

Urinary Calculi: Treatment Analysis, Myths, and Tips
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DISCLAIMER: These are simply thoughts, notes, and ideas on Urinary Calculi. None of these "treatment" options are guaranteed to work in ANY way. I am not a veterinary professional, so please consult a vet. As this is simply an analysis of treatments, I have not included dosages for the alternative treatments mentioned.

There are two main causes for Urinary Stones we see in male goats. The first is caused by too much phosphorus, often the overfeeding of grain. These stones are called **magnesium ammonium phosphate stones**, or in humans, struvite stones. The second, and less common cause, are calcium stones, which are often due to hard well water or the overfeeding of alfalfa, these are called **calcium oxalate stones**.

While both of these result in Urinary Calculi, the treatment path differs between the two. If we can know the cause of each case of Urinary Calculi, we can gear treatments better—and we may even be able to have more successful prognoses for these situations.

I saw Urinary Calculi as a dilemma for goat owners due to (1) frequent poor prognoses; (2) limited treatment options—including self-treatments or holistic treatments; and (3) limited studies and knowledge of the issue.

My goal was to take a closer look at the specific causes for UC, to research the current treatment options available, and to consider new options for treatment of this awful issue affecting goats of all different breeds and purposes.

I will also be discussing a few known alternative treatments for UC:

- Home Remedy by Hoegger Farmyard

- Fruit Fresh

- Apple Cider Vinegar

**And I will discuss newer alternatives as well.

“Phosphorus-caused” stones:

Most cases of UC are due to an imbalance (too much) of phosphorus. Current mainstream treatment for these stones (and all stones) is the administration of **ammonium chloride**. Ammonium chloride is an **acidifying agent**, which is what is needed to treat this type of UC.

Options that MAY work for alternative treatments to ACIDIFY urine and dissolve these stones include:

- Cranberry Juice
- Vitamin C (ascorbic acid)
- Vinegar (NOT apple cider vinegar)
- Prune Juice (Caution—high amounts may have laxative effect)

All of these are acidifying agents.

WHY APPLE CIDER VINEGAR WON'T WORK FOR “PHOSPHORUS-CAUSED STONES”

Unlike most other vinegars, apple cider vinegar results in an alkalizing effect, therefore it will not acidify urine in cases of magnesium ammonium phosphate stones.

ON VITAMIN C:

Vitamin C, a.k.a., ascorbic acid, has been shown to have an acidifying effect on urine pH. A similar acid, citric acid, DOES NOT have the same effect. Both of these acids can be

found in lemon juice. Thus, lemon juice is often included in alternative treatment options. Citric acid is metabolized by bicarbonate in the body, and, unfortunately, once metabolized, it will not likely acidify the urine. Lemon juice is highly acidic due to the citric acid—however, as said above, once lemon juice is metabolized in the body, it will actually have an ALKALIZING effect. It is for this reason, that lemon juice should not be used to treat “phosphorus-caused” stones.

While straight Vitamin C is best, a product called **Fruit Fresh** (a powder used for canning fruit) has reportedly been used in alternative UC treatments. This contains both ascorbic acid and citric acid. The ascorbic acid in Fruit Fresh is likely why this product may be helpful. While I mentioned previously that citric acid from lemon juice may not aid in treatments for UC, it seems, based on my research, that the citric acid in Fruit Fresh shouldn't have any negative effects on your treatment, either. Lemon juice as a source of acidity was deemed ineffective, due to the metabolism of citric acid, and the alkaline byproducts of lemon juice. Fruit Fresh, due to the ascorbic acid in it, may be a suitable alternative treatment. However, straight Vitamin C would be preferred.

A NOTE ON BAKING SODA:

As said above, citric acid is metabolized by bicarbonate in the body. While goats produce natural bicarbonate, adding extra bicarbonate through baking soda may increase the metabolization of citric acid. Citric acid aside, baking soda has an alkalizing effect on the body. For this reason, baking soda should never be offered free choice to male goats - and if it is needed for a case of bloat, use it only for short periods of time.

WHY HOEGGER FARMYARD'S RECIPE MAY NOT WORK FOR “PHOSPHORUS CAUSED STONES”

www.hoeggerfarmyard.com has included a “home recipe” for UC in goats in one of their informative blog posts.

The recipe from Hogger is as follows:

½ red onion

Juice from 3 lemons

6 garlic pods

¼ cup vinegar

As stated above, lemon juice may do more harm than good for treating this particular kind of stone. We will discuss onion later on, however, I have also come to the conclusion, based on my research, that there are no obvious acidifying effects from the onion in this recipe. The vinegar is the acidifying agent in this situation. It would be beneficial to use vinegar without these other ingredients.

