

“NATURAL” BVD VACCINATION – THE WAY TO GO?

Using identified BVD PI (persistently infected) animals as “vaccinators” has been an accepted way of exposing young stock to BVD infection before their first pregnancy. The resulting immunity is thought to be long lasting, possibly lifelong. I have used this technique myself in one particular herd and it appeared to work well - until all the PI animals were gone! The case presented here caused me to think again.

HISTORY

The herd is a 650 cow spring calving Jersey herd in South Taranaki. Heifer replacements and bulls for use on the herd are all home bred. Weaner heifer calves were sent to Vetcare Grazing in Wanganui in May and returned as in-calf heifers the following May.

While away grazing 9 heifers (year 2000 born) were identified as BVD “carrier” or persistently infected animals. These 9 PI heifers either died, were culled or euthanased while at Wanganui.

The investigation by our practice began in May 2002 when the in-calf rising 2 year old heifers returned from grazing. This mob of 194 R2 year heifers, (including some “holdover” cows), was blood sampled. Initially, all animals were tested for BVD Antibody using the ELISA test. Animals negative on this test were tested using the BVD Antigen ELISA test. BVD Antigen positive (Ag+ve) animals were re-sampled 4 weeks later in June 2002. The dams of these confirmed PI animals were blood sampled also. The mob of rising 1 year weaner heifer calves and all the bulls on the farm were also blood sampled in May 2002.

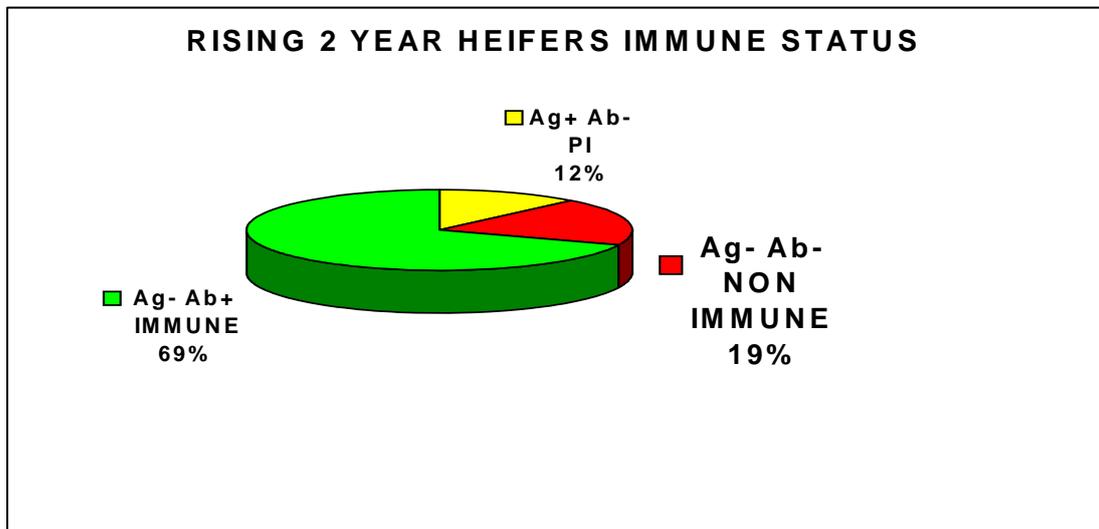
GRAZIERS EXPERIENCE

The first PI heifer (Ag+ve) showed up in November 2001 with an acute bloody scour unresponsive to the usual treatments. The other 8 PI heifers were identified by blood samples when they showed various symptoms ranging from a bloody scour (most common), ear tag infection, lameness and poor growth rates. John Pickering said the PI heifers that died or were euthanased did not show the classic “mucosal” disease collapse picture but were just unresponsive to treatment.

Vetcare Grazing use only BVD tested and vaccinated bulls. They also recommend heifers are vaccinated against BVD before arriving at grazing or at least before mating begins. Detailed records are kept of all treatments and diseases the heifers have and they are weighed regularly.

