



# RESEARCH FACTS

RESEARCH & TECHNOLOGY DEVELOPMENT FOR THE CANADIAN BEEF INDUSTRY

## Beef Science Cluster



## A Better Test for Anaplasmosis

### Project Title:

Genetic screening for *Anaplasma* in their tick vectors, and the development of species-specific markers for different species of *Anaplasma*

### Project Code:

ANH.05.10

### Completed:

March 2013

### Researchers:

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### Background

Bovine anaplasmosis can lead to anemia, jaundice, fever, lost production and abortion in cattle. It is caused by *Anaplasma marginale*, a bacterium transmitted to beef cattle by Rocky Mountain wood ticks and American dog ticks. This disease occurs in many regions of the USA including several northern states. Canada is considered free of bovine anaplasmosis, though several Canadian cases have been reported and eradicated in recent years.

The tests that are currently used to detect *Anaplasma marginale* infection in cattle may also detect closely related bacteria that do not cause anaplasmosis. This could lead to “false positive” diagnoses for anaplasmosis, and misleading surveillance results.

### Objective

To determine the prevalence of *Anaplasma marginale* and an *Anaplasma bovis*-like bacterium in questing adult Rocky Mountain wood ticks and American dog ticks in Alberta and Saskatchewan, and to determine whether the *Anaplasma bovis*-like bacterium may cause false positive diagnoses for bovine anaplasmosis.

### What they did

Adult ticks were collected from 17 sites in southern Alberta and eight sites in Saskatchewan during the spring and early summer. DNA was extracted from each tick and tested using molecular techniques to determine if individual ticks were infected with *Anaplasma*. A more complex molecular method was used to determine whether *Anaplasma marginale* or the *Anaplasma bovis*-like bacteria were present.

## What they learned

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Molecular methods can be used to reliably distinguish *Anaplasma marginale* from the *Anaplasma bovis*-like bacterium in ticks. *Anaplasma marginale* was not detected in any of the ticks. The *Anaplasma bovis*-like bacterium and other related bacteria were found in Rocky Mountain wood ticks from several localities in southern Alberta, but not in the American dog tick in Saskatchewan.

## What it means

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No *Anaplasma marginale* was found in ticks from either Alberta or Saskatchewan. An *Anaplasma bovis*-like bacterium was found in Rocky Mountain wood ticks in southern Alberta, but not in American dog ticks, even in locations where both types of tick were found. The *Anaplasma bovis*-like organism has a much broader geographical distribution than previously thought.

It still remains to be determined if this bacterium is transmitted from adult Rocky Mountain wood ticks to cattle, and whether it impacts cattle health. Additional work is needed to determine if the current diagnostic tests that detect the presence of the *Anaplasma marginale* (which leads to bovine anaplasmosis) cross reacts with the *Anaplasma bovis*-like bacterium.

## Proudly Funded By:



The Beef Cattle Industry Science Cluster is funded by the Beef Cattle Research Council, a division of 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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