

# DALMATIANS URINARY STONE DISEASE: A COMPENDIUM OF SCIENTIFIC INFORMATION

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## INTRODUCTION

Since 1938, Dalmatians are the only breed of dogs known by veterinarians to be born with a defect in how they produce their urine resulting in some of the breed forming insoluble "*urates*," one of several types of urinary stones. Only two other living species share the defect - humans and apes. Not every human forms urinary stones (or gout, its alternative) and neither will every Dalmatian. The breed-specific defect takes place during production of urine within the breed's liver and kidneys so that one waste chemical - "*uric acid*" - soluble in other dog breeds is insoluble in Dalmatian urine. It thereby precipitates out as abnormal urinary crystals or abnormal urinary stones in particular those made up of "*urates*" which are forms of uric acid. Crystals are young, immature stones and, undiagnosed or untreated, usually enlarge to become full-size adult stones.

This compendium of information is directed to preventing your Dalmatian's urinary flow being blocked by a large enough stone to create the ominous "urinary obstruction" when urine - dammed up and unable to be expelled - backs up into the dog's system and thereby becomes life-threatening within 24 to 72 hours.

Happily, there now are decades of advanced veterinary experience with the breed-specific urates urinary stones. Of those, one specific urate occurs in up to 96 percent of stone-forming Dalmatians: "*ammonium acid urate*." Unlike some other urinary stones, ammonium acid urate is especially responsive to knowledgeable non-surgical treatment and when the stone-forming Dalmatian is stabilized, an equally successful yet simple program of prevention.

Despite the vast majority of afflicted Dalmatians confirmed with urate stone disease, there are different and other prevalent types of urinary stones formed by other breeds. Dalmatians rarely form these others but a few Dalmatians indeed do. It is necessary therefore your dog be - first - accurately confirmed as to which type of stone is being formed. We urge all owners to send fasting urine specimens of stones or of crystals to one of several veterinary medicine centers

specializing in urinary stone identification. These are cited shortly. (The liquid should not be sent, only any sediment or gravel spinning out during the centrifuging of standard urinalyses.) The Minnesota Stone Center does not charge despite putting the specimens through hundreds-of-dollars of advanced scientific assays and tests! If identification has already been made elsewhere, another specimen (if still available) should still be sent to one of the urinary stone centers for a second confirmation because of the high degree of error reported by a vet textbook surveying provincial U.S. laboratories assaying abnormal urinary crystals or stones.

Insoluble minerals *other than urates* are precipitating out in the urine of some Dalmatians and explains why the type of crystal/stone being formed must be identified accurately despite the vast majority of Dalmatians forming the breed-specific urates/purines. False identification can worsen the dog's status if the stone-forming Dalmatian is automatically presumed to be creating the breed-specific urates when it is actually forming another type. Why? Treatment of some minerals can be the exact opposite of others and thereby can worsen a mis-diagnosed stone-forming Dalmatian.

If current preventative programs are followed conscientiously for diet, water and anti-urate drugs, the breed-specific type of stone disease with which all Dalmatians are born rarely will show up or recur. You and your Dalmatian will most probably be able to look forward to a joyful and happy life of uneventful companionship so long as you understand why and how, and are conscientious in not digressing from the preventative regimen.

A wealth of information hereby follows for you to slowly go through, several times if necessary, until you understand everything in order to knowledgeably care for your stone-forming Dalmatian.

**THERE IS NO SHORTCUT...MUCH OF THIS INFORMATION IS INTERLINKED  
SO IT IS NECESSARY FOR YOU ULTIMATELY TO UNDERSTAND  
BOTH "THE FOREST" AND "THE TREES."**

It is unfair to expect the average general practice veterinarian to know about every disease of every breed of dog, every specie of animal, Dalmatian stone disease included. That said, you may also wish to consider printing everything out for your vet, including the series of online articles from the homepage of the Dalmatian Club of America (DCA) cited shortly. To assure professional credibility, your vet should be informed the majority of information and recommendations in this compendium as well as online evolved predominately from that of the world famous U.S. Minnesota Stone Center of the University of Minnesota Veterinary Medicine Center, as created and currently directed by Carl A. Osborne, DVM, PhD.

Many years ago, my alltime favorite male Dalmatian had three surgeries before two years of age for obstructing due to stones! That prompted me to learn about this breed-specific health problem unique to Dalmatians. As motivation and hope for you, my Dalmatian had been symptom-free for more than 10 years to his death shortly before 14 years of age, including even of abnormal crystals, merely by following the simple preventative program!

Note, again, most if not all of your questions probably will be answered by reaching the end of the material.

**IMPORTANT NOTE!**

This compendium of information is solely for Dalmatians forming the breed-specific “*purine/urate*” type of abnormal urinary crystal/stone. The information does not apply to treating the most common type of crystal/stone found in all other breeds, “*struvites*” or “*magnesium phosphates*,” (synonyms) which are nicknamed “*infection stones*” because they are so often caused by infections due to stone-forming bacterial species.

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## 1. GENERAL INFORMATION - URINARY STONE-FORMING IN DALMATIANS

With the current progress of veterinary knowledge by specialists in canine stone-forming, there is no reason why most if not all stone-forming Dalmatians cannot live out their lives today happily and uneventfully so long as preventative methods are knowledgeably and conscientiously maintained by their owners. These include:

- ✓ a preventative anti-stone diet, if urates are confirmed by assay
- ✓ antibiotics for any infection secondary to the urate stone-forming
- ✓ intake of bottled water from the supermarket labeled "*distilled*," and
- ✓ for some stone-formers, an effective anti-urate medication called "*allopurinol*."

The purpose of this lengthy email and the many articles cited or included is to brief you on Dalmatian urinary stone-forming so that you can knowledgeably discuss your Dalmatian's stone forming with your general practice veterinarian.

A brochure summarizing information on Dalmatian stone forming (including preventative and emergency procedures) is available online. Those familiar with downloading and printing will find it immediately at the homepage of the Dalmatian Club of America (DCA), along with online articles about Dalmatian stone disease:

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

"*A Primer on Urinary Stones for Dalmatian Breeders & Fanciers*," an elaborate 60-page information package on the subject of urinary stone-forming in Dalmatians is out-of-print and has been replaced by this compendium.

## 2. IMMEDIATE PROCEDURES UPON RECEIVING THIS EMAIL

Firstly, Dalmatians with confirmed diagnoses of urinary stone-forming should receive only bottled water from the supermarket labeled "*distilled*." Not labeled "purified," not "drinking" but labeled "distilled." This is the only water, including for cooking for them, that should be used. The rationale is in article no. 7. Shift the dog to distilled water as soon as possible. In the U.S., Wal-Mart generally stocks distilled water @ US \$0.65 a gallon; supermarkets stock it slightly higher with house brands or other brands.

Secondly, boot up the series of online teaching articles on the DCA's or Brit Dalmatian Club's homepage. Print them out together with this compendium, and give a printed set to your vet. The articles will provide updated status of treating and preventing Dalmatian stone-forming. All vets may also wish to consult with one of the three world authorities in canine stone-forming (their details shortly listed). But the consult is for your vet and not for yourself - the specialists

necessarily require highly advanced terminology and very technical questions about your Dalmatian's case history, questions which a non-vet cannot answer nor understand.

You will learn from the articles that Dalmatians form different types of abnormal urinary crystals/stones (crystals "grow up" to become stones). The type of crystal/stone must be accurately identified because the treatment of one type can be the exact opposite of another type. There also was an 85 percent error in identification by local provincial testing labs reported in a survey in a veterinary textbook on canine stone-forming.

