



RESEARCH FACTS

RESEARCH & TECHNOLOGY DEVELOPMENT FOR THE CANADIAN BEEF INDUSTRY

IN PROGRESS

Vaccination programs to improve calf health

Project Title:

Comparison of immune response and respiratory disease-sparing effect of homologous and heterologous prime-boost vaccine programs in beef calves

Researchers:

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Project Code:

ANH.04.18

Completed:

In Progress. Results expected in August 2022.

Background:

Developing vaccines is very costly. But what we can make the vaccines we already have work better? There is some evidence that “heterologous” vaccine protocols that use one kind of vaccine for the initial vaccination, and a different kind of vaccine for the booster (e.g. a modified live vaccine for the initial calthood vaccination and a killed vaccine as the booster at weaning) may provide better immune protection than a “homologous” vaccine protocol that uses the same modified live vaccine (or same killed vaccine) for both the initial and booster vaccinations.

Objectives:

Provide tools that will decrease the risk of bovine respiratory disease (BRD) in calves and reduce the use of antimicrobials for prevention and treatment of BRD through:

1. Using a multiple viral challenge model to compare the disease sparing effect of heterologous and homologous vaccine protocols in a controlled study
2. A large-scale field study to compare the effectiveness of the protocols in reducing BRDC morbidity, mortality and the effect on average daily gain

What they will do:

This team will use different vaccines that both protect against infectious bovine rhinotracheitis (IBR), bovine respiratory syncytial virus (BRSV), parainfluenza virus (PI3), coronavirus and bovine viral diarrhoea virus (BVD) Types 1 and 2. In the first trial, calves will be vaccinated with an intranasal modified live vaccine against BRSV, IBR, PI3 and coronavirus at birth. At branding, half will be boosted with an injectable modified live vaccine and half with an injectable killed vaccine. At weaning they will be challenged with BRSV, PI3 and coronavirus. Animal health measures (including lung scores) will be recorded.

A follow-up field trial will compare the similar protocols in 1,000 commercial calves initially vaccinated with an intranasal MLV at birth or branding, and boosted at weaning using either an injectable modified live or injectable killed vaccine. The calves will be followed through the feedlot, and health, treatment and mortality rates and performance will be tracked.

Implications:

Vaccination strategies that help us find better ways to use the vaccines we currently have could provide better immune protection, better animal health, less sickness, and less antimicrobial use at significantly less cost than developing whole new vaccines.

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