

A high-protein dry diet stimulates water intake and increases urinary volume in dogs

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Introduction

The benefits on urinary tract health by feeding cats with high-protein diets are now largely described.¹⁻⁴ By stimulating osmotic diuresis, high-protein diets increase both water intake and urinary volume, favour the production of dilute urine and increase the frequency of urination.⁵⁻⁷

In dogs, some breeds are predisposed to urolithiasis.⁸⁻⁹ According to studies, several dietary nutrients, like moisture and sodium, might help reduce the risk for recurrence of lithiasis.¹⁰⁻¹³

The aim of this study was to assess the impact of a high-protein maintenance dry diet on water intake and urinary volume in adult dogs, compared to diets with lower protein contents.

Animals, materials and methods

Twenty four healthy adult Beagle dogs were randomized into 3 groups. They were fed exclusively, for 5 months, one of 3 maintenance dry diets, with a high (HP), moderate (MP) or low (LP) protein content (Table 1). The HP diet was the test diet, and the two others were commercial diets for adult dogs. The daily rations were calculated to maintain the dogs' body weight. At 2 different times of the study, during the first and the last week respectively, dogs were

placed in individual cages, daily water intake was measured, and daily urinary samples were collected.

Table 1: Nutritional characteristics of the diets

	HP diet	MP diet	LP diet
Crude protein (% ME)	34	22	15
Crude fat (% ME)	41	35	30
NFE (% ME)	25	43	55
<i>In vivo</i> ME (kcal/100g)	390	407	418

Results

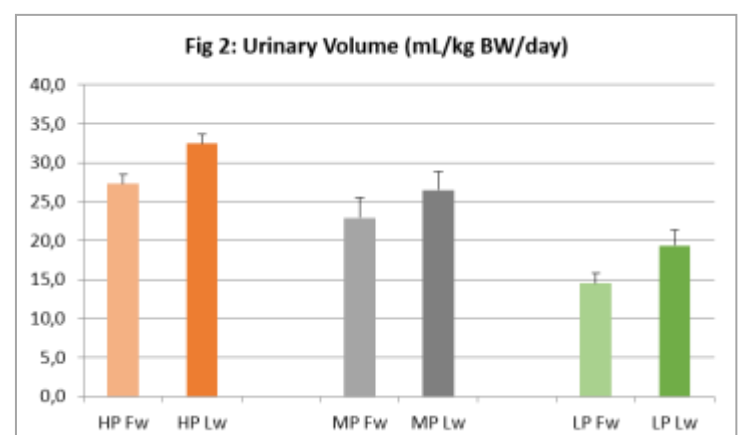
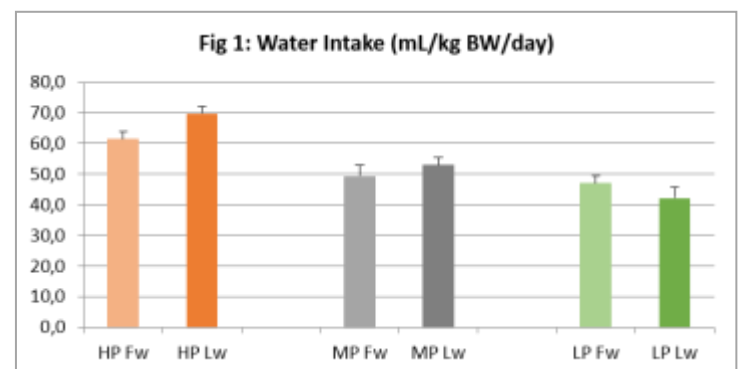
The mean dietary protein intake was 9.0 ± 0.3 , 5.0 ± 0.2 and 3.5 ± 0.2 g/kg BW/day with HP, MP and LP diets respectively. Water intake was significantly higher in the HP group, as soon as the first week, compared to both MP and LP groups. Moreover, a significant increase in water intake was observed with time in the HP group (Table 2 & Fig 1). The mean urinary volume showed the same differences between groups and the same evolution with time (Table 3 & Fig 2).

Table 2: Mean water intake (mL/kg BW/day) in each group

	HP diet	MP diet	LP diet	p
First week	61.4 ± 2.5	49.4 ± 3.4	47.0 ± 2.6	0.0025
Last week	69.8 ± 2.4	53.0 ± 2.4	42.2 ± 3.6	0.001
p	0.0014	NS	NS	

Table 3: Mean urinary volume (mL/kg BW/day) in each group

	HP diet	MP diet	LP diet	p
First week	27.3 ± 1.2	23.0 ± 2.5	14.5 ± 1.3	0.0001
Last week	32.5 ± 1.1	26.5 ± 2.3	19.4 ± 1.9	0.0001
p	0.0003	NS	0.0045	



Conclusion

This study shows the stimulating effect of dietary protein on both water intake and urinary volume in healthy adult dogs. Increase dietary protein content could therefore provide a natural and efficient way to help in prevention of urinary tract diseases in predisposed dogs.

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