



Clinical reports

A CLINICAL REPORT
FOR THE VETERINARIAN
FROM AFFINITY PETCARE

A MULTIMODAL APPROACH TO THE TREATMENT OF FELINE LOWER URINARY TRACT DISEASE

This report presents the findings of Affinity ADVANCE Veterinary Diets' URINARY FELINE investigations, as well as tools for use in clinical practice that promote environmental enrichment in the prevention of FLUTD.

STUDY 1:

Degree of water mineralisation.

STUDY 2:

Number of drinking points available.

CLINICAL TOOL 1:

Guidelines for environmental enrichment and stress reduction.

CLINICAL TOOL 2:

Diagnostic algorithms in urinary disease.

A good aetiological diagnosis and knowledge of how to manage the disease in an integrated manner are essential for ensuring the correct treatment of feline lower urinary tract disease (FLUTD).

This multimodal approach is based on **3 pillars**, namely:

1. **Medical treatment (drugs and surgery)**
2. **Dietary management**
3. **Modification of the cat's direct environment, which will affect its behaviour and level of stress (environmental enrichment)**



STUDY 1. DEGREE OF WATER MINERALISATION

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asalas@affinity-petcare.com Acvim Forum, June 12-15, 2013, Seattle, Washington.

INTRODUCTION

Dietary factors are known to be involved in the aetiology of feline urolithiasis. The main dietary changes required to reduce the recurrence of calcium oxalate (CaOx) and struvite calculi involve increasing the urine volume (high-sodium diet, addition of water to the diet, tinned food) or reducing the risk of precipitation of lithogenic components in the urine (by modifying urine pH, reducing lithogenic components or adding crystallisation inhibitors).

AIM

To study the effect of the degree of water mineralisation on the composition and risk indices for urine saturation.

MATERIALS AND METHODS

Animals

A total of 12 adult cats of both sexes were used in a crossover design (Figure 1). For 14 days, the animals received two types of mineral water to drink, with different degrees of mineralisation (high/low) (Table 1). Daily food and water consumption was recorded. After drinking this water for 11 days, urine was collected over 24 hours and subsequently analysed by the analytical chemistry laboratory at the Autonomous University of Barcelona. Urine density, volume and pH were analysed individually, whereas mineral concentration (Ca, Mg, P, Na, K, SO_4^{2-} , NH_4^+ , Cl), crystallisation inhibitors (citrates, pyrophosphates (PP),

phytates, glycosaminoglycans), oxalate, uric acid and creatinine were analysed in groups of urine from two cats.

Statistical analysis

The relative supersaturation of CaOx (RSS-COM) and struvite (RSS-STR) in urine was determined using the software Equil-92. A general linear model (GLM) with repeated measures was used to determine the effect of water type on all variables studied. A p-value less than 0.05 was considered to be statistically significant.

RESULTS

Water consumption was slightly higher for the water a low mineral content (water A) than for the water with higher mineralisation (B) (A: 102 ± 4 mL; B: 97 ± 4 mL) (Figure 2). No significant differences were observed between the two groups in terms of pH (A: 6.59 ± 6.3 ; B: 6.69 ± 0.04), urine specific gravity (A: 1.051 ± 1.1 ; B: 1.052 ± 1.5) or volume (A: 65.9 ± 6.3 mL, B: 69.3 ± 6.1 mL), or daily food consumption (A: 56.3 ± 6.3 g; B: 55.6 ± 2 g). The cats drinking water with a high mineral content (water B) presented significantly higher levels of Ca, Na, K and SO_4^{2-} in urine (crystallisation enhancers) and significantly lower levels of PP (crystallisation inhibitor) (Table 2). Cats drinking water B presented higher RSS-COM values than those drinking water A (A: 7 ± 1 vs. B: 14 ± 4) (Figure 3), although there was no significant difference for RSS-STR.



Table 1. Mineral water composition (mg/dL) [information from the manufacturer]

	Water A	Water B
Ca	4	100
Mg	1.8	38
Na	1.3	35
Cl	0.67	58
HCO ₃	18	306

Table 2. Chemical composition of urine (mg/L,

	Water A	Water B	P-value
Ca	36 ± 8	57 ± 11	0.041
K	$5,289 \pm 193$	$5,674 \pm 203$	0.005
Na	$3,502 \pm 162$	$3,875 \pm 238$	0.027
SO_4^{2-}	$7,977 \pm 193$	$8,623 \pm 420$	<0.001
PP	14 ± 1	12 ± 0.8	<0.001
Mg	56.9 ± 6.2	56.1 ± 3.3	NA
pH	6.04 ± 0.036	6.04 ± 0.05	NA

