



Urinary Stones in Goats

By Jackie Nix

Urinary stones can be a problem in goats, especially in show and pet wethers, but also in intact bucks. Stones often lodge in the bend in the penis called the sigmoid flexure (See Figure 1), or at the small tip of the penis called the pizzle. The reason that wethers are especially at risk is that the urethra, the tube that empties the bladder, is usually smaller than in bucks. Does can get bladder stones also, but these usually pass easily through the short straight female urethra. It is important to note that presence of urinary stones is a “herd problem” rather than a problem with an individual when all are receiving the same ration.

Why Stones Form

The formation of urinary stones is a metabolic disease. Stones are ultimately caused by an improper diet. Diets with excess amounts of phosphorus and/or calcium cause most urinary stones. The “typical” case consists of show wether kids that have been castrated at an early age and fed a high-grain diet with nearly a 1:1 calcium to phosphorus ratio or a diet high in magnesium. But this scenario also comes up in intact males with alarming frequency. An ideal calcium-to-phosphorus ratio in a goat’s diet is 2:1 to 2.5:1. A diet that is unbalanced or too rich in some minerals can lead to urinary stone formation. Excess calcium leads to calcium carbonate or calcium oxalate stones, while excess phosphorous leads to struvite (magnesium ammonium phosphate) stones. High magnesium in the diet is also believed to contribute to urinary stones. Other dietary problems include eating forages high in oxalates or silicate (although much less frequent), which lead to oxalate or silicate stone formation. Inadequate water intake also contributes to stone formation.

Symptoms of Stones

Goats with urinary stones may show one or more of the following symptoms: abdominal discomfort, pawing, restlessness, looking or kicking at its abdomen, tail twitching, vocalization, or other signs of pain. He may strain to urinate, and may even prolapse his rectum in the process. This act is often confused with constipation. Advanced cases may exhibit drops of bloody urine, or crystals on the hairs around the prepuce (See Figure 1). If the urethra has ruptured, the abdomen may be swollen (water belly) and the goat will likely lose its appetite and become depressed.

Prevention

The key to prevention is a properly balanced diet. Avoid too much grain or commercial feed and alfalfa hay. This is not to say that these feedstuffs are “bad” or shouldn’t be

utilized at all. Under correct management, these feedstuffs can be effectively utilized to maximize production and maintain healthy animals. However, as with all things, you need to know what you are doing in order to avoid problems. Grains and some commercial feeds are high in phosphorus relative to calcium, thus upsetting the optimum calcium to phosphorus ratio discussed above. Alfalfa hay is high in calcium and magnesium, which can also upset the balance.

Those who choose to feed alfalfa, grains or commercial feeds to goats, should “balance” the ration to determine the levels of nutrients that the goats are receiving and make any necessary adjustments to avoid complications such as urinary stones, rumen acidosis, over-eating disease and others. Consult a nutritionist to properly balance the ration if you do not know how to perform this yourself. A mineral imbalance not only causes urinary stones, but also interferes with the absorption and utilization of other minerals and vitamins and can cause functional deficiencies in the goat, therefore reducing overall health and productivity.

Novice goat owners who have not had their ration “balanced” should limit the amount of grain, commercial feed and alfalfa hay fed to avoid problems. As a rough rule of thumb, a 100-lb. goat should receive a maximum of 1 to 1.5 lbs of grain or commercial feed per day. Please note that feed should be actually weighed at least once to get a good estimate on proper portions (don’t rely on fluid ounce readings on measuring cups since solids have different densities than liquids. Also, don’t rely on the listed weight on a coffee can since feeds and coffee have different densities.). Additionally, try to utilize grass hay or grass-mix hay for males rather than alfalfa hay or other legume hays. Feed grains or commercial feeds twice a day (about 0.5 to 0.75 lb. of feed per head per feeding) and allow grazing in between feedings. Also, it is key to always provide plenty of clean, fresh water. Check water tubs often to check for fecal contamination, debris, freezing (in winter) or any other factor that would reduce water intake.

Mineral supplements can (and should) be used to balance mild mineral imbalances or to help prevent imbalances from occurring in the first place. For grass or grain-based diets it is important to provide a complete mineral supplement with more calcium than phosphorus. A 2:1 calcium to phosphorus ratio is preferable in many cases. Sweetlix offers several supplements with this 2:1 ratio, such as the **16:8 Meat Maker™ Goat Mineral**, **16:8 Meat Maker™ with Rumensin®**, **Meat Maker™ Roughage Balancer Tub** or the **Meat Maker™ 20% Pressed Block**. For legume-based diets (such as alfalfa), Sweetlix® offers the **Caprine Magnum-Milk mineral** that has a 1:1 calcium to phosphorus ratio to help offset the higher calcium levels in alfalfa.

