region has less than half a milligram of selenium per kilogram of soil, then it is considered deficient. These regions include the Pacific Northwest, parts of the Great Lakes area reaching into New England, and down the southern East Coast. However, there are also regions with high amounts of selenium in the soil, even high enough to cause selenium toxicity if you are not careful with your herd. These areas include parts of the Dakotas, Idaho, Nevada, California, Arizona, New Mexico, and into the neighboring states. While you can find maps that show the general selenium concentration for your county, I highly suggest contacting your local extension office to receive a definite number. Even within an area, selenium levels can vary broadly. You

can even send a soil sample for testing to determine exactly what the selenium levels are on your property.

Often, because vitamin E and selenium are interrelated in body functions, your goat may be deficient in both at the same time.

Forage is best, while alfalfa hays are usually also good sources of selenium for goats. Yet, even in plants that would normally have good amounts, low soil selenium means low plant selenium. Vitamin E also quickly diminishes in a feed as it is stored, as much as by 50% in the first month of storage after feed is harvested. Some minerals, such as sulfur, can actually inhibit your goat's absorption of selenium even if it is in good concentrations in their diet.

## SYMPTOMS OF WHITE MUSCLE DISEASE IN GOATS

I'm sure you are asking why selenium deficiency is under the category of "legs." Well, the legs are what will clue you in that a goat is deficient in either selenium or vitamin E. A goat suffering from white muscle disease will often stand with very stiff legs, sometimes hunched over. They will experience muscle weakness which is most pronounced in the legs, usually affecting the back legs first. If you feel the muscles, they will feel hard and tight and be tender



ABOVE: This baby straightened up after a few days of selenium and vitamin E. Photo credit: Colleen Allen of Arkansas.

RIGHT: "This is my three-year-old LaMancha wether pack goat this past March. The condition was corrected with persistent selenium supplementation. He was confirmed low in both selenium and zinc at the time." Submitted by Amy St. Pierre.



to the touch. Newborn goats with white muscle disease may be completely unable to stand, and their hind feet may even bend backward at the ankle. Selenium deficiency can affect your entire herd, but newborns and young kids are the most vulnerable, especially when their mother became deficient while they were still in the womb.

### SUPPLEMENTATION

How can we combat possible selenium and/or vitamin E deficiency, and white muscle disease, in goats? First, you must know the amount of selenium in your soil. That will determine your mineral management practices. If your soil is only a little deficient, then your goats only need a little

supplementation, perhaps a subcutaneous injection of BoSE (a selenium and vitamin E supplement given to sheep, so it would be off-label for goats but still effective) once or twice a year, usually around breeding time or four to six weeks before kidding season. If your area is extremely deficient, you may need a mineral salt block that has been formulated for your region, or possibly selenium gel given occasionally. There are other feed and mineral supplements that can help when given regularly. However, the federal government regulates how much selenium can be in these feeds in order to prevent toxicity in the regions where selenium is not deficient. While giving feed that contains added

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TOP AND MIDDLE: Weak pasterns on a doeling.  
Photo from Lynn Perara of Missouri.

BOTTOM: Lynn's doeling, older and looking great!



selenium for goats is good practice if you are in an area with less selenium, but it may not be enough if your area is very low in selenium.

## SELENIUM TOXICITY

There is a very fine line between too little and too much selenium. In the areas that have a very high concentration of selenium, toxicity can even occur from goats eating the wrong types of forage with no supplementation at all. If you are in a place with high amounts of selenium, look out for *Astragalus* (locoweed) which can indicate high selenium as well as absorb high amounts. Do not allow your goats to eat this plant.

Because giving the correct amount of selenium to your goats is such a delicate balance, please speak to your local veterinarian about soil conditions, how you manage your herd (pasture vs. pen), what you feed, and how you want to combat the possibility of white muscle disease in goats. Many goat owners keep BoSE on hand in case of an emergency need for selenium, especially in newborn kids. This must be obtained by prescription through your vet. You can also do blood tests on your goats to see if they are getting enough selenium in their current diet and adjust accordingly.

There is a very fine line between too little and too much selenium. Selenium toxicity can have symptoms very similar to those of deficiency.

Selenium toxicity can have symptoms very similar to those of deficiency. However, it can be difficult to save a goat experiencing toxicity, especially if you first think it to be the opposite problem. It is best to err on the side of caution on your selenium supplementation, keeping injectable selenium on hand for emergencies rather than simply feeding selenium gel indiscriminately. Once again, please coordinate with your veterinarian about the selenium levels in your area and the best way to adjust your own herd management to care for your goats.

