

Urolithiasis in Small Ruminants

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Urinary calculi result from mineral deposits in the urinary tract and are associated with dietary intake of excessive calcium, phosphorus, magnesium, oxalates and/or silicates. The feeding of diets with high concentrations of cereal grains (feedlot lambs, pet goats, etc) may predispose to this condition. This disease is usually of nutritional or metabolic origin, as affected animals excrete an alkaline urine that has a high phosphorus content. The incidence of struvite calculi can be reduced by lowering phosphorus consumption to minimal levels (reducing both cereal grains and pelleted feeds); maintaining a calcium to phosphorus ratio of $\geq 2:1$; and reducing the intake of sweet or molasses coated feeds. In sheep and goats living on range conditions, this disease may be associated with consumption of forages having a high silica content. Signs include difficult and painful or slow urination, straining and kicking

at the belly and the area of the penis. Blockage of the flow of urine generally occurs only in intact or castrated male sheep and goats. The blockage may result in rupture of the urinary bladder or urethra, with resulting peritonitis and/or death. Feeding anionic salts such as ammonium chloride (0.5% of the complete diet), dietary tetracycline, adequate vitamin A (or beta carotene) intake, and increased dietary intake of NaCl ($\leq 4\%$ of grain supplement) may also prove beneficial. Affected animals drenched with ammonium chloride (7-14 g/day for 3-5 days) may show a good response. Fresh, clean water should be fed free choice at a rate of approximately one gallon of water per day for ewes on dry feed in winter, one gallon per day for ewes nursing lambs, and one gallon per day for finishing lambs. In many range areas, water is the limiting nutrient, and may predispose if large quantities of cereal grains are supplemented.