



Factors Affecting the Risk of Ticks and Biting Flies ANH.04.10

Project Title: Biology of animal disease vectors – ticks and biting flies

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Background: Some livestock diseases are spread by arthropods. For examples, the Rocky Mountain wood tick can spread Anaplasmosis, and bluetongue is transmitted by a biting midge (*Culicoides sonorensis*), and certain mosquitos can spread Rift Valley Fever. Because these diseases can be very costly, it is important to understand the seasonal abundance, biology, and population dynamics of these organisms. In the event an arthropod-borne disease is introduced to Canada, a better understanding of these arthropods will help to identify ways to control them and help prevent disease spread.

Objective: To identify factors that influence male tick movement, on-host survival, overwintering success, and when tick questing ceases during the summer. Trapping methods for sampling the abundance of biting flies will also be compared, and the relationship between trap captures and biting rates on cattle will be determined.

These researchers will study cattle in a controlled environment facility to assess whether male tick movement is mediated by the presence of feeding females, determine if on-host survival of ticks is similar between early summer and late summer infestations, determine the overwintering success of fed male ticks, and determine whether the end of tick questing in summer is dependent on environmental conditions.

A variety of different trapping methods will be set up at two sites in southern Alberta. The numbers of *Culicoides* and mosquitoes captured by the different traps will be compared to determine the best method and time to capture these arthropods. Subsequently, these traps will be compared to actual results obtained using actual cattle as bait. This experiment will be done three times a night, on five to eight occasions through the year to assess biting rates of vectors on cattle.

Implications: A better understanding of the population dynamics and ecology of arthropod disease vectors will help to identify risks to cattle production posed by arthropods as potential disease vectors, and help to develop ecologically sound mitigation strategies.

The Beef Research Cluster is funded by the Canadian Cattlemen's Association and Agriculture and Agri-Food Canada to advance research and technology transfer supporting the Canadian beef industry's vision to be recognized as a preferred supplier of healthy, high quality beef, cattle and genetics.

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