

# Two year-follow up of renal function in healthy dogs fed a high-protein dry diet

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## Introduction

Despite the absence of evidence of any deleterious effect of high-protein diets on the renal function<sup>1-4</sup>, there are still concerns regarding the safety of such diets in healthy dogs.

**The objective of this study was to follow up selected parameters of the renal function in healthy adult dogs fed a high-protein diet for 2 years.**

## Animals, materials and methods

Twenty healthy entire adult Beagles (16±6 month old) previously fed a standard maintenance diet<sup>a</sup>, were fed exclusively a new high-protein diet<sup>b</sup> (Tables 1 and 2). The daily rations were calculated to maintain dogs' body weight. Fasting blood samples were collected at the start of the study (M0) and then every 2-3 months for 2 years.

<sup>a</sup> Virbac Vet Complex adult dog

<sup>b</sup> Virbac Veterinary HPM adult dog L&M

Six serum parameters were measured to assess the renal function. Statistical comparisons were performed between each time and M0 for each renal parameter, by ANOVA with repeated measures and Friedman tests, with a 5% significance level.

**Table 1: Composition of the previous and test diets**

**Previous:** Dehydrated protein, maize, wheat, animal fat, soybean, beet pulp, maize protein, linseed, wheat bran, FOS, chondroitin sulfate, chitosan, minerals.

**Test:** Dehydrated pork and poultry protein, rice, pea, animal fat, hydrolysed animal protein, potato starch, lignocellulose, linseed, bean hulls, minerals, beet pulp, FOS, psyllium fibre, chitosan, pasteurised Lactobacilli, chondroitin sulfate.

**Table 2: Characteristics of the previous and test diets**

Nutritional characteristics	Previous	Test
Metabolisable Energy (ME) (kcal/100g as fed)	398	369
Protein (% ME)	25	34
Fat (% ME)	41	41
Carbohydrate (% ME)	34	25
Calcium (g/Mcal)	3.5	3.5
Phosphorus (g/Mcal)	2.5	2.7
Sodium (g/Mcal)	1.3	1.6

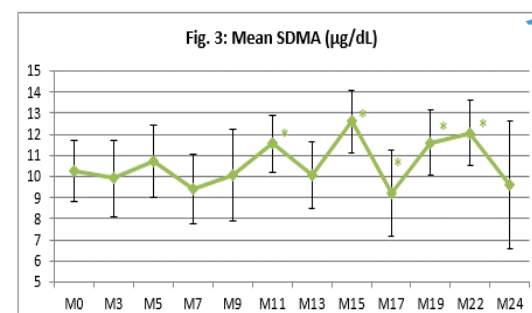
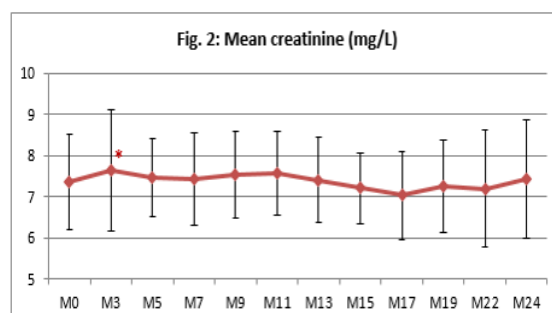
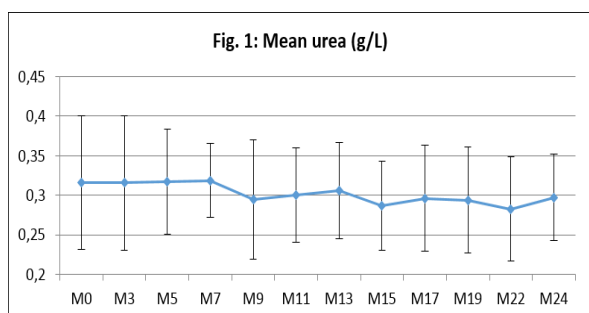
## Results

All **individual values** remained within the reference ranges over the study, except for total protein in 7 dogs (46-51 g/L), albumin in 4 dogs (41-46 g/L), and SDMA (symmetric dimethylarginine) in 3 dogs (15 µg/dL). These exceptions did not show any correlation between them, and can be considered incidental and due to biological variability of the biomarkers. In particular SDMA, known as the earliest and most sensitive indicator of renal dysfunction<sup>5,6</sup>, despite

3 minor and temporary increases, showed the good tolerance of the dogs to the high-protein diet. Significant changes were observed in **mean values** for some criteria at some time points in comparison with M0 (total proteins: increase, albumin: decrease, phosphates: decrease, and SDMA: decrease or increase), but always remaining in the safety ranges (Table 3 and Figures 1 to 3).

**Table 3: Mean values and standard deviations after 7, 13, 17 and 24 months feeding the test diet (\*: significant difference compared to M0)**

Serum renal parameters	M0	M7	M13	M17	M24	Laboratory ref ranges
Urea (g/L)	0.32±0.08	0.32±0.05	0.31±0.06	0.30±0.07	0.30±0.05	0.15-0.57
Creatinine (mg/L)	7.4±1.2	7.4±1.1	7.4±1.0	7.0±1.1	7.4±1.4	5.0-18.0
Total proteins (g/L)	52.3±2.1	60.2±2.2*	59.0±2.7*	57.3±3.4*	58.4±4.7*	52-82
Albumin (g/L)	35.7±2.6	34.3±2.0*	34.7±2.6*	33.4±3.3*	31.4±3.0*	23-40
Phosphates (mg/L)	46.1±8.8	42.0±5.2*	39.9±5.1*	41.3±6.5*	42.1±5.5	25-68
SDMA (µg/dL)	10.3±1.4	9.4±1.7	10.1±1.6	9.2±2.0*	9.6±3.0	0-14



## Conclusion

**These preliminary results confirm that a high-protein content in a balanced diet has no negative impact on the renal function in the long term in healthy adult dogs. The study is still on-going, results will be communicated at a later stage.**

**References:** <sup>1</sup>Laflamme DP. Top Companion Anim Med 2008; 23:154-157. <sup>2</sup>Pibot P. Thesis Doc Vet, Nantes, France, 1988. <sup>3</sup>Finco DR et al. Am J Vet Res 1994; 55: 1282-1290. <sup>4</sup>Bovee KC. J Nutr 1991; 121: S128-S139. <sup>5</sup>Hall JA et al. J Vet Intern Med 2015; DOI: 10.1111/jvim.12607. <sup>6</sup>Nabity MB et al. J Vet Intern Med 2015; DOI: 10.1111/jvim.12835.