The Hidden Risks of the Show Ring

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INTRODUCTION

A dairy farm in South Wales with a current Bovine Viral Diarrhoea (BVD) free status, after BVDv PCR testing the whole herd, had one positive and one suspect animal at the annual 5 animal youngstock screening for BVD antibodies. There was one positive animal in the previous screen a year before. Those positive results in young animals created confusion regarding the origin of the BVD infection in a free herd. Therefore, further investigation of the farm activities and the animal movements was necessary and revealed that the positive animal had been out of the farm for three cattle shows and for a total duration of three months, consequently, the animal became infected with BVD while being away from the farm and could transfer it back into the free herd.

HISTORY AND BACKGROUND

This South Wales farm was established in April 2016 with a herd of mainly Holstein-Friesians and a small number of Jerseys. The animals were all bought-in from non-BVD accredited herds in the Netherlands, but all herds reported a BVD-free status. Around half of the animals were already in calf during the second or third trimester of pregnancy and the rest came as youngstock. In their first year of milking all the animals were vaccinated with a modified live non-cytopathic BVD vaccine (Bovela, Boehringer Ingelheim). The owners of the farm are milking approximately 90 cows at the moment and there is no plan for expansion. It is a closed herd, calving all year round and all cattle are permanently housed. The cows are fed grass silage and maize silage with extra concentrate feed at cattle feed stations and feeders in the parlour. The average 305d milk yield per cow is 9208 kg with a butterfat of 4.26% and a milk protein of 3.36%. Cows are served solely by artificial insemination and the bull calves are sold in the first two months of life. Heifers are kept as replacements.

PREVIOUS BVD TESTING ON THE FARM

One year into the running of the farm and when the majority of the animals were milking (July 2017), a bulk milk sample tested negative for BVDv by PCR.

In the same year the national BVD eradication scheme “Gwaredu BVD” (figure 1) commenced in Wales and the farm became a member of this programme. The first stage of this scheme is annual youngstock screening for BVD antibodies by taking 5 blood samples from each management group for three consecutive years. The second stage follows where at least one positive result is found from these screens. A positive screen most likely meaning that the young animals came in contact with a persistently infected (PI) animal which transmits the BVD virus amongst the herd. After this result the farm became eligible for PI hunt funding through “Gwaredu BVD.”

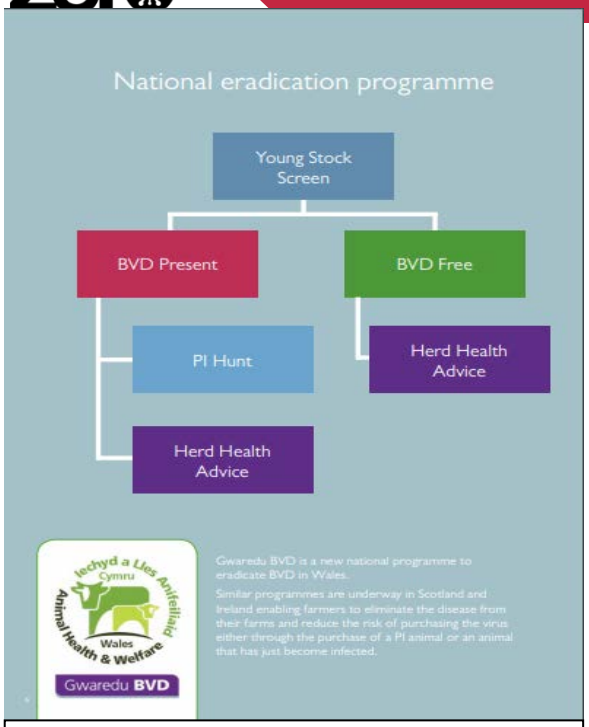

Figure 1: National BVD eradication programme in Wales. (https://ahww.cymru/en/)

In December 2018 during the annual TB test the first year youngstock screen was carried out according the Gwaredu BVD scheme. Out of the five one-year old animals tested, one returned positive for BVD antibodies. Following on from this result, a bulk milk sample was taken for BVDv PCR testing which returned negative.

Considering the size of the farm (only 90 milking cows) and the fact that the cows came into the farm already pregnant, a possible explanation for this antibody positive animal would be either that the animal came in contact with a PI calf from a Trojan cow (but the PI calf died or left the farm very soon, before transferring the virus to more calves) or, less likely, that it still had high concentration of maternal antibodies in its blood circulation (Sandick, 2005).

THE PI HUNT

The decision was made to carry out further investigation consisting of BVDv PCR testing for the whole herd. The available funding was used for a BVD investigation in two parts. The first part of the PI hunt completed in July 2019, aimed to test the adult animals of the herd for BVD virus. A bulk milk sample for BVDv PCR was taken to cover the milking cows and blood samples for BVD Ag Erns ELISA from all the dry cows and in-calf heifers. All tests returned negative results.

In December 2019, alongside the annual whole herd TB test, the remaining animals not tested in the previous summer were blood sampled and calves under 30 days of age were tag tested (indirect ELISA test in ear tissue) in order to complete the PI hunt. All the results came back negative in the concluding part of this PI hunt. As a result, the herd was BVD-free.

At the same time, two sets of 5 blood samples for BVD antibodies (Gwaredu BVD year 2) were taken from two youngstock management groups (9-12 month old animals and in-calf heifers). The first group all tested negative for BVD antibodies, which was additional evidence that, after the individual PI testing, no PIs had been born. The second group of five contained one antibody positive and one suspect animal.