Treatment

Most cases of urinary stones require veterinary assistance. If you suspect urinary stones, contact a veterinarian as soon as possible to avoid costly complications. If urinary output is totally blocked, the prognosis is not good, even with surgery. In these cases euthanasia is often recommended. Many goat producers use a chemical additive (ammonium chloride or potassium chloride) to help acidify the urine. These additives make the crystallized stones more soluble so that the goat may be more likely to urinate them out.

This treatment is preferable for early intervention of a case of urinary stones (while the goat is still urinating readily). ***However, these additives will do nothing to remedy the underlying mineral imbalance in the goat's diet that caused the stones in the first place. Be sure to make adjustments to the diet to correct imbalances to properly "treat" urinary stones for the long run.***

In conclusion, urinary stones can be a problem in goats. Male goats are most likely to exhibit disease symptoms; however, females form urinary stones too. Urinary stones are caused by mineral imbalances in the diet. Improper feeding is a primary cause for urinary stones. Goat owners should have an understanding of the overall calcium to phosphorus ratio in their goats' ration. Mineral supplements should be used to prevent mineral imbalances or correct slight imbalances. Sweetlix[®] offers several quality supplement products that will not only help prevent urinary stones by providing the correct balance of calcium and phosphorus, but also provide the necessary vitamins and minerals needed by goats to allow them to perform up to their genetic potential. Please visit the Sweetlix[®] website at www.sweetlix.com to learn more about these supplement products.

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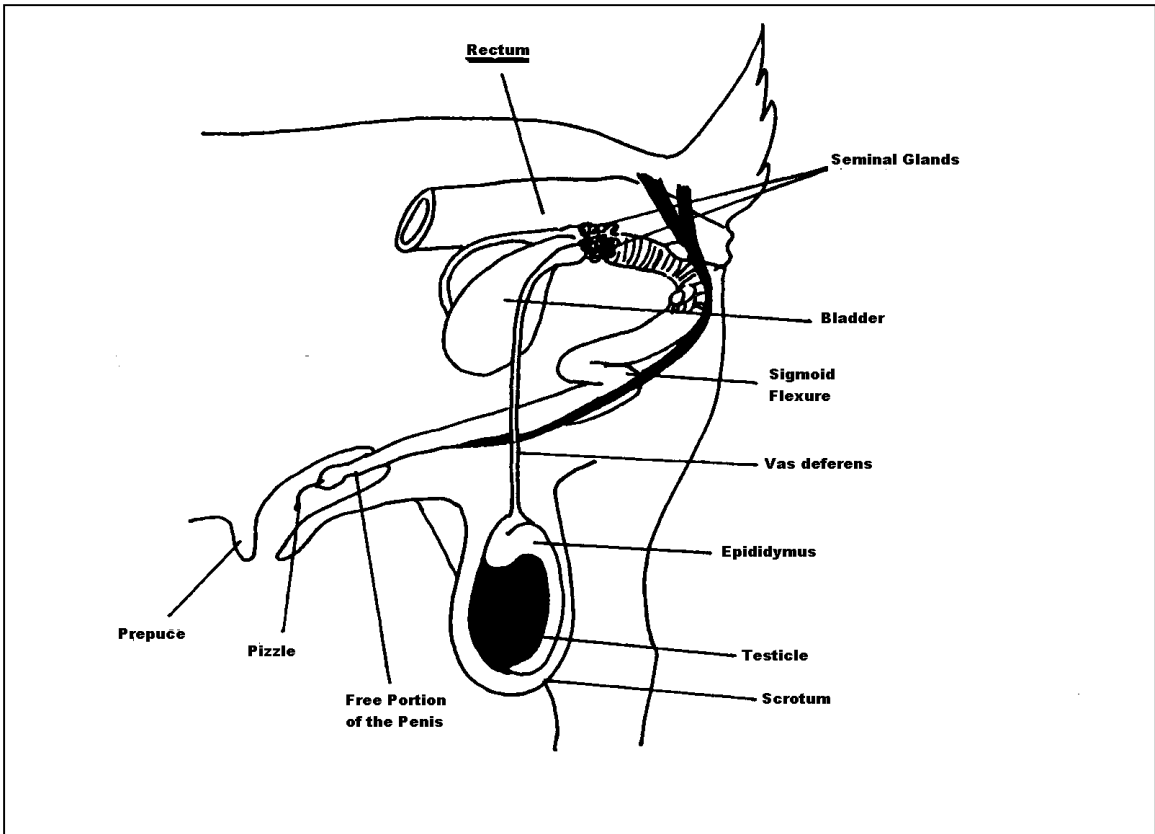


Figure 1. A diagram of the physiology of a male goat.

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