

Immune Function and Vitamin D in Shelter Dogs

Project title: Immune Function and Vitamin D in Shelter Dogs

Organization: Midwestern University

Project lead(s): Dr. Jared Jaffey

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Grant amount: \$5,000

Topics: Medicine, Surgery & Sterilization

Project Summary: This Midwestern University study aimed to determine if there was a link between immune function and Vitamin D in shelter dogs. The study found that dogs in a shelter for 7 days demonstrated more immune issues compared to healthy control dogs. There was no significant difference in the production of white blood cell production of cytokines between shelter dogs and healthy dogs. However, higher Vitamin D concentration was found to be associated with higher destruction of the bacterium, *E. coli*, per cell in both the control and shelter populations.

The objective of the project was: to compare the immunities of shelter dogs and healthy, non-shelter control dogs; to compare Vitamin D concentrations in shelter dogs with healthy, non-shelter control dogs, and determine if Vitamin D concentrations are associated with stronger immune systems.

Methods: Ten randomly selected dogs from the Arizona Humane Society with a mean age of 4.5 years were placed in the study group and housed in the shelter for approximately 10 days. Ten healthy, non-shelter dogs with a mean age of 4.8 years were enrolled as a control population. A 10 mL blood sample was collected from each dog and processed within 1 hour of sample collection.

Results:

- Shelter dogs were found to have a significantly decreased ability to break down *E. coli* per cell compared to healthy control dogs
- There was a significant positive association between Vitamin D concentration and *E. coli* destruction per cell in the entire population
- There was no significant difference in white blood cell production of cytokines between shelter and healthy control dogs

Conclusions: Dogs housed in a shelter for 7 days demonstrated immune issues that could contribute to their development of infections. The positive correlation between Vitamin D concentration and *E. coli* destruction highlights the potential for use of Vitamin D supplements in shelter dogs as a means to improve their immune function and protection against infections.

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Tags: Summer Scholar, Shelter, Dog, Vitamin D, Supplement, Immunity, Immune, *E. coli*

Audience: Executive leadership, Shelter/Rescue Staff & Volunteers, Public, Veterinary team