Figure 1. Experimental

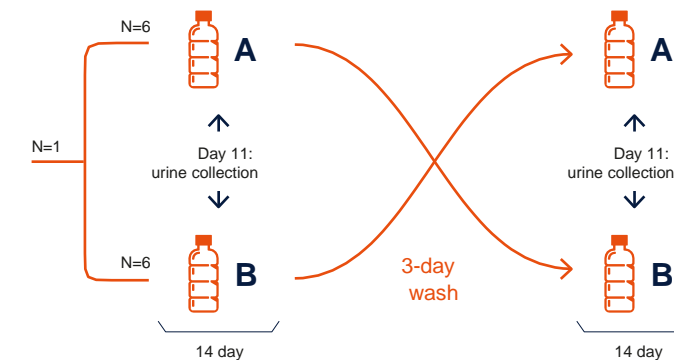
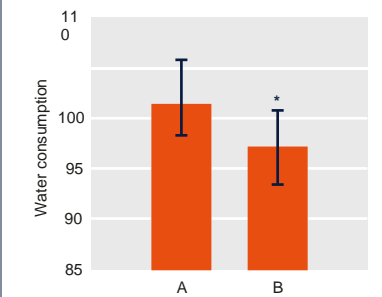
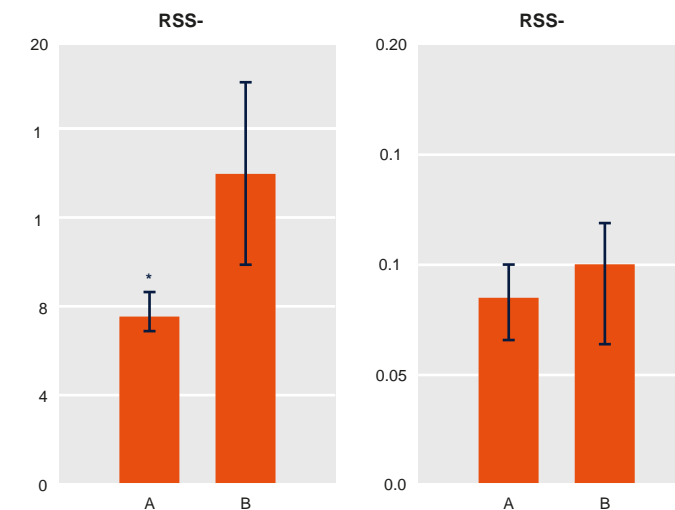


Figure 2. Daily water intake (mean \pm SEM; $p=0.037$)



SEM: Standard error of the mean

Figure 3. Relative supersaturation of CaOx and struvite in urine (RSS-COM, mean \pm SEM; $p=0.008$; RSS-STR, mean \pm SEM; $p>0.05$)



SEM: Standard error of the mean

CONCLUSIONS

- The mineral composition of drinking water may vary considerably depending on its source and/or quality.
- The degree of mineralisation of water may have a significant effect on cats' urine composition.
- This should be taken into account as a dietary factor and may affect the risk of feline urolithiasis.

STUDY 2. NUMBER OF DRINKING POINTS AVAILABLE

Research by Affinity Petcare, internal data from Affinity Nutrition Center.

AIM

To evaluate how the number of drinking points available affected water consumption in cats in order to obtain produce more dilute urine.

STUDY DESIGN

Two studies were carried out in parallel, the first involving cats housed together (Figure 1) and the second with cats housed individually (Figure 2).

Both groups were given the same low mineral content, bottled water and commercial feline maintenance diet. Only the water and food consumed were recorded.

