

## Minimize Purine-Yielding Foods

More elaborate listing of 224 foods at:

<http://www.britishdalmatianclub.org.uk/downloads/Purine%20Table%202003.htm>

### FOODS HIGHEST IN PURINES

- anchovies
- brains
- gravies
- herring (including roe)
- liver (calf or beef)
- mackerel
- meat (beef, lamb, pork & ham, veal)
- meat, game (venison, etc.)
- meat soups & broths
- meat, beef extracts & by-products
- mussels
- organ meats (liver, kidney)
- sardines
- scallops
- yeast

### FOODS MODERATELY HIGH IN PURINES

- asparagus
- breads & cereals, whole grain
- cauliflower
- eel
- fish (fresh & saltwater)
- legumes (kidney, navy & lima beans, lentils, peas)
- mushrooms
- oatmeal
- peas, green
- poultry (chicken, duck, turkey)
- shellfish (crab, lobster, oysters)
- spinach
- tongue
- tripe
- wheat germ & bran

### FOODS LOWEST IN PURINES

- beverages (coffee, tea, sodas, cocoa)
- butter
- bread & cereal (except whole grain)
- cheese
- eggs
- fats
- fish roe (including caviar)
- fruits & fruit juices (avoid citrus)
- gelatin
- milk (including butter, condensed, malted)
- nuts (including peanut butter)
- pasta (evaluate sauce ingredients separately)
- sugars, fruit syrups, sweets (avoid chocolate)
- vegetables (except those above)
- vegetable & cream soups (made with acceptable vegetables, but not with beef stock)

## Dipsticking to Monitor Stone Formers and Their Diets

Modern dipsticks are like litmus paper in high school chemistry. They are simple to use and show exact degrees of urinary pH. A quick dip into a dog's urine will indicate if the pH is abnormally acidic (how much below normal) or abnormally alkaline (how much above normal). By regularly dipsticking and keeping a diary of the results, any owner can monitor their Dalmatian to detect when and how long it is producing abnormally unstable urine, often long before stones reach a size capable of obstructing.

Dipsticking is best done first thing mornings before feeding, collecting fasting "first-catch" urine when the Dalmatian has been indoors and urine has sat overnight in the bladder. Some very conscientious owners also dipstick a few hours deliberately after feeding to compare differences in pH between fasting urine and that due to digesting whatever food formulation the Dalmatian is being fed.

The success or failure of preventative diets and drugs also can be monitored by dipsticking and the regimens modified if the Dalmatian's pH shows it persisting abnormally.

### OF SEVERAL PREVENTATIVES, ONE IS FOR THE DALMATIAN WITH URATE/PURINE STONE DISEASE TO STABILIZE AT URINARY pH 6.5 - pH 7.0

Dipsticks, also known as "chemstrips," can be purchased from your veterinarian or drug store. If those sources do not stock them, look in the yellow pages of your telephone directory under *Medical Supply Companies*.

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## EMERGENCY!

### Dalmatian Cannot Pass Urine (Obstruction of Urinary Stream)

- Rush dog to your veterinarian or emergency clinic! Obstruction of the urinary pathway can quickly reach life-threatening status within 24 to 72 hours as urine relentlessly backs up into the dog's body system instead of being expelled out of it.
- Have dammed-up urine instantly removed from bladder either by *cystocentesis* or by *catheterization*. Urine may be so drained several times while diagnosis and treatment are being evaluated. Tapping off urine "buys time."
- Have the type of urinary stone or crystal assayed at once. Abnormal urinary crystals are identifiable under an office microscope. *Urate/Purine* crystals thrive in abnormally acidic urine. *Struvite* ("infection") crystals thrive in abnormally alkaline urine.
- Have ultrasound confirm size, location of stones. **Important** - Remind veterinarian urate/purine stones in Dalmatians may not be seen by normal x-rays which therefore provide a false-negative visualization. Instead, ultrasound should be the visualization-of-choice.
- Non-surgical clearing of the obstruction can be often accomplished by *uropropulsion* whereby, under anesthesia, the obstructing stones are flushed back up into the bladder. The newest adaptation, also under anesthesia, is *voiding uropropulsion* which instead of backflushing, expels the obstructing stones out of the dog's urinary pathway. If other stones continue to move down and re-obstruct, then surgery may be unavoidable to restore more than temporary urinary flow.
- **Important!** "UrethroStomy" (with an "S") is **not simple stone-removal surgery!** It is a surgically-created, irreversible urinary opening and should be considered a last resort after all other modern anti-stone procedures have failed. If unavoidable, it should be performed only by a member of the American College of Veterinary Surgeons (who must be "Board certified" for membership) and is experienced in performing urethroStomies.
- Consider the Dalmatian being started on antibiotics for urinary infection or to prevent the onset of one.
- Consider shifting the stone former to distilled water.
- Rush specimens (stones passed, catheterized or removed surgically - or sediment centrifuging out during urinalysis) - to one of the North American urinary stone centers who will confirm assay by electron micrography, chromatography and other highly specialized testing procedures. Minnesota Urolith Center does not charge.  
<http://www.cvm.umn.edu/depts/MinnesotaUrolithCenter/>

