

## Purines, Uric Acid, and Stones... Oh My!



Do bad things really come in threes? Maybe... at least that is what I found out in researching this article. While purines are not totally evil to Dalmatians, after all they are necessary to the body, they are part of the overall problem that stone forming Dalmatians have. We need to look at several things in order to fully understand the problem of 'Dalmatian Stone Disease' in our beloved breed.

What are purines, why are they necessary, and why should we limit their intake if they are needed for good overall health? Without getting all scientific on you, Purines are natural substances found in all of the body's cells and in virtually all foods. The reason for their widespread occurrence is simple... they are part of the basic building blocks of DNA and RNA.

Vital for sustaining life, their role is so extremely important that the body cannot survive without them. The problem comes with the manner in which the body metabolizes (processes) the purines.

Humans, Dalmatians and Apes... oh my! Yes, we are all three common in that we have a little bit of difficulty in metabolizing the purines that we consume. So more so than others... namely our Dals. Do all Dalmatians become 'stone formers'? No. Actually it is believed that the stone forming Dalmatian is in the minority. But Dalmatians are genetically predisposed to becoming stone formers. Lets look at that for a moment to help better understand why restricting purines in your Dalmatian's diet is important. As purines are completely processed by the body, they break down into uric acid. And this is where the problems for Dals begin. Dalmatians, according to an extensive amount of scientific study, have three main issues that prevent them from properly handling and expelling uric acid:

1. Liver function – their livers don't completely metabolize purine-yielding proteins which results in excess uric acid production.
2. Kidney function – their kidneys don't fully excrete or absorb the increased uric acid and;
3. Bladder function – their bladders can't always keep the uric acid in solution, thus crystals and stones begin to form in the bladder.

Because Dalmatians have problems handling increased uric acid, the amount of dietary purines must be limited to help control the production of uric acid in the bladder. So what foods contain purines and at what level? There are several charts and informational sources online and in printed material; it really depends on which one you look at as to whether some foods contain high, moderate or low levels. But one thing is common amongst these sources. Beef is high in purines, as are game meats (deer, elk, duck, geese, etc.) and organ meats (liver, kidney, brains, etc.). So we always recommend alternate protein sources for feeding. Mainly, dog foods with primary protein sources which are from chicken and turkey. But meats are not the only foods with purines. So you have to be familiar with the dangerous foods and look for them on the labels of your preferred brand of dog food to make sure they aren't adding a lot of purines.

Many people allow their dogs to 'share' in one way or another some 'people food'. Whether that is by scraps from the dinner food or foods intentionally added to their dog food as a dietary supplement or as a special treat. Knowing what foods are high, moderate and low in purines will help to ensure that you are not adding to the problem by treating your Dalmatian to high purine foods. This link will take you to a purine table where you can switch between an alphabetical food listing or listing by purine level: <http://www.britishdalmatianclub.org.uk/downloads/Purine%20Table%202003.htm>

So now we know what purines are and we know that we have to limit their intake. But how do we know if, even through all our vigilance, our Dalmatian is developing stones? The best way is to have the urine tested. A standard urinalysis, a relatively inexpensive test that can be done at your vet's office, can generally show if abnormal crystals are developing long before they become stones (where numerous crystals 'join' and become larger). It can also show if there is abnormal acidity versus alkalinity in the urine. Without testing and early intervention, the problem can advance to the formation of larger crystals and stones that can form blockages. Any dog displaying symptoms of urinary blockage **MUST** be taken to the vet immediately because a urinary blockage can be fatal in a very short time. Things you can look for in your Dalmatian's urinary behavior that can indicate a potential blockage are:

- Bloody urine
- Gritty or 'sand-like' material in the urine
- Straining to urinate
- Repetitive attempts to urinate with little or no results
- In females, signs could be excessive urination, 'accidents' in the house by housebroken dogs and frequent licking of the genital area

This is where the pet parent will likely be the first one to notice something is amiss. It is much easier to tell if a male is forming stones than a female. This is because of the differences in their gender's normal urinary anatomy. The male

passes urine through a dam-like narrowing of cartilage called the 'os penis.' As a large enough crystal or stone is carried through this passageway it can become lodged and create a very deadly blockage. The same size crystal or stone may very well pass through a female since their anatomy is different and the opening is larger. Possibly it is this difference that results in more males being clinically diagnosed as stone formers than females... because the females can pass a larger stone than a male. So, in review, you can have a female stone former and not realize it... urinalysis testing is important for all Dalmatians, but especially so for females as they can pass stones unnoticed.

