

R&D BRIEF 141: DISEASES LIMITING CALVING PERCENT IN BEEF HERDS

This R&D brief outlines the results of a study into diseases affecting beef cow fertility.

About 65% of the 94 herds tested were found to have bovine viral diarrhoea (BVD). These herds had, on average, a five per cent lower pregnancy rate.

The data showed no clear link between leptospirosis or neospora and in-calf rates at pregnancy diagnosis time. However they are known to cause abortion and may affect wet/dry rates.

All three pathogens are widespread in the New Zealand beef herd.

SUMMARY

This study is the first in New Zealand demonstrating an extremely high prevalence of all three pathogens in beef cattle.

A few herds with BVD had reproduction rates that were greatly reduced (i.e. 15% lower) while others were affected to a smaller extent or not at all.

The high prevalence of leptospirosis suggests that human exposure to this zoonotic agent must be considered high among beef farmers.

94 HEIFER HERDS TESTED

This study into the effects of disease on fertility was part of a wider two-year project looking at beef fertility.

Data from 978 farms was collected in 2002, 2004 and 2005 and analysed. From this group, herds that had poor fertility and herds with very high fertility were identified. 94 of these herds were randomly selected and then visited by a veterinarian in 2004 and 2005.



Fifteen heifers in each herd were tested for the presence of antibody against:

- BVD virus
- Neospora caninum
- Leptospirosis (two forms; Hardjo and Pomona)

The target group was heifers reared as replacements who were 12 to 18 months of age.

Herds were excluded from the study if the heifer calves had been in contact with animals from other herds.

Herds vaccinated against *Leptospira Serovars* Hardjo or Pomona were excluded from the analysis because tests can't distinguish between vaccinated or naturally infected animals.

RESULTS SHOW BVD WAS WIDESPREAD AND CAUSED A 5% LOWER PREGNANCY RATE OVERALL IN BVD-INFECTED HERDS

About 65% of all herds were infected with BVD and, within the positive herds, about 75% of individual animals were positive.

A herd was defined as infected when there were two or more animals among 15 heifers that tested positive for antibodies to the BVD virus. The presence of a persistently-infected animal that is shedding the virus defines the herd as actively infected.

The prevalence of BVD antibodies at both herd and animal levels was extremely high, reflecting the very frequent and widespread exposure to the virus.

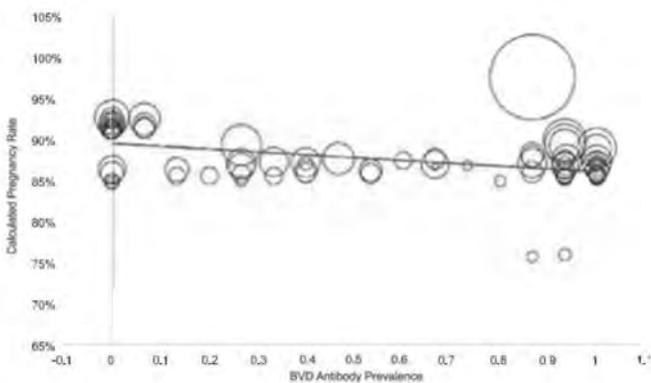
Herds with one or more persistently-infected animals (i.e. shedding virus) had a lower in-calf rate (87% versus 92%).

Over the whole population of cows in the survey, BVD reduced the pregnancy rate by about 5%.

However, the effect is varied.

Two out of 94 herds had in-calf rates 15% lower while others had no drop off in fertility.

Figure A: Pregnancy rates against BVD presence



ADULT COWS JUST AS AT-RISK AS YOUNG HEIFERS

Results suggest that adult cows are affected just as much as young replacement cows.

The rate of infection is higher in beef cattle than dairy cattle.

BVD can also decrease growth rate and increase mortality rate.



NO CLEAR LINK BETWEEN NEOSPORACANINUM AND LOWER FERTILITY

This disease is commonly known as neosporosis and it can cause abortions in mid-pregnancy.

Half of all beef herds tested had at least one heifer with antibodies to neosporosis. About half of the heifers in infected mobs had been exposed to this single-cell parasite at some stage.