It is recommended that a standard and inexpensive urinalysis be done on a fasting urine specimen (obtained as "first catch" in the AM before feeding and after urine has sat in the bladder overnight). If sediment spins out during routine centrifuging that, not the liquid, should be sent to one of the centers for correct identification. Minnesota Stone Center does not charge for this; its form to accompany the specimen is online at:

<http://www.cvm.umn.edu/depts/MinnesotaUrolithCenter/>

Once the correct identification comes back, you can embark on treatment and prevention assured by the assay those procedures are correct for the exact type of crystals/stones your specific Dalmatian is actually forming.

Most Dalmatians form one type of urates but this still should be confirmed instead of being presumed. Once confirmed, many vets will prescribe the anti-urate drug *allopurinol*, and the prescription anti-urate diet, Hill's u/d.<sup>®</sup>

One of the easiest and most effective monitoring tests owners of stone-forming Dalmatians can do themselves is to monitor the dog's urinary pH by dipsticking (described subsequently). A definite trend over weeks to abnormal urinary acidity or alkalinity is a well-in-advance sign to consult with your vet to abort and reverse whatever is producing the abnormal pH. Known stone-formers should also have a routine urinalysis periodically to monitor if abnormal crystals are forming and, if so, the sediment (not the liquid) sent to Minnesota to confirm they are the same type as originally assayed. The best dipsticks (available from the vet or a local "medical supply company") are unfortunately also the most expensive. Two of their brandname are *Chemstrips* or *Medistrips*; specify you want to use them primarily to test the pH of urine but also read article no. 17 on dipsticking in this compendium.

### 3. STONE-FORMING INFORMATION ON THE INTERNET

No. 1 - Urinary Stone Forming By Dalmatians: A Compendium of Scientific Information

<http://www.lukius.com/Health/Dalmatian%20Stone%20Forming.doc>

No. 2 - 2003 Purine Table: A listing of over 200 foods. Tabs at bottom of your computer monitor screen shift between one tabulation alphabetized by food, the other by purine content. (Thanks to Sarah Morgan from the U.S. now residing in Ireland where she shows her Dalmatians in conformation and in performance events.)

<http://www.lukius.com/Health/Purines%20tabulation%202003.xls>

No. 3 - Urinary Stone Forming by Puppies (including anti-urate food formulations suggested by Dr. Joseph Bartges)

<http://www.lukius.com/Health/Puppy%20Stone%20Forming.doc>

There is a reported error of 85% on the part of local provincial labs assaying urinary crystals/stones. For info on sending urine specimens of abnormal crystals or abnormal stones to a world-famous center specializing in canine urinary stones, go to the homepage of the Minnesota Stone Center:

<http://www.cvm.umn.edu/depts/MinnesotaUrolithCenter/>

An additional online series of nine articles is on the official homepage of the Dalmatian Club of America (DCA):

**OFFICIAL DCA PAMPHLET ON STONE FORMING (2006 third edition):**

The latest Acrobat Reader is required plus printing on legal-size paper.)

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

**URINARY STONE-FORMING IN DALMATIANS & OTHER DOGS:**

[http://www.thedca.org/dal\\_book.html](http://www.thedca.org/dal_book.html)

**1992 SEMINAR BY DR. JOSEPH BARTGES:**

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

**DIPSTICKING TO MONITOR STONE-FORMERS:**

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

**EMERGENCY PROCEDURES FOR OBSTRUCTED DALs:**

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

**GENERAL PREVENTATIVE PROCEDURES:**

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

**TABULATION OF PURINE-YIELDING FOODS:**

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

**THE FALLACY OF "LOW PROTEIN" VS. "HIGH PROTEIN" IN DAL DIETS:**

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

**FIFTEEN YEARS OF DATA ON ALMOST 3,000 DALMATIAN STONES:**

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

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#### **4. VET SPECIALISTS FOR CONSULTATION ON DALMATIAN STONE-FORMING**

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Today, owners of stone-forming Dalmatians are fortunate that there are three world-renown specialists in canine stone-forming. They have pioneered in both state-of-the-art treatment of the stone-forming dog and also in non-surgical maintenance regimens to prevent future recurrences.

Any general practice vet treating a stone-forming Dalmatian should consult with one of these experts because most veterinary schools cannot possibly include everything in their curriculums for the students on this health problem. Only limited knowledge on breed-specific problems like Dalmatian stone-forming is taught and, accordingly, these specialists are available for immediate consultation by general practice veterinarians to assure the treatment and maintenance of their Dalmatian patients is the best possible and reflect the most current and most expert knowledge.

Please note it is not desirable for the owner to contact the specialists but only the vet treating the dog so the consultation can take place with a rapid dialogue at high scientific levels.

Important! If abnormal urinary stones are obtained from your Dalmatian by surgery or if abnormal crystals spin out during a urinalysis' centrifuging, they should be sent to one of the two vet school departments for assay (Minnesota does not charge). There is a reported error as high as 85 percent by provincial identification labs! Because correct treatment must be directed specifically to what mineral the dog is forming in its urinary stones, this assay and identification of type-of-stone is critically important and its accuracy essential if preventative measures are to be successful.

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Website: listed below to avoid word wrap.

Dr. Osborne is difficult to reach.

Contact his chief resident:

Telephone (612) 625-1719

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Urology Laboratory for assay results:

Telephone (area 612) 625-1919

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**MINNESOTA STONE CENTER ONLINE** (all info about center, submitting samples, etc.):  
<http://www.cvm.umn.edu/depts/MinnesotaUrolithCenter/>

**5. MINIMIZE OR AVOID PURINE-YIELDING FOODS** (short inventory, go online for listing of 200 foods at: <http://www.lukius.com/Health/Purines%20tabulation%202003.xls>)

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#### FOODS HIGHEST IN PURINES

anchovies  
brains  
kidney, beef  
game meats (venison, etc.)  
gravies  
herring (including roe)  
liver (calf or beef)  
mackerel  
meat extracts  
mussels  
sardines  
scallops  
yeast

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#### FOODS MODERATELY HIGH IN PURINES

asparagus  
bacon  
breads & cereals, whole grain  
cauliflower  
eel  
fish (fresh & saltwater)  
legumes (kidney, navy & lima beans, lentils, peas)  
meat (beef, lamb, pork, veal)  
meat soups & broths  
mushrooms  
oatmeal  
peas, green  
pork (including ham)  
poultry (chicken, duck, turkey)  
shellfish (crab, lobster, oysters)  
spinach  
tongue  
tripe  
wheat germ & bran

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#### 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 to minimize abnormally acidic urinary pH)  
gelatin  
milk (including butter, condensed, malted)  
nuts (including peanut butter)  
pasta (evaluate sauce ingredients separately)  
sugars, syrups, sweets  
vegetables (except those above)  
vegetable & cream soups (made with acceptable vegetables. but not with beef stock)

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For those who wish to research purine-yielding proteins further, here are a few online web pages with more information:

<http://www.pumpa.co.uk/index.htm>

The *Purine Metabolic Patients' Association* homepage at London's Guy's Hospital. The "*Diet and Research*" linked pages are the most relevant. The "*Research*" page discusses the Purine Research Unit work at the Hospital.

<http://www.dialadietitian.org/resources/handouts/goutdiet.html>

Scroll down for purine tabulation. Note "*to avoid*" stipulations are for human patients. Although it generally is unwise automatically to presume an equal interchange of medical information between humans and dogs, it may be possible there is more-than-usual continuity considering the two species share the uric acid defect in urine production.

[http://www.digitalnaturopath.com/data/metabolic\\_diet.html](http://www.digitalnaturopath.com/data/metabolic_diet.html)

Chart at bottom of page cites purines.

