

Cattle Producer's Handbook

Animal Health Section

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Urinary Calculi in Beef Cattle

Bill Kvasnicka, Extension Veterinarian
University of Nevada

Urinary calculi are sometimes a problem in feedlot and range steers, and less often in intact males. Calculi are hard aggregations of mineral salts and tissue cells that form either in the kidney or the bladder. They may produce a mechanical irritation and a chronic bladder inflammation. A more serious complication results when they lodge in the urethra and partially or completely block the flow of urine (Fig. 1).

Symptoms

Affected animals evidence colicky pain such as licking at the belly, treading with the hind feet, and switching the tail. Attempts to urinate are frequent with straining and grating the teeth. Urine passage is scanty, often blood-tinged, and sometimes totally absent. When the obstruction is complete, the urethra or bladder will rupture. Rupture of the urethra results in diffusion of urine under the skin of the belly, extending toward the chest. Rupture of the bladder brings relief from the pain, but urine accumulates in the abdomen, causing toxemia and death in about 48 hours. The gathering of urine under the skin or in the abdominal cavity is referred to as *water belly*.

How the Disease Develops

The factors cited in development of the disease differ for feedlot animals and range animals.

In feedlot cattle, the diet high in grains causes an increase in mucoproteins in the urine. The grain diet increases the phosphorus intake. The high levels of phosphorus and mucoproteins, in an alkaline pH urine, result in phosphate stones being formed. These stones are usually soft and mushy in character.

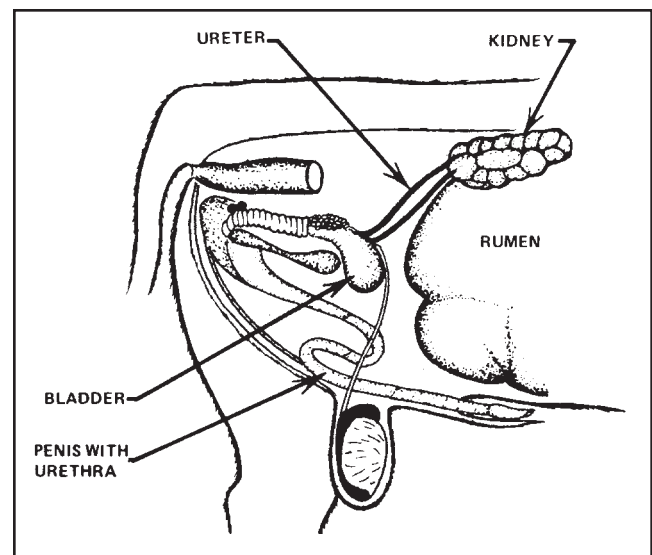


Fig. 1. Anatomy of the urinary tract.

In rangeland animals, calculi results from ingestion of high levels of silicates, from siliceous plants, and water high in silicates. Silicate stones have a tendency to form in the presence of normal amounts of mucoproteins. An acid pH favors the formation of these calculi. The result is a hard, stony calculus.

Additional factors that favor formation of stones include concentrated urine that forms after water deprivation. Urine concentration is also increased by consumption of excessive minerals, particularly phosphates. Vitamin A deficiency, and the increased administration of growth stimulants such as estrogens, have been reported to increase the incidence of water belly. The newer implants in use today are void of estrogens and are not related to an increased incidence of the problem.

Treatment and Control

Routine observation of cattle is necessary to detect the earlier signs of disease. If the disease is detected early, salvage by slaughter may be the most cost effective method of handling water belly. If slaughter is not feasible, then it may be of value to use urinary tract relaxants that aid in keeping the urethra open and allow the passage of the mineral deposits. Acidification of the urine with ammonium chloride will help dissolve the phosphate stones that occur in feedlot cattle.

Surgery is the surest cure if used soon after the problem is first discovered. Animals that have been surgically corrected are marketable after a period of time to eliminate tissue residues of urine and medications. These treatments may be attempted, but the prognosis is poor.

Providing a ration with 2:1 calcium:phosphorus ratio will reduce the incidence of calculi formation in feeder animals. Adding 1 to 4 percent salt in the ration has proved beneficial, and 2 percent ammonium chloride can be added. A well-balanced diet that includes adequate vitamin A along with an ample supply of warm palatable water is suggested.

Range pastures should be checked for silicates and oxalates. Pastures where these are high should only be grazed by the cow herd. The more susceptible male population should have only limited access. Supplies of salt and water should also be adequate.



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Fourth edition; December 2016 Reprint