Now we know what to look for. What can we, as responsible owners, do to prevent "Dalmatian Stone Disease"? As mentioned previously, urinalysis testing at the vet at least at every physical exam. It is best for you to collect the sample in a clean, chemically inert container such as a glass jar. It is best to take the sample when your Dalmatian urinates the first time in the morning, after the urine has sat in the un-emptied bladder overnight. This 'fasting sample' is best as the urine is most concentrated and any crystal formations will not have been expelled yet. **DO NOT** refrigerate the sample; let your vet know ahead of time that you're bringing it in and **TELL** them **NOT** to refrigerate the sample; and to please read it promptly. Get it to your vet as soon after collection as is practical.

You can also purchase 'dip strips' for home testing, at many drug and pet stores, to monitor acidity levels. The strips are easy to use. Simply hold the strip in the urine stream and then compare the resulting color change to the chart to determine the pH level of the urine. The normal pH range is 6.5 to 7.0, with the ideal pH level being 7.0. Several testing results of low pH can be indicative of high uric acid levels which lend to production of crystals and stones. Several testing results of high pH can be indicative of urinary infection. Both these conditions require attention to prevent complications.

Crystals and stones form a lot faster in Dalmatians that do not urinate frequently. Ensure that your Dalmatian is taking in enough water. The more water they drink, the more they urinate, the less likely they are to form stones. One way to help ensure they are getting plenty of water is to 'float' their food by adding enough water to the dry food so that it floats in the bowl. No need to soak it, just add water and serve. So make sure your dog is allowed access to the outdoors to relieve itself frequently, at least once every four to five hours. Dalmatian Rescue of Colorado always recommends the use of dog doors to allow the dog access to the yard whenever they want or need it. That way they should never have to 'hold it' till you can open the door for them. This helps keep the bladder 'flushed out' and allows the Dalmatian to pass smaller crystals before they can become a problem.

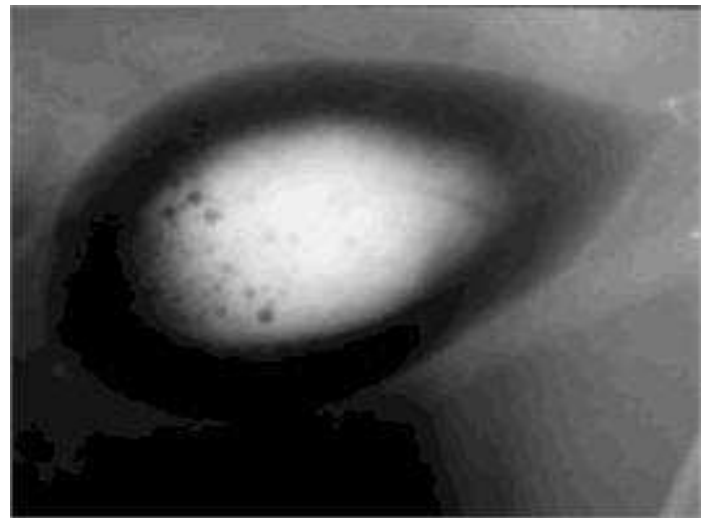
In diagnosing a blockage, many vets will use x-rays.

There is a problem with this sometimes. Stones and crystals are not always visible on a standard x-ray. Oftentimes ultrasound or contrast radiography is needed to make them 'visible'.

Uric acid crystals are an abnormal finding in the urine of most dogs other than Dalmatians. In the Dalmatian, because of their unique metabolism, uric acid crystals are normal in any urine sample and do not, alone, indicate whether stone are present or not.



Radiography showing a urinary bladder full of stones (these are oxalate stones, but it would look the same if they were uric acid stones).



Close up of a Dalmatian urinary bladder with uric acid stones using contrast radiography. The black dots show stones that were not visible on a normal radiograph.

