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# The Effects of Supplemental Vitamin E and Selenium on Feline Immunity

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# Abstract

Both vitamin E and selenium are essential for optimal immune function and their supplementation in the diet is known to enhance various immune parameters in many species. Immune function may be enhanced further by their combined supplementation (Kubena & McMurray, 1996). There have been very few studies on the effects of vitamin E supplementation on immune function in the cat and it appears that vitamin E does not produce the same enhancement of immune parameters that has been found in other species, although older cats may benefit from supplementation (Hayek *et al.*, 2000). No studies have investigated the effects of selenium supplementation or of combined vitamin E and selenium supplementation on immune function in the cat. The aim of this study was to examine the effects of both single and combined supplementation of vitamin E and selenium on immune function in the cat.

The 4 week study followed a 3x3 factorial design with 9 diets, including a control or basal diet containing 68.2 IU/kg DM Vitamin E and 0.38 mg/kg DM selenium, and 8 diets supplemented with moderate or high levels of Vitamin E (250 or 500IU/kg DM diet) and/ or Selenium (2 or 10mg/kg DM diet). Blood samples were analysed for immune cell phenotype expression, lymphocyte proliferation to concanavalin A and phytohaemagglutinin, phagocytosis, immunoglobulin G concentration and prostaglandin E<sub>2</sub> concentration. Results were analysed in SAS by mixed procedure repeated measures analysis.

Vitamin E supplementation at both a moderate and high level were found to significantly increase lymphocyte proliferative responses to concanavalin A and phytohaemagglutinin, whether or not selenium was supplemented in the diet. Phagocytic activity was significantly increased by vitamin E and combined vitamin E and selenium supplementation. Selenium supplementation alone had no significant effect on any of the immune parameters measured. None of the supplemental diets were found to have a significant effect on the expression of immune cell phenotypes, immunoglobulin G concentration or prostaglandin E<sub>2</sub> concentration. Overall, a moderate level (250 IU/kg DM) of vitamin E supplementation may benefit feline immune health when supplemented in the diet. A higher level of vitamin E

supplementation is unlikely to offer any added benefit to immune health and would add unnecessary cost to the manufacture of the diet. Selenium supplementation appears to offer no benefit to immune health in cats.

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# List of Abbreviations

APC	Antigen Presenting Cell
CAT	Catalase
CoQH	Coenzyme Q
Con A	Concanavalin A
DM	Dry Matter
DNA	Deoxyribonucleic Acid
GPx	Glutathione Peroxidase
H	High
H <sub>2</sub> O <sub>2</sub>	Hydrogen Peroxide
IgG	Immunoglobulin G
IU	International Units
M	Moderate
MHC	Major Histocompatibility Complex
NADPH	Nicotinamide Adenine Dinucleotide Phosphate
O <sub>2</sub>	Oxygen
PGE <sub>2</sub>	Prostaglandin E <sub>2</sub>
PGG <sub>2</sub>	Prostaglandin G <sub>2</sub>
PGH <sub>2</sub>	Prostaglandin H <sub>2</sub>
PHA	Phytohaemagglutinin
Se	Selenium
SOD	Superoxide Dismutase
Vit E	Vitamin E