Have you dealt with selenium deficiency and white muscle disease in goats? We would love to hear your stories. 🐐

# PREVENTING HOOF ROT IN GOATS

By Janet Garman

Foot rot and related foot scald cause soreness and limping. In severe cases, goats will try to walk on their knees.

When you see goats limping, examine the hoof. Secure the goat in a milking stand then wipe the hoof and remove accumulated mud, pebbles, or debris. Gently inspect between the toes. Irritated, red areas or white and infected-looking tissue are telltale signs of foot scald or hoof rot.

Two organisms cause foot rot: *Fusobacterium*

*necrophorum* and *Bacteroides nodusus*. *Fusobacterium necrophorum* lives in the soil and needs to grow in the absence of oxygen: exactly the situation in deep, muddy pastures, or stalls. When the secondary bacterium is introduced, *Bacteroides nodusus* joins with *F. necrophorum* to create an enzyme-causing hoof rot. Winter wet weather can contribute to a bad case, or other goats with foot rot can bring the infection to your herd. A small irritation or abrasion allows bacteria enter the foot tissue. This can then lead to fungal growth.

## WHAT TO DO NOW

Gently clean the affected hoof using a disinfectant solution diluted in water. Keep the goat on dry ground until you have cleaned the stall and set down dry bedding.

Disinfect tools before use on any other hooves. This highly contagious bacterium spreads easily through the herd. Even clean the goat stand.

Check the stall or paddock where the goats are housed. Is the ground damp and moist? Is manure, mud, and dirty bedding accumulated? Clean it out and put fresh, dry bedding down.

## TREATMENT

Copper sulfate foot bath is a standard treatment. Pour enough solution into a pan for the goat to immerse affected hooves. You can use any large, shallow container. Farm supply retailers sell boots for goats that hold the solution against hooves.

Copper sulfate solutions also come in easy-to-use spray bottles, which squirt directly onto affected areas between toes.

## USING HERBAL AND ESSENTIAL OILS

Katherine Drovdaahl, in *The Accessible Pet, Equine and Livestock Herbal*, recommends blending garlic and lavender essential oils to treat foot rot in hoofed animals. Other blends can include tea tree, cinnamon, clove, peppermint, or sage oils. Note that not all these essential oils are safe for use in pregnant livestock. Ms. Drovdaahl recommends 12 total drops of essential oil per tablespoon of olive oil.

## HOW TO AVOID HOOF ROT IN GOATS

If any animal on the property has foot rot, the bacterium now lives in the soil. Keep shelters dry so goats do not bring disease in.

Not all limping is a foot rot symptom. Stone bruising can cause pain and goats will limit weight on that foot. Arthritis leads to lameness and sore joints, and cold weather plays a part. A goat may hold up a stiff leg after lying down for a long period. If you don't see evidence of disease or find any

tender spots on the hoof, check for other causes of lameness.

Proper goat hoof trimming can't eliminate the chance of hoof rot, but a healthy hoof is more resistant to bacteria.

## TAKE THESE STEPS TO ENSURE GOOD GOAT HOOF HEALTH:

Trim hooves regularly and inspect for injury or disease.

Keep stalls clean and dry. Remove soaked bedding, mud, and manure.

Quarantine any new animals for at least 30 days, even your own goats that leave the farm for breed shows or fairs.

Practice good biosecurity on and off your property. Have designated footwear and do not wear those boots to visit other farms or goat areas.

Unfortunately, once the causes of hoof rot enter your property, it is almost impossible to eradicate it. With good prevention tactics, you can avoid dealing with it.





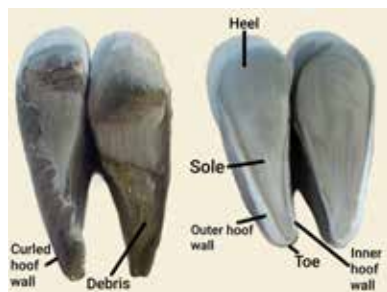
## GOAT HOOF TRIMMING

By Lacey Hughett | Illustrations by Lacey Hughett

Typical goat hoof trimming should be completed every two to three months. Goats allowed to walk on natural, rocky materials or concrete may require less frequent trimmings and goats raised on dry-lots with built up bedding and fallen hay may require it more often. Spring and fall are especially important, as folds in overgrown hooves

can trap mud and moisture, creating the perfect environment for bacteria to invite rot and scald.

You can use hoof trimming shears or even garden shears, and some companies make grinding discs that attach to power tools. Be sure to disinfect your tools, especially when working with mud, moisture, and possible hoof rot.





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# Fecal Float Test:

## WHY AND HOW

BY PATRICE LEWIS

**W**HAT IS THE BIGGEST HEALTH management challenge facing goat owners? Is it hoof care? Digestion issues? Mastitis? Nope — it's parasites.