Infection lasts for life and can lead to repeated abortion so the risk to fertility must be viewed as high.

This pathogen is more likely to affect foetal loss later in gestation (abortion) rather than in-calf rates at pregnancy diagnosis. Wet/dry rates are the best way to test for its impact but they were not measured in this study. New Zealand is funding a follow-up study that will collect data on wet/dry rates.

LEPTOSPIROSIS

Two forms of leptospirosis were tested for. Hardjo was evident in 62% of herds (with one or more heifers testing positive) and in 34% of all heifers tested.

The Pomona form was less evident (in 26% of herds) and 12% of heifers tested. This is about half that of Hardjo. However in infected herds about half of all animals were infected with both Hardjo and Pomona. Pomona is more associated with abortion in cattle than Hardjo.

Hardjo and Pomona cause most of the human leptospirosis notified in New Zealand.

There is a vaccination available for both forms but in the sample only nine of the 94 herds had been vaccinated. This suggests that beef farmers do not regard leptospirosis as a potential health hazard or as a production limiting disease.

About 90% of dairy farmers vaccinate their breeding stocks, mainly to protect themselves from infection.

In contrast to BVD, there was little evidence that leptospirosis has adverse effects on herd fertility.

ABOUT BVD

In adult cows BVD can cause weight loss, reduced milk yield and death as well as infertility, embryo losses, abortion and deformed or stunted calves.

The virus can affect pregnant cows in different ways, depending upon when the infection takes place

- 0 to 45 days after conception: cows fail to conceive or lose embryo and return to service;
- 45 to 125 days after conception: abortion or birth of a persistently-infected calf
- 125 to 180 days after conception: virus enters unborn calf and can cause abortion or congenital deformities

In young stock (three to 12 months) BVD can cause poor weight gain, loss of body condition and premature death. It is immuno suppressive, meaning cattle that have an active infection will have a compromised immune system. This means they are more prone to other diseases.

BVD does the most damage when it infects pregnant cows during early pregnancy. If a cow contracts BVD at this stage, she may give birth to an infected calf. This calf sheds the disease, spreading it and perpetuating it from one generation to another. Surviving infected calves make up about one per cent of the adult cattle population.

The virus can survive in the environment for up to seven days and is transmitted through semen, milk, saliva, urine, placenta and birth fluid.

BVD does the most damage when it infects pregnant cows during early pregnancy. Symptoms include:

- Reduced appetite
- Poor weight gain
- Scouring
- Rough coat
- Discharge from eyes/mouth
- Ulcers in mouth/between toes

STEPS TO MITIGATE RISKS FROM BULLS:

Blood test breeding bulls prior to mating to check that there are no persistently infected animals and then vaccinate twice, three to four weeks apart.

Give booster vaccine annually prior to mating.

A common way that herds are infected is through introducing a new bull that is a persistently infected carrier of the disease. Vaccinating bulls will also protect them from catching BVD from cows or calves with which they are going to be joined. BVD can cause temporary infertility in bulls.

STEPS TO MITIGATE RISKS IN THE HERD:

Identify persistently infected animals by blood test and cull. Adopt stringent biosecurity measures to prevent the herd getting reinfected.

Another option is to vaccinate all heifers each year rather than going through the expense of blood testing the herd. Let any persistently infected animals die out over time. As BVD is widespread in herds a lot of the older cows will be naturally protected anyway as they have been exposed and have immunity. Note: however that persistently infected cattle will not respond to vaccination and continue to spread the virus.

SURVEY SHOWS 12% OF FARMERS VACCINATED AGAINST BVD

As part of the wider Beef Fertility Project, data was collected from 568 farmers on their management practices that related to beef cattle fertility.

Results showed that 12% of farmers vaccinated their beef cattle against BVD.

In comparison, 25% of farmers vaccinated beef cattle against leptospirosis.

ACKNOWLEDGEMENTS & MORE INFORMATION

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Contact Beef + Lamb New Zealand for more information: email enquiries@beeflambnz.com or call 0800 BEEFLAMB (0800 233 352)

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