EFFECT OF DIETARY SODIUM ON URINE COMPOSITION AND CALCIUM OXALATE RELATIVE SUPERSATURATION IN HEALTHY CATS

Tournier C., Aladenise S., Vialle S., Venet C., Ecochard C., Sergheraert R., Biourge V. Royal Canin, Research Center, Aimargues (France)

ROYAL CANIN

INTRODUCTION

Over the past twenty years, the prevalence of calcium oxalate uroliths has dramatically increased in cats but their physiopathology is still poorly understood[1]. The aim of this study was to establish the influence of dietary sodium on urine composition, volume and calcium oxalate relative supersaturation in healthy adult cats.

MATERIALS & METHODS

- **Animals & Diets: Eleven commercial complete dry diets were fed successively to 7 Chartreux cats (3 neutered males, 4 females, 6.7 ± 1.4 years old, weight : 4.6 ± 1.7kg) for 2 weeks. The diets tested were similar in composition except for their dietary sodium content (mean : 0.79 ± 0.38% Na on a DM basis, range 0.44%-1.56%).**
- **Parameters recorded: Water intake was recorded the last 5 days of each study period. Urine volume, urinary specific gravity, pH and concentrations of 10 solutes (Ca, Mg, Na, K, NH4+, phosphate, citrate, sulfate, oxalate, uric acid) were measured on the pooled urine of each cat for the last five days of each study period. Based on those data, the urinary relative supersaturation (RSS) for calcium oxalate (CaOx) was calculated using the software SUPERSAT[2].**
- **Statistic: The effect of dietary sodium on those parameters was assessed using simple regression (P<0.05 for significant correlation).**

RESULTS & CONCLUSION

- **Results: Increasing dietary sodium linearly and significantly decreased CaOx RSS (R^2= 80.2%) and urinary oxalate concentration (R^2=97.08%), linearly and significantly increases urine volume (R^2=73.67%), water intake (R^2=57.65%). Urinary specific gravity also decreased linearly with increasing dietary sodium but only at a level above 0.58 g/100g DM. No correlation was found between urinary calcium concentration and dietary sodium.**

Figure 1 : RSS CaOx ±SD vs dietary Na level

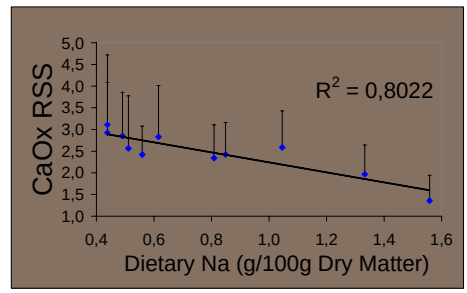


Figure 2 : Urinary oxalate ±SD vs dietary Na level

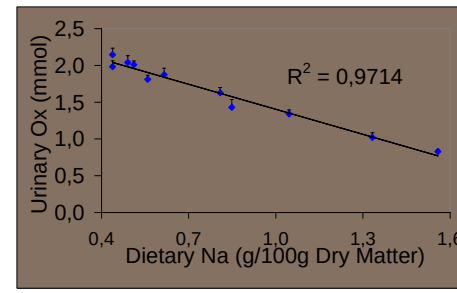


Figure 3 : Diuresis & Water intake ±SD vs dietary Na level

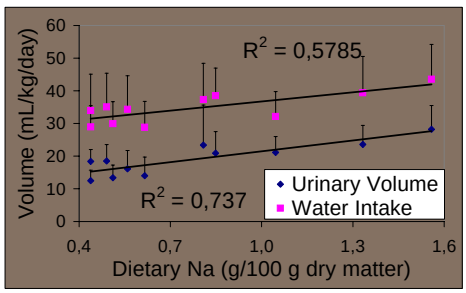
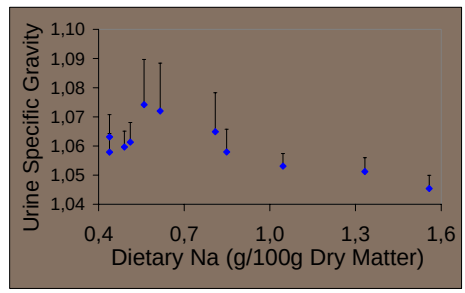


Figure 4 : Urine Specific Gravity ±SD vs dietary Na level



Discussion: The correlation between urinary oxalate concentration and dietary sodium was excellent probably because urinary oxalate is mostly derived from endogenous production[3] and thus its excretion over time is stable in urine as long as the cat remains on diets similar in protein[4], vitamin B6 and C[5] content. Urinary calcium concentration remained stable despite the increase in dietary sodium.

- **Conclusion: This study demonstrates that increasing dietary sodium significantly decreases CaOx RSS in cats by urine dilution. This could therefore be a useful strategy to minimize the risk of CaOx crystallisation in susceptible cats.**

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