In fact, parasites are the biggest health issue caprines face. Coccidian and worms kill more goats than all other illnesses combined. The barber's pole stomach worm (*Haemonchus contortus*) is the biggest troublemaker in America. It sucks blood and causes severe blood loss, anemia, diarrhea, dehydration, and death.

The most popular diagnostic tool veterinarians use to check for parasites is the fecal float test, sometimes called the egg flotation or Fecalyzer test. As the name implies, a fecal float test is based on the differences in specific gravity between parasite eggs and solution. When parasites reproduce, the eggs pass out of the host animal via its feces into the general environment (where they may be ingested by another animal, thus continuing the worm's life cycle). When examined through a microscope, it's the parasite's eggs (or sometimes the oocytes, which are tough egg-like structures of fertilized female protozoans) — but not the actual parasites themselves — that will be visible.

Vets ask for the freshest poop available; straight from the animal is ideal. Some parasite eggs can hatch in as little as an hour, so fecal pellets aged 30 minutes or less are best. In older samples, eggs will have already hatched and not be visible in the fecal float, giving a false negative result. If you can't get to a vet or laboratory rapidly, then place the fecal sample in a well-sealed container and refrigerate it, which will slow the development and hatching of any eggs. (Do NOT freeze any fecal samples; this destroys the eggs.)

Not all internal parasites can be determined by the fecal float test. Parasites outside a goat's gastrointestinal tract, biliary ducts, or lungs will not be detected. Additionally, parasites whose eggs are too heavy to float, who exist solely as swimming protozoans, who produce live young, or which are so fragile they're destroyed by the flotation techniques will not be detected via floatation. Tapeworms, which shed whole segments into the feces, also don't float (but are otherwise easy to spot because the segments are large).

### STEPS FOR A FLOAT TEST

Floats are performed using a "Fecalyzer" apparatus. This consists of an outer casing which contains a removable filtration basket. The feces are placed inside the outer casing, then the filtration basket is replaced, squashing the feces down. The apparatus is then half-filled with a solution of sodium nitrate, Sheather's sugar solution, zinc sulfate solution, sodium chloride solution, or potassium iodide. Once the liquid is in place, the filtration basket is rotated vigorously, which breaks up the fecal material into fine particles that become suspended in the solution. Parasite eggs float upward, and the heavier fecal matter remains behind at the bottom of the container.

After this step, the filtration basket is locked in place, and additional solution is carefully added to the container until it reaches the top — in fact, so far to the top that the liquid actually bulges above the lip, forming a small dome called a meniscus. A glass microscope coverslip is gently placed on top the meniscus and left in place between 10 and 20 minutes (depending on the type of solution used).

The reason for the lag time is because parasite

eggs take a bit of time to drift upward to the surface of the solution. The eggs collect at the surface of the fluid layer adjacent to the microscope coverslip, which then get picked up, along with a thin layer of fluid, when the coverslip is removed. Then the coverslip is placed, wet side down, onto a microscope slide, which sandwiches the fecal floatation fluid (and any parasite eggs) between glass. At that point, the microscope work begins as the vet examines the results to detect parasite eggs.

### DO-IT-YOURSELF TESTING

Some enterprising goat owners, particularly those comfortable with using a microscope and following laboratory procedures, perform their own fecal float tests. The correct equipment (a microscope, float solution, test tubes or test apparatus) can be obtained from veterinarian supply sources.

Fair warning: While the procedure to conduct a fecal float test and properly prepare slides is straightforward and can be learned with a little practice, the difficult part comes at the microscope stage. At this point, discerning the difference between benign and pathological results is easy to goof up, resulting in misdiagnoses.

If you can work under the tutelage of a veterinarian or laboratory specialist to learn what to look for on the slides under magnification, and are willing to take the time and careful preps necessary for proper samples, then DIY testing is a fine option. The price of a fecal float test can range from \$15 to \$40, so if you are monitoring a large herd, conducting your own fecal float tests is a more cost-effective route.

### DON'T IGNORE PROBLEMS

For parasite management, the best offense is a strong defense. Caprine parasites are NOT a case of "If I ignore it, it'll go away." These little buggers don't go away, and you don't want to risk your goat's health under the disillusion of "It can't happen to me (or my goats)."

Parasite infestation can become deadly quickly. Don't wait for your goats to experience problems; prevent them in the first place by scheduling routine monthly examinations of your goat's feces. For a list of laboratories that conduct tests, check with your veterinarian or see this link: [wormx.info/fecclabs](http://wormx.info/fecclabs).

Do your beloved animals a favor and stay on top of their health.

