RESEARCH PROGRESS REPORT SUMMARY

Grant 01840: Health Implications of Early Spay/Neuter on Canine Health

Principal Investigator: Dr. Benjamin L Hart, DVM, PhD

Research Institution: University of California, Davis

Grant Amount: $146,589.00

Start Date: 2/1/2014 **End Date:** 1/31/2016

Progress Report: End-Year 2 (Final)

Report Due: 1/31/2016 **Report Received:** 2/23/2016

Recommended for Approval: Approved

(Content of this report is not confidential. A grant sponsor's CHF Health Liaison may request the confidential scientific report submitted by the investigator by contacting the CHF office. The below Report to Grant Sponsors from Investigator can be used in communications with your club members.)

Original Project Description:

This project extends our just-completed ACORN grant with Golden Retrievers, where we found that spay or neuter was related to a significant increase in risk in five diseases of concern: hip dysplasia; cranial cruciate ligament tear; lymphosarcoma; hemangiosarcoma; and mast cell tumor. Importantly, the disease risk was dependent upon whether the dogs were female or male and whether the spay or neuter was performed early (before one year of age) or late. Mammary cancer occurred so infrequently that it could not be analyzed.

Because breeds differ in vulnerability to joint disorders and risks of various cancers, we propose to expand this approach, on a breed-by-breed basis, to additional popular breeds and analyze all important joint disorders and cancers in each breed. We propose to include in this phase Labrador Retrievers, German Shepherd Dogs and Dachshunds. Upon negotiation with CHF, we will include 1-2 additional breeds, such as Rottweilers, Chihuahuas, Standard Poodles or Miniature Poodles.

We now know the numbers of subjects needed for each breed and the minimum number of disease cases needed to perform statistical analyses. For the breeds mentioned above, our database has sufficient subjects. The expected results will be of immediate benefit to caregivers of the breeds wishing to reduce the likelihood of various devastating diseases.

Grant Objectives:

To develop a generalized understanding of the impact of early spay and neuter on disease risk in dogs.

Publications:

Hart, B.L., L.A. Hart, A.P. Thigpen and N. H. Willits. 2014. Long-term health effects of neutering dogs: Comparison of Labrador Retrievers and Golden Retrievers. PLoS ONE 9(7): 10.1371/journal.pone.0102241.

Report to Grant Sponsor from Investigator:

The long-term goal of this project is to evaluate the breed-specific effects of neutering (both sexes) at different ages on joint disorders (hip dysplasia, cranial cruciate ligament tear and elbow dysplasia) and some cancers (lymphosarcoma, hemangiosarcoma, mast cell tumor). The effects of neutering at various ages were also examined in females with regard to mammary cancer, urinary incontinence and pyometra. The breeds examined were: Labrador Retrievers, German Shepherd Dogs, Dachshunds, Boxers, Rottweilers and Chihuahuas, Yorkshire Terriers, Shih Tzus, Corgis (two breeds combined for analyses), Doberman Pinschers and Bulldogs. In the space below, we will provide a summary of the findings.

Labrador Retriever (1,500 cases: males–272 neutered, 536 intact; females–347 neutered, 345 intact)
The findings on the Labrador Retriever are published. The major finding was a significant 2-fold increase in one or more joint disorders with neutering in the first year in both males and females above the 5 percent level of intact dogs. The occurrence of the cancers followed was low (3-4%) and not affected by neutering.

German Shepherd Dog (1,170 cases)
The paper is under review. Early neutering significantly increased the incidence of one or more joint disorders and the occurrence of the cancers followed was low and not affected by neutering.

Small-dog Breeds
Chihuahua (831 cases)
Yorkshire Terrier (553 cases)
Shih Tzu (322 cases)

These breeds lacked joint disorders associated with neutering at any age above the low incidence of intact dogs. The occurrence of one or more cancers was low in both intact and neutered dogs.

Long-dog breeds
Dachshund (548 cases)
Corgis (191 cases)
Joint disorders in these breeds were not associated with neutering at any age above the low incidence of intact dogs. The occurrence of one or more cancers was low in both intact and neutered dogs. In male and female Dachshunds the occurrence of intervertebral disc disorders was high in intact dogs and not increased by neutering.

Rottweiler (696 cases)
Males and females showed an increase above intacts in one or more joint disorders with early neutering. The incidence of one or more of the cancers was not increased in either gender by neutering at any age.

Boxer (645 cases)
There was no increase in joint disorders associated with neutering at any age above the low incidence in intact dogs. Intact males had a fairly high incidence of cancers, which was increased in one of the neuter periods. Intact females had a fairly high incidence of cancers, not increased by neutering.

Doberman Pinscher (295 cases)
In males, there was no increase in one or more joint disorders associated with neutering above the low level in intact males. In females, however, there was an elevated incidence of joint disorders in an early neuter period, compared to none in intact females. In both sexes, the occurrence of cancers was less than the low level in intact dogs and not markedly affected by neutering.

Bulldog (471 cases)
The moderate occurrence of one or more joint disorders in intacts appeared not to be increased with neutering in males and females. For cancers, there was no evident increase in occurrence associated with neutering above the moderate level of intact male and female dogs.