

# Bladder stones (obstructive urolithiasis) in cattle

## Introduction

Uroliths, also known as bladder stones, are concretions that form when mineral salts precipitate or crystalize out of urine. If they are large enough, uroliths may block the normal drainage of urine from the kidney to the bladder, or from the bladder to the penis. This prevents the animal from passing urine, and causes a condition called obstructive urolithiasis.

In cattle, most reported cases occur in steers. Bulls and female cattle can also produce stones, but because their urethras are shorter and wider, they can usually pass the stones in the urine making obstructions less common.

The condition can cause significant economic loss. Obstruction caused by uroliths may lead to rupture of the bladder or the urethra (the tube that drains the bladder through the penis). Affected animals may die or require humane destruction. Death may also result from the accumulation of toxic waste products that usually pass out of the body in urine.

## Cause

The condition is more frequent in feedlot situations than in pastured cattle. There is a direct relationship between the mineral composition of uroliths and diet. Predisposing factors include:

- high mineral intake from bore water or high concentrate diets
- consumption of plants containing high levels of oxalate, oestrogens or silica
- diets high in magnesium
- pelleted rations containing a high percentage of concentrate and low roughage
- animals that are relatively water-deprived for extended periods due to insufficient water availability, poor quality water or very hot living conditions, resulting in highly concentrated urine.

## Signs and symptoms

### Partial obstruction

Animals may be off food, uncomfortable, stretching and straining to urinate, but may either dribble urine or only pass small amounts of urine.

### Total obstruction

Symptoms similar to partial obstruction but with increasing pain. Animals may strain to urinate but are unable to produce any urine. They may be stretched out or go down.

## Rupture of the urethra

The animal may appear more comfortable initially, but will soon develop swelling under the skin around the sheath and/or under the tail. The animal will gradually deteriorate over the next few days. Animals in this state should be humanely destroyed.

## Rupture of the bladder ('water belly')

These animals will also appear more comfortable when the bladder ruptures, as the pressure of the full bladder is relieved. However, as the abdomen fills with urine, the belly will start to swell. The animal will become depressed and weak, and will usually collapse and die within a day.

Obstructions that are not relieved will usually lead to rupture of the urethra or bladder within 48 hours.

## Diagnosis

A presumptive diagnosis is made on history and physical examination. Post-mortem examination often leads to definitive diagnosis, when uroliths obstructing the ureters (the tubes between the kidney and the bladder) or the urethra in the penis are identified. Additional stones may be found in the bladder, or may be free-floating in the abdomen if the bladder has ruptured.

A veterinary laboratory will determine the chemical composition of a urolith. Knowing the proportions of minerals in a urolith is essential to determine options for treatment and prevention of further cases. If urolithiasis is diagnosed in one animal in a herd, all animals in that mob are at risk. Dietary management to prevent more cases is essential.

## Treatment

Surgical removal of uroliths may be considered in valuable animals. Most affected cattle are humanely destroyed.

## Prevention

- Ensure the calcium:phosphorus ratio in the diet is balanced between 1.5:1 to 2:1.
- Increase water intake of vulnerable herds by adding salt to the ration. For a 300kg steer, 200g/day of salt will significantly reduce urolith formation and 300g/day will eliminate some types of urolith. Ensure that available water is fresh and not brackish to prevent salt toxicity.
- Ensure adequate intake of vitamin A, especially in drought and in feedlot steers fed on concentrates.

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