



Kit4Cat – Urine Sample Collection Sand – Validation Study

Dr. Catabi, DVM & Dr. Gans, DVM
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Introduction:

Coastline Global, makers of Kit4Cat hydrophobic sand for the collection of feline urine samples, have conducted numerous independent studies to verify the validity of Kit4Cat for use by veterinarians to diagnose common feline diseases. The studies show that Kit4Cat provides identical results to existing invasive urine collection methods such as Cystocentesis.

Urinalysis (UA) is one of the basic laboratory tests needed for the complete medical evaluation of cats. In addition to a complete blood count, biochemical analysis and electrolytes, UA completes a minimal database required for the evaluation of the sick patient. Of all of these tests, UA is the cheapest test to run, and can often be accomplished in a non-invasive manner.

UA is the ultimate test, which can differentiate between renal and non-renal azotemia. In addition, UA enables the clinician to detect urinary red and white blood cells, bacteria, glucose, ketones, bilirubin, crystals, pH and more. Despite its importance and ease of testing, UA is often not performed (especially in feline medicine) because obtaining a sample can be challenging.

In feline medicine, kidney disease, lower urinary tract problems and behavioral problems, which include inappropriate urination, are very common, therefore UA is a much needed test for routine cat wellness and when assessing sick patients. Since most cats do not allow owners to collect a urine specimen at home, they are usually brought to the veterinary clinic/hospital for urine collection, a step that is often stressful for the cat and may involve considerable costs to the owner, if the cat needs to be hospitalized for the collection of urine. Because of the difficulty involved in obtaining a urine specimen, cat owners often choose not to perform the test, and sometimes veterinarians themselves do not recommend the test. It has been determined that simply bringing a cat into a clinic setting can alter the pH levels of its urine.

An interim solution for the problem has been to use plastic beads that are placed into the cat's litter box, either at home or in the veterinary clinic/hospital. The two primary disadvantages of this method are: (1) Most cats do not like using the plastic beads as substrate due to its odor and unnatural texture. Therefore at home they may find an alternative location for urination, and in the veterinary clinic/hospital they may hold off on urinating for many hours. (2) The urine adheres to the surface of the plastic beads, and when the urine quantity is small (common with inflammatory urinary conditions), it is difficult to collect an adequate urine sample from the beads.

The company Coastline Global has developed a new and innovative solution called kit4Cat, for cat urine collection in the home or veterinary clinic/hospital. The sand particles are similar in consistency to natural sea sand, but unlike natural sea sand, Kit4Cat does not absorb water. When a cat urinates on Kit4Cat, a puddle of urine is left on the sand's surface. The urine drops can then be easily collected with a syringe or pipette.

During experimental usage of Kit4Cat on hospitalized cats at a veterinary center over a 12 weeks period, we found high acceptance of Kit4Cat by cats. When cats had a choice between plastic beads and Kit4Cat, they consistently preferred Kit4Cat.



UA samples were taken from 20 of the hospitalized cats, and were sent to a commercial veterinary laboratory for analysis. From each cat, one sample was collected using Kit4Cat, and one sample was collected using cystocentesis (the laboratory was neither aware that an experiment was being conducted, nor was it aware of the source of the samples that it received). The laboratory results showed an almost perfect match in the test results of the paired samples. In some instances, red blood cells (RBC's) were detected in the cystocentesis sample and not in the free catch (Kit4Cat) sample; the RBC's were likely an artifact caused by the cystocentesis itself. In samples where crystals, bacteria or glucose were detected, they were seen in all paired samples.

Kit4Cat can be easily and reliably used for urine sample collection in cats. It can be used on cats requiring monitoring due to a history of urinary calculi or crystals, cats that exhibit inappropriate urination behavior, diabetic cats to monitor the level of glucosuria and ketonuria, and on cats with chronic renal disease in order to detect inflammatory changes. This method should not be used when a bacterial urine culture is required.

The use of Kit4Cat will improve the ability of veterinarians to monitor the condition of cats suffering from several chronic conditions, and it will make it easier to identify new patients, as well as provide the veterinary clinic/hospital with another profitable service that they can offer their customers.

