



DIAGNOSTIC OF PARATUBERCULOSIS

Adapt your protocol to the epidemiological situation



VETERINARY DIAGNOSTICS







Bovine paratuberculosis is an enteritis characterized by a chronic and persistent diarrhea, a decrease of the production level (milk, reproduction) and a loss of weight leading to death. These economic and health consequences lead bovine paratuberculosis as a major disease in animal health, thereby justifying the establishment of surveillance and control programs.

To do this, different players of veterinary world need several detection tools for:

- Better understanding of the current level of contamination of herds.
- Better control the spread of the disease and secure trades.
- Prioritizing reforms and control introductions.

The diagnosis of paratuberculosis should not be limited to a too late clinical diagnosis of shedders. Whitlock *et al.* defined classes of animals according to their level of excretion and they highlighted the importance of low and passive shedders in the evolution of the health status of a herd.

Level of contamination inside herds according to Whitlock *et al.**

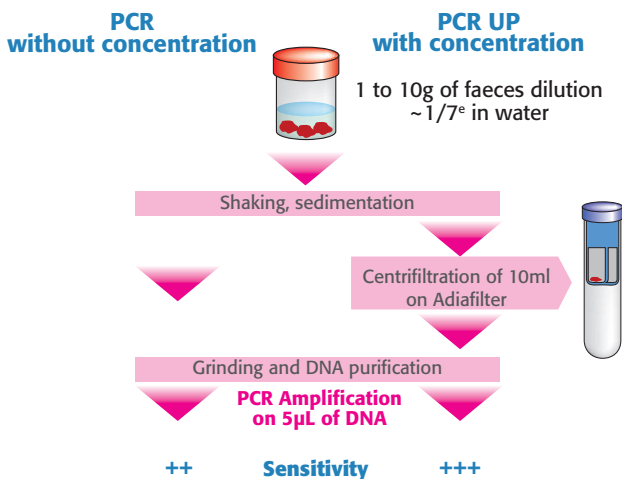
-  • High shedders, Positive +++, > 8 000 bacteria/gram of faeces
-  • Intermediate shedders, Positive ++, 100 to 550 bacteria/gram of faeces
-  • Low shedders, Positive +, 5 to 95 bacteria/gram of faeces
-  • Negative animal, non shedder



USE OF PCR

Different tests and different levels of sensitivity are useful to:

- Perform analysis on an isolated animal or at herd level
- Define herd status (infected or not)
- Estimate the prevalence

EXISTING PCR PROTOCOLS



Aim of test	Which test(s)?
1 Define herd status	- PCR UP on environmental samples (dairy farms) - PCR UP on pool of faeces (dairy and meat farms) - ELISA
2 To follow a negative or low infected herd managing well paratuberculosis and new cattles introductions	- PCR UP on individual faeces for new animals (trade) - PCR UP on bovines <24 months - ELISA on bovines >24 months
3 • To manage spread of the disease and elimination of shedders. • Prioritize reforms	 - PCR UP on pool of faeces Or PCR on individual faeces Or ELISA  - PCR UP on individual faeces (and young cattles)



SPECIFICITY OF PCR

Inclusivity

Inclusivity has been determined against 140 strains of MAP.

Number of MAP tested	Results
140	+

All strains of *Mycobacterium avium* subsp. *paratuberculosis* have been detected with ADIAVET™ PARATB REAL TIME.





Exclusivity

Number of strains tested	Results
58 other micro-organisms	-
59 mycobacteria + 2 close IS	-

No cross reaction has been observed with 59 other mycobacteria strains different from *Mycobacterium avium* subsp. *paratuberculosis*, 2 other close IS and 58 strains from other micro-organisms.

LONGITUDINAL STUDY

During a longitudinal study, PCR UP allows to check evolution of herds level of infection.

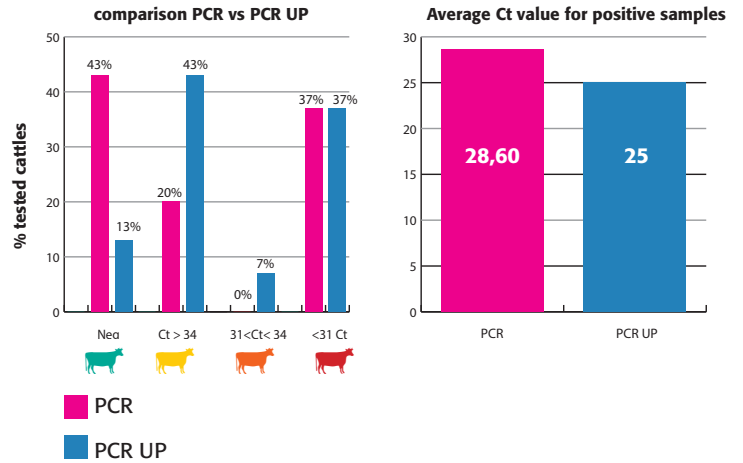
Number of cattles				
t ₀	25	30	556	399
t + 4 months	41	57	525	385

98% of bovines high or intermediate shedders remain high positive after 4 months.

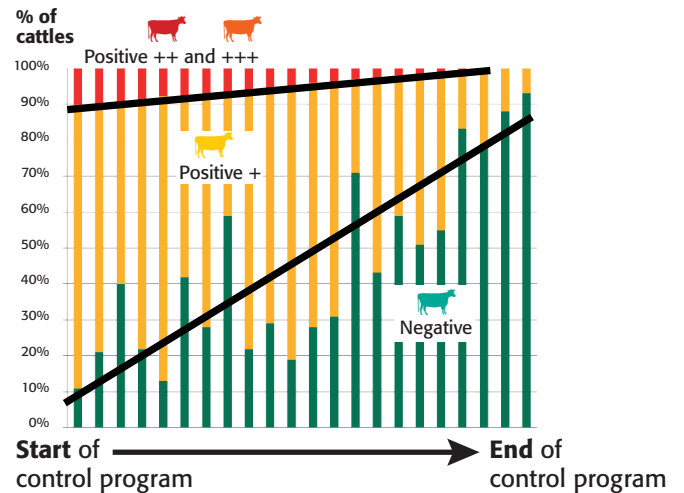
In a contaminated farm, 60% of negative or low shedders bovines remain or become positive.



SENSITIVITY OF PCR



PREVALENCE OF POSITIVE PCR RESULTS IN HERDS at different stages of PARATUBERCULOSIS control



More Paratuberculosis control program moves forward and lower is the prevalence of high and intermediates shedders. A very sensitive diagnostic tool used at the individual animal level makes a lot of sense at the end of a control program to detect low shedders and to check animals before trades and introductions when prevalence is low.

* Fecal shedding of *mycobacterium avium* subsp *paratuberculosis* by dairy cows Crossley, Whitlock et al. Vet microbio 2005 May ; 107(3-4) :257-63.



bioMérieux S.A.

69280 Marcy l'Étoile • France

Tel.: 33 (0)4 78 87 20 00

Fax: 33 (0)4 78 87 20 90

www.biomerieux.com

www.biomerieux-industry.com/vet