The following three web sites are exclusively about purine-related diseases in humans:

<http://www2.dgsys.com/~purine/index.html - pathways>

<http://www.med.unibs.it/~marchesi/nucmetab.html>

<http://www2.dgsys.com/~purine/index.html - pathways>

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## 6. FOOD & VITAMIN SUPPLEMENTS FOR STONE-FORMING DALMATIANS ON VERY LOW PROTEIN ANTI-URATE DIETS

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Firstly, be sure that your Dal is *not* allergic to eggs. If he is not, add one hardboiled egg to his AM meal of the anti-stone food formulation and one-half to his PM meal. Purchase Canola oil from the supermarket and spoon one (1) Tablespoon over the u/d<sup>®</sup> food in his bowl, each meal. As you peel the hardboiled eggs (a dozen at a time can be boiled up and refrigerated), save the shells in a refrigerated container until you have enough to pulverize into a fine powder in a coffee grinder. Save the powder in a refrigerated baggie and sprinkle one-quarter teaspoonful over each of his daily meals.

In addition to the distilled water, he should also get daily vitamins but not the ones made for dogs all of which are in a base of desiccated *liver*, the worst food a urate stone-former can receive.

Instead, get standard human children's vitamins. Parallel your Dal's weight to that of a child from the bottle's labeling in order to find the correct number of vitamin pills the dog should get. Give them once daily after his AM meal. My male, for example, weighed 75 lbs. and my female 40 lbs. so I translated each of those to what ages a human child would weigh in, and then read the labeling for how many vitamin pills that meant. Vitamins should be given with or after meals.

## 7. DISTILLED WATER FOR DALMATIAN STONE-FORMERS

Overly simplified, urate stone-forming in Dalmatians can be regarded as a metabolic defect in the normal solubility of uric acid so that it becomes insoluble in urine and thereby abnormally crystallizes out as undesirable urinary crystals or stones. Urine is the single, largest liquid waste of the body. That said, the corresponding single, largest source of liquid intake - namely, water - may *possibly* be one of many factors of stone-forming if that water is significantly impure and contributes to the insolubility of stone-forming chemicals crystallizing out in urine. For example, water containing abnormal lead tends to be acidic, a urinary environment in which formation of Dalmatian urate crystals and stones thrives.

A July 1997 issue of *Consumer Reports*, known for excellence in scientific articles, reported some aspects of U.S. tap water quality. The article noted, *"...people who get their water from a private well or from one of the thousands of small water systems that serve only a few thousand customers can't be...certain about the quality of what they're drinking. And even water from large systems may be contaminated by pipes in [their] neighborhood or [their] own home or may be subject to breakdowns at the treatment plant."* The article quoted the 1997 head of the U.S. Environmental Protection Agency as stating *"Unfortunately, at this time we cannot take for granted the safety of our drinking water."*

Many contaminants were reported for tap water such as lead, rust, dissolved iron, calcium, sulfur sediment, chlorine, organic and industrial chemicals and some pathogens such as certain species of coliform bacteria. Many faucet filter systems do not remove some of these chemicals and bacteria but filter only for taste and smell.

Preventatively then, purified bottled water from supermarkets labeled *"distilled"* may possibly be beneficial for Dalmatians in an overall prevention program of anti-stone diet, drugs and liquid intake. It should be noted, however, there are no published scientific studies in veterinary or human medical journals proving or disproving the use of distilled water for confirmed urinary stone-formers.

An archaic caution with distilled water was that it may "leech" some minerals from the body. *Consumer Reports* also stated that *"Distilled water...isn't bad for you. Distillation removes nearly all particulates as well as dissolved substances including trace quantities of minerals but your body won't miss them..."*

Bottled distilled water should not be confused with labeling of *"purified"* or *"drinking"* water. For the stone-former benefiting from distilled water, it is important that it also be used for all cooking or moistening of dry foods.

U.S. Owners of stone-forming Dalmatians who wish to test their own water supply can obtain information from the U.S. EPA Safe Drinking Water Hotline, telephone (800) 426-4791. Testing

can cost from under \$20.00 to well over \$100.00 depending on the testing laboratory and the number of water contaminants requested to be tested.

## 8. CAUTION SUGGESTED FOR STONE-FORMING DALMATIANS ON LONG-TERM, VERY LOW-PROTEIN DIETS

[Urge your vets to read: "*Idiopathic Dilated Cardiomyopathy in Dalmatians: Nine Cases (1990-1995)*" by Lisa M. Freeman, DVM, PhD, and coauthors in *Journal of the American Veterinary Medicine Association*, volume 209, pp. 1592-1596 (Nov. 1) 1996.]

Extremely isolated reports of a certain type of heart problem in a few Dalmatians were reported nationally. The condition is called "*cardiomyopathy*" or "*cardiac myopathy*." It was seen in Dalmatians who had been fed very low-protein diets for long periods of time because they were urate stone-formers.

Immediate research to explore the relationship of diet to the heart problem was started by veterinary academic centers including those which specialize in canine stone-forming. Preliminary findings suggested a dietary deficiency of one or both of two amino acids were perhaps factors in the strange onset of the heart symptoms. They were "*taurine*" and "*l-carnitine*." Taurine deficiency has been known by veterinarians to be associated with cardiomyopathy in cats but rarely if ever in dogs. Because of the small number of reports, it cannot be positively or even probably concluded that diet, alone, is responsible. Other coincidental factors have yet to be finally evaluated such as for example, heart problems in the breedline.

Stone-forming Dalmatians being successfully maintained symptom-free on home-cooked low-protein diets or on prescription anti-urate food formulations should not be shifted from their food regimens. (As of April 1995, Hills Prescription Foods added taurine to both dry and canned versions of their u/d<sup>®</sup> formulation.) For stone-formers on any anti-urate, low-protein food formulation including home-cooked ones, daily supplementation with a high-protein but low purine-yielding food such as hard boiled eggs may be considered unless the dog is allergic to them.

**PLEASE CONSULT WITH YOUR VETERINARIAN IF YOUR STONE-FORMING DALMATIAN STARTS TO COUGH UNCHARACTERISTICALLY OR TO SHOW OTHER SUSPICIOUS SYMPTOMS OF POSSIBLE HEART PROBLEMS.**

## 9. CAUTIONS ABOUT ALLOPURINOL DOSAGE FOR URATE STONE-FORMING DOGS

Abstractor's note: When treating a stone-forming Dal with the anti-urate drug, allopurinol, some vets are very aggressive in the total daily amount of dosage regimen, others more conservative. Some vets specializing in canine stone-forming suggest aggressively high dosages *for a short period of time* are required *to dissolve* existing urate stones, as compared to a maintenance dosage of no more than 300 mg. daily for prevention only. The following 1991 report, albeit on only 9 Dalmatians suggests **THE HIGHER, MORE EXCESSIVE THE DOSAGE OF ALLOPURINOL CONTINUED FOR TOO LONG A DURATION OF TIME, THE GREATER THE RISK OF DRUG-INDUCED FORMATION OF XANTHINE STONES.**

However, specific dosage is a vet's decision so that a stone-forming Dalmatian is not denied the proven anti-urate effectiveness of the drug.

### **"Xanthine-Containing Urinary Calculi in Dogs Given Allopurinol"**

by GERALD V. LING, DVM and others.

*Journal of the American Veterinary Medicine Association*

Volume 198, Pages 1935-1940 (June) 1991

Ten male dogs of which 9 were Dalmatians and 1 an Australian Shepherd all were treated with allopurinol because they had formed stones confirmed to be urates. After either surgical removal of the urate stones or passing them while urinating, the 10 dogs again developed subsequent stones all of which now contained xanthine as a result of their allopurinol dosage.

Total daily dosage of allopurinol for the Dalmatians had ranged from 450 mg. up to 2,400 mg. One Dal had received 450 mg. daily, 6 Dals had received 600 mg. daily, 1 Dal 900 mg. and 1 Dal had gone over the course of three years from 900 mg. to 2,400 mg. daily before the drug-induced stones were removed by two episodes of surgery. The Australian Shepherd had received 1,500 mg. of allopurinol daily.

Before the xanthine stones were removed, 6 of the Dalmatians were known to have been maintained on K/D prescription food and of those, 1 Dal had the K/D also supplemented with rice.