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## FLOAT TEST PROBLEMS

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Fecal float tests are not perfect, and can give both false positive and false negative results.

False positive results can happen in a number of ways:

- Parasites are present but not causing health issues, and/or the animal's immune system has them under control.
- The animal has clinical parasitism due to an underlying immune disorder (an animal is ill for another reason, so parasites flourish; but the parasites themselves are not causing the illness).
- The parasite species found in fecal flotation is not the right species for that host (the animal may have ingested a parasite that can harm another species but is not a concern for goats).
- Some species of parasites are incidental and simply not pathological (not all parasites are dangerous).
- Incorrectly diagnosing the correct parasite species (at a microscopic level, many parasite eggs look similar, so it's easy to mistake harmless eggs for dangerous eggs).
- Lab error and veterinarian inexperience (enough said).

False negatives can happen because:

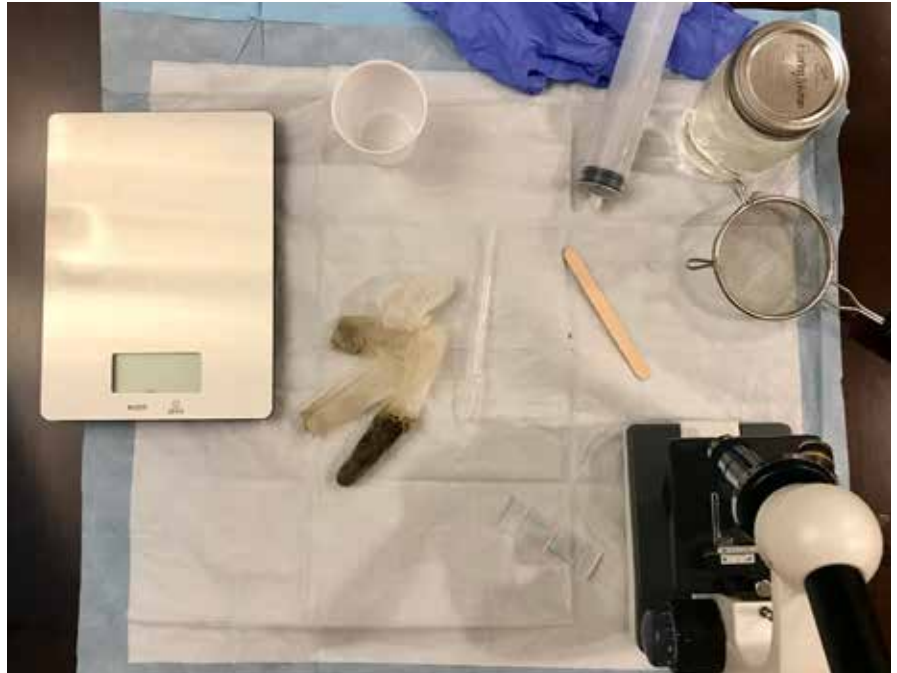
- The fecal sample isn't fresh enough (the eggs have already hatched).
- The sample may be devoid of eggs (parasites don't shed eggs nonstop, so a particular fecal sample may not have any eggs; alternately, some parasites shed comparatively few eggs).
- Low parasite burden (not every egg will be captured on the microscope slipcover).
- Delicate parasite eggs might be destroyed by the fecal float solution.
- Some parasite eggs do not float well.
- Some parasite eggs hatch early, making detection difficult with a float test.
- Some parasites produce health problems in an animal before they produce eggs.
- Incorrectly diagnosing the correct parasite species (mistaking benign parasite eggs for dangerous eggs).
- Lab error and veterinarian inexperience (enough said).



