

OP01 - ENZOOTIC DISEASES - ORAL PRESENTATIONS

O 02 DETECTION OF ACTIVE INFECTION OF NEW-BORN CALVES BY MYCOBACTERIUM AVIUM SUBSP. PARATUBERCULOSIS (MAP) IN FIRST DAYS OF LIFE

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Introduction:

In herds monitored for paratuberculosis, it is essential to detect active infection in new-born calves (either transmitted by the mother or other calves) as early as possible to exclude them from the breeding herd.

Current diagnostic tools allow reliable detection from only 18-24 months and are not able to distinguish between active and passive infection. Therefore, it is essential to develop new diagnostic tools, easily used by routine testing laboratories, to detect low levels of MAP potentially present in blood of new-born calves.

Materials and Methods:

Three dairy cattle herds were selected in terms of prevalence and clinical expression (Table 1).

Table 1: Specifications of herds selected for the study

Herd	Percent of MAP prevalence (cattle MAP-POSITIVE by ELISA, BioLisa® Kit MAP Ab or by PCR, Bio-T kit® MAP on faeces)	Clinical expression
Herd A	19%	No clinical expression
Herd B	47%	No to mild clinical expression
Herd C	17%	Severe clinical expression leading to death

We pre-selected 24 MAP-Positive and 38 MAP-Negative females, calving at the same time, to create a cohort of calves born from either shedding and non-shedding cows. The status of the females was confirmed by PCR (Bio-T kit® MAP, Biosellal) on faecal samples before and after calving.

Each calf was monitored monthly from birth, over a six-month period, using Actiphage-PCR on whole blood (Actiphage™Rapid kit, PBD Biotech and Bio-T kit® MAP) and also PCR on faecal samples.

Results:

Natural, active infection was identified by detection of MAP in blood samples using Actiphage-PCR from the first day of life, but bacteraemia was transient (Table 2).

Table 2: Results of MAP detection on calves followed monthly from birth until 6 months by Actiphage-PCR on blood samples (active infection) and PCR on faeces samples (passive infection)

Herd A	<ul style="list-style-type: none"> • Separation of calving boxes according to the MAP status of cows before calving • Females removed from mothers within 15 minutes of birth, nursery in individual boxes for 2 weeks, then collective boxes by age group until weaning • Colostrum intake of the mother only if MAP-Negative then milk powder 					
	Calves born from MAP-POSITIVE cows before and/or after calving			Calves born from MAP-Negative cows before and after calving		
	Total No. of calves	Actiphage-PCR POSITIVE on blood	Faeces-PCR POSITIVE	Total No. of calves	Actiphage-PCR POSITIVE on blood	Faeces-PCR POSITIVE
3	0	0	2	0	0	
Herd B	<ul style="list-style-type: none"> • Separation of calving boxes according to the MAP status of cows before calving • 2 days in contact with the cows, then calves tied until weaning, without contact with adults for females only • Colostrum intake of the mother even for MAP-POSITIVE cows, mother milk for 3 days, then milk powder 					
	Calves born from MAP-POSITIVE cows before and/or after calving			Calves born from MAP-Negative cows before and after calving		
	Total No. of calves	Actiphage-PCR POSITIVE on blood	Faeces-PCR POSITIVE	Total No. of calves	Actiphage-PCR POSITIVE on blood	Faeces-PCR POSITIVE
	11	2 calves Female - at 1 day of life - Ct 33.86 – Negative after Male - at 15 days of life- Ct 38.72 - Negative after	2 calves Male - at 29 days of life - Ct 38.19 – Negative after Male - at 15 days of life – Ct 35.55	5	1 calf Male - at 14 days of life – Ct 31.66 – dead at 24 days of life	1 calf Male - at 124 days of life – Ct 36.71 – Negative before and after
Herd C	<ul style="list-style-type: none"> • Separation of calving boxes according to the MAP status of cows before calving • Calves in individual boxes the first month then collective boxes by age group until weaning • Colostrum intake of the mother even for MAP POSITIVE cows, then milk powder 					
	Calves born from MAP-POSITIVE cows before and/or after calving			Calves born from MAP-Negative cows before and after calving		
	Total No. of calves	Actiphage-PCR POSITIVE on blood	Faeces-PCR POSITIVE	Total No. of calves	Actiphage-PCR POSITIVE on blood	Faeces-PCR POSITIVE
9	1 calf Male - at 84 days of life – Ct 36.82 – Negative before and after	0	7	0	0	

Discussion and Conclusion:

Using an optimized, easy-to-use Actiphage-PCR protocol, it was possible to detect active infection by MAP in blood of calves with good reproducibility of results.

The early detection of MAP infection by Actiphage-PCR will be very useful to monitor and improve preventive measures to limit the spread of paratuberculosis on farms.