RESULTS OF BLOOD SAMPLES

Chart 1

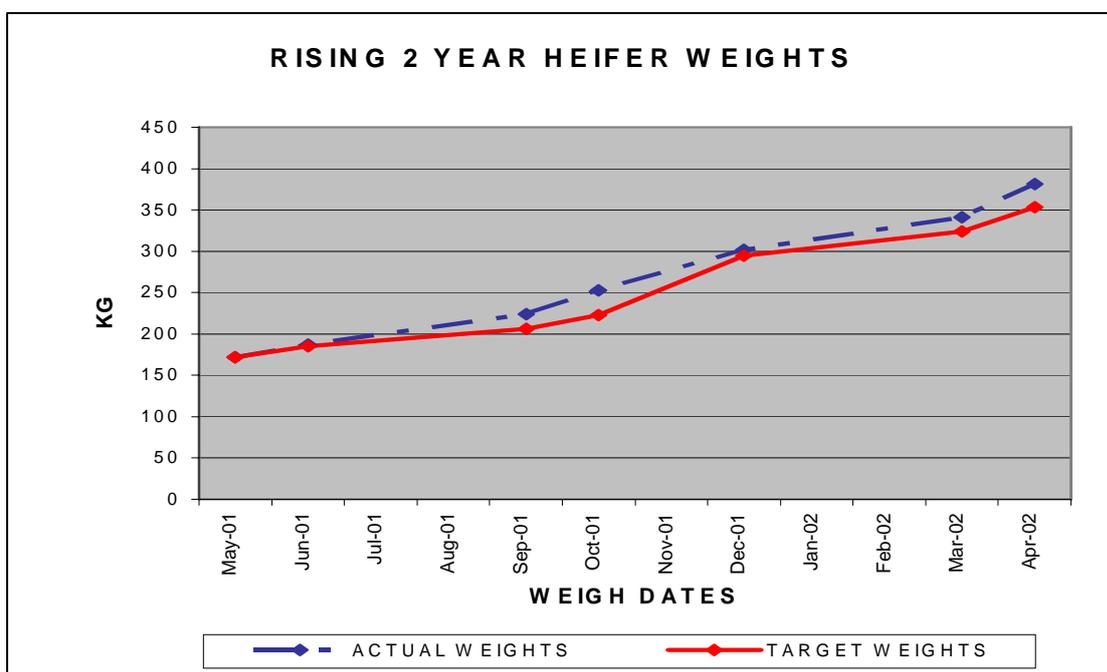


I was surprised by the results illustrated in Chart 1 which showed that 19% of heifers were not immune. Due to the high level of challenge and the length of time these heifers had run together I expected almost 100% to be immune. The original PI rate was 15.7% which included the 9 dead or culled heifers; the 23 surviving PI animals still made up 12% of the mob. The heifers had been run together for their whole lives (around 600 days!) so there was no shortage of time for infection and immunity to take place.

As a comparison, in a recently reported Ancare trial¹, a 10% PI rate was used (2 steers for 20 heifers). All 20 (100%) of these previously naïve heifers were immune by 60 days.

The R2 heifers as a group were good average Jerseys. They achieved just over their target weights during their time at Vetcare Grazing as shown in Chart 2

Chart 2



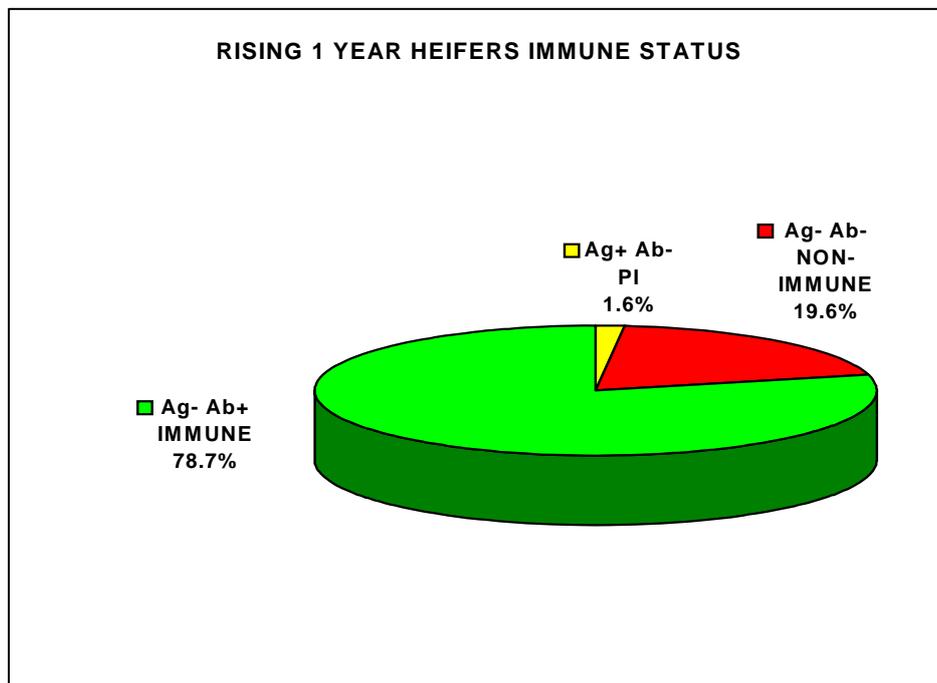
The veterinarians taking the blood samples commented that there were no obvious “ill-thrifty” heifers when the mob was blood sampled. Therefore the 23 further PI animals identified by blood sample would not have been identified on clinical grounds.

