

Can dogs go–go–go with no–no meat? Evaluating a meat–free diet in performance dogs

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Theoretically, a dog's nutrient requirements can be met from a properly balanced meat-free diet. There are few commercially available meat-free diets for dogs, and their recent arrival onto the market suggests a new consumer demand for this type of product. However, there is no scientific evidence to demonstrate that a meat-free diet is adequate for exercising dogs. A study by Yamada *et al.* (1987) which compared the effects of vegetable protein and animal protein diets in dogs during vigorous physical training found a significant decrease in haemoglobin (Hb) and red blood cells (RBC) in dogs fed the vegetable protein diets after 2 weeks while dogs fed the animal protein diet showed no significant change.

To test the adequacy of a totally meat-free diet for performance dogs an experiment was designed involving 12 sled-racing Siberian Huskies (6 dogs and 6 bitches aged 2 to 7 yrs and a mean weight of 20 kg). The Siberian Huskies were fed either a commercial meat-based diet recommended for active dogs (n = 6), or a meat-free diet formulated to the same nutrient specifications. Both diets were dry extruded products based on rice and corn. The meat-based diet included chicken, whereas the meat-free diet contained soybean. Diets supplied 96 g of crude protein and 6.7 MJ of energy daily. Dogs were fed these diets as their sole

nutrient intake for a period of 16 weeks. The study period included 2 weeks of pre-race training, followed by 10 weeks of competitive racing, and 4 weeks of recovery during which training was gradually reduced. All dogs received identical exercise and care. Fresh, whole blood samples, collected at weeks 0, 3, 8 and 16 were analysed with a Cell-Dyn 3500R haematology unit. Vet checks were performed at weeks 0, 8, and 16 by the dogs' usual veterinarian.

Haematology results were within normal range for all of the dogs throughout the study (Table 1). Veterinary examinations found dogs to be in excellent physical condition. Dogs performed well at a national level in races. Dogs fed the meat-free diet performed equally to dogs on the premium meat-based diet. No dogs in this study developed anaemia. On the contrary, RBC and Hb values increased significantly over time ($P < 0.01$) in both groups of dogs, confirming the adequacy of both diets for dogs in a performance situation.

Yamada, T.M., Tohori, M., Ashida, T., Kajiwara, N. and Yoshimura, H. (1987). Comparison of effects of vegetable protein diet and animal protein diet on the initiation of anemia during vigorous physical training (sports anemia) in dogs and rats. *Journal of Nutritional Science and Vitaminology* 33(2), 129–49.

Table 1 Haematology results of Siberian Huskies during a racing season in which dogs were fed either meat-free or meat-based diets as their sole nutrient intake for 16 weeks (n = 6). Values shown are means \pm SEM.

Diet	RBC ($\times 10^{12}/L$)			Hb (g/dL)		
	Meat	Meat-free	P value*	Meat	Meat-free	P value*
Wk0	6.5 \pm 0.27 ^a	6.0 \pm 0.12 ^{ab}	.04	15.0 \pm 0.52 ^a	14.4 \pm 0.31 ^{ab}	.16
Wk3	6.4 \pm 0.21 ^a	6.0 \pm 0.08 ^a	.04	15.0 \pm 0.36 ^a	14.2 \pm 0.17 ^a	.10
Wk8	7.0 \pm 0.29 ^b	6.3 \pm 0.20 ^{ab}	.01	16.0 \pm 0.45 ^b	15.0 \pm 0.36 ^{ab}	.02
W16	7.3 \pm 0.28 ^b	6.4 \pm 0.21 ^b	.001	16.0 \pm 0.46 ^b	15.2 \pm 0.25 ^b	.11

Normal range for RBC in dogs 4.9 to 8.2 and for Hb 10 to 20.6

^{a,b,c,d}Within columns, means with a common superscript are not statistically different ($P > 0.05$)

*P values compare meat vs meat-free diets (within rows)