

WALTHAM Viewpoint

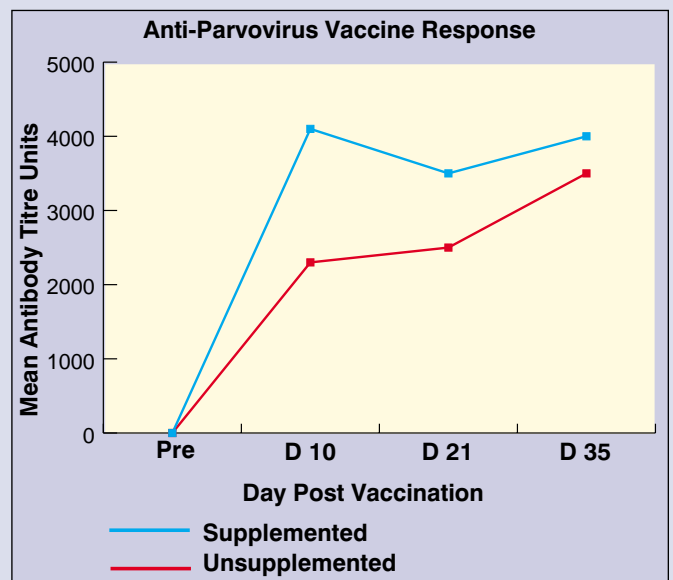
# Enhancing puppy immune response through diet



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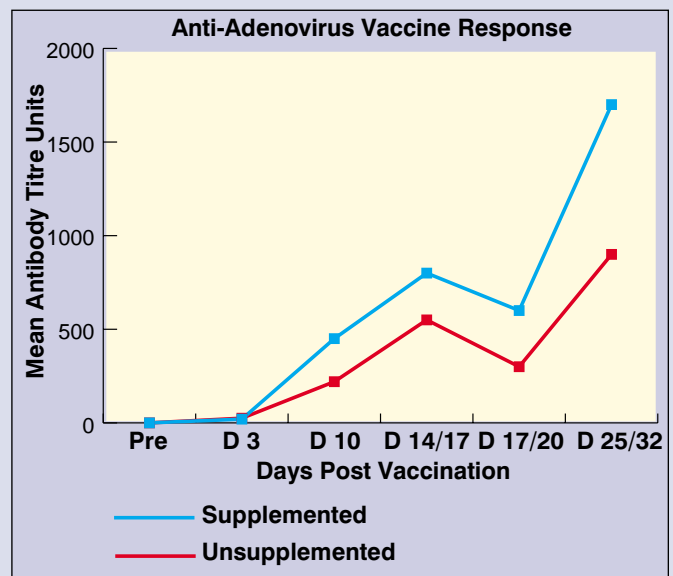
All animals are particularly vulnerable to infectious disease at certain life stages. In neonates, although there is initially a degree of maternal protection conferred either through maternal milk or from maternal blood exchanged *in utero*, this maternal immunity wanes and, as the neonate waits for its immune system to mature, it is at particular risk from infection. It has been recognised that stress contributes to the progression of disease and that social and environmental factors can influence the susceptibility to illness and disease through its effects on the immune system. During their first year of life puppies will encounter a series of stressful events (Table 1) which may compromise the performance of their immune system and possibly increase susceptibility to infection. With all these potentially stressful situations a healthy immune system is essential, especially during this first year of life.

Recent WALTHAM studies show that feeding an antioxidant cocktail to weaned puppies enhances their humoral immune response (1). Fourteen puppies of two different breeds (Labrador retrievers and greyhounds) received either a standard or an antioxidant-supplemented diet from weaning. At 8 weeks and 12 weeks of age, the puppies received their routine and booster vaccinations, respectively, against canine distemper, adenovirus type 2 and parvovirus using a standard combination vaccine. Analysis of specific antibody titres against parvovirus, distemper and adenovirus, measured at different times before and after inoculation,



Figures 1 and 2: Graphs of antibody responses to parvovirus and adenovirus vaccines in pups fed an antioxidant supplemented diet and those fed a normal complete balanced diet without antioxidant supplementation.\*

\*Because of the scale of the graphs, initial antibody titre appears as zero when in fact there are low level circulating maternal antibodies for both parvovirus (<8) and adenovirus (<16).



showed that the supplemented dogs responded earlier to the vaccine antigens (Table 2; Figures 1, 2 and 3). Clearly, there are significant beneficial effects on the kinetics of puppy immune responses when their diet is supplemented with an appropriate antioxidant cocktail. Puppies receiving the antioxidant supplement appear overall to respond faster to a foreign antigen as introduced via a vaccine.

This research has great potential for both veterinarians and owners – possibly optimising the effectiveness of vaccine regimens. However, further work is required to evaluate the application of this antioxidant cocktail apart from age-associated immunosence, other intrinsic factors influence the outcome of an immunological challenge including gender of an animal and its genetic make up. Failure to induce protective humoral immunity via vaccination particularly with reference to parvovirus has been observed in a variety of dog breeds including Rottweilers, Golden retrievers and Huskies. Despite the use of appropriate vaccination regimens some of these dogs contracted parvovirus. A study at the University of Munich demonstrated that only about 90-95% of puppies were protected after three repeated vaccinations, whereas a fourth vaccination induced 100 % protection (2). Data trends have indicated that giant breeds in particular are affected (e.g. St. Bernards, Rottweilers, Golden retrievers) suggesting that this low vaccine response may have a genetic component. Upon this basis such dogs may be candidates for nutritional supplementation in order to enhance their immune function.

Based on our preliminary data showing that antioxidant supplementation was able to enhance the anti-parvo, distemper and adenovirus response in puppies of various breeds, it is reasonable to assume that immunoenhancing diets could help to overcome suboptimal functioning of the immune system in apparently healthy animals especially in poorly responding dog breeds. And, although a range of extrinsic factors may affect the outcome of immune challenge; and Devlin *et al.* (2000) show that diet is one area where the outcome can be positively influenced.

Table 1

**Some potentially stressful situations experienced by puppies during their first year of life**

- Weaning
- Leaving breeder for a new home
- Meeting children for the first time
- Visiting the veterinary surgeon for health check, inoculations, worming and flea treatments
- After first inoculations the pup is introduced to the rest of the world, e.g. puppy classes etc.
- Spaying/neutering
- Formal dog training
- Holidays
- Travelling
- Visiting kennels and being without their owner
- Exercising too little/too much
- Eating strange objects and stealing food
- 'Nervous phase'
- Growth

Table 2

**Comparison of specific antibody titres (distemper and parvovirus) in puppies supplemented with antioxidants and in untreated controls.**

	Diet	Supplemented	Control
Anti-distemper titre	< 128*	25%	100%
Day 10 post vaccination	> 129*	75%	0%
Anti-Parvovirus titre	<512*	25%	67%
Day 7 post vaccination	>513*	75%	33%

● REFERENCES ●

1. Devlin, P., Koelsch, S., Heaton P. R., Charlton, C. J., O'Reilly, J. D., Smith, B. H. E., Harper, E. J. Effect of antioxidant supplementation on the immune response in weaned puppies. *Proceedings of the 18th American College of Veterinary Internal Medicine forum* 2000, in Seattle, Washington 738.
2. Truyen, U. Vergleich der Effektivitaeten verschiedener Impfschemata mit Monovakzinen und Kombinationsvakzinen gegen das canine Parvovirus. *Rundschreiben* 1999; 9.

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