

# Urinary Calculi in Goats

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<http://www.uky.edu/Ag/AnimalSciences/goats/goat.html>

# Urinary Calculi in Goats

## What is it?

- Urinary calculi, or Urolithiasis, water belly, and stones
- Urinary calculi is a common metabolic disease of male goats.
- The disease occurs when the calculi “stones” usually comprised of phosphate salts, lodge in the urinary tract and prevent normal urination.

# Urinary Calculi in Goats

## What is it?

- When goats are fed forage based diets phosphorus is recycled through the saliva and excreted via feces
- High grain-low roughage diets decrease the formation of saliva and increase the amount of phosphorus in urine

# Urinary Calculi in Goats

## What is it?

- The primary causes of urinary calculi is feeding concentrate diets which are excessive in phosphorus and magnesium
- These feeds have an imbalance in Ca:P ration
- Lack of water
- Water source is high in minerals

# Urinary Calculi in Goats

## Who is at risk?

**Wethers are most at risk.**

**Occurrence**

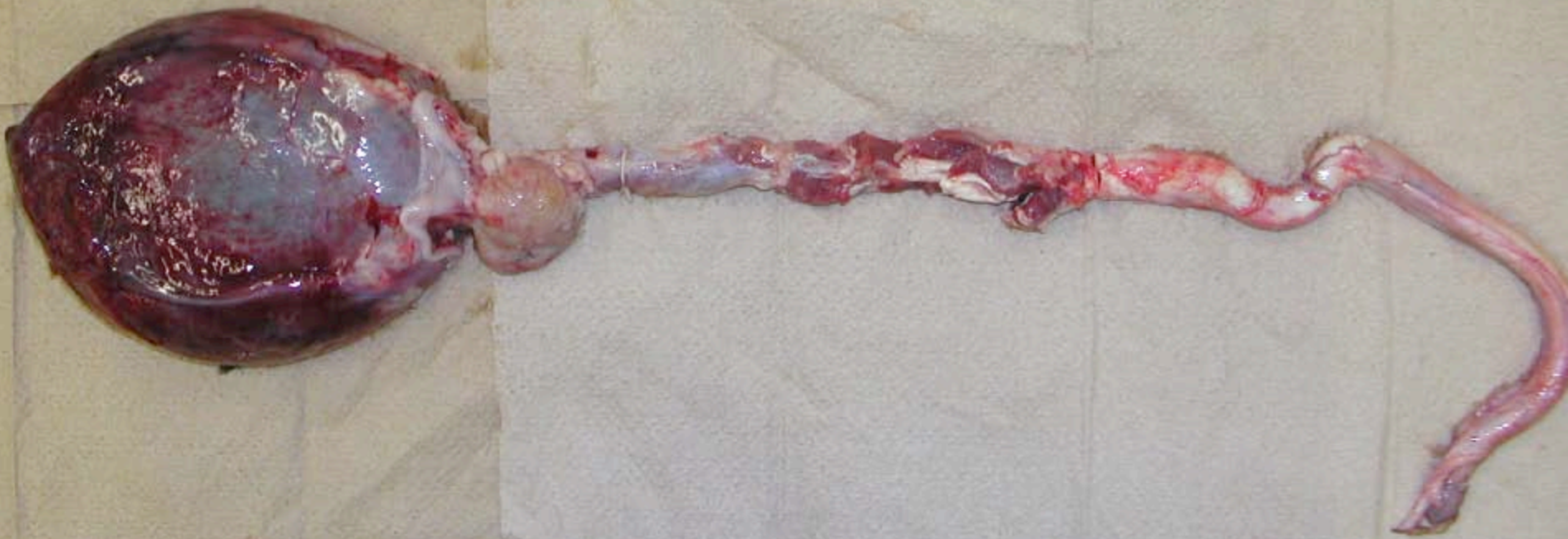


- Urinary calculi occur in intact males
- Castrates are most venerable
  - Castration of your males removes hormonal influence (testosterone) necessary for penis and urethra to development to full size.
- Goats banding from day 1-30 are most at risk.
- Calculi form in females but are excreted (flush out readily)
- Genetic predisposition
- What is your reason for castrating?

# Urinary Calculi in Goats

## What are the symptoms?

- Increased vocalization and tail twitching
- Loss of appetite with restlessness and anxiety
- Abdominal pain, urine dribbling, distention and rupture of the urethra
- May have humped-up appearance and belly edema
- Kicking at the belly and straining to urinate
- Dribbling, bloody urine
- Death when bladder bursts and urine fills the peritoneal cavity and urine is absorbed into the blood stream



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# Urinary Calculi in Goats

## How do you treat it?

- Treatment depends on location of the obstruction.
- Simple case :
  - Snip off the urethral process to allow calculi at end of penis to dislodge.
- Complex case :
  - Tranquilizers may help relax the muscles of the urethra causing calculi to expel
  - Pass a catheter in to the urethra to infuse with sterile saline solution
  - Surgical intervention may be necessary to save valuable animals.
  - Consult with your veterinarian

# Urinary Calculi in Goats

## How do you Prevent It?

- It is better to prevent urinary calculi than to treat.
- **Top of the list: do not feed a high percentage of the daily ration as a grain concentrates**
- Feed rations which contain a calcium to phosphorus ratio of at least 2:1 (up to 4:1) and never below 1:1
- High calcium diets are effective at reducing the absorption of phosphorus from the GI tract.



# Urinary Calculi in Goats

## How do you Prevent It?

- Neither magnesium or phosphorus should be added to the concentrate diets.
- Diets should contain adequate amounts of vitamins (A, C)
- Once the ration is balanced don't add to it, dilute with corn, horse feed.

# Urinary Calculi in Goats

## How do you Prevent It?

- Calcium Sources:
- Addition of calcium is well tolerated:
  - Calcium carbonate (not dicalcium phosphate)
  - Legume hays are excellent sources: alfalfa, clover, lespedeza
  - Soybean hulls as a fiber and energy source (2:1, Ca:P ratio)
- Roughage will increase salivation and rumination resulting in greater phosphorus excreted in the urine.

# Urinary Calculi in Goats

## How do you Prevent It?

- Excessive Phosphorus:
- Cereal grains, corn, barley, wheat
- By-product feeds, distillers dried grains with solubles, corn gluten pellets
- All contain a low Ca:P ratio 1:4-1:6

# Urinary Calculi in Goats

## How do you Prevent It?

- Water intake:
- Adequate water intake is necessary to prevent urinary calculi
- Inadequate water intakes causes the urine to be more concentrated
- Adding 4% salt to the ration will help increase water intake



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# Urinary Calculi in Goats

## How do you Prevent It?

- Feed additives for reducing urine pH
- 10 g ammonium chloride/hd/day or
  - 20% of the concentrate ration or
  - 40 lbs/ton of concentrate
- Ammonium sulfate at 0.6%-0.7% of the total ration
  - 100 lb goat 15g/hd/day
- Bio-Chlor feed 4 oz/hd/day

# Conclusions

- Urinary calculi is a metabolic disorder of male goats and is caused by feed excessive amounts of phosphorus rich grains or by-product feeds
- The total ration should be balanced and should not exceed a calcium phosphorus ration of 2:1
- Roughages should be an integral part of all rations
- Use feed additives to reduce urine pH