GRANT PROGRESS REPORT REVIEW

Grant: 01105: *Understanding the Dynamics of Canine Influenza Virus Transmission in Dog Populations and Intervention Strategies for Reducing Transmission*

Principal Investigator: Dr. Cynda Crawford, DVM PhD

Research Institution: University of Florida

Grant Amount: $104,220.00

Start Date: 1/1/2009   **End Date:** 12/31/2011

Progress Report: 30 month

Report Due: 6/30/2011   **Report Received:**   6/1/2011

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:
Background: Canine influenza is a newly emerging and highly contagious respiratory infection of dogs caused by a novel influenza A virus of the subtype H3N8. The canine influenza virus (CIV) has caused respiratory disease outbreaks in thousands of dogs housed at greyhound race tracks, boarding/training kennels, and shelter facilities across the U.S. Although most dogs recover, many develop a debilitating pneumonia that can be fatal. There is no information on whether dogs housed in different types of premises are more or less at risk for canine influenza.

Objective: For this study, the researchers are analyzing data from previous canine influenza outbreaks to determine if dog populations in different types of premises have different risk for canine influenza. Using the results from this analysis, they will develop a computer model to investigate parameters important to CIV transmission in dog populations at race tracks, boarding/training kennels, shelter facilities, and dog shows. The model will then be used to determine what intervention strategies (vaccination, quarantine, sanitation) are most effective in reducing or preventing virus transmission. The results of this study will provide valuable information to dog show organizers, and others responsible for the health of dogs in other settings, to guide development of policies for control and prevention of canine influenza.

Grant Objectives:

Objective 1: Identify significant intrinsic (dog-related) and extrinsic (premise-related) risk factors predisposing to canine influenza outbreaks in racetrack kennels, boarding/training kennels, and shelter facilities.

Objective 2: Develop a mathematical model for CIV transmission in populations at racetrack kennels, boarding/training kennels, shelter facilities, and dog shows.

Objective 3: Apply three intervention strategies (vaccination, quarantine, and infection control/sanitation policies) singly and in combination to the transmission model to determine their efficacy in reducing or preventing viral transmission within a premise and the movement of infected dogs from the premise.

Publications:

Report to Grant Sponsor from Investigator:
Canine influenza is a recently emerging, highly contagious respiratory infection of dogs caused by a novel influenza A virus of the subtype H3N8. H3N8 canine influenza virus (H3N8 CIV) has caused respiratory disease outbreaks in thousands of dogs housed at greyhound race tracks, boarding kennels, and shelter facilities in 36 states in the U.S. Although most dogs recover from an influenza-like illness, many develop a debilitating pneumonia that can be fatal. There is little information on risk factors for canine influenza, either for individual dogs or for kennel facilities that house dogs. In our first epidemiological study, geographic location (Northeast and West) and exposure setting (shelters and boarding facilities) were identified as risk factors for H3N8 CIV infection of individual dogs. We are currently completing a second epidemiological study focused on identifying kennel facility factors (population density, source and frequency of introduction of new dogs, sanitation practices, disease surveillance and infection control protocols) that may increase the risk for canine influenza outbreaks. Based on the finding that shelters are a risk factor for virus exposure, we developed a simulation model to investigate parameters important to H3N8 CIV transmission in shelter facilities. This study identified indirect virus transmission parameters and number of dogs housed in the shelter as the most important factors promoting influenza outbreaks. Isolation and vaccination have been applied to the shelter model as two common intervention strategies to assess their effect in reducing or preventing virus transmission. Preliminary data analyses indicate that neither isolation nor vaccination alone can completely eliminate virus transmission in a population of dogs housed in a shelter as defined by the model parameters. An individual-based model to simulate H3N8 CIV virus transmission in dog shows is currently under development. The results of all these studies will provide valuable information to dog show organizers, and those responsible for the health of dogs in kennel settings, to guide development of policies for prevention and control of canine influenza.