

# “Nutritional dissolution is the compassionate choice for managing struvite uroliths.”

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## To help dissolve canine struvite uroliths

### Hill's® Prescription Diet® s/d® Canine pet food

- Aids struvite urolith dissolution with low magnesium, phosphorus and protein, and an acid urine pH that increases solubility of struvite crystals<sup>1-6</sup> (**Target urine pH: 5.9-6.1**)
- A clinical study has shown the nutrition of s/d® Canine can dissolve sterile struvite uroliths in an average of 3.3 weeks<sup>1</sup>
- Feeding s/d Canine in conjunction with appropriate antibiotic therapy can aid in the dissolution of infection-induced struvite uroliths<sup>3-5</sup>



## To help manage occurrence and recurrence of canine struvite urolithiasis

### Hill's® Prescription Diet® c/d® Canine pet food

- Reduced magnesium, phosphorus and protein help limit formation of struvite building blocks
- Clinically tested to promote an acid urine pH that discourages formation of struvite crystals<sup>7</sup> (**Target urine pH: 6.2-6.4**)
- Added antioxidants help reduce oxidative stress and promote a healthy immune system
- Animal feeding tests using AAFCO procedures substantiate that c/d® Canine dry and canned formulas provide complete and balanced nutrition for maintenance of adult dogs
- Dry food naturally preserved for freshness and great taste



# To help manage dogs with calcium oxalate and other non-struvite uroliths

## Hill's® Prescription Diet® u/d® Canine pet food

- Low protein and calcium reduce urinary concentrations of urolith-forming constituents (**Target urine pH: 7.1-7.7**)
- The nutrition of u/d® Canine aids in the management of calcium oxalate<sup>8,9</sup> as well as uric acid, sodium urate, ammonium urate and other purine uroliths<sup>8,10-13</sup>
- Aids in dissolution of urate\* and cystine<sup>†</sup> uroliths<sup>11</sup>
- Backed by multiple studies in urolith-forming dogs
- Available in canned form — preferred for dogs with uroliths — in addition to dry (41% of dog owners prefer to feed both canned and dry pet food)<sup>14</sup>
- Decreases purine intake and uric acid excretion, which lowers risk of forming urate crystals and uroliths
- High protein digestibility
- Protein level sufficient for maintenance of adult dogs, yet low enough to dilute urine by decreasing urea production
- Animal feeding tests using AAFCO procedures substantiate that u/d Canine dry and canned formulas provide complete and balanced nutrition for maintenance of adult dogs
- Added antioxidants help reduce oxidative stress and promote a healthy immune system
- Dry food naturally preserved for freshness and great taste



## Recommend evidence-based therapeutic pet foods for your canine lower urinary tract disease patients

\* In conjunction with allopurinol, 15 mg/kg body weight BID for dissolution of ammonium urate uroliths in dogs. Beware of allopurinol use in hepatic or primary renal failure, as allopurinol is metabolized to its active form in the liver and excreted via the kidney. Do not feed foods high in purines to patients receiving allopurinol as xanthine uroliths could result. Maintenance dose of allopurinol if indicated, 10 to 20 mg/kg body weight per day. Long term use of allopurinol is discouraged because of the potential for development of xanthine uroliths.

† In conjunction with tiopronin, 15-20 mg/kg body weight BID for dissolution of cystine uroliths in dogs. Adverse reactions to tiopronin are uncommon but can be serious and may include myopathy, proteinuria, spherocytic anemia, thrombocytopenia, dermatopathy, elevated liver enzymes, and aggression. Maintenance dose of tiopronin if indicated, 15 mg/kg body weight BID.

<sup>1</sup> Abdullahi SU, Osborne CA, Leininger JR, et al. Evaluation of a calculolytic diet in female dogs with induced struvite urolithiasis. *Am J Vet Res.* 1984;45:1508-1519.

<sup>2</sup> Bartges JW, Osborne CA, Polzin DJ. Recurrent sterile struvite urocystolithiasis in three related English cocker spaniels. *J Am Anim Hosp Assoc.* 1992;28:459-469.

<sup>3</sup> Hoff ME. Dietary management of struvite cystic calculi in a dog. *Modern Vet Pract.* 1986;December:883-886.

<sup>4</sup> Lulich JP, Osborne CA, Johnston GR. Non-surgical correction of infection-induced struvite uroliths and a vesicourachal diverticulum in an immature dog. *J Small Anim Pract.* 1989;30:613-617.

<sup>5</sup> Seaman R, Bartges JW. Canine struvite urolithiasis. *Compend Contin Educ Pract Vet.* 2001;23:407-420.

<sup>6</sup> Osborne CA, Bartges JW, Lulich JP, et al. Canine urolithiasis (Cases 20-1, 20-6, 20-8). In: Hand MS, Thatcher CD, Remillard RL, Roudebush P, eds. *Small Animal Clinical Nutrition*, 4<sup>th</sup> ed. Topeka, KS: Mark Morris Institute, 2000;670-688.

<sup>7</sup> Gleaton HK, Bartges JW, Laffamme DP. Influence of diet on urinary pH, urine and serum biochemical variables, and blood-ionized calcium concentrations in healthy dogs. *Vet Ther.* 2001;2:61-69.

<sup>8</sup> Bartges JW, Osborne CA, Felice LJ, et al. Diet effect on activity product ratios of uric acid, sodium urate and ammonium urate in urine formed by healthy Beagles. *Am J Vet Res.* 1995;56:329-333.

<sup>9</sup> Lulich JP, Osborne CA, Lekcharoensuk C, et al. Effects of hydrochlorothiazide and diet in dogs with calcium oxalate urolithiasis. *J Am Vet Med Assoc.* 2001;218:1583-1586.

<sup>10</sup> Bartges JW, Osborne CA, Felice LJ, et al. Influence of four diets containing approximately 11% protein (dry weight) on uric acid, sodium urate and ammonium urate urine activity product ratios of healthy Beagles. *Am J Vet Res.* 1995;56:60-65.

<sup>11</sup> Bartges JW, Osborne CA, Felice LJ, et al. Influence of two amounts of dietary casein on uric acid, sodium urate and ammonium urate urinary activity product ratios of healthy Beagles. *Am J Vet Res.* 1995;56:893-897.

<sup>12</sup> Bartges JW, Osborne CA, Felice LJ, et al. Influence of four diets on uric acid metabolism and endogenous acid production in healthy Beagles. *Am J Vet Res.* 1996;57:324-328.

<sup>13</sup> Bartges JW, Osborne CA, Felice LJ, et al. Influence of allopurinol and two diets on 24-hour urinary excretions of uric acid, xanthine and ammonia by healthy dogs. *Am J Vet Res.* 1995;56:595-599.

<sup>14</sup> Habits and Practices Study – Pet Care Report 2002. Data on file. Hill's Pet Nutrition, Inc.