# URINARY STONE DISEASE IN DALMATIANS

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More stone disease information on the DCA homepage:

<http://www.thedca.org/stones.html>

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## Introduction

Dalmatians and mostly all other dog breeds form urinary stones. Some stone-forming dogs, Dalmatians included, live out their lives happily without ever revealing any symptoms, according to U.S. veterinarian specialists in Canine Urinary Stone Disease who call them “*silent stone formers*.” Most Dalmatians never form urate/purine stones at all.

Today, stone-forming dogs can easily and successfully be treated - the benefit of 40 years of research and findings. Accumulated knowledge has markedly improved diagnosis and treatment providing methods even to avoid surgery which is no longer the only treatment. Today there are three medical centers in North America totally devoted to urinary stones: (1) the *Minnesota Urolith Center* at the School of Veterinary Medicine of the U. of Minnesota, (2) the *Gerald Ling Urinary Stone Analysis Laboratory* at the School of Veterinary Medicine of the U. of California at Davis and (3) the *Canada Veterinary Urolith Center* at the U. Guelph Vet Medicine Center. Their aggregate clinical experience and decision-making with stone-forming animals encompass over a million patients!

Of the few Dalmatians ultimately progressing into stone forming, the most prevalent breed-specific type-of-stone are the *urates/purines*. Simply minimizing purine-yielding food ingredients therefore is a major step in prevention:

<http://www.thedca.org/purines.html>

Another advance in veterinary knowledge is Rx-only food formulated to be anti-urate/anti purine. After being weaned from nursing and puppy diets, adult Dalmatians can be fed now from a choice of non-Rx non-beef, non-meat dogfoods such as vegetable-and-rice or turkey-and-barley and go their entire lives without the onset of active stone disease. In other Dalmatians, urate/purine stones already formed can be successfully dissolved without surgical removal by an anti-urate drug, *allopurinol* plus anti-urate/anti-purine food formulations.

## Why Do Some Dalmatians Form Urinary Stones?

Dalmatians, humans and apes are unique species the way their urine is formed and is metabolized in their bodies. **Not every human will form purine/urate stones and neither will every Dalmatian.**

The beginning of successful treatment and prevention is to obtain an accurate assay of the type-of-stone by one of the North American stone centers. If confirmed as urates/purines, scrutinize the dog’s meals. Avoid non-Rx dog foods containing high amounts of purine-yielding proteins.

When some Dalmatians metabolize excessive purines, a few may precipitate out urate/purine crystals/stones ultimately in their urine. Dogfoods with “*beef*” and “*meat*” or their “*by-products*” should be avoided for those few Dalmatians forming abnormal urate/purine urinary crystals/stones.

**Why some Dalmatians progress into stone-forming is unknown. A defective recessive gene was discovered in 1937 but it is NOT a stone-forming gene! It merely “*predisposes*” only those Dalmatians inheriting two recessive genes to abnormal metabolizing of purines. And perhaps why only a few purebred Dalmatians progress into late-stage stone forming while littermates do not.**

Of the few stone-forming Dalmatians, the majority form urate/purine stones but some may form other types. Treatment of one stone can worsen another, the reason for the first step to identify its type. Correct assay is essential for the success of today’s simple, effective anti-stone treatments and prevention.

Of all urate/purine stones, 90 percent are *ammonium acid urate*, one of the family of urates/purines responsive to simple non-surgical treatment. A conscientious program of anti-urate/purine medication and anti-urate/purine diet is highly effective for both treatment and especially for long term prevention of recurrences.

