

Unexpected diarrhoea in adult cows can be caused by bovine coronavirus and needs proper feed management measures: a case report

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INTRODUCTION

- ▶ Mandatory herd vaccination programmes are often hampered by the occurrence of suspected adverse events.
- ▶ A systematic approach of such pharmacovigilance cases is necessary to investigate the possible causal relationship between the applied vaccination and the observed clinical picture.

OBJECTIVE

The present case report describes the systematic investigation of an outbreak of diarrhoea and milk drop on a Dutch Holstein-Friesian dairy farm shortly after mandatory whole herd vaccination against bovine herpesvirus 1 (BHV1).

MATERIALS AND METHODS

- ▶ As part of the mandatory BHV1 whole herd vaccination programme, in place since 2018, a six-monthly booster vaccination was executed on a Dutch Holstein-Friesian dairy farm in January 2023.
- ▶ In total 200 milking cows were vaccinated with an inactivated gE deleted BHV1 marker vaccine [Bovilis® IBR Marker Inac] and 110 young stock animals were vaccinated with a live, attenuated gE deleted BHV1 marker vaccine [Bovilis® IBR Marker Live].
- ▶ One week after the vaccination 30% of the cows presented diarrhoea and on average the milk production dropped from 27.5 kg to 22 kg. The decreased milk production continued even after cessation of the diarrhoea and accounted for a total production loss of 12.000 kg of milk.
- ▶ Forage composition was unchanged since October 2022. Concentrate allowance was automatically adjusted to the production level in the robotic milking system.
- ▶ Paired sera were collected for antibody determination against bovine viral diarrhoea virus (BVDV), Schmallenbergvirus (SBV), bovine coronavirus (BCoV) and salmonella B/D LPS.
- ▶ Feed composition analysis with emphasis on phosphorus content was performed.
- ▶ Cows were sampled for the determination of the serum concentration of trace minerals copper, zinc, iodine and selenium.
- ▶ All animals older than 4 years (n=103) were screened for BHV1 gE antibodies to evaluate the mandatory vaccination programme.

Bovine coronavirus is a possible cause of diarrhea and milk drop in dairy cows.

On farms where the concentrate allowance is automatically linked to the milk production level of the cows, it is recommended to adjust the concentrate allowance manually to avoid prolonged production losses after cessation of the clinical symptoms.

Mandatory systematic BHV1 whole herd vaccination contributes to becoming BHV1 free.



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RESULTS

- ▶ No seroconversion was seen for BVDV, SBV and Salmonella B/D LPS. Seven out of nine tested cows had high titers against BCoV at the first sampling point. Two other cows showed a clear seroconversion for BCoV (Table 1).
- ▶ Feed analysis indicated a low phosphorus content (< 4 gr phosphorus/ kg dry matter).
- ▶ Serum selenium levels in the cows were low (on average 0.4 µmol/l).

FIGURE 1-2. Serum antibody titers against schmallenbergvirus, salmonella LPS, bovine coronavirus and bovine viral diarrhoea virus.

Cow ID	Schmallenberg Ab		Salmonella B/D LPS Ab		BCoV Ab		BVDV Ab	
	I	II	I	II	I	II	I	II
	31/01/2023	21/03/2023	31/01/2023	21/03/2023	31/01/2023	21/03/2023	31/01/2023	21/03/2023
3187	neg	neg	neg	neg	+++	n.a.	<2	<2
2190	non-specific	non-specific	neg	neg	++++	n.a.	<2	<2
1089	neg	n.a.	neg	n.a.	+++	n.a.	<2	n.a.
3031	neg	neg	neg	neg	+	++++	<2	<2
3101	neg	neg	neg	neg	+	++++	<2	<2
8515	neg	n.a.	neg	n.a.	++++	n.a.	128	n.a.
2657	pos	pos	neg	neg	++++	n.a.	<2	<2
2982	neg	neg	neg	neg	+++	n.a.	<2	<2
2525	pos	neg	neg	neg	++++	n.a.	<2	<2

n.a.: not available; Ab: antibodies

RESULTS

- ▶ Fifty out of 103 cows were seropositive for BHV1 gE antibodies. All the gE seropositive animals were older than 5.5 years. No association between the mandatory BHV1 herd vaccination and the diarrhoea outbreak could be revealed.
- ▶ The prolonged milk production dip was mainly due to the automatically adjusted concentrate allowance in the robotic milking system. After manual adjustment of the concentrate allowance the average milk production returned to levels as seen before the outbreak.



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