A field study evaluating humoral immune response in calves vaccinated with two multivalent respiratory vaccines.

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INTRODUCTION

Bovine respiratory disease (BRD) in calves causes huge financial losses to the dairy and beef industry worldwide.

Early vaccination is often needed since BRD is common around weaning.

Vaccine response in young calves is often reduced by colostral-derived immunity.

Vaccines against BRD pathogens such as Bovine respiratory syncytial virus (BRSV) and Parainfluenza 3 virus (BPI3V) and *Mannheimia haemolytica* (Mh) are available for young stock vaccination.

OBJECTIVE

To evaluate the seroneutralising (SN) antibody responses against BRSV and specific humoral (IgG) ELISA response to BRSV, BPI3V and Mh in young calves vaccinated with either Bovilis® Bovipast® RSP, MSD Animal Health (BPAST) or Bovalto® Respi 3, Boehringer Ingelheim (BTO) and after booster vaccination 9 to 11 months later compared to non-vaccinated control calves.

MATERIALS AND METHODS

- This field study was performed on one dairy farm in France.
- Three study groups: 12 calves vaccinated with BPAST, 13 with BTO and 5 non vaccinated negative controls.
- Vaccinated at 15-30 days of age (T0), 1 month (m) later (T0+1m) and at 9-11 months of age (T10).
- Serum samples at the start of the study and at pre-set times post vaccination. Serum neutralization (SN) antibodies for BRSV and ELISA tests for BRSV, BPI3V and Mh performed on all serum samples.
- Areas under the curve (AUC) analysis of Log2 BRSV SN titres and ELISA optic density measures. Multivariate general linear models.

Early vaccination of calves with the multivalent adjuvanted inactivated BRD vaccine Bovilis® Bovipast® RSP can elicit a humoral response with a memory effect against BRSV up to 9 months after primo vaccination.

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RESULTS

- The AUC multivariate statistical analysis indicated that the serum neutralization titres were overall significantly higher for BPAST vaccinated calves compared to BTO and control calves **(Fig. 1A)**.
- **Fig. 1B:**

  BRSV seroconversion:
  - Primo vaccination: 0% control, 15% BTO and 75% BPAST calves.
  - Booster vaccination: 0% control, 0% BTO and 75% BPAST calves.
- **Fig. 2&3:**

  BPAST and BTO calves mounted a significantly higher AUC ELISA OD for both BPI3V and Mh compared to control calves after primovaccination. Highest AUC was measured in the BPAST calves. A natural BPI3V and Mh infection could be identified.
- **Fig. 2&3**:

  At booster vaccination only the BPAST calves mounted a significantly higher AUC ELISA OD for both BPI3V and Mh compared to negative control calves.

Log 2 BRSV seroneutralisation titres and seroconversion **(Fig 1A, 1B)**, serum ELISA OD measures for BPI3V **(Fig 2)** and Mh **(Fig 3)** from calves vaccinated with multivalent bovine respiratory disease vaccines.

FIGURE 1A.

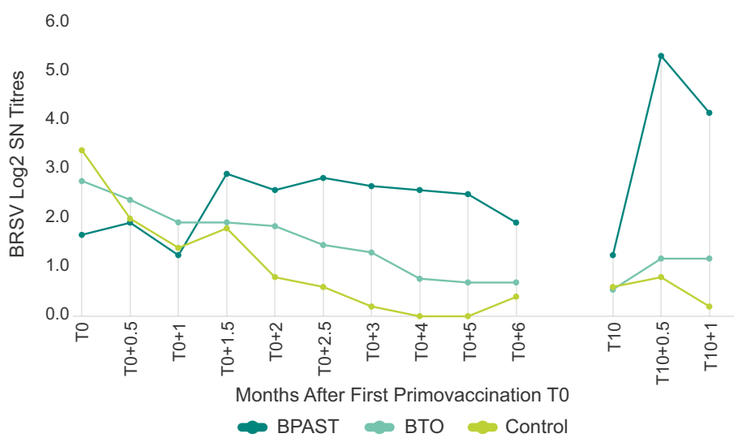


FIGURE 1B.

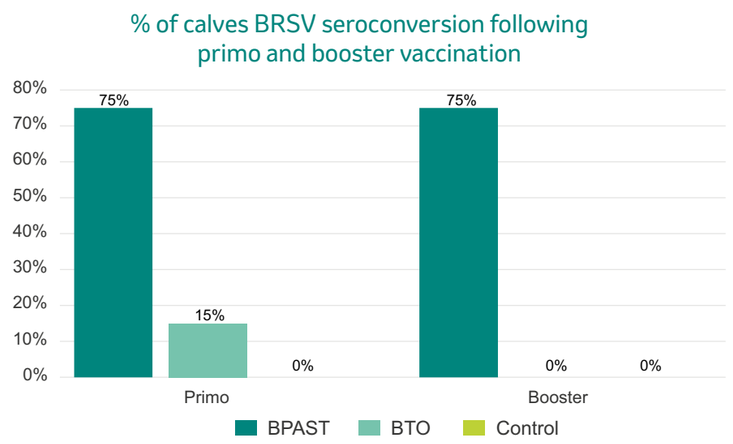


FIGURE 2.

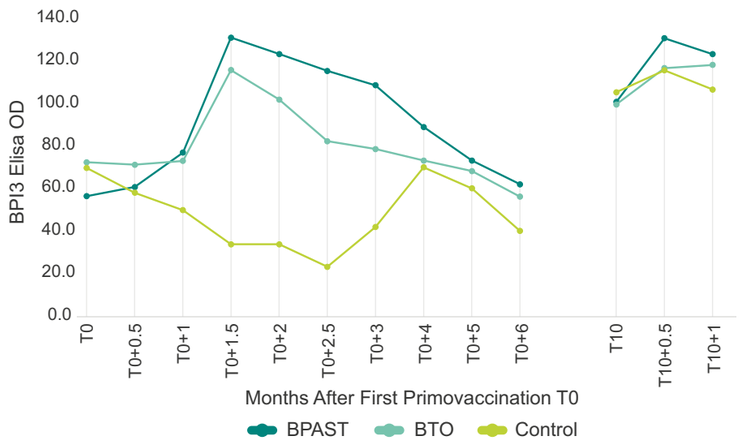
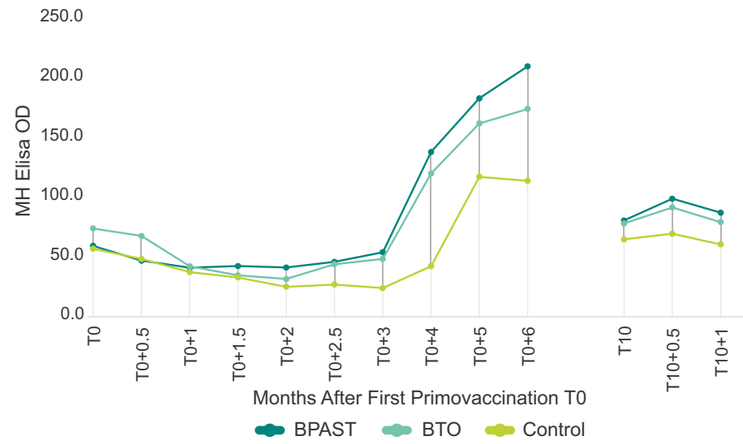


FIGURE 3.



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BPAST = Bovilis® Bovipast RSP

BTO = Bovalto® Respi 3

Control = nonvaccinated calves

MSD Animal Health