You've now built up a knowledge base of what causes the problems... and you've done your absolute best to prevent stone formation, but your best buddy developed stones in spite of your efforts! What to do now? There are several medical interventions available. We'll discuss each one with their pro's and con's.

### **Surgical removal of stones**

This is usually the fastest method of removing stones, but it is also the most invasive and likely the most expensive method. Under anesthesia, the surgeon will surgically open the bladder and remove the stones, which are collected and sent for analysis to determine their composition. Dalmatians are capable of forming stones other than uric acid stones, so it is important to know what type of stone you are dealing with. Once the obvious stones are removed, the bladder is flushed to ensure 'hiding' stones are found and removed. The surgeon will then close the bladder, check for

leaks, and then close the belly. Usually the dog is ready to go home within a day or two, depending on how well he is able to urinate and his appetite. Sounds simple, right? Well, there are some disadvantages to surgical removal. Cost is a factor for a lot of people. Then, although this procedure is relatively low-risk, there is always the possibility of complications resulting from any surgical procedure. Also it may not be possible that all of the stones (including those that can become imbedded in the bladder wall) will be removed. And you need to keep in mind that surgical intervention is NOT a cure. A stone former may likely have to undergo surgical removal more than once in their life.

## **Removal of stones using Dissolution**

This isn't really 'removal' of the stones in the usual context. The idea here is to create urine that is capable of returning the uric acid of the stone back into solution, thus dissolving the stone. First, any bladder infection must be controlled. Infections interfere with creating the desired urine pH level and may even lead to the creation of struvite bladder stones. During the dissolution process the Dalmatian must be on a therapeutic diet which is available only from the vet by prescription. (It should be noted that this diet is not appropriate for puppies so surgical removal is the best choice for uric acid stones in puppies). Canned diet is believed to be superior to dry diet as it adds water to the diet (and ultimately to the urine) which helps dilute the uric acid. Once ready, the Dalmatian is given a medication called Allopurinol twice a day to dissolve the stones. (Note that the Merck Drug company manual states that Allopurinol should NOT be used for more than two (2) years because it will kill the liver. Dogs taking Allopurinol should have liver testing done each year. Further alkalization may or may not be needed beyond what occurs with the special diet. Urine testing to ensure the proper pH level is usually done periodically to determine if further pH level control is warranted or not. Normally after a month of this treatment, the stones are radiographed again to compare the size to those on the original radiograph and a urinalysis is done to assess the pH levels. If the stones are getting smaller, the treatments are continued. If they are gone, the Dalmatian is then switched to a prevention protocol. If there are more stones or they are bigger, surgical removal should be considered. Disadvantages of dissolution are that it can take many months to be successful, it may not work at all, and over the course of treatment the cost of radiographs, urinalysis, and special diet may eventually be more costly than surgical intervention would have been if it takes a long time to dissolve the stones. The average treatment process is between three and four months. Again, as with surgical intervention, this is not a cure... and the stone former may have to undergo this procedure several times throughout their life.

So your Dalmatian did form stones, and you either had them surgically removed or dissolved. Now it's time to work on preventing a reoccurrence of stone formation. You are now at the prevention and monitoring life stage of your stone former. Diet is the most important factor in preventing the reoccurrence of stones. One way is for the dog to remain on a low purine, low salt, therapeutic (prescription) diet from the vet's office. One possible disadvantage to these foods is that they are often low protein as well, thus they aren't very tasty and you might find yourself having to bribe the dog with additional foods, gravies or treats mixed in to get them to eat it. It can also be rather costly. There are other alternatives to the prescription diets from the vet. You can switch to a raw diet and there are commercially available foods you might consider that designed for low purine, low salt diets that were not available in years past. Check around, read labels. These foods are generally considered virtually purine-free and can be used as treats: whole grain cereals (as long as they do not contain yeast), butter, cheese, eggs, milk, and fruits (but avoid citrus fruits). Also as part of the prevention and monitoring you may need to use Allopurinol as a maintenance drug, at a lower dosage level than required to dissolve the stones.