RESULTS

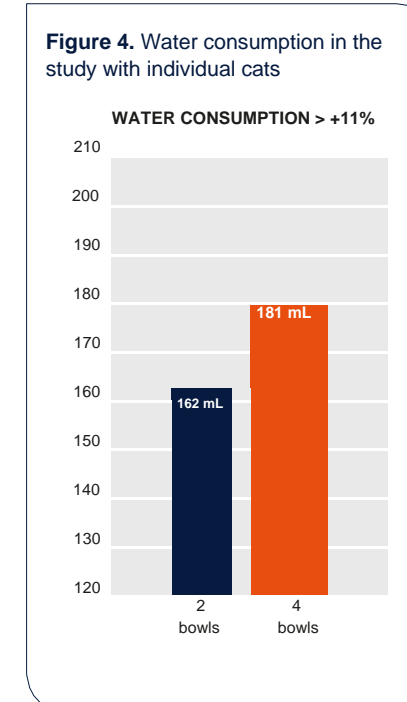
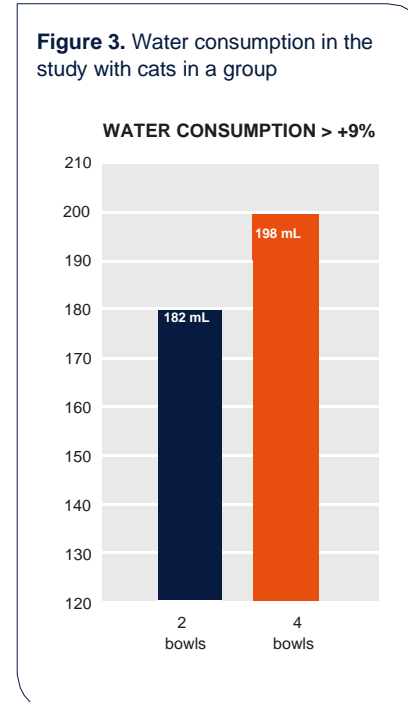
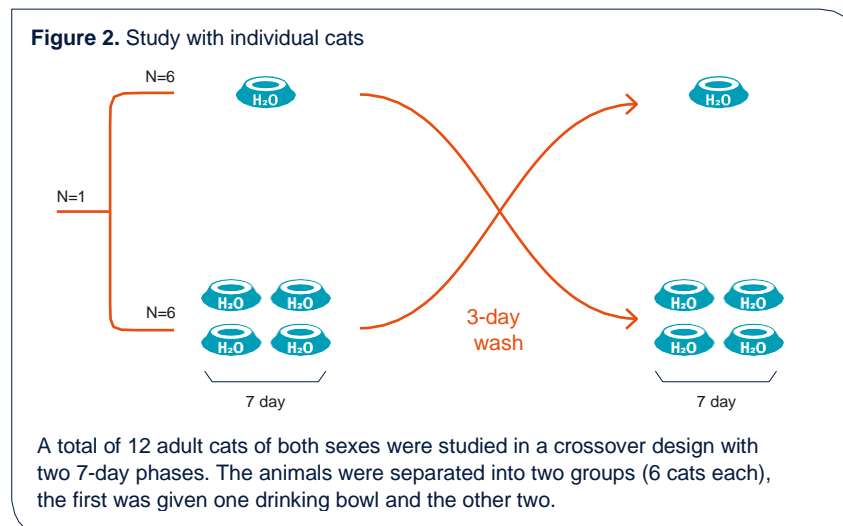
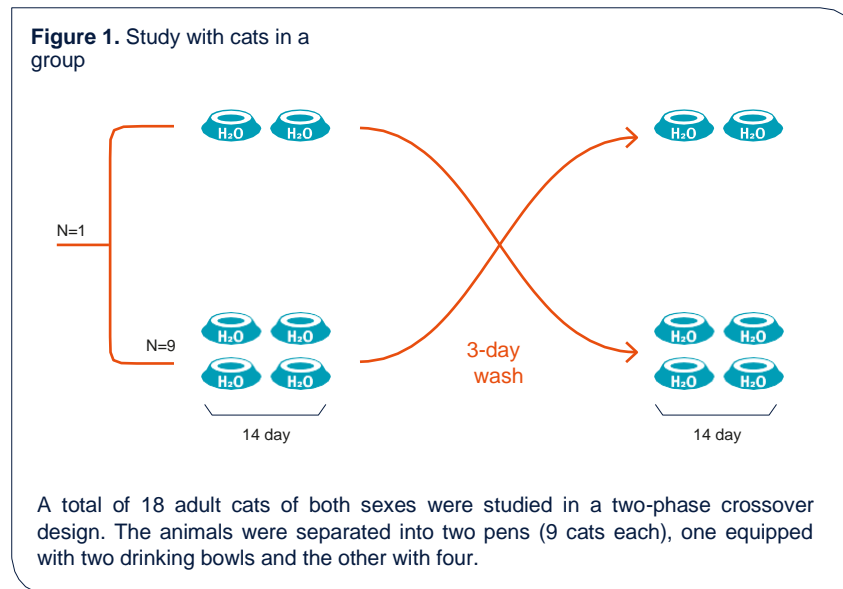
Study with cats in one group

The group of cats with access to four drinking bowls consumed 198 mL of water, whereas those with only two bowls consumed 182 mL, so the former had a 9% greater intake (Figure 3).

Study with individual cats

Cats with access to just one drinking bowl consumed an average of 162 mL of water, whereas those with two bowls consumed 181 mL, so the cats with two bowls drank 11% more water (Figure 4).

A SIMPLE AND EFFECTIVE SOLUTION: INCREASING THE NUMBER OF DRINKING BOWLS INCREASES WATER CONSUMPTION



CONCLUSIONS

Increasing the number of drinking bowls available for cats is a simple and effective solution to increase water consumption and, therefore, reduce the risk of FLUTD.



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