



Vaccination in the eradication of bovine viral diarrhoea

Niall Jackson MVB MSc, Ruminant Technical Consultant – Ireland, Elanco Animal Health Ireland, outlines the role of vaccination as we move towards eradication of bovine viral diarrhoea

The national bovine viral diarrhoea (BVD) eradication programme has led to considerable reduction in the prevalence of the disease in Ireland. In terms of the number of persistently infected (PI) animals born last year, there were less than one quarter of the number of PIs found in 2013, the first year of the compulsory programme. The number of positive herds in the country is also declining year on year.¹ The rate of PI retention on farm has also decreased and is a welcome development as the country edges closer to successful eradication of this costly disease, estimated to cost Irish farmers around €102m per annum.¹

WHAT IS THE ROLE OF VACCINATION FOR BVD?

Undoubtedly BVD vaccination has and continues to be a vital cornerstone of BVD control on Irish farms. Vaccination aims to prevent the birth of PI calves by protecting the

developing foetus from viral exposure *in utero* in the early months of gestation. For BVD vaccination to be deemed successful foetal protection is required as just one to 10 viral particles are required to cause infection of the foetus.² Unfortunately, the correct use of the available BVD vaccines has been lacking on many farms with surveys revealing that only around 30% of farms are actually using the vaccine correctly.² Expecting complete foetal protection in all vaccinated animals is unrealistic as Brownlie (2014) explains that viral challenge can be high and continuous especially in the presence of any PIs, even if the vaccine is stored and used correctly. This is frequently not the case as stated before with the low rate of correctly used vaccines. It is therefore, imperative that vaccination continues to be carried out correctly as part of an overall BVD strategy on farm. The main objective of vaccinating for BVD is to

induce protective immunity in breeding animals. This helps in mitigating against the negative consequences of BVD infection in a herd in terms of reproduction parameters including reduced conception rates, early embryonic losses, abortions, congenital defects and obviously the formation of calves that are persistently infected with the virus. Increased levels of respiratory and enteric disease may also be found in younger animals. Other components of this strategy include the prompt removal of PIs, strict biosecurity measures and rigorous testing and monitoring (see Figure 1). Biosecurity will become even more crucial as the eradication programme progresses as the prevalence of PI animals decreases as discussed previously. The number of animals with natural immunity due to prior exposure to the virus will also fall. Clearly, this should result in the likelihood of breeding heifers and cows that have been exposed to virus declining. However, the potential negative impact of reduced natural immunity to BVD virus would increase. With declining levels of natural immunity arising from infection, vaccination is, therefore, a crucial method of inducing immunity particularly during this the first trimester.

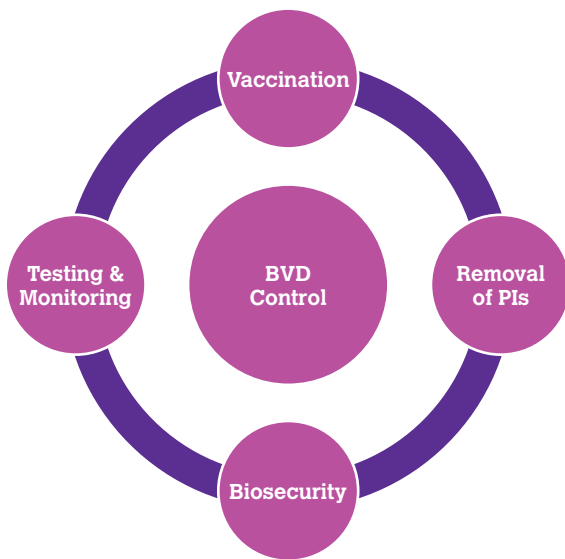


Figure 1: BVD control strategy.

Vaccination also acts as a protective measure should a breakdown in biosecurity occur. Biosecurity in the context of BVD is often a cause for concern as the virus can be introduced through the purchase of an infected animal, incursion and contact of infected animals across farm boundaries and also through fomites such as contaminated farm equipment or via visitors to the farm. The risk of purchasing a PI has receded with the ban on selling an animal without a confirmed negative status.¹

Consideration should also be given to the 'Trojan' animal who herself, is negative for BVD, but the foetus she carries may be a PI if the dam was exposed to the virus in early pregnancy. Thus appropriate quarantine measures should be put in place on all farms when the BVD status of an

animal is unknown or yet to be confirmed through testing. Other sources of infection include other species that are known to harbour BVD, namely sheep, wild deer and goats.³

As discussed, there is still a requirement to continue to vaccinate cattle in Ireland against BVD, especially with the difficulties in achieving strict biosecurity on many Irish farms due to their fragmented nature and risk of animal contact. Even in the absence of PIs on individual farms, it has been shown that BVD can continue to circulate for five years in a herd through either direct or indirect transmission.⁴ Farms that purchase bulls must have these animals tested for BVD prior to their use and appropriate quarantine protocols put in place as the BVD virus can be spread in semen of PI bulls or in bulls experiencing acute BVD with transient virus infection.

The majority of BVD vaccine used in Ireland occurs prior to the main breeding season following spring calving with a peak in March.⁵ Veterinary surgeons should discuss suitable vaccination protocols with their clients and remind them of the need to continue to vaccinate due to the reasons outlined above. Reviewing biosecurity measures should also form part of the conversation and, ideally, this should take place on farm to highlight any areas of concern that need to be addressed as part of an overall herd health plan. Reminding your clients on the correct use and storage of the BVD vaccine is also worthwhile to aid compliance and efficacy. Avoid vaccination of animals that have intercurrent disease, are on a course of concomitant therapy or have a poor nutritional status, as these animals may not mount a sufficiently effective immune response to the vaccine. Vaccination should take place prior to breeding commencement and the use of a killed vaccine, which offers foetal protection, an annual booster option and 420 days duration of immunity makes this easier for farmers. Controlling infectious disease through vaccination has and will continue to be crucial and vaccinating for BVD in Ireland needs to continue as we strive to eradicate this costly disease.

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