# IBR causing infertility in bulls: a case study

**B Askin**
Totally Vets Ltd, 25 Manchester Street, Feilding

## Introduction

This is an outline of similar findings on two geographically separate farms in two consecutive years. In both cases routine fertility testing of bull teams demonstrated azoospermia over the entire teams. Laboratory testing demonstrated IBR virus to be present in semen samples that were collected at the time of fertility testing. Described below are the findings at the time, how the case was managed to ensure the best outcome for the farmers concerned, and the advice now given to our clients to reduce the risk of similar events occurring.

## Farm 1: October/November 2011

- Routine fertility testing of a team of four two year old Jersey bulls two weeks after they had been introduced to approximately 100 R2 Freisian heifers demonstrated azoospermia in all cases.
- All bulls appeared to be clinically well. There was no evidence of any penile lesions. All bulls demonstrated good libido and two of the four bulls had a mild pyrexia of 39.2°C.
- Blood tests demonstrated all bulls were negative for BVD antigen, two out of four were positive to IBR Elisa.
- Semen samples from all four bulls were submitted for IBR PCR and three out of four were found to be positive.
- CBC and fibrinogen on two of the bulls indicated marked inflammatory response.
- Serological testing of ten of the mob of approx one hundred heifers demonstrated that four out of 10 were seropositive for IBR in the absence of any overt clinical signs
- The two bulls that were previously sero-negative subsequently sero-converted.
- A replacement bull team was introduced and a similar picture was seen a few weeks later with almost total azoospermia. By this stage it had been approximately six weeks since the initial bull team had been introduced to the heifers and a semen re-evaluation of these bulls suggested that semen quality was almost restored to an acceptable standard.
- The replacement bull team was removed and the initial bull team re-introduced.
- Pregnancy testing of the heifers demonstrated an acceptable result with approx 90% in calf. There were no obvious gaps in pregnancies.

## Farm 2: October/November 2012

- Once again routine fertility testing of eight two year old Hereford bulls that had been on farm for three weeks, but not introduced to the cows, demonstrated azoospermia in five out of eight bulls and semen quality below an acceptable standard in the remainder.
- Two weeks later all eight bulls had complete azoospermia.
- There was no evidence of any clinical disease in the bulls, all showed good libido and there were no penile lesions evident. In this case none of the bulls examined were pyrexic and there was no suggestion of an issue with the herd.
- Bulls were due to go with the herd so a new team was sourced. Fertility testing demonstrated no semen quality issues and the bulls were introduced.
- Three weeks later five of the eight bulls were pulled from the herd and semen collected, the evaluation of which

demonstrated five out of five azoospermia.
- These bulls had been BVD tested and vaccinated so semen was sent away for IBR PCR only. Five out of five came back positive.
- As before the initial bull team was re-evaluated for semen quality and seven out of eight were acceptable so the bull teams were swapped back over. A more than acceptable pregnancy rate was achieved in the herd.
- Several months later the replacement bull team had its semen evaluated and all eight passed.

## Discussion

A simple explanation in both cases is that naive bulls became exposed to IBR virus on introduction to situations where the virus was circulating. On Farm 1 the mode of spread could have been either venereal or respiratory whilst on Farm 2 respiratory spread must have occurred to the initial bull team, since they were not with the herd, and then either venereal or respiratory spread for the replacement team. In either case the outcome was the same, all bulls were rendered temporarily infertile for a period of approximately five weeks, presumably as a result of a pyrexia that they experienced as a result of the infection but in the absence of any other clinical symptoms. Following the ejaculation of damaged sperm, a period of rest and the replenishment of sperm stores with fresh semen fertility was restored.

Bovine Herpes Virus 1 (BoHV-1), the causative agent of IBR, has three subtypes: BoHV-1.1, BoHV-1.2a and BoHV-1.2b. While it is considered that 1.1 strains are usually associated with respiratory or nasal disease and 1.2 strains are usually associated with genital infections this has been shown not to be mutually exclusive. The lack of genital lesions seen in the above cases in either male or female cattle tends to point towards the respiratory form of the disease. Replication of BHV-1 takes place in the mucosal surfaces of the upper respiratory tract and genital mucosal surfaces and virus is shed in nasal and genital secretions. In this way semen may become contaminated during ejaculation.

It seems very unlikely that under field conditions we would be fortunate enough to find five out of five bulls all excreting BoHV-1 in their semen. A logical explanation could be that all semen samples were collected using an artificial vagina (AV) so it is more than likely there was cross contamination of samples between bulls collected consecutively at any one visit. Given the sero-conversion taking place during the investigation however, together with the semen quality issues and the positive PCR tests demonstrated, I believe this should not detract from the explanation.

## Conclusion

We were extremely fortunate to be in a situation on Farm 1 where we were fertility testing bulls that had been out working for two weeks (more by luck than judgement). The farmer might never have known and if a bull fertility issue had been suspected by the time the bulls were checked they would have been fully recovered.

How often does this happen?
In light of these two cases we now advise that all bulls joining our dairy herds are fully vaccinated for both BVD and IBR and that where possible bulls are on farm for a minimum of six weeks prior to use.

## References

**Gu X, Kirkland PD.** *Infectious Bovine Rhinotracheitis. Australia and New Zealand Standard Diagnostic Procedures*. 2008

**Lawrence L.** An overview of bovine herpesvirus1. *VetScript* June 2012

**Pena Joya M, Gongora A, Jimenez C.** Infectious agents affecting fertility of bulls and transmission risk through semen. *Revista Colombiana de Ciencias Pecuarias* 24, 634-46, 2011