Duration of the allopurinol treatment in the 10 dogs ranged from five months to six years. Following prior removal of their urate stones, onset after surgery of the symptoms of the xanthine stones ranged from as soon as five weeks in a three year old Dal receiving 600 mg. allopurinol daily, to as long as four years in a nine year old Dal receiving 450 mg. allopurinol daily. The Dal receiving the enormous dosages was 6 years old and, over three years after urate stones had been removed surgically, had his allopurinol increased from 900 mg. daily to 2,400 mg. daily because his stone-forming "had worsened;" two final surgeries, eight months apart, confirmed the stones removed to be xanthine in content.

To retain the therapeutic benefit of allopurinol treatment for urate stone-forming Dals, the authors urge a special 24 hour collection of the dog's urine be done with accurate measurement of the volume of urine produced during that time. If the uric acid amount is greater than 300 mg. daily, the dosage of allopurinol must be increased to prevent urate stone-forming. If the uric acid amount is less than 300 mg. daily, allopurinol dosage must be decreased to prevent xanthine stone-forming.

Specialized methods are required to differentiate if urinary crystals or stones are urate or xanthine caused by longtime allopurinol overdosage. Both minerals look almost identical under the polarizing microscope. Both stones look similar under gross examination. Even the usual specialized testings by a urinary stone

laboratory will not help in differentiating between the two minerals. The authors recommend "*high pressure liquid chromatography*" to distinguish between urates and xanthine because this test is "*quantitative, sensitive and accurate*" and, unlike other assays, can be done on a smaller amount of testing material.

## 10. WHAT IS A "URETHROSTOMY?"

(SURGERY FOR AN OBSTRUCTED MALE DALMATIAN)

If surgery is unavoidable, most obstructed Dalmatians can have simple surgery whereby the bladder or the urethra (tube from bladder to outside) is opened, the offending stone(s) removed and the incision closed up without anatomically changing the normal urinary channel. But please note drastic surgery called a "*urethrostomy*" may be suggested and prematurely, perhaps even unnecessarily.

Firstly, do not confuse your vet saying "*urethrostomy*" (with an "s") as compared to a "*urethrotomy*" (no "s"). A urethrostomy (with an "s") is not simple bladder surgery. "Urethrostomy" (with an "s") is an artificial opening surgically created before the "os penis" anatomical area within the penis where most male stone-forming Dals obstruct. It generally is opened near the testicles or scrotal sacs and done as **A LAST RESORT** after less drastic methods have failed. For example, a recent method not even involving surgery at all, has been introduced to remove bladder stones by the world famous Minnesota Stone Center of Dr. Carl Osborne, and is called "*voiding urohydropulsion*."

Premature or indiscriminate choice of a urethrostomy (with an "s") must be carefully evaluated because:

- (1) it is an irreversible, delicate operation and the surgeon should be experienced and knowledgeable in the surgical procedure;
- (2) it is a very bloody operation and, postoperatively, the dog heals very slowly;
- (3) it is generally done at the base of the scrotal sacs and - even there - if a large enough stone subsequently forms, that size stone can obstruct before it reaches the urethrostomy. Therefore a urethrostomy by no means is a panacea nor removes the daily caution of observing the male dog to monitor if they are urinating normally or have obstructed. It is important that the decision for a urethrostomy should be finalized after consultation with one of the three stone-forming veterinary specialists in the U.S. to determine if less drastic procedures are available and more desirable.
- (4) once performed, the Dal may be prone to more-frequent-than-normal urinary infections.
- (5) ***a urethrostomy does not affect the underlying stone-forming of the dog.*** It merely (if successful and well done) minimizes or prevents urinary obstruction at the os penis by stones continuing to be formed and expelled.

Wherever possible, an unavoidable urethrostomy should be performed by a "Board-Certified" veterinary surgeon and one who is experienced in this surgical procedure. Membership in the American College of Veterinary Surgeons requires applicants to be Board-Certified so merely

asking if the surgeon is a member of that group will tell you. If "yes," he/she is Board-Certified; if "no," they probably are not. We also suggest that the general anesthetic be one of the newer chemical class such as "Isoflurane" which has demonstrated significantly fewer anesthetic deaths than its predecessor anesthetics.

## 11. IDENTIFYING ABNORMAL URINARY CRYSTALS / STONES

A 1986 vet textbook reported a survey by a vet center on U.S. laboratories assaying urinary stones/crystals. The survey found an 85 percent error!

Any owner of a stone-forming Dalmatian understandably is impatient to get definitive results on which mineral the dog is forming...especially because that information is crucial for the correct treatment and effective prevention, which can be different per the type of stone. The Minnesota Stone Center at the university is astonishing in this day and age - they do not charge! Despite this, specimens go through tests requiring scientific equipment costing many thousands of dollars such as electron microscopes and liquid chromatographs. How long they will be able to maintain this free-of-charge service to vets and owners of stone-forming dogs is unknown. (With that said, all owners whose dogs have benefited from their world-famous knowledge and insight may wish to consider a donation to them...whatever the amount.)

Currently, results from the Minnesota Stone Center can take as long as six to eight weeks to be reported back to the vet/dog owner...not surprising considering there is no charge and they accordingly are deluged with specimens. Depending on the severity of the Dalmatian's condition, the referring vet can telephone and most times get a more rapid telephone report. But for a no-charge service, their incontestably correct assay is worth waiting for and deserves patience except for emergency status.

## 12. REPEAT ASSAY OF ABNORMAL CRYSTALS/STONES

*"...[my Dalmatian bitch] has formed stones before so my vet is probably assuming since allopurinol / ud worked well last time (we got 5 years stone free...)"*

An understandable assumption but questionable especially with a female who's more prone than males to urinary tract infections and the accompanying struvite crystals/stones - and the main reason to confirm what kind of stone the Dalmatian is forming. With chronic, repetitive crystal or stone formation, assay should be done every time a stone-former shows symptoms.

For example, if (repeat "if") the current stones are indeed a result of bacterial infection and not (repeat "not") the prior urate/purine ones, then allopurinol and u/d<sup>®</sup> will WORSEN them. Why? Because urates/purines thrive in an abnormally acidic urine whereas the struvite/infection ones thrive in just the opposite...an alkaline urine. That said, both the anti-urate allopurinol and the anti-urate u/d<sup>®</sup> usually alkalinizes the urine. If your bitch has the struvite/infection type, the allopurinol/ud diet will worsen abnormal urinary alkalinity in which formation of struvites thrive.

So, to be necessarily accurate, it is always mandatory to send whatever sediment (not the liquid) centrifuges out during a urinalysis to one of the canine stone centers. You'll get one of two answers - yes, they're the same type as formed previously or no, they're different ones this time. In either

case, it is essential information to confirm what drugs and treatment the dog should receive to correct whichever is the confirmed culprit.

### 13. STONE-FORMING DOGS NEED TO URINATE AS FREQUENTLY AS POSSIBLE

Most urinary stones, including urates, thrive in stagnant urine. Minnesota points out that exceptionally well-housebroken dogs who, for whatever reason, are not permitted to *frequently* flush out their bladders may progress to fully-formed stones more often and rapidly than those stone-formers who do go out often to urinate frequently.

The prescription diet u/d<sup>®</sup> contains some chemicals to enhance thirst so the stone-forming dog will drink more, in turn fills its bladder sooner and then as a result flushes it out more often if permitted.

### 14. PROTEIN LEVELS IN DALMATIAN FOOD FORMULATIONS

Two considerations:

No. 1 - One known contributing factor to Dalmatian urate stone-forming is the presence and amount of "purine-yielding" proteins in their diets. Owners of confirmed urate-forming Dalmatians can therefore PREVENTATIVELY avoid or minimize the life-threatening urinary obstruction by feeding a diet low in purine-yielding proteins (in addition to other preventative measures). A tabulation of such foods is on the DCA homepage (<http://www.thedca.org/purines.html>) and a more elaborate tabulation of 200 foods is online at: <http://www.lukius.com/Health/Dalmatian%20Stone%20Forming.doc>

Please note liver is perhaps the worst purine-yielding food to feed to any Dalmatian and, therefore, show Dalmatians should NOT be baited with liver but with turkey or poultry hot dogs (microwaved to degrease them), raw vegetables like carrots (if the dog is enticed by them) or one of the home-cooked recipes owner-handlers use.

