

Campylobacteriosis (Vibriosis) in the Northern Territory

Introduction

Vibriosis, also known as 'vibrio' or campylobacteriosis, is a venereal disease of cattle caused by the bacterium *Campylobacter fetus subsp. venerealis*. The organism lives indefinitely in the reproductive tract of bulls and is transmitted to heifers and cows at joining. The organism establishes in the uterus, causing endometritis and/or infection of the fallopian tubes and oviducts. Early embryonic death may result, or the pregnancy may persist despite infection. The infected cow may subsequently abort between 3 and 7 months gestation.

Distribution in northern Australia

Vibriosis is widespread in northern Australia. The prevalence of disease varies between properties and can be dependent on management procedures, such as vaccination. Where the disease is endemic in a herd, vibriosis can be a major cause of reproductive failure and production loss.

Symptoms

Identifying vibriosis in the field is difficult owing to the absence of clinical signs. There are no symptoms in bulls. Cows may return to service early with poor conception rates, sometimes below 50%. Some cows develop immunity and conceive later in the breeding season. Over 10% of infected females become permanently infertile owing to fallopian tube obstruction. These present as well-conditioned, barren cows. Aborted foetuses of 3 to 7 months gestation are sometimes found in the paddock, as well as an increased percentage of second round calves.

Reproductive impact

Vibriosis affects reproductive performance by:

- reducing the reproductive rate
- prolonging the calving period
- increasing losses between pregnancy testing and weaning.

A sudden reduction in pregnancy rate is likely in newly infected mobs. This can create management problems owing to numerous brandings, uneven lines of weaners and increased cost in managing breeders that calve outside the optimal calving window.

Most cows develop immunity 3 to 6 months after exposure, although some cows may remain carriers for up to 2 years. These animals are a source of re-infection for previously clean bulls.

Diagnostic testing

Laboratory diagnosis is supported by a history of:

- low pregnancy rate

- low calving rate
- cows late in calf or abortions (if seen).

Affected animals rarely show other obvious clinical signs. Diagnosis is made through:

- demonstration of the *C.fetus* organism in samples collected from the prepuce of an infected bull
- antibodies or the organism in vaginal mucous from an infected cow
- or bacterial culture of the organism from the tissues of an aborted foetus.

Veterinary sample collection technique and test selection for diagnostics is crucial, because the organism is fragile and only survives 6 hours in normal atmospheric conditions. Careful attention to sample collection is critical to obtaining useful laboratory test results. Timing of collection, transport and submission method to the lab are very important.

Isolating and identifying the bacterium leads to an unequivocal diagnosis. However, this is extremely challenging to achieve when sampling geographically remote northern Australian herds. The organism is most likely to be recovered from aborted foetuses, submitted whole to the laboratory, within 24 hours of abortion. However, foetuses are rarely found within this period. Vaginal mucus and preputial washings or penile scrapings tend to have comparatively fewer organisms present.

To evaluate infection status in an unvaccinated herd, sample at least 10 early pregnant and empty heifers or cows. Individual cows that have aborted can be sampled from one week to 3 months after the event.

In herd tests, at least 30% of the tested animals must be positive to consider vibriosis as a cause of infection and reproductive failure. Therefore, it is important to sample a representative number of animals (at least 10) to achieve a statistically significant result. Immunity lasts 3 to 4 years, so positive herd results do not always correlate with recent infection.

Testing of bulls is currently problematic because of the large number of false positive test results. Therefore, testing of bulls for vibriosis detection is not recommended as a first-line test.

Control measures

Best practice management – strategic vaccination

To reduce the risk of transmitting vibriosis, vaccinate all bulls. Vaccination requires a primary vaccination course of 2 doses, given a minimum of 4 weeks apart. Give the second dose one month prior to joining and give boosters annually.

However, lack of bull control on large pastoral properties means bull vaccination alone may not be sufficient to control the spread of vibriosis. As heifers are at greatest risk of infection and reproductive loss, heifer vaccination strategies are another key means of disease control.

Give 2-year-old heifers a single, 5ml dose of vaccine, at least a month prior to first joining. This provides protection during the first 2 pregnancies when most infection is likely to occur. For heifers mated as yearlings, give 2 doses a minimum of 4 weeks apart, with the second dose one month prior to joining. Heifer vaccination provides a practical means of controlling the disease as eradication of vibriosis from extensive herds is unlikely to be successful.

Other management strategies

1. Consider culling bulls over 8 years old. As the preputial skin folds increase in aging males, these crevices enhance conditions for the organism to multiply. Older bulls are therefore more likely to be chronically infected.
2. Seasonally mate heifers. Pregnancy test and cull those that do not get in calf in the desired calving period.
3. Remove all empty, dry cows at first round muster in case they are carrying the organism and pose a risk to reinfection of bulls.

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