# DIY FECAL FLOAT TEST

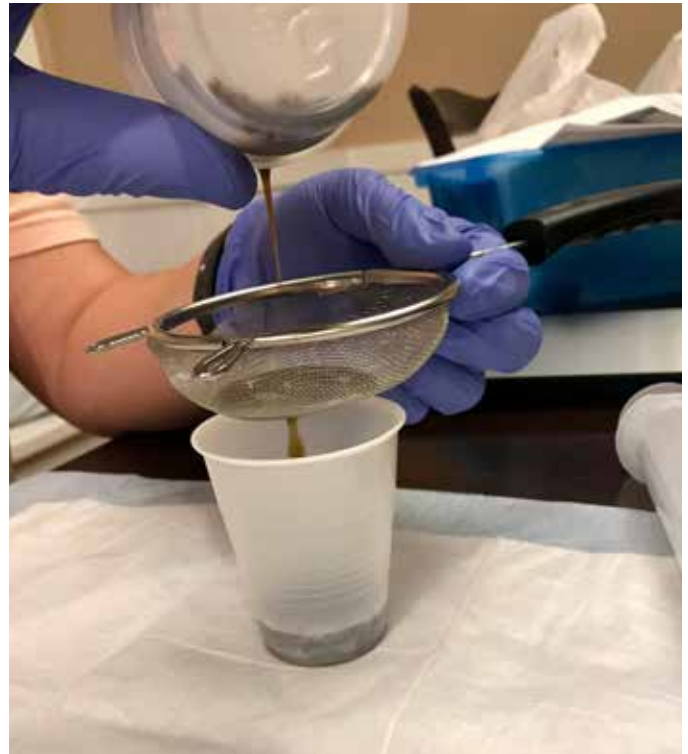
## 1. TOOLS NEEDED

- Digital scale
- Gloves serving as vials
- Pipette
- Craft stick
- Microscope
- Clean microscope slides and covers
- Fine-mesh strainer
- Flotation solution (mixture of epsom salt and clean water)
- Disposable gloves
- Syringe that holds 20ml
- Cups to mix solution and catch strained liquid



## 2. SAMPLE

Acquire the freshest manure possible. Weigh 3g of manure and place in a cup and mash it well. Add 25ml flotation solution and stir.



## 3. STRAIN

Let the mixture sit a few minutes then strain the mixture through a fine mesh strainer and collect liquid in a clean cup.



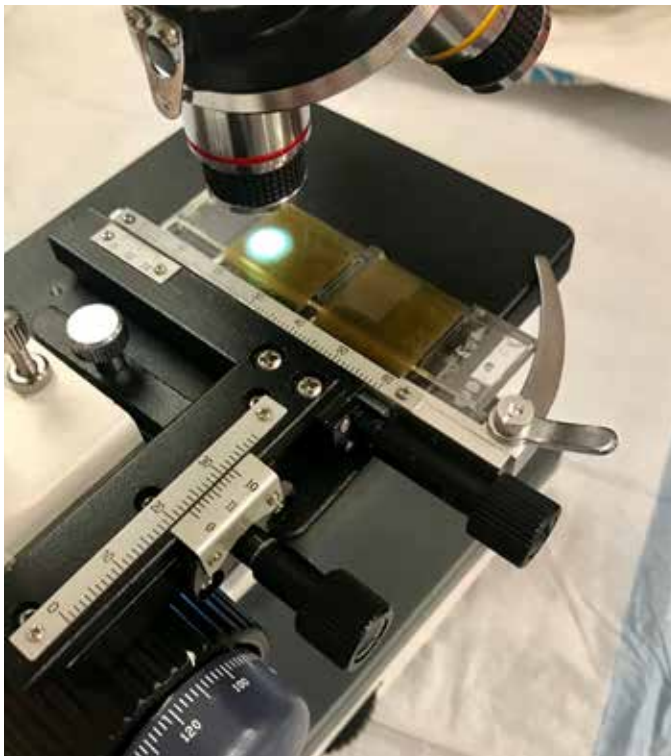
#### 4. PREPARE THE SLIDE

Use the pipette to place a drop or two of the mixture onto a clean slide.



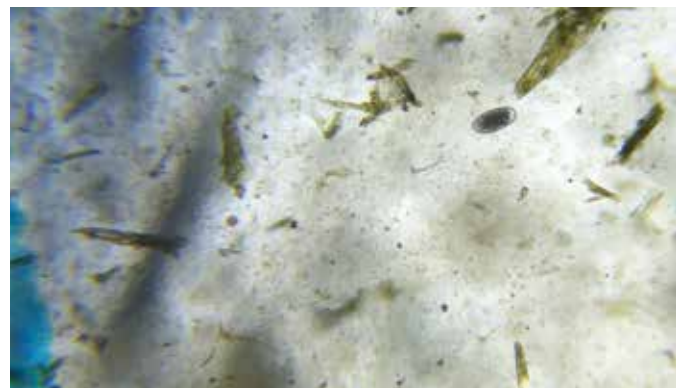
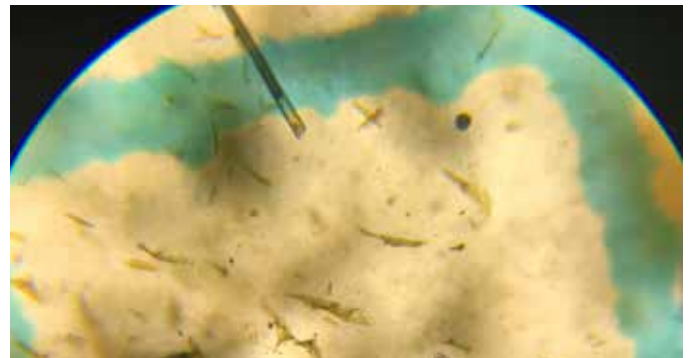
#### 5. SLIDE COMPLETE:

If using coverslips, carefully place slip atop liquid.