No. 2 - Divorcing purine-yielding foods for the moment, any high protein diet is assimilated by canines to momentarily produce an acidic urinary pH as one result of digestion (and the reason why fasting urine should be the specimen when a urinalysis is scheduled at the vet's to avoid deceptive pH reading). Urate stones form and thrive in an abnormally acidic urine (and treatment/prevention of those types of stones indeed include alkalinizers to neutralize the acidity).

### 15. HIGH PROTEIN FOOD FORMULATIONS AND THEIR INFLUENCE ON UNDESIRABLY ACIDIC URINE

It is known by canine physiologists that the higher the protein (any kind, not merely purine-yielding proteins), the more ACIDIC the dog's urine becomes during normal assimilation of the high protein food formulation.

Urates (identified as the type of stone Dalmatians predominately form uniquely of all breeds) thrive in an acidic urine. That is not the only reason urate-forming Dals can worsen but it is one of

them...so much so that in some stone-forming Dalmatians, one component of an effective treatment/preventative sometimes is to chemically neutralize that acidic urine with urinary alkalinizers.

In a sense, stone-forming Dalmatians can receive a "double whammy." One, a diet undesirably high in purine-yielding proteins and, also, a diet high in other proteins, too. Both can be culprits in Dalmatian overt stone-forming. The prescription diet u/d<sup>®</sup> depending on the dry vs. canned formulation, varies between 3 and 5 percent protein and is one reason why it was formulated and is prescribed for urate stone-forming breeds, Dalmatians included. It also contains potassium citrate, a urinary alkalinizer to help reverse abnormally acidic urine in urate-forming dogs.

My male Dalmatian was fed canned u/d<sup>®</sup> for over 11 years since he was first confirmed as a urate stone-former before age 2, at which time he required three surgeries when he repetitively obstructed. Concerned about the extremely low protein in his u/d<sup>®</sup> diet, I added hardboiled eggs to it...one in his AM meal and 1/2 in his PM meal. He drank exclusively bottled water labeled "distilled" and received raw celery and carrots as his only treats (in the "low" category of the online purine list, as are eggs too). For 11 years, his urinalyses remained clear of even abnormal crystals and his pH dipsticking remained at a stable plateau of Dalmatian normal of pH 6.5 to 7.0. He never required further surgery in all that time because he never again obstructed.

He was a testimonial to the accumulating evidence for the success of an anti-stone preventative regimen, especially his regimented diet.

## 16. CANINE STONE-FORMING TEXTBOOK CAUTIONS AGAINST BICARBONATE-OF-SODA TO ALKALINIZE ACIDIC URINE

For decades, sodium bicarbonate has been known and used by Dalmatian fanciers when their dogs have been confirmed with abnormal urate urinary crystals/stones. It now appears that sodium bicarbonate may worsen and complicate the dog's urate stone-forming. According to the Dalmatian chapter in the latest and most definitive teaching textbook for veterinarians on canine stone-forming:

*"Because sodium may combine with uric acid to form sodium urate, potassium citrate may be preferable to sodium bicarbonate as a urine alkalinizing agent."*

Unfortunately all Dalmatians are born with the potential urinary problem for urates. Why some Dalmatians become overt stone-formers while others including littermates do not, is unknown. Sodium urate is only one type of urate but ***all urates are characterized as thriving in an abnormally acidic urine.*** Therefore, one component of treatment and prevention is to reverse that abnormal acidity by attempting to neutralize it with alkalinizing chemicals such as potassium citrate. This should be started only by consulting with your veterinarian being that this can affect the overall electrolyte balance of the dog.

## 17. DIPSTICKING BY OWNERS OF STONE-FORMING DALMATIANS TO MONITOR STATUS

On the Internet, go to the following linked page and print it out:

URINARY STONES: DIPSTICKING TO MONITOR STONE-FORMERS:

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

The most expensive (and the most dependable and accurate) seem to be those made by two companies: Ames and Miles. The Merck brand cited by "Carla" below and available at a very reasonable price through her is also excellent!

If you ask the counter clerk at a drugstore about dipsticks, you'll probably get an uninformed answer. You must ask the pharmacist. If that doesn't help, look in your yellow pages under "**Medical Supply Companies**," and they may have them. They're also known as "**chem strips**," but you can describe them as a "**super litmus paper used to test urine for abnormal acidity or alkalinity**."

Make sure you double-check the expiration date printed on the labeling somewhere. Outdated dipsticks can give a false reading. The very inexpensive Nitrazine paper used for fish tanks has been found to give very erratic and questionable readings, dipsticking-to-dipsticking, so the old cliché is true: "**Penny wise and pound foolish**."

From:

Carla Baker

827 Boulevard Road SE

Olympia, WA 98501

<mailto:AtoZDals@scattercreek.com>

***"I was forced this Spring [2006] to raise the price. Current price is: \$16 first package (of 100 pH strips), \$15 for all subsequent packages in the same order."***

***"I am now able to accommodate purchasers from almost all countries (except just one or two third world countries). If you live outside the US, please email me with your location and I will have to check with the bank (they sometimes charge to cash non-US checks) and with the postal service for the cost of shipping."***

***"Include your full name and address with your payment and make checks out to me.***

***Snail Mail to:***

Carla Baker

827 Boulevard Road SE

Olympia, WA 98501

***"Please remember to email to confirm your order (<mailto:AtoZDals@scattercreek.com>), so that I can get a head start if I need to reorder. The company I order from is notoriously slow, so if you let me know ahead of time, you won't have to wait for your order."***

## 18. HOME-COOKED DALMATIAN RECIPES FOR URATE/PURINE STONE-FORMERS

(Omit "beef" and "meat" wherever cited for your urate-forming Dalmatian)

Like all else about this breed-specific health problem, it is important to understand that the TYPE of Dalmatian urinary stone must be first identified before embarking on a drastic change in the Dal's existence such as changing the dog's food and water intake. The following recipes have been reported as successfully used by owners of stone-forming Dalmatians but only after their abnormal crystals/stones have been confirmed as the breed-specific URATES. *Dalmatians forming other than abnormal urate urinary minerals may require totally different anti-stone food formulations.*

A choice of several dogfoods has been formulated and made commercially available by enterprising manufacturers for the special metabolism of stone-forming dogs. For Dalmatians who are urate stone-formers, prescription diets (available only from veterinarians) of Hill's u/d<sup>®</sup> and s/d<sup>®</sup> are recommended by the U.S. vet centers specializing in this health problem. A growing number of non-prescription dogfoods low in purine-yielding foods and low in protein such as "vegetarian" or "senior citizen - less active" may now be purchased at most pet stores. Do not however indiscriminately select any promisingly-named food: it is important to carefully read the list of ingredients before selecting one! (See online tabulations of purine-yielding foods)

Despite this, many owners of stone-forming Dalmatians prefer to cook for their dogs. Some find it more economical, others prefer to assure themselves their stone-formers receive fresh, natural ingredients free of preservatives, food colorings or other chemical additives. For example, commercial dry dogfoods have a tendency to go rancid or develop molds the longer they sit in their packaging. Accordingly, anti-rancid and anti-mold additives-preservatives are used some of which perhaps may be undesirable for dogs with urinary stone-forming.

