

## AN OUTBREAK OF BVD PI CARRIER CALVES IN A 300-COW JERSEY HERD

BVD (bovine viral diarrhoea) virus inflicts the greatest harm if it infects cows during pregnancy. Depending on the stage of pregnancy, BVD may result in low fertility, abortions, deformed calves or the birth of persistently infected (PI) calves that remain BVD virus carriers for life. These PI calves are often ill-thrifty and have poor immunity. On first inspection many PI calves appear to be normal, healthy animals. Yet they are prone to infections (eg pneumonia and mastitis) and often die of mucosal disease – when BVD causes severe diarrhoea which invariably leads to the calf's death. Throughout their lives PIs spread vast quantities of BVD virus.

If a BVD carrier is introduced into a seasonal breeding herd during or after mating, the impact of BVD may be profound. However, as many of the effects of BVD infection are delayed and insidious, BVD outbreaks are often missed or diagnosed later. The herd described here experienced repeated bouts of poor health amongst the 2004-born calves with 'outbreaks of incurable pneumonia'.

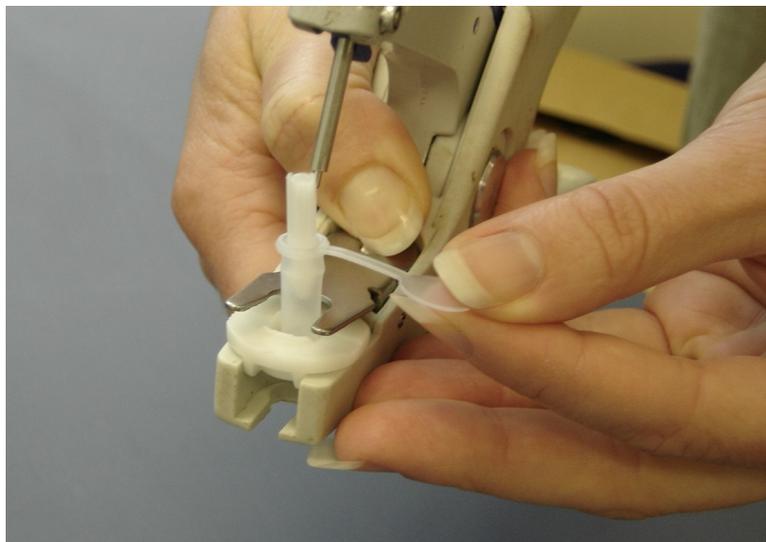
This is a case study of an average sized, seasonal supply, pedigree Jersey herd. The dairy farm is a family-operated herd and has been at its present location in the Waikato for several decades. Breeding involves the use of stud bulls in conjunction with AI. Superb record-keeping by the owners allowed us to investigate the outcome of the BVD outbreak in detail.

The death of an 18-month old bull in early 2006 was caused by mucosal disease – a fatal form of BVD. Following veterinary advice, the owners screened all bull calves for BVD and found another carrier (or PI). After this calf's dam plus three more first-calvers were found to be persistently infected as well, we decided to screen the entire herd.



**The Punch biopsy leaves a small puncture <1mm across**

We used the Genemark ear Punch to collect tissue samples, which were tested by **antigen ELISA** for BVD. The Punch is a simple tissue-sampling device that uses a Zeetags eartagger to take a tiny ear biopsy (~1mm in size). As the sampling punch and pouch are self-contained, there is very little risk of cross-contamination between samples and no need to sterilize the equipment. With several helping hands, the Punch enabled us to sample all 313 cows in the milking herd within 1½ hours. The young stock (102 calves and 86 yearlings) were also tested on the same day.



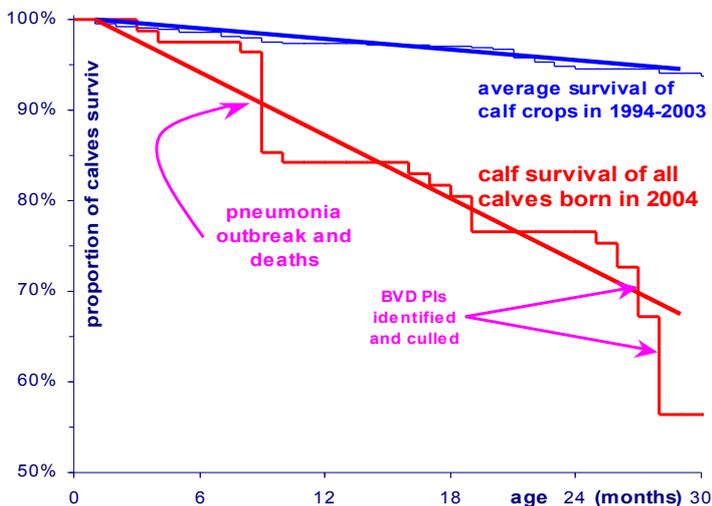
**The self-contained pouch with tissue sample**

The whole-herd screening and BVD testing revealed that another nine first-lactation heifers and one calf were BVD PI carriers. None of the yearlings (born in 2005), nor any older cows (3+ years) were infected.

