

# Prospective cohort study in Dutch Holstein-Friesian female breeding calves to evaluate the evolution of *Pasteurella multocida* serum antibodies in the first six months of life

H. Kuijk<sup>1</sup>, A. Beulens<sup>2</sup>, P.A.A. Penterman<sup>1</sup>, H. Swam<sup>3</sup>, G. Vertenten<sup>4</sup> and B. Sustronck<sup>1</sup>

## INTRODUCTION

- Serologic BRD screening to identify which major respiratory pathogens are circulating on a farm (BRD quick scan) is frequently being used on dairy farms in The Netherlands to guide practitioners and farmers in the implementation of improved BRD farm management routines and to adjust and fine-tune BRD vaccination programmes (Kuijk et al, 2022).
- *Pasteurella multocida* (*P. multocida*) is frequently detected in respiratory tract samples from calves with BRD, necessitating the inclusion of *P. multocida* in the routine BRD quick scan.
- To correctly interpret the result of a BRD quick scan, including *P. multocida* a better knowledge of the evolution of *P. multocida* antibodies over time seems appropriate.

## OBJECTIVE

The aim of the present study is to obtain better insight in the evolution of *P. multocida* antibodies in the first 6 months of life of Dutch Holstein-Friesian female breeding calves.

## MATERIALS AND METHODS

- A prospective cohort study was conducted on a convenience sample of 5 Dutch Holstein-Friesian dairy herds, all belonging to the same veterinary practice.
- On each farm five new-born calves were randomly selected to be included in the trial. All calves received at least 3 litres of colostrum from their own dam in the first 24h after birth. The calves were blood sampled in the first month of life and each month thereafter for 6 consecutive months.
- The serum samples were analysed in the Centre for Diagnostic Solutions (MSD Animal Health, Netherlands) for antibodies against *P. multocida* by ELISA using an in-house test.

On Dutch dairy farms circulation of *Pasteurella multocida* amongst Holstein-Friesian breeding calves seems to occur in different patterns.