#### 6. OBSERVATION

Observe the sample at 10x power, starting at one corner of the slide and working back and forth until you have viewed the whole sample.



#### 7. READING RESULTS

Familiarize yourself with different parasite eggs so you can identify those from air bubbles or debris. Count the number of eggs you see. A healthy goat may still show a few eggs. If you have a high egg count, identify the type of egg so you know what deworming product to use. 🐐





# A Tail to Tell

## When your goat's tail could indicate a serious problem

BY LAURA KELLY

ONE OF MY FAVORITE SIGHTS on the farm is when I greet our herd every morning at breakfast. Their ears go up, their tails wag, and I swear that I can almost see them smiling! But sometimes their tails can tell us an entirely different story, and it's one that you really want to pay attention to.

Scours is a fancy name for goat diarrhea. Your goat's once-happy tail may now be coated in liquid fecal matter that ranges in color from pasty white to watery brown. Unfortunately common, scours may be brought on by a variety of stressors including transportation, sudden feed change, unsanitary living conditions, vaccinations, and more. One of the primary concerns with scours is dehydration, so quick treatment is key. Goat electrolytes and a call to your vet are in order if you suspect severe dehydration.

A fishtail braid might be a stylish way to put up your hair, but a fishtail on a goat is quite the opposite. Copper deficiencies in goats used to be predominantly an East Coast affliction, but is being seen more and more across the United States. Copper affects red blood cell formation, hair pigmentation, connective tissues, immune system function, the central nervous system, and even bone growth.

Signs of copper deficiency include anemia, dull and rough hair coat, diarrhea, weight loss, atrophied muscles, bleached coat color, and fishtail. Copper supplements are commonly found at feed stores and can be a great annual (or biannual) preventative if your herd isn't getting enough from their diet, but be careful if you also keep sheep in the herd or pasture because they cannot have added copper.

Discharge or blood on your pregnant doe's tail could mean imminent labor (thick, stringy mucus) or a sign of an aborted pregnancy (blood under the tail and/or on the upper part of the udder).

If you're expecting kids, these are signs that something big is going on and you need to take a closer look. If you think your doe is in labor, check for loose pelvic ligaments, look to see if she's "dropped," and pay attention to her behavior. She may be more vocal than normal, or she may want privacy. She may be restless, refuse to eat, or she may gorge herself up until delivery. (Our Toggenburg chewed her cud and ate hay in between pushes!) Unfortunately, if your doe has or is in the process of aborting her pregnancy, the symptoms will vary depending on the cause. Moldy hay, a well-placed head bump or kick to the belly by a herd mate, and infections like pinkeye,



Signs of copper deficiency include anemia, dull and rough hair coat, diarrhea, weight loss, atrophied muscles, bleached coat color, and fishtail.

salmonella, or toxoplasmosis, can all be causes of a lost pregnancy.

There are many types of parasites, both internal and external, that can use your goat's tail as their calling card. Coccidia, roundworms, and tapeworms will all wreak havoc on your goat from within, and mites, lice, and flies will do the same from the outside.

Coccidiosis is usually a result of overcrowded, wet and/or dirty pens, and unclean water. The coccidia parasite is transmitted via fecal to oral contact. Your goat may appear to scour (see above), but diarrhea will become chronic, watery, and filled with mucus and dark blood. Over-the-counter dewormers cannot prevent or cure coccidiosis. A fecal sample should be taken to confirm that it is indeed coccidia, and there are many antibiotics and other medications that may be available depending on your region and your vet's recommendation. Prevention is much easier than curing a coccidia outbreak; clean living quarters, fresh food, and clean water will go a long way toward keeping your herd free of this parasite.

Worms are a common affliction, particularly in pastured animals. Signs of worms include lethargy,

rough coat/tail, weight loss, poor or no appetite, diarrhea, and anemia. A fecal test will tell you which worm you are dealing with and will help determine the most effective treatment. Many over-the-counter dewormers are no longer effective in some areas due to overuse, so it is very important to research before you give treatment.

Chewing and sucking mites and lice can drive your goat beyond distraction, and can result in coat damage, skin lesions, flakey skin, anemia, exhaustion, and poor growth rates. Look for skin lesions and damage from scratching on face, flanks, and tail; specifics will vary on species as well as region. There are many preventative powders and sprays available, as well as other more natural preventatives as well as treatments.