ANALYSIS OF THE RESULTS

For the understanding of these positive and suspect results, the animal numbers were compared with the ones from the previous year blood tests. The suspect animal was the same that was positive last year but the new positive animal was not included in the previous year's testing. There was no clear explanation for a second positive in BVD antibodies in a BVD free closed herd. Researching the history of this animal on the British Cattle Movement Service unearthed where the animal was infected with BVD. The positive animal had been away from the farm in three cattle shows during the previous year and had stayed in a different location for exhibition purposes for a period of three months. As a result, this young heifer was exposed to BVD virus whilst away from the farm in cattle shows. The animal was still young and had not been served at that time; therefore there was no risk of abortion or subsequent birth of a PI calf (Brownlie et al., 2000), which would be the worst case scenario as she would have returned into the farm as a Trojan and there would be a resulting BVD breakdown. The impact at the time of infection would have been immune-suppression leaving the heifer more vulnerable to other diseases, such as pneumonia, especially as she had been away from the farm in a high risk and stressful environment at the showground. There was a chance that this animal remained infectious for some time after and could transmit the virus to other animals back at the farm (Gates et al., 2014). This could be an additional explanation for the antibody positive animal found in December 2018, as the two animals belong in the same group.

FINAL DIAGNOSTICS AND CONTROL ACTIONS

The farmer has been informed of the event and the risk of bringing a transiently infected animal into his herd which could be infectious for other animals or even worse a Trojan which would give birth to a PI calf. Our suggestions were to vaccinate the animals that he wants to take to cattle shows and to keep them in quarantine for at least four weeks before introducing them back to the herd. Additionally, we planned to tag and test the calves from the positive and suspect heifers and to keep monitoring for BVD annually by taking 5 blood samples for antibodies from the youngstock and bulk milk samples for BVDv PCR. The farmer reported that the positive animal, even having been a very nice type as a young heifer, gaining very good comments in three cattle shows, has not grown on as well as the other animals from her group. BVD could have played a role in that but until today the animal looks healthy and normal upon clinical examination. She calved a month ago and the newborn calf has been isolated pending a negative result from the tag and test.

DISCUSSION AND CONCLUSION

Vet practitioners need to know the BVD status and that of other endemic diseases of all their farms and keep controlling and eradicating those diseases where possible. It is really important for a detailed herd health plan, biosecurity measurements and a risk assessment for diseases to be in place by taking into consideration the type of farm and farming system and all the possible ways that a current free status can change, such as buying in cattle, hiring bulls, nose-to-nose contact with neighbouring herds, animals visiting shows, etc. Veterinarians need to take an active role in the prevention of a breakdown and to act swiftly and efficiently to eradicate diseases where a breakdown does occur.

BVD is a relatively straightforward disease to eradicate from a farm as there are many types of testing available with excellent sensitivity and specificity, but it is easy to have BVD breakdowns, too. The only way to keep BVD away from a free herd is by educating and informing the farmer.

REFERENCES

- https://ahww.cymru/en/ , Gwaredu BVD Accessed: 10/03/2020
- Sandvik, T., 2005. Selection and use of laboratory diagnostic assays in BVD control programmes. Preventive Veterinary Medicine, Volume 72, Issues 1-2, 15 November 2005, Pages 3-16.
- Brownlie, J., Thompson, I. and Curwen, A., 2000. Bovine virus diarrhoea virus – strategic decisions for diagnosis and control. In Practice, April 2000, Pages 176-187
- Gates, M. C., Humphry, R. W., Gunn, G. J. and Woolhouse, M. E. J., 2014. Not all cows are epidemiologically equal: quantifying the risks of bovine viral diarrhoea virus (BVDV) transmission through cattle movements. Veterinary Research 2014, 45:110

APPENDIX

TESTING SUMMARY

Determination:	BVDRTP
Units:	
Limits:	

Sample ID	
Milk	n/a
Milk	Negative

27.7.17

Appendix 1: Negative bulk milk BVD PCR dated: July 2017

SEROLOGY – BVD / BD ANTIBODY ELISA

	GROUP DESCRIPTION: N/A		
	Animal ID	S/N %	Result
1	006	100.566	Neg
2	035	28.917	Pos
3	016	92.110	Neg
4	021	88.637	Neg
5	015	98.905	Neg

Appendix 2: BVD youngstock antibody ELISA screen showing 1/5 positive, dated: Dec 2018

Samples Received:

Sample Date: Unknown

1 x Milk

Test Results:

Molecular Diagnostics	Result
BVD / BD PCR	Not Detected

Appendix 3: Negative bulk milk BVD PCR dated: Dec 2018

Virology

Sample ID	TC0709 BVDV PCR Bulk Milk Result (†)
001 (Tyfri-4/7/19)	Negative

Appendix 4: Negative bulk milk BVD PCR dated:

SEROLOGY - BVD/BD Antibody ELISA

	GROUP DESCRIPTION: Youngstock			
	Animal ID	Tested	S/N %	Result / Note
1	035	17/12/2019	41.477	Suspect
2	037	17/12/2019	97.037	Negative
3	039	17/12/2019	6.156	Positive
4	043	17/12/2019	99.192	Negative
5	045	17/12/2019	68.18	Negative

Appendix 5: BVD youngstock antibody ELISA screen showing 1/5 positive and 1/5 suspect dated: Dec 2019