The number one type of stone in all breeds is *struvite* so identified with urinary tract infections they are nicknamed “*infection stones*.” The treatments of infection stones vs. urate/purine stones are different and emphasizes the importance for accurate assay of the stone being formed if treatment of the Dalmatian is not to be misdirected and fail due to misdiagnosis.

Urinary stones in dogs are found in the *upper* system (e.g., the kidneys), or in the *lower* urinary system (e.g., the bladder). Of data only from stone-forming Dalmatians, 97 percent of the breed’s urinary stones were passed or found in the lower system where treatment is more successful and less expensive than for those in the kidneys. Kidney stones today have a non-surgical laser treatment method called “*lithotomy*.”

## How is a Stone Former Detected?

A standard urinalysis generally shows if abnormal crystals are forming in the urine long before the crystals “grow up” to mature into a size of stone large enough to obstruct the normal flow of the urinary stream. Urinary pH showing persistent and unchanging abnormal acidity vs. alkalinity may be in advance warning signs of different types-of-stones/crystals.

If no warning tests ever are done, stone forming may progress to show advanced symptoms. These are more obviously detectable in male dogs than those in females because of the marked difference in the gender’s urinary anatomy. As a large enough stone is carried down the urinary pathway, it can lodge within the male’s penis at a damlike inflexible narrowing of a cartilage, the *os penis*. (The same size stone may pass uneventfully through female urinary anatomy which does not possess an *os penis*.)

When the urinary stream is obstructed by stones or aggregating crystals, the male dog will strain to urinate. No urine will pass or be seen as dribbling only a few drops. The dog will repetitively attempt to urinate with little or no result. Late-stage urinary obstruction in male dogs is thus very visible to the observer aware of these signs and watching for them.

Obstructed females with stones may demonstrate symptoms similar to those of urinary infections, namely more frequent urinating, “accidents” by housebroken bitches and very frequent licking of their genital area. (Because these are similar symptoms to simple urinary infections, do not become concerned unless results of a urinalysis confirm the presence of abnormal crystals and/or abnormal pH, or blood cells in the specimen seen with urinary tract infections.)

Some stone-forming dogs will have a sudden floodlike outpouring of urine. It is likely that the stone(s) creating the obstruction were “passed” thereby opening and restoring the normal flow and pathway of urine. Any obstructed dog, even those who pass stones, should be quickly seen by their veterinarian for workup and to embark immediately on a preventative program of anti-stone medication with the proper anti-stone diet.

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## General Preventative Guidelines for Stone-Forming Dalmatians

- Have a routine, inexpensive urinalysis done periodically. If centrifuging spins out sediment (“sand” or “gravel”) have your vet send it - **not the liquid** - for assay by one of the urinary stone centers. The Minnesota Stone Center does not charge.  
<http://www.cvm.umn.edu/depts/minnesotaulolithcenter/>
- Obtain fresh urine for testing in a clean and chemically-inert container, such as glass. Avoid obtaining a sample after Dalmatian has recently urinated when crystals or stones may have been already flushed out. Instead, obtain a fasting specimen as “first catch” in A.M. **before** feeding and **after** urine has sat unemptied in the bladder overnight. Deliver urine to vet promptly. **Do not refrigerate** to avoid introducing very questionable temperature-induced crystals forming undesirably as urine cools down from body temperature.
- One major goal of prevention is to maintain a normal plateau of urinary pH 6.5 to 7.0. Dipstick fasting urine from stone formers frequently and keep a diary of pH readings.  
<http://www.thedca.org/dipstick.html>
- If the pH falls into the acidic area of pH 6.0 or less **below normal** and stays there over several dipstickings, consult with your vet to re-evaluate the Dal’s diet and anti-urate/purine drugs and chemical additives like *potassium citrate* to alkalinize the abnormally acidic urine and chemically neutralize it.  
If the pH remains up in the alkaline area of 8.0 or **higher above normal** over the course of several dipstickings, contact your vet to rule out a possible urinary tract infection and the onset of infection stones.
- Stone formers may be candidates to drink only distilled water. It is inexpensive and available from super markets. Make sure labels specify **distilled** water. Many faucet filters affect only the taste of water, not its purity. Please note, though, no medical research supports this recommendation, only anecdotal reports of its benefit.
- Crystal and stone formation accelerate in stagnant urine. Permit the Dalmatian to urinate as frequently as possible (at least every 4-5 hours if possible) permitting the bladder to be flushed of crystals before they can mature into larger stones capable of obstructing.