Several protocols have been advocated for periodic monitoring to be sure no new stones are likely to form:

- Urinalysis and either ultrasound or contrast radiography should be performed every 1 to 2 months. If after 6 months no stones have recurred then testing can be extended to every 4 to 5 months. If small stones develop, they can be flushed from the bladder without surgery. This is a very complete method, but all that ultrasound/contrast radiography is going to get expensive very quickly.
- The 24-hour uric acid production test. Collecting ALL of the urine your dog produces over either a 12-hour period and multiplying the value by two, or by actually collecting ALL the urine produced over a 24-hour period. This typically involves some kind of urine collection bag and a urinary catheter (or a very cooperative dog!). It is very difficult to keep a urinary collection system in place in a normal dog and thus this test is problematic to run. The urine is collected, sent to the lab, and the total production of uric acid is determined. This will tell if the dog is 'on track' to avoid future stones or not. Because the collection is so difficult, many skip it and simply do the monitoring via urinalysis and ultrasound/contrast radiography. The goal value is less than 300mg of uric acid production per kg of body weight daily.
- The uric acid (urate) to creatinine ratio test. The idea with this test is to use a single urine sample to get an idea how much uric acid the dog is producing. This test seemed like a good idea when it was first developed and was certainly much easier than the 24-hour urine collection. The problem is that it has not panned out as a valid test to predict stone reformation, but it will tell the veterinarian if the pet's owner is cheating on the diet!!
- The blood urea nitrogen level (BUN) is a common parameter assessing kidney function. In most cases, we are concerned about its being elevated but in monitoring stone forming in Dalmatians, a lower than normal BUN indicates that no dietary cheating is going on.

Your veterinarian is likely to discuss these protocols with you and choose the one they are comfortable with that fits your budget.

As you can see, having a stone former is a life long commitment, both for you and the Dalmatian. But with proper diet, management and prevention, there is no reason that your stone forming Dalmatian cannot live a long, healthy and happy life.

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# Ask The Trainer

## Fear Of Men

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**Question:** We think our (dog) was abused by a man since she is afraid of men, including my husband. He has never raised his voice to her but she runs when he approaches. What can we do?

**The Trainer Answers:** While it is possible your (dog) was abused, it is a common misconception that dogs who are afraid of men were all abused by a man at some point. Some (dogs) are afraid of children as well, but it doesn't mean they were abused by a child. More than likely, these dogs were not well socialized as puppies and are therefore shy or fearful around people, new places, or other new things. In addition, some dogs are simply genetically predisposed to be more fearful.

In the case of being fearful around men, it often has more to do with deep voices, tall stature and forceful straight-on approaches than with being of the male gender. Look at the way your husband approached your new (dog). Does he approach quickly and head on, trying to pet her on top of her head? (Does he) approach at an angle, lowering your body closer to the ground, speaking softly and reaching in near her shoulder or chest? Does he make direct eye contact with her, while (he) looks off to the side?

Rather than trying to approach a fearful or shy dog, let your dog approach your husband at her own pace and check him out without worrying about him trying to chase her down and pet her. Ask him to ignore her for a few days. Given the chance, most dogs will approach on their own to check things out. Have your husband spend some time around your new (dog) without forcing any interaction from her. Have him drop tasty treats near him while he reads the paper.

When meeting other people, do not let them approach your shy dog head on and pet her. Step in between your dog and the new person, and explain that you dog is shy. Ask if they will ignore you dog and allow her to check them out on her own. Let her take wide angles around people for now. Give her a chance to walk up behind and take a quick sniff as the person walks away. Forcing her to stand still while people approach her head on and pat her on the head will only confirm that people are scary and very rude. Approaching head on and over the head is extremely rude and confrontational in the dog world.

Don't let her run and hide every chance she gets, but neither should you force something on her if she is not yet ready. Don't coddle her, and don't make a big deal out of new people or things. Act like it's no big deal and let her get comfortable at her own pace. Hopefully she will soon learn that men are not so scary after all.

(This "Ask The Trainer" article is reprinted with permission of Sue Brown, owner of Love My Dog Training and a Certified Dog Behavior Consultant. Love My Dog Training is located in and services the Denver Metro Area. <http://www.lovedogtraining.com/index.html>.)

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## Bits & Pieces

### A Dog's Purpose

Being a veterinarian, I had been called to examine a ten-year-old Irish Wolfhound named Belker. The dog's owners, Ron, his wife, Lisa, and their little boy, Shane, were all very attached to Belker, and they were hoping for a miracle. I examined Belker and found he was dying of cancer. I told the family we couldn't do anything Belker, and offered to perform the euthanasia procedure for the old dog in their home.