**PLEASE CONSULT WITH YOUR VETERINARIAN BEFORE SHIFTING DIETS AS WELL AS FOR THE RECIPE SELECTED!**

**BE AWARE SOME STONE-FORMING DALMATIANS MAY BE ALLERGIC TO ONE OR MORE INGREDIENTS IN THE ANTI-STONE RECIPES.**

Underlying goals of these diets are to feed the Dalmatian nutritious yet anti-urate food formulations that are desirably low in purine-yielding foods. The majority of the recipes fall into the "rice-and-vegetables" category so that diets containing high amounts of purine-yielding beef, meat, poultry or their respective by-products can be minimized or totally avoided.

Unfortunately, expertise in nutritional knowledge for stone-forming Dalmatians is not rampant. Ideally, a diet which does not produce nor contribute to an abnormal and unstable urine is desirable. It should also promote thirst to increase water intake (which in turn increases the volume and frequency of urinating thereby flushing out abnormal crystals and small stones from the bladder).

The overall nutritional need of an active Dalmatian is an equal concern. Some diets highly effective in minimizing stone-forming may not provide overly generous nutritional support while contrariwise, highly nutritious diets may aggravate ongoing stone-forming and the specter of its dreaded urinary obstruction. It is the best compromise between these two seemingly conflicting goals that is the ideal of home-cooked recipes for urate stone-forming Dalmatians.

Conscientious owners should monitor their Dalmatian's diet by dipsticking the urine (and keeping a diary of its pH) to avoid excessive acidity of the urine. Vitamins certainly should supplement the low-protein formulations associated with low purine-yielding ingredients required for urate stone-formers...but examine the vitamin ingredients carefully! Many popular brands of dog vitamins are in a base of or contain desiccated *liver*, perhaps the worst purine-yielding food to give to a Dal! The alternative of human children's vitamins is possible. Prorate the Dalmatian's weight to that of children's ages cited on the labeling.

But first let's look at some generalities about the basic ingredients of these diets for Dalmatian urate stone-formers.

### RICE

Of the several types and varieties available, wild rice is not recommended for stone-formers. Brown rice appears to be slightly more desirable than white rice. The two types are frequently mixed in preparation but using only white rice is acceptable. Any form of rice is suitable such as instant, long-grained, etc. Sales and prices can be deciding factors. Once the Dalmatian's acceptance of the rice-based diet has been observed, most cooks purchase large-size packages of rice and prepare portions to which assorted vegetables are added. When cooking, please note it has been reported that some factory production of white rice involves preserving with talcum powder. It is important therefore to first rinse any form of uncooked rice several times in running water. Impurities will be clearly visible as they progressively rinse off. The rice component of the recipes can be frozen but most cooks prefer its simple preparation either daily or once weekly, refrigerating the balance until used up. There are no preservatives in these recipes so if not frozen in advance, they must be refrigerated.

### VEGETABLES

Any vegetable not in the highest or high purine-yielding categories such as undesirable legumes may be substituted. Vegetables in any form such as frozen, canned or fresh may be used. If canned, do not discard the liquid from the container but use the nutritious liquid in cooking or pureeing. Changing the choice of vegetables occasionally can be a welcome change for a finicky Dalmatian. The vegetables may be mixed either in chunks or pureed in a processor or blender. Meal-size portions of vegetables may be frozen in advance. If using fresh vegetables, they should be blanched in boiling water before freezing. Similar to human diets, roughage has been diminished in dogfood perhaps to reduce stool size and minimize clean up, so chilled, crunchy celery or carrots can be used as treats.

### ADDING POULTRY, MEAT, LAMB ?

Some of the following recipes, especially those pioneered by Jack Lowrey for Dalmatian stone-formers, cite poultry, meat or lamb as ingredients. It is important for the stone-former's owner to evaluate those recipes very carefully because these ingredients are high in the list of purine-yielding foods. Some stone-formers who are on maintenance dosage of the anti-urate drug

allopurinol may tolerate these ingredients. Others, particularly those Dalmatians not receiving allopurinol, should be fed these ingredients with caution. Dipsticking will be a valuable index to avoid highly acidic pH of the urine possibly induced by these particular ingredients. When in doubt, check with your veterinarian!

### OILS

A publication issued by a dogfood manufacturer has been quoted as suggesting, "There is no evidence that the normal dog needs any polyunsaturated fatty acids in the diet other than linoleic." However, some veterinarians are prescribing diet supplementation with formulations of Omega-3 (linolenic) and Omega-6 (linoleic) fatty acids to dogs with allergic inhalant allergy as well as to elderly dogs with pain from chronic arthritis. Amounts of one or both of these fatty acids are present in commonly-available oils such as: linseed (flaxseed), canola, corn, peanut, safflower. If cooking with one or more of these oils, remember that some Dals are allergic to corn-based products. Others may overreact with diarrhea or skin & coat rashes to even small daily amounts of any of the oils. Be cautious therefore when introducing them into the Dal's diet. Containers of oils should be refrigerated immediately after opening; rancid oils frequently induce nutritional deficiencies.

### FRUITS

Most fruits are welcome treats for the stone-forming Dalmatian and are in the low purine-yielding category. Avoid citrus-containing vitamin C (ascorbic acid) fruits which would only contribute to the already abnormally acidic pH of the urate stone-formers' urine.

### FOOD ALLERGENS

Veterinarians specializing in allergy testing of dogs list the following food allergens as frequently-seen although by no means the only allergenic ones. Be cautious adding any of these food ingredients to your home-cooked formulation. If your Dal starts to scratch and bite abnormally or develops diarrhea, please discuss with your vet the possibility of one or more ingredients in the home-cooked recipes perhaps being allergenic to your dog.

BARLEY / RYE	PORK
CHICKEN	POTATOES
CORN	RABBIT
DUCK	SORGHUM
EGGS	SOYBEAN
FISH	TOMATO
KELP	TURKEY
LAMB	WHEAT
MILK	YEAST, BREWERS
OATMEAL	
PEAS	

Do not take this list literally and deny your Dalmatian any of the cited foods in the absence of any allergic symptoms. Of course, do not use those which are high purine-yielders even if the Dal is not allergic to them.

### SOME GENERALITIES FROM OWNERS COOKING FOR DALMATIANS

Do not shift the stone-forming Dalmatian overnight from commercial formulations to the home-cooked recipe. Slowly but progressively alter the ratio of the home-cooked food to the diet the Dal has been eating until, after a week or two, the transition has been made.

Experienced owners cooking for their stone-formers feel strongly that the Dalmatian be fed at least two to preferably three times a day in modest quantities instead of one large daily meal. They suggest that "peaks" in blood-urine uric acid levels with one single meal may be lowered by more frequent feedings of smaller amounts. (No scientific documentation is available for this impression but it theoretically has merit.)

The amount of food to maintain an adult Dalmatian as well nourished depends on its size and weight, extent of daily exercise, temperament (placid, active, etc.) and its individual metabolic characteristics. Most adult Dals should be fed the home-cooked formulation three times daily, one-to-two cups per feeding (total of three to six cups daily). Do not overfeed - keep the Dal well fed without permitting it to become overweight.

Many do not cook canned vegetables believing sufficient cooking has already taken place during the canning process. Further, they feel additional cooking would destroy essential vitamins in the canned vegetables.

*"When I cooked a large pot of rice, I added any assortment of herbs to the water that I wanted... I almost always added garlic salt because, containing salt, it encouraged more drinking."*

### RECIPES

FOR ACUTELY SEVERE STONE-FORMING DALS  
(USE ONLY AFTER CONSULTATION WITH YOUR VETERINARIAN!)

Per serving:

2 1/2 cups cooked white rice  
2 Tablespoons vegetable oil  
1 large hard cooked egg  
1/4 teaspoon calcium carbonate  
1/4 teaspoon potassium chloride

Add balanced vitamin-mineral supplement fulfilling canine Minimum Daily Requirements.

The above recipe is from Jack Lowrey and his one-man "Dalmatian Research Foundation." It is unknown if this recipe has been analyzed by licensed, experienced clinical nutritionists.