Validation Study Methodology:

The cats were divided into 3 groups (young/mid-life/older), and were selected at random. They had no prior clinical history. A 5ml cystocentesis urine sample was drawn from each cat and placed into a test-tube. The same cat was allowed to freely urinate in a litter box containing Kit4Cat hydrophobic sand (from a freshly opened bag). The cats being studied frequently buried their urine, exhibiting their natural behavior, requiring the lab technician to move the sand aside to expose the buried urine before collecting it with a pipette. All of the samples were then submitted to a commercial laboratory for UA, with each sample being given a different name, so that the lab would not know that each cat had provided 2 samples (one from cystocentesis and the other using Kit4Cat).

Age Grouping of Cats: *(each cat was labeled numerically in each group 1,2,3...)*

- **Group A** – Teenage cats (9 months to 3 years)
- **Group B** – Adult cats (3 years to 10 years)
- **Group C** – Senior cats (10 years and above)

Urine Collection Method:

- **K** – Kit4Cat Sand
- **C** – Cystocentesis

Sample Labeling: *(each sample test-tube was labeled as follows)*

- **AK1** – Cat #1 from Age Group A, collection method Kit4Cat Sand
- **AC1** – Cat #1 from Age Group A, collection method Cystocentesis
- **BK4** – Cat #4 from Age Group B, collection method Kit4Cat Sand
- **BC4** – Cat #4 from Age Group B, collection method Cystocentesis
- **CK6** – Cat #6 from Age Group C, collection method Kit4Cat Sand
- **CC6** – Cat #6 from Age Group C, collection method Cystocentesis



Validation Study Results:

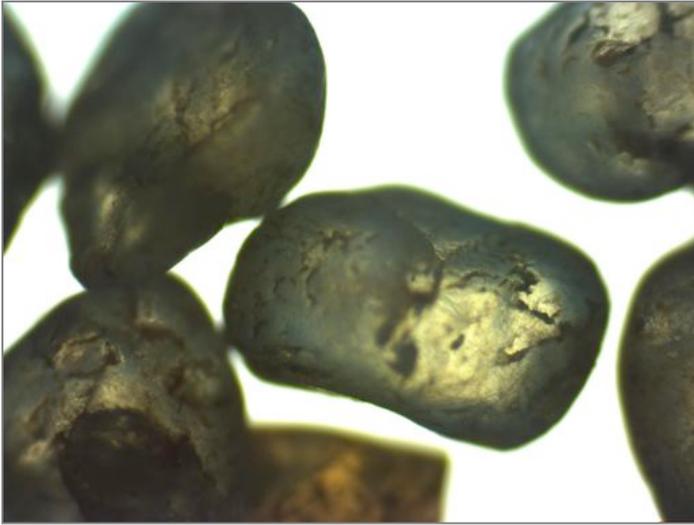
Below we present the urinalysis results for 6 half-samples that were collected from 3 of the cats. The results show that there was perfect agreement (pH, SG, chemistries, sediment exam) between the Kit4Cat samples and the cystocentesis samples for all 3 of the cats.

	CAT #1 – Group A		CAT #4 – Group B		CAT #6 – Group C	
	AK1	AC1	BK4	BC4	CK6	CC6
Glucose (g/dL)	Negative	Negative	100	100	Negative	Negative
Bilirubin	Negative	Negative	Negative	Negative	Negative	Negative
Ketones	Negative	Negative	Negative	Negative	Negative	Negative
S.G.	1.060	1.060	1.058	1.058	1.043	1.043
Eryth.	3+	3+	Negative	Negative	1+	1+
pH	8.0	8.0	6.0	6.0	6.5	6.5
T.S (g/dL)	13.5	13.0	12.2	12.2	8.8	8.8
Leuk	-	-	-	-	-	-
Urinalysis Comments	The cellularity is low. Large number of struvite crystals predominate in the sediment smears. There is acellular debris, but there are no apparent inflammatory cells.	The cellularity is low. Large number struvite crystals predominate in the sediment smears. There is acellular debris, but there are no apparent inflammatory cells.	Glucose levels of 100g/dL	Glucose levels of 100g/dL		
Diagnosis	Struvite Crystalluria	Struvite Crystalluria	Suspicion of Diabetes (testing of blood glucose level recommended)	Suspicion of Diabetes (testing of blood glucose level recommended)	Non-Specific Findings	Non-Specific Findings

Conclusion

The urinalysis laboratory results from both cystocentesis and Kit4Cat provided the same laboratory result for each cat that was tested, with no anomalies or artifacts whatsoever.