As we made arrangements, Ron and Lisa told me they thought it would be good for six-year-old Shane to observe the procedure. They felt as though Shane might learn something from the experience. The next day, I felt the familiar catch in my throat as Belker's family surrounded him. Shane seemed so calm, petting the old dog for the last time, that I wondered if he understood what was going on. Within a few minutes, Belker slipped peacefully away.

The little boy seemed to accept Belker's transition without any difficulty or confusion. We sat together for a while after Belker's death, wondering aloud about the sad fact that animal lives are shorter than human lives. Shane, who had been listening quietly, piped up, "I know why."

Startled, we all turned to him. What came out of his mouth next stunned me. I'd never heard a more comforting explanation. He said, "People are born so that they can learn how to live a good life – like loving everybody all the time and being nice, right?" The six-year-old continued, "Well, dogs already know how to do that, so they don't have to stay as long."

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## **\*\*\*\*\*Be A Pal, Save A Dal\*\*\*\*\***

PLEASE – They need YOUR help!! Remember when your rescue Dalmatian came home with you, from the warmth of a loving foster family? If we hadn't had foster homes, you probably would not have gotten YOUR dog. PLEASE think about fostering a dog for the Dalmatian Rescue where you obtained your Dal, or the one closet to where you now live, so they can save lives like they saved your dog's life!! PLEASE give a warm home to a dog who can relax, show his true personality, enjoy a thick bed rather than a concrete floor in a shelter and get ready for a new home. PLEASE help rescues and the dogs so that others might have a dog that is well socialized, trained and ready to love. PLEASE think about this... Dalmatians are everywhere and are literally dying to meet you or someone willing to give them a "spot" to LIVE until their forever home comes along. PLEASE be a spot for rescue and for them?

We thank you and you know any dog you help your local rescue save will be eternally grateful! PLEASE submit a foster application if you can possibly help your local rescue and them! PLEASE take your cookie... good boy/girl!

## **In The Doghouse... Our Featured Dalmatians**

### **Keller**



4 Years Old, Black Neutered Male  
Reason Available: Owner Surrender  
Other Shelter, Pueblo, CO

Keller is a 4-year-old black and white Dalmatian with brilliant blue eyes. He is deaf and a total fetch-a-holic! He really needs a 12 step program. The fact that he is deaf doesn't bother him if it doesn't bother you. He thinks it's nice because he can sleep through the loudest thunder storm undisturbed. He is kennel trained, loves to go for car rides. Good with kids and other dogs but not good with cats. He is neutered, vaccinated and heartworm negative. His adoption fee is only \$75. We can bring him to you for a visit (we will travel just about anywhere for the right loving home) Did we mention that he also loves to chase a flashlight beam at night? You can call Tammie for help at 719-240-4375. or e-mail at [trumansaunt@yahoo.com](mailto:trumansaunt@yahoo.com). Keller is in Pueblo.

### **Ms. Beasley**

8 Years Old, Black Spayed Female  
Reason Available: Owner Deceased  
Other Shelter, Longmont Humane Society, Longmont, CO

Ms. Beasley is a Dalmatian mix now living in the Longmont Shelter (303-772-1232) after being surrendered when her owner died. Her owner was not a very nice person we were told by the family, so this little girl is looking for a stable environment now. Unfortunately, we didn't have room at the time to take Ms. Beasley into foster. This poor girl needs a new home and a new name! Please go see Ms. Beasley at the Longmont shelter. They report that she is an affectionate girl who is attentive to what's going on around her and loves getting lots of affection. She is looking for a warm place and a warm-hearted person to call her own again.



**Please don't forget... if you haven't sent in your Happy Beginnings Story yet, why not do it right now while it's fresh in your mind! It's never too late to see your story in print!!**

NewSpots is published and released on the first calendar day of the month. The deadline for submissions for future issues of NewSpots will be the 25<sup>th</sup> of the previous month. Submissions received after the deadline may be delayed in publication until the following month, subject to the Editor's discretion.

Send submissions to the Editor at: [spotted-dog-designs@comcast.net](mailto:spotted-dog-designs@comcast.net)

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