However, analysis of the weight data from Vetcare Grazing showed an interesting trend. In Table 1 below “clinical PI” refers to the original 9 PI heifers and “subclinical PI” to the 23 PI heifers identified later by blood sample. The period May to October is used as after this the “clinical” PI animals began to become sick or die.

Table 1. Weight gains for rising two year old heifer (year 2000 born) groups

GROUP	MOB SIZE (No)	MAY 01 AVERAGE WEIGHT (KG)	OCTOBER 01 AVERAGE WEIGHT (KG)	AVERAGE DAILY WEIGHT GAIN (KG PER DAY)
NORMAL	133	176	259	0.55
SUBCLINICAL PI	23	153	231	0.52
CLINICAL PI	9	144	206	0.41

Chart 3



The blood results for the weaner heifer calves are shown in Chart 3. Only 3 calves (1.6%) were PI in this mob, (compared to 15.7% in the R2 heifers), but the percentage of non-immune animals was almost the same as the R2 heifers (19%). Again, the animals had been run together for their whole lives (about 300 days).

These weaners were at least 9 months old so maternal antibody would not affect the results.

COMMENTS

If BVD Antigen ELISA testing had been used as the initial screening test the presence of so many non-immune animals would not have been apparent. This situation would lead to an assumption that the non-PI animals would be likely to be immune, at least given my expectations.

Both age groups of heifers had been vaccinated with a combined IBR/BVD vaccine when 3 and 4 months old. The rising 2 year heifers had received a booster vaccination before mating in October 2001. Responses to vaccination do **not** produce a positive BVD Antibody ELISA test. Vaccination does not prevent a response to natural infection so vaccinated heifers should still have a positive Antibody ELISA after such exposure. There was no pregnancy test data for either the heifers or the milking herd.

All "subclinical" PI (Antigen+ve, Antibody-ve) heifers identified on blood test were re-sampled 4 weeks later to confirm their status (Ag+ve, Ab-ve). Only 1 animal was found to have sero-converted and was Ag-ve, Ab+ve on the retest.

The dams of all PI animals were blood sampled also and were found to be, with one exception, Ag-ve, Ab+ve. This one cow was found to be Ag-ve, Ab-ve on blood test. In a large herd such as this I would assume this anomalous result to be due to mistaken identity at calving.

This result shows that the PI animals were produced by naïve cows becoming infected with BVD for the first time when they were approximately 40-120 days pregnant.

The 35 bulls and bull calves on the farm were blood sampled. No BVD Antigen ELISA tests were done on these but all 11 BVD Antibody –ve or BVD Antibody suspicious animals were culled.

This herd situation must have arisen when a naïve herd was exposed to BVD for the first time during the 1999 mating period. The most likely source of infection would be bulls introduced to the milking herd after the end of the AI mating in November 1999. The bulls were all home bred but biosecurity would not have been perfect and detailed memories of that time have now faded.

Unfortunately we have no data on heifer or herd fertility as pregnancy testing is not done on a whole herd basis. No BVD vaccination or Bulk Tank BVD antibody tests have been done. The herd does have a significant Johnes disease problem.

CONCLUSION

Using identified PI animals as natural "vaccinators" didn't work for this herd. Although this was not the intention in this case it might have been expected (by me at least!) to happen by default.

I have used identified PI animals in another herd in the past to expose heifers to BVD before their first mating. This system worked until all the PI animals died or were culled.

Given the situation with this herd I certainly won't be recommending "natural" vaccination again.

REFERENCE

1. Morgan J. McArthur. Foetal Protection by Viracare 3 in seronegative heifers when challenged with a New Zealand strain of bovine viral diarrhoea virus. Proceedings Sheep and Beef Cattle Veterinarians 2004.

ACKNOWLEDGEMENTS

THANKS TO THE FOLLOWING

John Pickering of Wanganui Vet Services and Vetcare Grazing for his interest and detailed records.

Stephen Williams and Stephen Hopkinson of the Manaia branch of our practice for taking the blood samples and organising the results.

Roger Ellison of Gribbles Alpha laboratory for help and advice.

Cathy Thompson

Veterinarian

Hawera