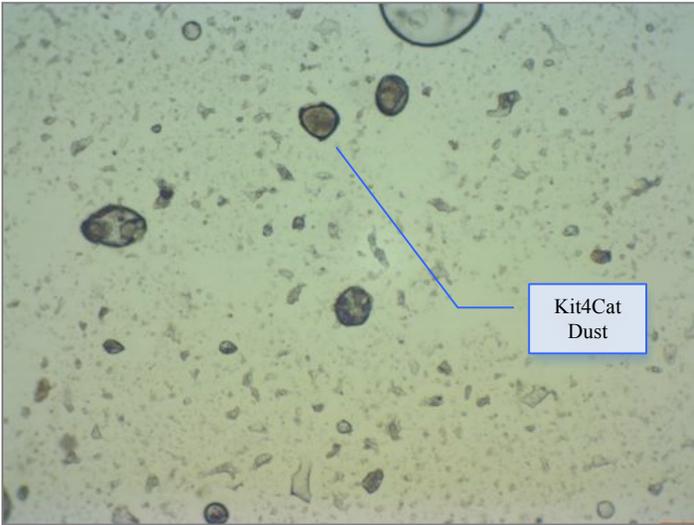
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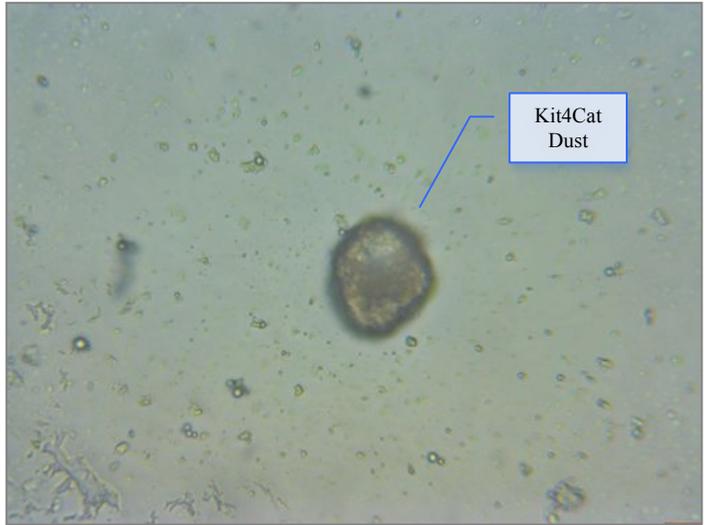
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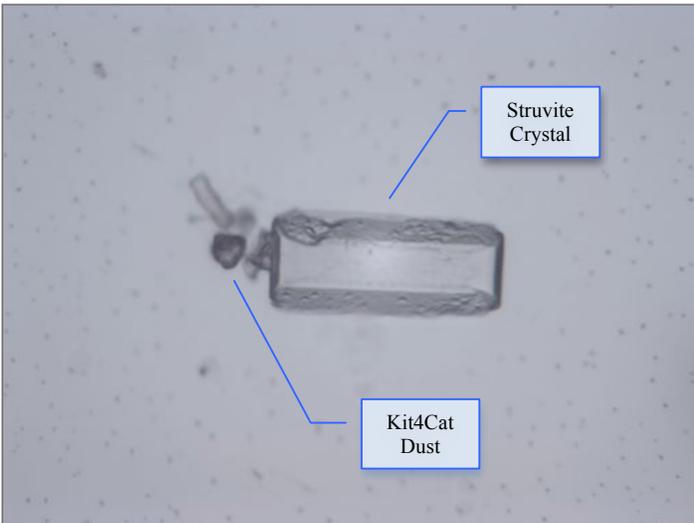
Kit4Cat Dust Particles:



Kit4Cat Dust Particle:



Kit4Cat Dust Particle next to a Struvite Crystal:



Struvite Crystals:

