

Quantitative Analysis of 4468 Uroliths Retrieved from Farm Animals, Exotic Species, and Wildlife Submitted to the Minnesota Urolith Center: 1981 to 2007

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KEYWORDS

- Exotic • Zoo • Wildlife • Uroliths • Calculi
- Quantitative analysis

Knowledge of the mineral composition of uroliths in various species of animals can often help veterinarians predict the mineral composition of stones *in vivo*. This information is important because dissolution of existing uroliths, or minimizing further growth of uroliths *in situ*, is dependent on knowledge of the mineral composition of uroliths.

With this objective in mind, this report summarizes the results of quantitative mineral analysis of uroliths retrieved from 4468 farm animals, wildlife, and so-called “exotic” species of animals and sent to the Minnesota Urolith Center by various individuals living primarily in North America, Eastern Europe, Australia, New Zealand, and Asia. We have reported the methods we used to identify and classify various minerals found in these uroliths.¹ The information provided in this report summarizes the most extensive database about uroliths from animals other than domesticated dogs and domesticated cats that we could identify in the literature.

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We have also included selected reports of uroliths in the English literature related to specific stones that we have evaluated (**Appendix 1**). We did not include reports of uroliths whose composition was not described, or reports of uroliths evaluated by insensitive qualitative techniques.

We encourage our colleagues to continue to send us uroliths retrieved from farm animals, exotic species, and wildlife for evaluation by quantitative techniques. Because of the strong support of an educational grant from Hill's Pet Nutrition, we are able to provide this service without a monetary fee. However, to gain insights into the epidemiology of urolithiasis, we ask that each submission be accompanied by a one page urolith analysis request form. This form can be found at our Web site: www.cvm.umn.edu. Click on the link to department and centers to find Minnesota Urolith Center, and follow the menu to the request form. The details are available under the icon labeled "How to submit samples." For colleagues residing outside the borders of the United States, packaging instructions for noninfectious clinical samples may be found at: <http://www.usps.com/>, US Postal Service Packaging Instruction 6C. Alternatively, contact your preferred shipper for instructions about complying with International Air Transportation Association Regulation 3.6.2.2.3.6. We comply with all federal and state regulations regarding handling and shipment of samples that are a potential source of diseases that are communicable to animals and humans. Information on acceptable species for USA importation and documentation necessary for the United States Department of Agriculture (USDA) customs inspection can be found under guidelines 1102, 1103, and 1104 at: www.aphis.usda.gov/.

Appendix 1	
Quantitative analysis of 4468 uroliths retrieved from farm animals, exotic species, and wildlife sent to the Minnesota Urolith Center: 1981–2007	
Animals	No. (%)
<i>Carnivore</i>	
Bobcat uroliths (n=2)	
Struvite	2 (100)
Bush dog uroliths (n=2)	
Struvite	1 (50)
Purines	1 (50)
Cape hunting dog uroliths (n=1)	
Calcium phosphate	1 (100)
Caracal (Persian lynx) uroliths (n=3)	
Calcium oxalate	2 (66.7)
Miscellaneous	(33.3)
Cheetah uroliths ² (n=2)	
Calcium phosphate	1 (50)
Purines	1 (50)
Cougar uroliths (n=1)	
Calcium phosphate	1 (100)
Cusimanse (Dark mongoose) uroliths (n=3)	
Calcium oxalate	2 (66.7)
Compound	1 (33.3)

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