

ELISA antibodies against Bovine Rotavirus, Coronavirus and enterotoxigenic *E. coli* in serum from cows and calves as indicator for the protective status against Neonatal Calf Diarrhea.

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INTRODUCTION

Protection against Neonatal Calf Diarrhea (NCD) is provided by the ingestion of specific antibody present in colostrum and transition milk. Most vaccines that aim to control neonatal calf diarrhea are therefore designed to increase the magnitude and duration of specific antibody levels in mammary gland secretions.

Some recent studies in herds not vaccinating against NCD showed that antibody levels against Bovine Coronavirus (BCoV), Bovine Rotavirus (BoRV) and enterotoxigenic *E. coli* (ETEC) in the cow's serum, colostrum and calf serum were relatively low (Gonzalez 2021).

OBJECTIVE

In this preliminary study, we measured NCD antibodies in non vaccinated cows of several commercial herds in the Netherlands, knowing that the 3 pathogens are endemic and test kits are available for detection of protective antibodies.

If results show low levels, the Elisa test may be a tool to address the importance of vaccination against NCD.

MATERIALS AND METHODS

5 Dutch dairy farms with no history of NCD.

On each farm, 3 to 6 healthy fresh cows (first week post calving) never vaccinated against NCD and their respective healthy calf were blood sampled.

Serum antibody titers against BCoV, BoRV and ETEC were assessed by measuring the inhibition of optical density (percentage of inhibition, PI) using a

commercial competitive enzyme-linked immunosorbent assay (ELISA, BioX diagnostics, Belgium).

Descriptive statistics were generated, including the mean, median and standard deviation for the PI of each antigen.

Anova, a t-test or the corresponding non-parametric tests were performed to compare between farms and between cows and calves for each type of antibody ($p=0.05$).

Measuring ELISA antibodies against Bovine Coronavirus, Rotavirus and enterotoxigenic *E. coli* in serum from cows and calves provides information on the possible benefits of vaccinating the cows to improve the protection against NCD in the herd.



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RESULTS

Average PI values : **Table 1.**

The PI were significantly different between the farms for BCoV ($p=0.03$) and ETEC ($p<0.01$) but not for BoRV ($p=0.13$) (**Table 2**).

PI values in non-vaccinated herds were intermediate (40-70) for BCoV, intermediate to low for BoRV (20-60) and low (<10) for ETEC.

In contrast, PI values reported in vaccinated cows and calves that received colostrum from vaccinated animals were shown to be high (>70) for BCoV, and intermediate to high (40-99) for BoRV and ETEC (Gonzalez, 2021).

High PI are also expected in herds that recently had an infection with BCoV, BoRV or ETEC.

TABLE 1. Average PI values for BCoV, BoRV and ETEC for several sampled groups.

	BCoV	BoRV	ETEC
Adult cows	54.3	26.56	5.44
Calves	59.35	46.09	5.19
All sampled animals	56.82	36.32	5.31

PI values in red are significantly different from each other ($P=0.01$).

TABLE 2. Average PI values for BCoV, BoRV and ETEC per farm.

	BCoV	BoRV	ETEC
Farm A	53.66	46.05	6.67
Farm B	70.31	43.31	3.91
Farm C	47.58	38.85	4.03
Farm D	44.61	16.60	11.25
Farm E	63.54	35.95	0.79

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