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### TYPICAL VEGETABLE-AND-RICE RECIPE

Fresh or frozen vegetables may be substituted. The recipe should fill nine one-quart freezer bags - three cups of the pureed vegetables to each ziplock bag. Divide quantities for smaller preparation, multiply for larger preparation.

3 cups white rice  
2 cups brown rice  
10 cups distilled water  
1/3 cup canola oil (unless dog is allergic to corn)  
2 Tablespoons bacon fat (optional)

Cooking Rice: Bring distilled water and oil to vigorous boil, add rice, stir occasionally. Reduce heat to low and cover. Allow to simmer until liquids have been completely absorbed (approximately one hour). Set aside to cool. (Weight of this portion should be approximately 9 lbs.)

4 one-lb. cans - carrots (do not drain)  
4 one-lb. cans - green beans (do not drain)  
4 one-lb. cans - tomatoes (do not drain)  
3 one-lb. cans - greens: choose any acceptable low purine-yielding ones (do not drain)

Preparing vegetables: use vegetables directly from cans. Puree canned vegetables and mix well in a large container. These quantities should fill nine one-quart freezer bags, three cups of the pureed mix to each ziplock bag.

Feeding: If frozen, defrost frozen vegetable puree in microwave or overnight in refrigerator. Prepare a batch of rice and mix puree into it when rice has cooled.

Supplements: Give each Dalmatian a vitamin-mineral supplement plus a calcium supplement...both as discussed with your veterinarian...but avoid pet vitamins as they are in a base of dessicated liver, perhaps the worst purine-yielding protein to give to a Dalmatian. Instead, use human children's vitamins. Vitamins should never be given on an empty stomach.

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RECIPE FROM NILDA DORINI  
ZARA DALMATIANS & "THE DOG'S KITCHEN"  
7871 Willowfield Drive  
Richmond, British Columbia V7C 4S8  
Canada  
Telephone/Fax (604) 277-0436  
<mailto:zara@rogers.wave.ca>  
<http://members.home.net/zara>

The recipe following is a complete diet and exceeds the standards set by the NRC (National Research Council) which is an organization setting up standards used by commercial dogfood manufacturers. The recipe has also been analyzed by the Nutridelta System. The diet has been formulated as a maintenance diet for dogs between the ages of one through eight years. Puppies and older dogs have different needs. I have been feeding my Dalmatians this way for 28 years without a problem (yet!) .

Most dogs will eat any food presented to them but the choice is the owner's alone. Some dog owners might say "I don't have time to cook for my dog," but compare the time you would have to find and to sit in the vet's waiting room if your dog has a problem! The 30 minutes required for the preparation of this diet will be rewarded many times over with hopefully fewer health problems and the satisfaction of home-cooking contributing to a healthy dog!

This diet is 88-95% digestible. It is calculated to be 4% protein in the wet form and, in the dry form, 16% protein. Caloric value of the cooked food is 300 calories per cup of cooked food. For a 44 pound animal, for example, it means feeding 4 cups daily.

Good nutrition is a key component for maintaining a healthy immune system providing resistance to diseases. Foods containing chemicals, preservatives, drugs and toxins are alleged to suppress normal immune function especially in those genetically susceptible to immune dysfunction. If you are already feeding your dog a properly balanced home-cooked diet, it will be rewarding in his old age.

The food balance in the following recipe comes from its variety of foods. The nutrients are divided into groups. Meat (undesirable for confirmed urate stone-forming Dalmatians), eggs and corn oil will provide the essential protein and essential fatty acids (corn oil is a good source of linoleic acid). Rice and macaroni (or oats and barley) provide carbohydrate while vegetables, milk and salt provide minerals and vitamins. Some dogs cannot tolerate milk but the amount is so minimal that it may not affect even those animals.

**Do not use onions** (large amounts cause the formation of Heinz body's in red blood cells, hemolytic anemia and death.) The toxic principle is n-propyl disulfide, an alkaloid). If you add a potato, be sure not to use a green, sprouting one as it contains large amount of "*solamine*," a toxic substance.

The calcium in egg shells may be ground to a powder; one Tablespoon is equivalent to 7,800 mg of calcium carbonate. The eggshells must be cooked to avoid the risk of Salmonella after which they are dried, cooled and pulverized (most easily in a coffee grinder).

#### RECIPE

4 cups - rice (brown rice may be used, it contains more minerals than white rice but is more expensive) .

9-10 cups - water

1/2 cup - milk

1/2 cup - macaroni

8 ounces - meat (chicken or lamb) but use cautiously or omit entirely for urate stone-formers

1 teaspoon - salt,

1 Tablespoon - ground egg shells,

4 - whole eggs

3 Tablespoon - corn oil (unless dog is allergic to corn)

2 cups - grated carrots (or 2 cups of blenderized frozen veggies - no spinach)

2 cloves - garlic (a good source of selenium and phosphorous)

2 Tablespoon - parsley.

Cook the above, simmering for 25-30 minutes until rice is mushy and has absorbed all the water. Because this food contains no preservatives it MUST be stored in the refrigerator . I add supplements once a day, just before serving the morning meal:

1/8 teaspoon powdered Kelp  
1 heaping Tablespoon of cottage cheese  
2 slices of toast spread with bacon fat or peanut butter.

Feed twice a day. Introduce this diet gradually. Mix 25% diet to 75% the usual diet and do this for a few days. This will allow the dog's digestive system to adapt. This step is very important, so do not rush through it!

Yes, you can make a big batch and store the cooled food portions measured for the amount your dog eats per meal. A handy way to store the portions is to use ziplock bags. Remove as much air as possible, flatten the bag like a pancake, seal and freeze. Frozen portions can be kept up to three months.

Make sure you feed your dog's meal lukewarm. Do not "free-feed." The average dog should have a minimum of two meals a day.

It is important to feed your dog to maintain it's optimal body weight. Weigh your dog before shifting to this recipe. If the dog gains from his optimal weight, decrease his meals by 10%. If he loses weight, increase the food by 10%.

For treats I give fresh apples, grapes and bananas. Many food producers use a fungicide on their products so I peel the apples to remove the wax or residue that has been sprayed on.

#### NILDA DORINI'S SUGGESTED READING

Nutrient Requirement of Dogs (rev.1985)  
National Academy Press  
Washington DC

Small Animal Clinical Nutrition III  
by Lon D. Lewis DVM and associates  
Mark Morris Associates  
5500 S.W. 7th Street  
Topeka KS 66606

Dr. Pitcairn's Complete Guide to  
Natural Health for Dogs and Cats  
by Richard H. Pitcairn DVM and Susan Hubble Pitcairn  
Rodale Press  
Emmaus PA

The Collins Guide to Dog Nutrition, ed. 2  
by Donald R. Collins DVM  
Howell Book House  
New York

The Wellness Encyclopedia of Food & Nutrition  
by Sheldon Margen MD and Editors  
U. California at Berkeley  
Rebus, NY  
Distributed by Random House

Nutritive Value of American Foods (in common units)  
by Catherine F. Adams  
U.S. Department of Agriculture, 1975

Dog Owners' Veterinary Handbook  
by Delbert G. Carlson DVM and James M. Giffin MD

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### **19. DO URATE-FORMING DALMATIANS HAVE TO TAKE THE ANTI-URATE DRUG, ALLOPURINOL, THE REST OF THEIR LIVES?**

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One of the many anti-urate actions of allopurinol is to neutralize the abnormal urinary acidity seen in urate stone-formers (urates thrive in an acidic urine). Dipsticking by the owner (to determine if a desirable plateau of urinary pH 6.5 to pH 7.0 has been stabilized for a urate stone-former) can also be used to possibly withdraw allopurinol without putting the dog in jeopardy.