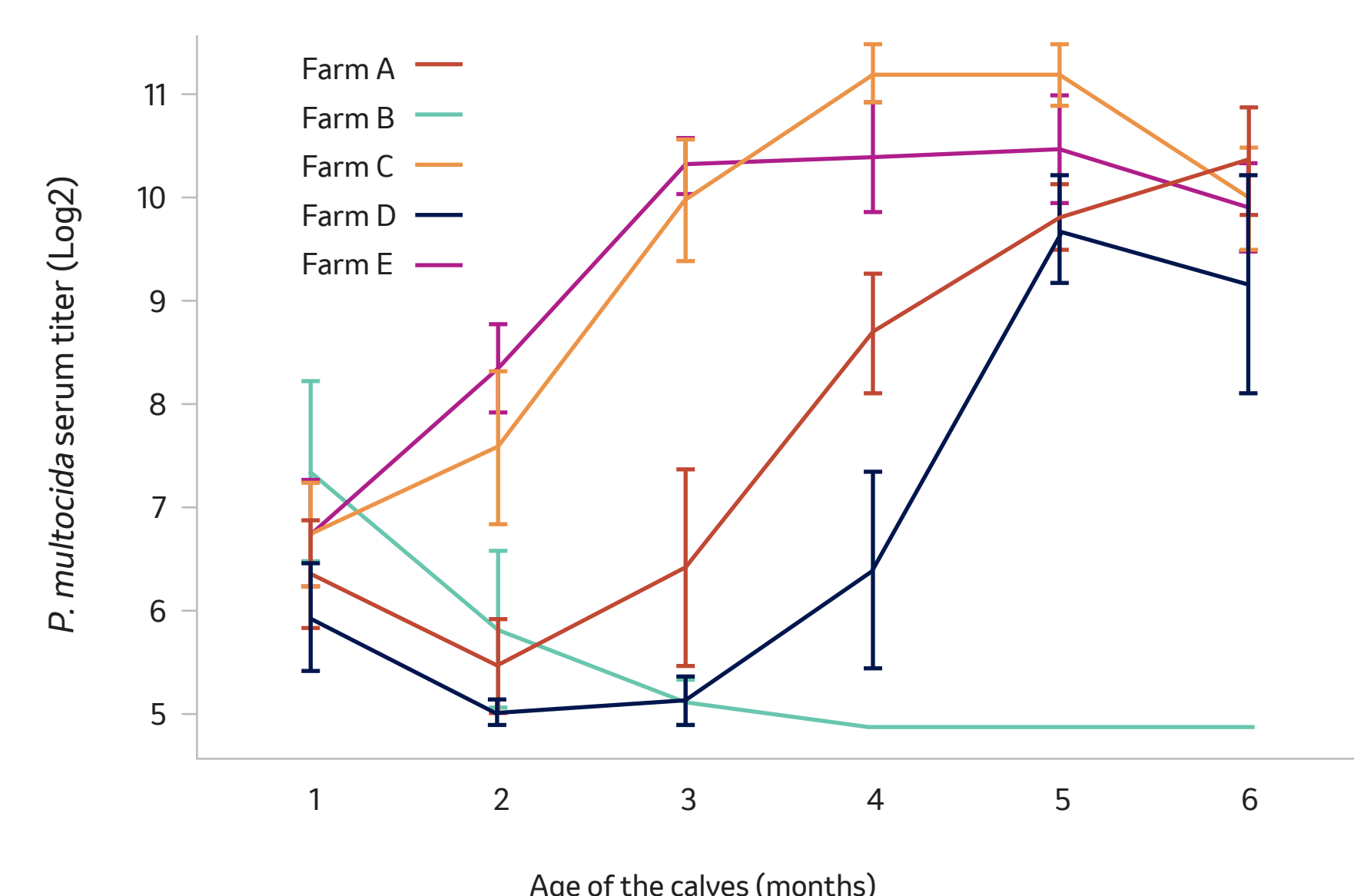


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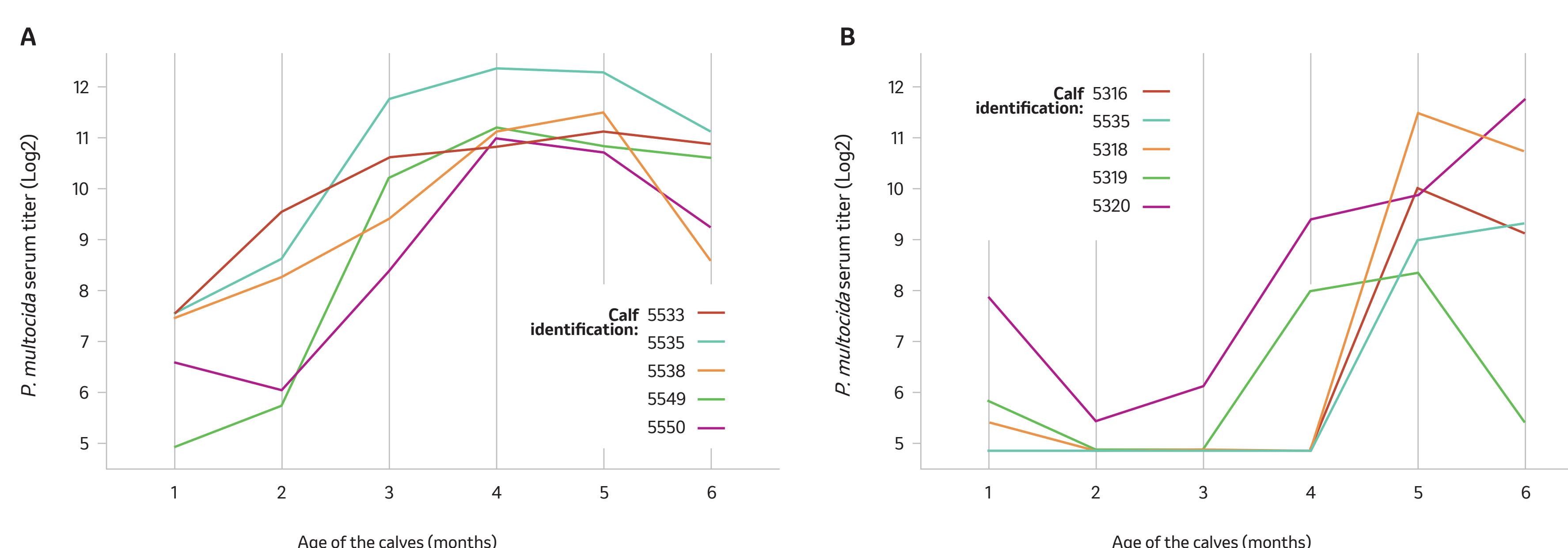
## RESULTS

- Quite different evolutions of the mean serum titer against *P. multocida* on farm level was observed over time (**Fig 1**).
- In young calves, serum antibody titers <7 Log<sub>2</sub> can be considered as maternally derived antibodies, whereas antibody titers >8 Log<sub>2</sub> are indicative for an active circulation of *P. multocida* on a farm.
- On one farm (Farm B) the maternal antibodies declined from 1 month onwards becoming negative at 3 months of age and remaining negative for the entire study period.
- On farms with active circulation of *P. multocida* a distinct early or late seroconversion pattern was observed (**Fig 2**).

**FIGURE 1.** Evolution of *Pasteurella multocida* serum antibody titer over time in Dutch Holstein-Friesian female breeding calves grouped by farm.



**FIGURE 2.** Evolution of *Pasteurella multocida* serum antibody titer over time in Dutch Holstein-Friesian female breeding calves on a farm with early seroconversion (A) compared to a farm with late seroconversion (B).



## AUTHORS' AFFILIATION

1. MSD Animal health Benelux, Ruminant Business Unit, The Netherlands/Belgium
2. Diergeneeskundig Centrum Midden Salland, The Netherlands
3. MSD Animal Health, Center for Diagnostic Solutions, The Netherlands
4. MSD Animal Health, Global Ruminant Biologicals, The Netherlands

## REFERENCES

- Kuijk H., Swam H., Penterman P., and Vertenten G. (2022). Identification of BRD antibodies to install a tailor-made prevention plan on Dutch dairy farms. 31st World Buiatrics Congress Madrid, Abstract Book, volume 1, 230-231.