



Combined approach of vaccination and test & cull of persistent infected animals delivered successful control of Bovine Viral Diarrhea– A field experience

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Objective

Bovine viral diarrhea virus (BVDV) is a diverse group of viruses that can infect ruminants worldwide. Infection by BVDV leads to substantial costs for cattle producers through decreased milk yield, respiratory disorders, congenital defects, growth retardation, extended calving intervals, reduced first service conception, and increased mortality of affected animals. It is believed that successful control of BVDV requires a multidimensional approach, involving vaccination, biosecurity, and identification and removal of BVDV reservoirs, i.e. persistently infected animals (PI)¹. The aim of this study was to evaluate the efficacy of this combined approach to control BVDV infection under field conditions.



Materials and methods

This trial was carried out in a dairy herd of > 250 lactating cows that experienced an acute episode of BVDV infection in February 2017. At that time, the herd presented an increased incidence of bovine respiratory disease (BRD) cases in young calves and heifers. Bovine Respiratory Syncytial Virus (BRSV) and *M. haemolytica* were isolated from lungs at necropsy and from broncho-alveolar lavage. Further on, in October 2017, four heifers aged 14-17 months experienced an acute and severe diarrhea. One heifer died while the three others were slaughtered. BVDV Type 1 was detected at necropsy by PCR. Concomitantly, BVDV was isolated from the faeces of young calves with diarrhea (PCR), confirming that BVDV was actively present in the herd. Decision was then rapidly taken to start implementation of a combined approach using extensive screening of PI animals together with vaccination using a modified live vaccine able to prevent fetal infection (Mucosiffa[®], Ceva Santé Animale). The vaccination protocol implied the vaccination of all the animals aging more than 6 months. Heifers received a booster every six month and cows every 12 months.



Results

On November 2017, 261 animals from 4 to 30 months of age were tested, in pool of 20 animals, for the detection of BVDV by PCR. Positive animals to BVD virus were tested again after 1 month to confirm their viremic status. On January 2018, 38 young heifers were also tested in pool of 20 animals by PCR. Animals of the positive pools were tested individually for the detection of the BVD virus (by BVDV antigen ELISA test). Subsequently, PI research on ear notch samples, by ELISA antigen test or by PCR, was performed on all newborn calves. Moreover, bulk milk tank was tested by PCR on a six-monthly basis.

Following this detection scheme, 17 animals of the 299 animals tested in pool were found to be persistently infected (PI) and were removed from the herd. All these animals were born from unvaccinated dairy cows. Since the implementation of vaccination with the modified-live vaccine until the end of November 2019, no PI animals were detected in newborn calves. All the tests on bulk milk also came back negative for BVDV antigen.

Background

- In a >250 lactating cows' Italian herd, BVDV type 1 was detected in 14-17 months heifers with severe diarrhea and confirmed in diarrheic calves
- One infected heifer died

Strategy

- Vaccination with a modified live vaccine (Mucosiffa[®]) combined with extensive screening of PI animals was rapidly initiated

Results

- 17 PI animals were found and removed from the herd
- Following this combined strategy, no further PI animals were found and BTM remained negative for BVDV antigen

Conclusions

- This field report illustrates the successful approach of using vaccination with a modified-live vaccine (Mucosiffa[®], Ceva Santé Animale) in combination with a test and cull strategy to control an acute BVDV infection. This combined approach resulted in the absence of new PI calves, the absence of BVDV circulation as assessed by PCR in the bulk tank milk and the absence of any new clinical manifestations of BVDV.