During the many years the Study Group had been in existence, we had several owners of urate stone-formers who were vehemently anti-drug - for themselves, their family and their Dalmatian. These people were able to slowly (repeat "slowly") cut back on the allopurinol dosage while dipsticking every day. The dogs, of course, were also on what we recommend as a prevention program in addition to allopurinol...u/d<sup>®</sup> (or a home-cooked anti-urate food formulation), plus distilled water.

Embarking on withdrawing the drug, the owners dipsticked every few days and recorded the pH in their diary. If the pH daily readings did not suddenly plummet into the abnormally acidic range (pH 6.0 or lower), the owners continued to slowly withdraw the allopurinol. Of the owners who kept in touch with us during the withdrawal, every single one was successful in totally withdrawing the drug, based on the Dalmatian never going into an abnormally acidic urinary pH during or after the withdrawal period. These owners were extremely conscientious in not permitting their families, friends, etc. unknowingly to give the Dal treats. Also, all their Dalmatians had been stabilized in the "normal" pH range *for some time before* the owners commenced the allopurinol withdrawal procedures. On the other hand, there are many veterinarians who are convinced that a low-dosage allopurinol regimen (no more than 300 mg. daily) should be given confirmed urate stone-formers for life to prevent any future urate stones. Readers are reminded to read the caution about allopurinol overdosage in article no. 9.

## 20. STRANGE HEART CONDITION REPORTED IN A VERY FEW DALMATIANS ON ANTI-URATE LOW-PROTEIN DIETS

*"...In an earlier post there was mention of CARDIOMEGALY that Dals on the u/d<sup>®</sup> diet/allopurinol can get as a result of long term use. What is this? I have 2 boys on the UD/Allopurinol for the past 9-10 years, are they at risk for heart problems from this?..."*

It's called "*dilated cardiomyopathy*," (abbreviated to DCM). I am attaching the national bulletin issued when the DCA Study Group first learned of it. Since then, some further data suggests not one but two amino acids may be involved: the taurine, as cited in the vet article, and carnitine.

Some hopefully reassuring points:

1. Dogs who are NOT Dalmatians nor even stone-formers, can develop DCM. So far, very few confirmed Dals have been reported. However, of those few reported, the DCM was on the opposite side of the heart from breeds known to develop it such as Dobermans.
2. ANY low protein diet, u/d<sup>®</sup> included, may be incriminated but diet is only one of many possible causes;

The exact incidence of Dals with DCM (overt stone-formers or not) - like so many other Dal health problems - is unknown either because it does not occur in many, many Dalmatians or if it did, the owners and their vets chose not to report it.

Despite many other causes of DCM but with one possibility being dietary deficiency, supplementing with hardboiled eggs daily may be of nutritional advantage. Eggs, unless the Dal is allergic to them, are a marvelous broad-scale nutritional supplement, not just for health problems. The dogs, each, can get one hardcooked egg in their AM meals, 1/2 in their PM meals. (Uncooked eggs are not digested by canines, so cook the eggs).

So far, DCM does not seem to be a breed-wide alarming problem including in those Dalmatians who are confirmed urate stone-formers and on preventative long-term anti-stone diets such as u/d<sup>®</sup>. Nonetheless, like urinary obstruction due to overt stone-forming, that's hardly consolable to the owner of the infrequent Dal experiencing DCM. Very frequently, the early onset of symptoms is coughing by the Dalmatian, so that's what to look for. That's also a symptom of other types of heart disorders, not just DCM.

For those who are concerned and insist to rule DCM out in their Dals on long-term anti-urate diets, the best diagnostic procedure is to see a vet cardiologist. Of several heart monitorings, the "echocardiogram" will undoubtedly confirm or deny the presence of DCM. One appropriate anecdote: the owner of a littermate to a Dal with confirmed DCM was very concerned even though her Dalmatian showed no symptoms. She took her Dal to the same cardiologist diagnosing the littermate. Going through two cardiac tests, nothing showed up at which point the cardiologist suggested the owner perhaps might want to avoid the echocardiogram being expensive costs were mounting up. The owner, a determined and worried one, nonetheless authorized the final and

complete echo despite its added expense...and the echocardiogram finally showed up DCM in her Dal whereas previous diagnostic tests had been negative!

Unless the dog has a confirmed allergy to eggs, u/d<sup>®</sup> or any low-protein diet may be supplemented with one hard-cooked egg in the AM meal, and 1/2 egg in the PM meal. Eggs are in the lowest purine-yielding category of food and they are an excellent source of protein and nutrients.

For those who find u/d<sup>®</sup> prohibitively expensive for their urate stone-formers, recipes are included in article no. 18.

BULLETIN (August 1996)

From: Study Group on Urinary Stones /

Research Committee of the Dalmatian Club of America, Inc.

#### CAUTION SUGGESTED FOR STONE-FORMING DALMATIANS ON LONG-TERM, VERY LOW-PROTEIN DIETS

Extremely isolated reports of a certain type of heart problem in a few Dalmatians are being reported nationally. The condition is called "*cardiomyopathy*" or "*cardiac myopathy*." It is being seen in Dalmatians who have been fed very low-protein diets for long periods of time because they were urinary stone-formers.

[Addendum: this now has been published. Urge your vets to read: "*Idiopathic Dilated Cardiomyopathy in Dalmatians: Nine Cases (1990-1995)*" by Lisa M. Freeman, DVM, PhD, and coauthors in *Journal of the American Veterinary Medicine Association*, volume 209, pp. 1592-1596 (Nov. 1) 1996.]

Immediate research to explore the relationship of diet to the heart problem was started by veterinary academic centers including those which specialize in canine stone-forming. Preliminary findings suggest that a dietary deficiency of one or both of two amino acids may perhaps be factors in the strange onset of the heart symptoms. They are "*taurine*" and "*carnitine*." Taurine deficiency has been known by veterinarians to be associated with cardiomyopathy in cats but rarely if ever in dogs. Because of the small number of reports, it cannot be positively or even probably concluded at this time that diet, alone, is responsible. Other coincidental factors have yet to be finally evaluated such as for example, heart problems in the breedline.

Stone-forming Dalmatians being successfully maintained symptom-free on home-cooked low-protein diets or on prescription anti-urate food formulations should not be shifted from their food regimens. (As of April 1995, Hills Prescription Foods added taurine to both dry and canned versions of their u/d<sup>®</sup> formulation.) For stone-formers on any anti-urate, low-protein food formulation including home-cooked ones, daily supplementation with a high-protein but low purine-yielding food such as hard boiled eggs may be considered unless the dog is allergic to them.

PLEASE CONSULT WITH YOUR VETERINARIAN IF YOUR STONE-FORMING DALMATIAN STARTS TO COUGH UNCHARACTERISTICALLY OR TO SHOW OTHER SUSPICIOUS SYMPTOMS OF POSSIBLE HEART PROBLEMS.
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## 21. LATEST VET TEXTBOOK ON CANINE STONE-FORMING

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The latest, state-of-the-art textbook has been issued on canine urolithiasis. It is excellent! The series of articles are based on 77,000 canine stones and cover diagnosis, treatment, drugs, diagnostic methods of x-rays, 25 years experience of uropropulsion, etc. (This volume is a follow-up to their two-volume 1986 textbooks...) All vets treating stone-forming dogs should be urged to add this to their reference library.

Details are as follows:

THE VETERINARY CLINICS OF NORTH AMERICA  
January 1999 Volume

*"The ROCKet Science of Canine Urolithiasis"*

In U.S., order by calling toll free:

1-800-654-2452.

P.S. The chapter on urate urolithiasis is written by one of the three co-editors, Joseph Bartges DVM, PhD, who gave the 1992 DCA annual Education Seminar - and who mentions the DCA website and the series of teaching articles there in his published chapter! One of the other co-editors, Jody Lulich, DVM, PhD, is a *specialist in calcium oxalate stones* which currently is the number two type of stone assayed in dogs.

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