Enterotoxemia is also known as "overeating disease." It's caused by two strains of bacteria called *Clostridium perfringens* that release a toxin as their population grows within the animal's intestines. That toxin causes damage to the intestines as well as other organs, and moves with deadly speed. Signs that your goat may be fighting off enterotoxemia include lethargy, stomach pain (your goat

may kick uncomfortably at their belly, repeatedly lay down and get back up, lay on its side and pant, or cry out in pain), and scours. In an advanced case, the animal may lose the ability to stand up, and will extend its legs out with its head and neck extended back towards its withers. At this point, death can occur within minutes or sometimes hours. Prevention is often more successful than treatment, and there is a vaccine available. It typically can be found in feed stores or with your vet; it is often combined with a tetanus vaccine and is commonly referred to as a three-way or CD&T vaccine.

As goat owners, we always want our goats to wag their tails because they are happy to see us (and their breakfast). Unfortunately, that's not always the case, and things like scours, worms, mites, lice, toxins, and even a lost pregnancy can be very detrimental to your herd's health and wellbeing. This is only a short list of stories your goat's tail might be telling you, so if you think something is off or that you recognize any of these signs, it's time to get into research mode and maybe even call your vet.

Happy tails! 🐐



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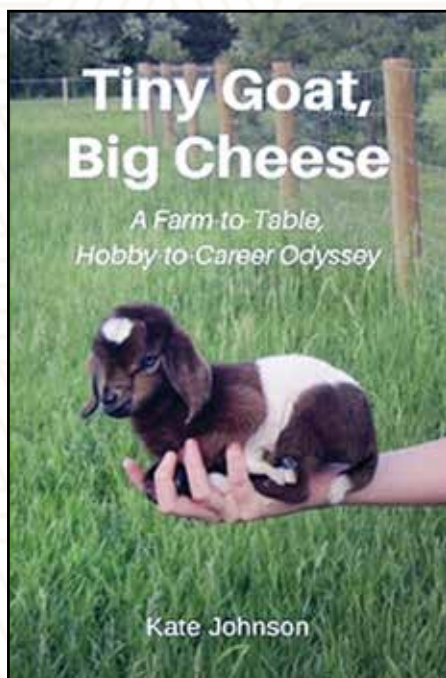
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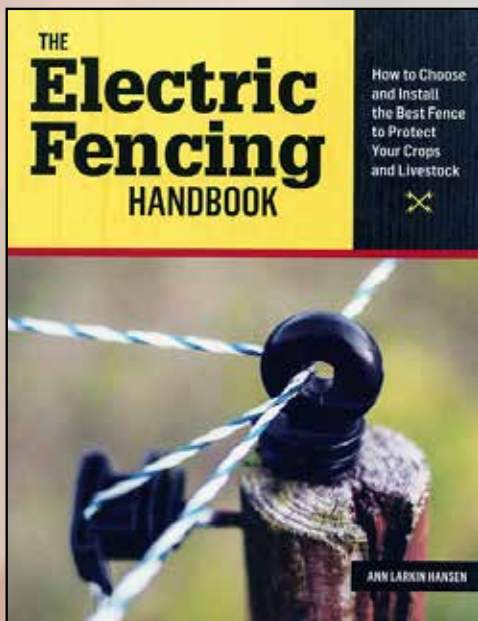
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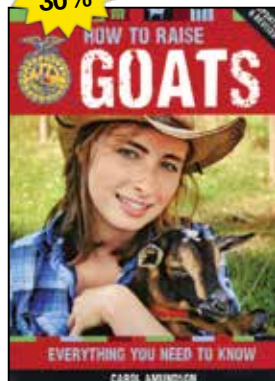