In all, thirteen 2-year old persistently infected BVD-carriers (born in 2004) and two young PI calves were identified by testing in the spring 2006.

## 2004 calf crop: over 1/3 BVD PI carriers (13 milking PIs)

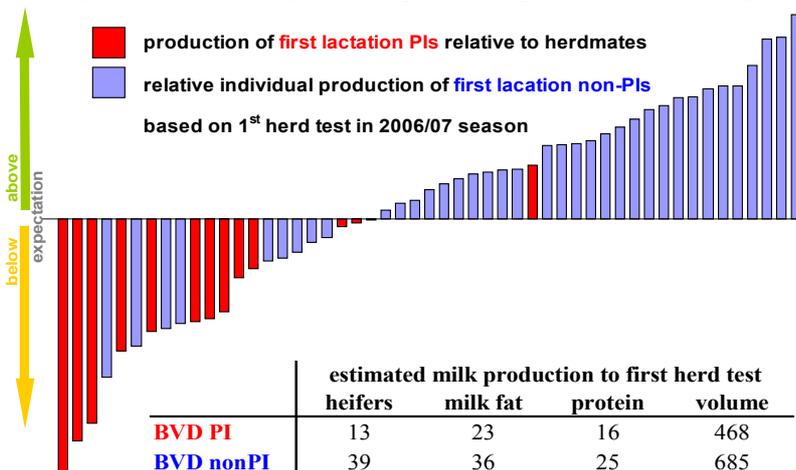
The 2004-born calf crop was plagued with health problems, including outbreaks of pneumonia which resisted treatment. Survival to 24 months was 18% below the 10-year herd average. The 2004 replacement heifers were 4 times more likely to succumb to disease, and only 55 of the original 84 replacement heifers were alive this spring. In total, 13 surviving 2004-born heifers were confirmed PI. This means, over one third of that year's calves were born persistently infected with BVD and almost half of them died before 24 months.



### Survival of the 2004-born heifers to calving at 24 months was almost 20% lower than normal over the previous 10-years

Interestingly, fertility during the 2003/04 season appeared unaffected and no increase in abortion rates or calf defects was recorded.

Milk production of the surviving PI heifers was 35% lower than their contemporaries with only one PI producing above the average.



### 12 of 13 first lactation PI heifers produced below average at the first herd test & the 3 worst producers were BVD PI

Clearly the BVD virus was introduced into this previously clean herd over spring / summer in 2003-04. The cows were infected during the critical window in early pregnancy when foetal infection results in persistent infection of the calf. Seasonal breeding and the use of unscreened mop-up bulls makes NZ dairy herds particularly prone to disastrous BVD outbreaks.

## Protecting the herd

PI carrier cattle are crucial to the spread of BVD virus and may cause BVD PI outbreaks in unexposed herds. It is therefore vital that all imported stock (and especially bulls) have been screened for PI status before purchase. A single once-in-a-lifetime negative BVD antigen or virus test is sufficient to ensure that the animal is not a PI carrier. Any positive animal should be culled or retested a few weeks later to confirm PI status.

BVD vaccination is a useful tool to minimize the risk of accidental re-introduction of the disease, but must be carried out consistently in consultation with your vet to make sure it is effective.

The BVD Punch antigen ELISA and the BVD PCR can both be used to test newborn calves. Routine screening of all reared calves at birth will ensure that:

- any PI problem is identified early,
- ill-thrifty PI calves are culled,
- unproductive PIs are not retained,
- high treatment costs due to secondary infections amongst these PIs are not incurred and do not affect the health of normal calves,
- early deaths and increased losses due to PI status are avoided.
- Purchased cows, heifers returning from the grazier and cows exposed to BVD over the fence may carry a PI calf. Screening all reared calves will keep the PI out of the breeding herd, and help prevent BVD PI outbreaks in future in the herd.

**To be successful, BVD control demands on-going vigilance and sound veterinary advice.**

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**THANK YOU!** TO THE HERD OWNERS