



## Causes of Reproductive Failure ANH.09.10

**Project Title:** Investigating Reproductive Failure in Western Canadian Cow-Calf Herds

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**Background:** Reproductive failure is extremely costly for ranchers. Trich (*Trichostrongylus axei*) and vibrio (caused by *Campylobacter fetus* ssp. *venerealis*) can be major causes of reproductive failure. Vibrio testing is very challenging because the bacteria can die before it makes it to the lab for culture. A new commercially available polymer chain reaction (PCR) test for vibrio is highly sensitive and has over 90% agreement with the traditional culture method. Trich is easy to culture, but requires repeated testing to improve accuracy. A new PCR test for Trich is available but has not been modified and tested under field conditions in Western Canada.

Fertility is also influenced by nutrition. For example, blood samples indicate that up to 46% of cows in Western Canada may be copper deficient. This suggests a need for field research on the use and effectiveness of trace mineral supplementation programs to improve fertility of beef cows.

**Objective:** To determine the specificity of a commercially available PCR test for vibrio, validate the use of a new PCR test for Trich, and to study the most appropriate time and method of trace mineral supplementation to improve fertility in cows.

Three hundred virgin bulls representing major breeds at the PFRA Spring Creek Bull Station in Saskatchewan will be sampled over two years with duplicate sub-samples to be analyzed for Trich using either the PCR test (Prairie Diagnostic Services) or culture procedures. Samples containing known numbers of Trich will be prepared to determine the sensitivity of the PCR test when the organism is present at very low levels. Semen will be sampled from 30 bulls known to be infected with *Campylobacter fetus* spp. *venerealis* or *foetus* and analyzed using culture or the new PCR test. Specificity and sensitivity of the new test will be determined by performing the culture/PCR test comparisons on the 300 bulls used for the research into Trich.

The trace mineral study will use 400 cows from 40 beef herds (10 cows per herd). Half of the herds will feed mineral as part of a complete feed whereas the other half will supplement minerals free choice. Blood samples will be obtained immediately post-calving and again at time of pasture turnout. Blood, feed and water samples will be analyzed for copper, molybdenum, manganese, selenium, vitamin A and E. After accounting for feed and water mineral levels, the prevalence of deficiency will be compared supplementation method (complete feed vs. free choice) and will be related to specific outcomes in cows and calves.

**Implications:** Finding better ways to avoid reproductive disasters will be a key risk management strategy for cow-calf operations.

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