

Minnesota Urolith Center * UNIVERSITY OF MINNESOTA

College of Veterinary Medicine * 1352 Boyd Avenue * St Paul, MN 55108

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CANINE CALCIUM OXALATE PREVENTION SUPPLEMENTAL INFORMATION

► **NEW:** The Canine Genetics Laboratory at the University of Minnesota's College of Veterinary Medicine discovered a mutation that is strongly associated with risk for calcium oxalate stones. The mutation was first identified in English Bulldogs but is also present in related breeds (e.g. Boston Terrier, Rottweiler, American Staffordshire Terrier). The condition associated with this mutation is being referred to as: Hereditary Calcium Oxalate Urolithiasis, Type 1 (CaOx1). A genetic test for CaOx1 is now available through the [Canine Genetics Lab](#). We are now conducting research to determine which therapies are most likely to reduce stone risk specifically for dogs with hereditary CaOx1.

We are actively working to discover additional genetic risk factors for CaOx stones in dogs. If you own a dog that has formed CaOx stones and are interested in helping with this research, please visit our [CaOx study website](#) for details.

DIET QUESTIONS

Calcium oxalate (CaOx) is a common and difficult urolith to prevent because factors responsible for formation are incompletely understood. Selecting the most effective diet is challenging because appropriate studies (prospective, case-controlled, ≥ 3 yr) evaluating recurrence have not yet been performed. Therefore, prevention strategies are based on physiology of calcium and oxalate excretion, surrogate endpoints (e.g. RSS) and identification of risk factor in retrospective studies. In general, ~50% of dogs reform CaOx uroliths within 2 years.

SOME FEATURES TO CONSIDER WHEN SELECTING A DIET:

1. Select Moist Foods-canned foods contain a lot of water. Water consumption increases urine volume and decreases urine concentrations of calcium and oxalate. More water = less mineral precipitation.
2. Avoid Over-Acidifying Foods-over acidification of urine is a risk factor for calcium oxalate partly because it increases calcium excretion. It is likely that other protective factors are also altered (decreases inhibitors, precipitates proteins, etc.)
3. Avoid High Sodium Foods- As the body gets rid of unwanted sodium, calcium is lost in urine.
4. Avoid High Protein Foods-animal protein consumption promotes acidic urine. Lower protein promotes diuresis and minimizes calcium and oxalate concentrations in urine.
5. Avoid Phosphorus Restricted Foods-Pyrophosphate is an inhibitor of calcium oxalate. Low phosphorus foods may stimulate vitamin D production and promote calcium absorption.

SOME KEY POINTS

- Recommendations for CaOx prevention can be found at urolithcenter.org under the Resources tab.
- Listed diet selections are those that we have evaluated and published results, researched in the literature, or have experience with in managing our clinical patients.
- We avoid some marketed preventative diets because they are overly acidifying or too high in sodium.
- Some over-the counter diets (eg. Science Diet Adult 7+ Chicken & Barley, others) may have suitable nutritional profiles similar to our recommended dietary features for CaOx prevention.
- Feed moist diets, or add water to dry formulations.
- Minimize vitamin and mineral supplements.
- Monitor urine: Goal = specific gravity ≤ 1.020 and pH ≥ 6.5 (add potassium citrate to \uparrow urine pH if needed).
- Image dogs every 6 to 12 months to allow non-surgical removal by voiding urohydropropulsion or basket retrieval.

These general recommendations are based on urolith analysis and may not be appropriate for all pets. We advise reviewing manufacturer's literature regarding selected therapeutic foods to determine indications and contraindications. For pets with multiple health concerns, we suggest that the selection of diet should take into consideration all health needs of the pet, and prioritize nutritional needs on the most serious disease, which is not always the stone disease.

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What commercial or home-prepared diets are available to feed animals with a history of urolithiasis?

More and more, pet owners are partnering with their veterinary team to determine appropriate diets for their pets. In some cases, the pet may have multiple medical conditions in addition to urolithiasis.

The Minnesota Urolith Center recommendations which include optimum dietary characteristics for management of urolith patients can be found under mineral-specific prevention recommendations at:

<http://www.vetmed.umn.edu/centers-programs/minnesota-urolith-center/recommendations>

or at urolithcenter.org under the Resources tab.

Other diets may be appropriate. However, we have not performed appropriate studies on home-prepared diets or on many commercial diets regarding their efficacy in the treatment or prevention of urolithiasis. If a home-prepared diet is being considered, be aware that some individual ingredients may be higher in calcium, oxalate, purine, etc.

How do I contact and consult with a veterinary nutritionist?

Veterinary nutritionists can assist in the formulation of a diet, make recommendations on commercial diets, discuss management of patients with multiple medical concerns, or consult on the appropriateness of a selected diet.

If you would like to work directly with a veterinary nutritionist to develop a customized home-prepared diet for your pet or identify a commercial diet for your specific patient's needs visit:

The American College of Veterinary Nutrition Diplomate Directory at: www.acvn.org/directory/

Some Colleges of Veterinary Medicine offer consultations with nutritionists on staff. Contact your nearest College of Veterinary Medicine for services provided.

Hill's Pet Nutrition veterinary consultation service can be reached:

Veterinary Clinics/Staff contact: 1-800-548-VETS (8387), or by email at vet_consult@HillsPet.com

Pet Owners: Consumer Affairs Department 1-800-445-5777 or hills_corporate_consumer_affairs@hillspet.com.

Many diet manufacturers offer consultation on dietary recommendations — contact your preferred manufacturer.

At the University of Minnesota, Veterinary Medical Center contact the nutritionists at
Phone 612-624-5024.

Veterinary nutritionists are also available on-line at websites such as: www.petdiets.com and www.balanceit.com

Online Resources for owners

Frequently asked nutrition questions: <http://www.acvn.org/frequently-asked-questions/>

The World Small Animal Veterinary Association WSAVA – Nutrition Toolkit: <http://www.wsava.org/nutrition-toolkit>

Topics include: The savvy cat owners guide to nutrition on the internet

The savvy dog owners guide to nutrition on the internet

Selecting the best food for your pet