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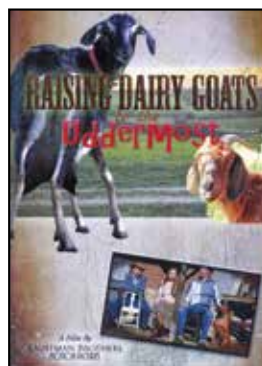
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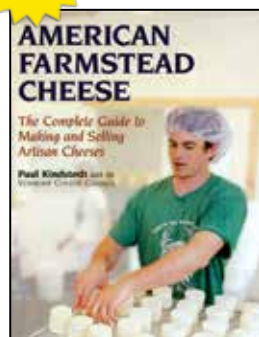
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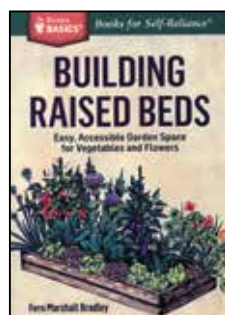
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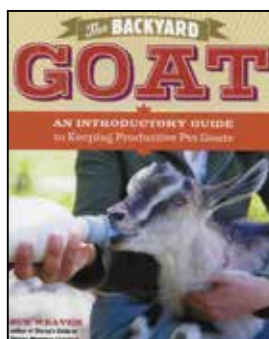
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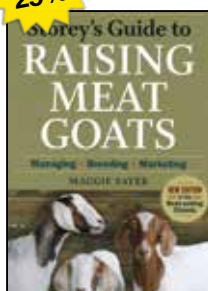
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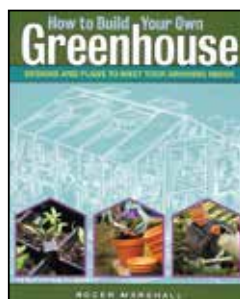
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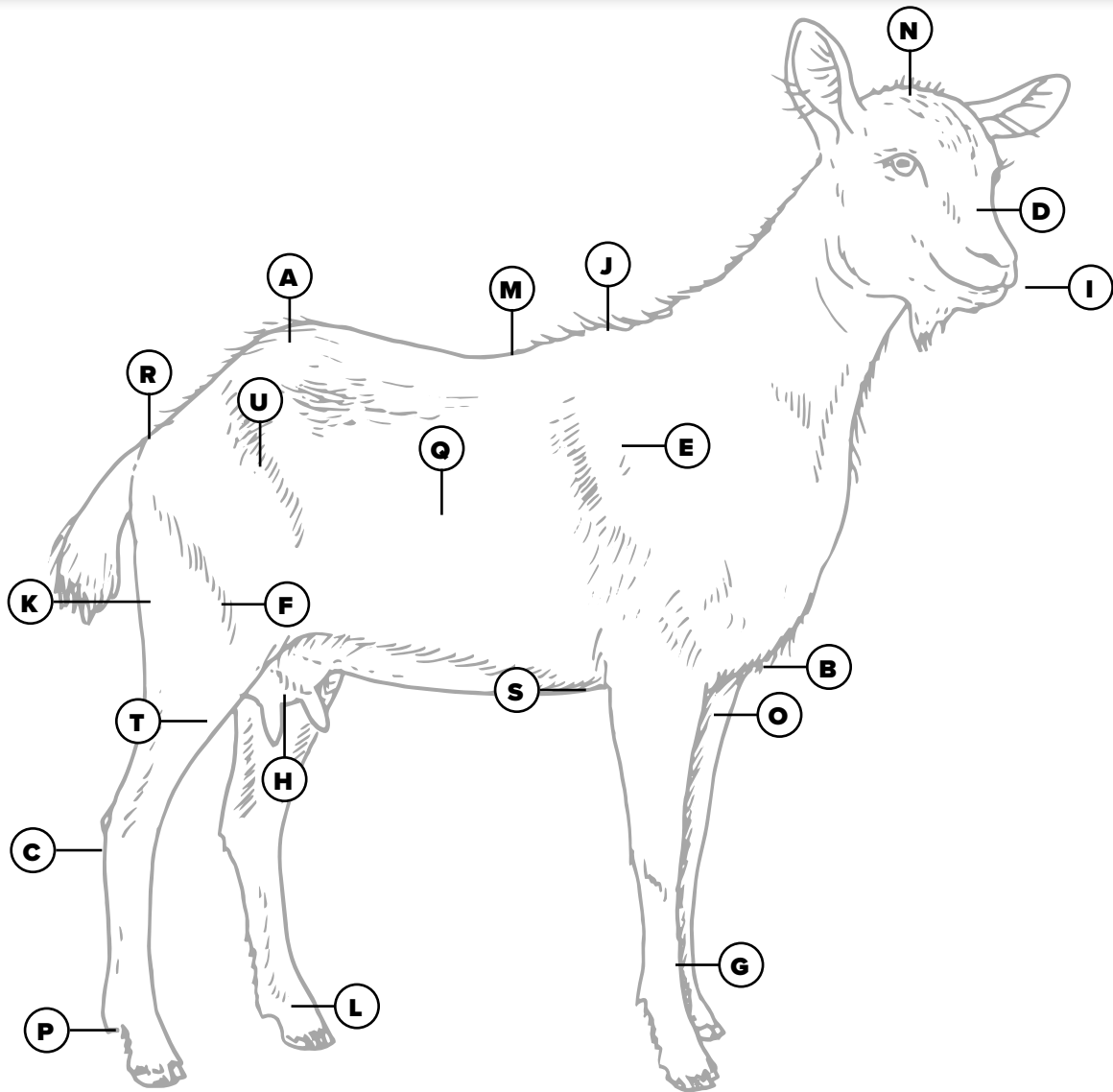
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