Cystine Rising: Ferreting Out the Cause – Minnesota Urolith Center Image of the Month 11/2018

Cystine (also called dicysteine) is a dimer of two sulfur-containing amino acids of cysteine. Cystine is sparingly soluble in urine and efficiently reabsorbed by kidney tubules. However, genetic mutations in the cystine transporter inhibit the kidney from reabsorbing cystine. Genetic mutations have been identified in dogs, cats and humans with cystine uroliths.

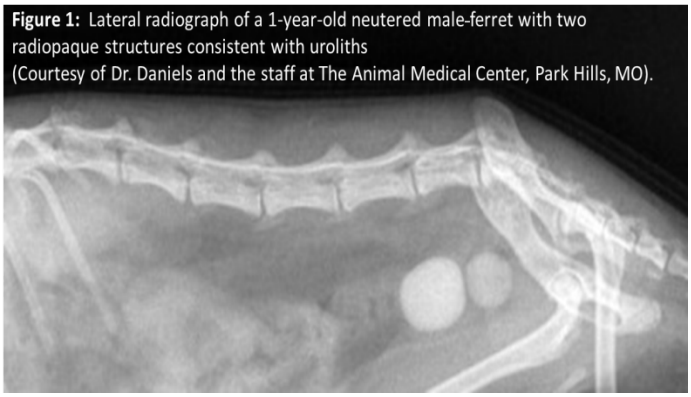

Figure 1: Lateral radiograph of a 1-year-old neutered male-ferret with two radiopaque structures consistent with uroliths
(Courtesy of Dr. Daniels and the staff at The Animal Medical Center, Park Hills, MO).

What about cystine in ferrets (Figure 1 and 2) Initially, we reported that the most common urinary stone in ferrets was struvite, 67% of 408 submissions received between 1981 and 2007 (Figure 3). The second most common urolith was cystine (15%). Over the last 8 years, the tables have turned. From 2010 to 2017, only 6.5% of the 700 ferret urolith submissions were struvite, and a whopping **89% were cystine.** (Figure 4).

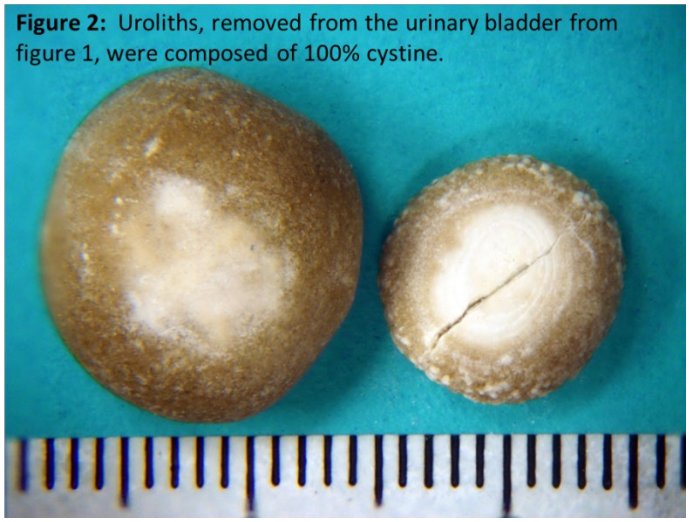

Figure 2: Uroliths, removed from the urinary bladder from figure 1, were composed of 100% cystine.

Help us ferret out the reason why. The Minnesota Urolith Center and the U of MN Canine Genetics Lab are investigating genetic mutations responsible for cystinuria in ferrets. Genetic screening is performed at no cost to you (USA cases only). Contact Dr. Furrow at the Canine Genetics Laboratory (stones@umn.edu) for genetic testing.