“Calcium-caused” stones:

These stones are tricky, and there have been many misconceptions regarding them. Calcium oxalate stones will appear in urine whether it is acidic or alkaline; it is purely dietary with no relation to pH. Treatment for these stones is much more difficult.

Options may include:

- Vitamin C (not for acidifying purposes, but to prevent the union of calcium and oxalate, which would form new stones)
- Vinegar (apple cider vinegar is okay in this situation, because we want the acetic acids and other acids, not the pH effect)
- Vitamin B6
- Magnesium (magnesium citrate)

Vitamin C may prevent the union of calcium and oxalates in the body. In doing so, it will prevent more stones from forming and/or combining to make larger stones.

Vinegar contains acetic and phosphoric acids. While again, we are not looking for an acidifying effect, these acids in particular may increase the amount of moisture urinary stones are able to absorb, therefore softening them and allowing them to break down easier. Vinegar also contains citrate, which binds urinary calcium and oxalate crystals to prevent formation and growth.

Vitamin B6 also helps with calcium oxalate stones. Onions are high in B6, however, complete B Complex supplements may be useful in treatment for calcium oxalate stones.

Magnesium, similar to B6, may be one of the most important (and under-studied) factors in calcium oxalate stone treatment. Magnesium has the ability to keep calcium in “solution.” It prevents calcium from crystallizing. Magnesium citrate (a supplement for humans) is a well-absorbed form of magnesium that may be useful to dissolve calcium oxalate stones.

The Hoegger Farmyard Home Remedy MAY WORK for “Calcium-caused” stones:

½ red onion

Juice from 3 lemons

6 garlic pods

¼ cup vinegar

While I feel that this may not be a successful treatment in cases of “phosphorus-caused” stones, as explained previously, it would certainly be something you could try along with other treatment measures for calcium oxalate stones. And while I recommend against lemon due to it increasing urine pH, in calcium oxalate stones pH is not relevant and lemon juice may have some added citrates (but vinegar alone is good enough) to help.

AMMONIUM CHLORIDE:

Ammonium chloride is an acidifying agent, so if you have calcium oxalate stones, this may not be a successful treatment.

CHANCA PIEDRA: STONE BREAKER HERB

Chanca Piedra is an herb known to treat stones in humans. I have had inquiry on whether or not this would work for goats. I have come to the conclusion based on my research of how this is used in humans, that this may be beneficial in cases of CALCIUM OXALATE stones, but may do more harm than good for magnesium ammonium phosphate stones.

Chanca Piedra is commonly used for uric acid stones in humans. These stones are actually caused by overly-acidic urine. Chanca Piedra actually causes urine to be more **alkaline**. DO NOT use this in cases of "phosphorus-caused" stones.

Because calcium oxalate stones will survive in acidic or alkaline environments, Chanca Piedra appears to pose no immediate dangers in its method of altering urine pH in the treatment of these stones. Chanca Piedra does not reportedly dissolve calcium oxalate stones. However, the herb is an anti-inflammatory agent, which may help stones pass easier. So, in cases of calcium oxalate stones, Chanca Piedra may aid in the passing of stones through the urethra, but it does not seem to have many other benefits - and it may not be the first choice for resolving stones.

The takeaway:

Know what type of stone you are treating. While “phosphorus-caused” stones rely on acidifying agents, “calcium-caused” stones rely on calcium oxalate binding agents. I believe that the misunderstandings regarding the treatments for specific types of UC may partially be why treatment is not highly successful.

BUT WHAT ABOUT PREVENTION TECHNIQUES?

Preventing “phosphorus-caused” UC:

Ammonium chloride, a well known UC preventative, should be very effective in preventing this type of UC.

However, the common recommendation of adding apple cider vinegar to water will likely do more harm than good if you feed large amounts of grain/phosphorus. It has an alkalizing effect on urine pH, despite common beliefs.

Preventing “calcium-caused” UC:

In the case of a diet too high in calcium (hard well water, high alfalfa consumption), apple cider vinegar as an addition to water may prove helpful. As you recall from above, the pH does not matter, it is the acetic acid, phosphoric acid, and citrate that dissolve and prevent calcium-oxalate stones.

Providing suitable dietary magnesium to balance high calcium may, in fact, be one of the best preventative methods for calcium oxalate stones in goats.

Please do not hesitate to contact a vet in a case of Urinary Calculi. These home remedies are not guaranteed to work, and to my knowledge, most have not been tested adequately on goats.

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