EXTERNAL REFERENCES

ID SCREEN® MYCOPLASMA BOVIS INDIRECT

February 2025

Publications / References:

PERFORMANCE EVALUATION

MILK SAMPLES

1) Bokma J. *et al*. (2024). **Diagnostic performance of *Mycoplasma bovis* antibody ELISA tests on bulk tank milk from dairy herds**. BMC Veterinary Research, 20(1), 81.	• Comparison of diagnostic performance of three commercially available *M. bovis* ELISAs (including the ID Screen MYCOPLASMA BOVIS INDIRECT Elisa, and 2 BioX Elisa tests: kit A and kit B) on **Bulk Tank Milk** (BTM), and exploration of optimal cutoff values for screening purposes. A prospective diagnostic test accuracy study was performed on 156 BTM samples using Bayesian Latent Class Analysis. • *Results*: Following the manufacturer's guidelines, sensitivity of 91.4%, 25.6%, 69.2%, and specificity of 67.2%, 96.8%, and 85.8% were observed for the ID Screen® MYCOPLASMA BOVIS INDIRECT Elisa, kit A, and kit B respectively. Optimization of cutoffs resulted in a sensitivity of 89.0%, 82.0%, and 85.5%, and a specificity of 83.4%, 75.1%, and 77.2%, respectively. ***The ID Screen® MYCOPLASMA BOVIS INDIRECT showed the highest diagnostic performance after optimization of cut-off values and could be useful for screening.* (sic)**	Comparison with competitors

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2) McAloon C. I. *et al*. (2024). **Estimation of sensitivity and specificity of bulk tank milk PCR and 2 antibody ELISA tests for herd-level diagnosis of *Mycoplasma bovis* infection using Bayesian latent class analysis**. Journal of Dairy Science.	• The objective of this study was to estimate the sensitivity (Se) and specificity (Sp) of 3 diagnostic tests (1 PCR and 2 ELISA tests, the ID Screen MYCOPLASMA BOVIS INDIRECT Elisa and the BioX Elisa) on **Bulk Tank Milk** (BTM), for the herd-level detection of *M. bovis* using Bayesian latent class analysis (BLCA). 728 herds were analyzed. • *Results*: In total, of 728 herds, 7 (1.0%) were positive on PCR, 88 (12%) were positive on the BioX test, and 406 (56%) were positive on the ID Screen® MYCOPLASMA BOVIS INDIRECT Elisa. ***The ID Screen® MYCOPLASMA BOVIS INDIRECT had a relatively high Se (the highest Se of the 3 tests studied) and may be an appropriate test for herd-level screening or prevalence estimation within the context of the endemically infected Irish dairy cattle population.* (sic)**		**Comparison with competitors**			
3) Salgadu A. *et al.* (2023). **Evaluating Cut-Offs for Use of the Id Screen *Mycoplasma Bovis* Elisa in Bulk Tank Milk in New Zealand**. Available at SSRN 4614096.	• The objective of this study was to evaluate the optimal cut-off for using the ID Screen® MYCOPLASMA BOVIS INDIRECT on **Bulk Tank Milk** (BTM). Data were obtained from 68 dairy herds. • *Results*: a BTM cut-off of 24 S/P% gave the best combination of sensitivity (DSe) and specificity (DSp) when testing BTM for antibodies against *M.bovis* with the ID Screen® MYCOPLASMA BOVIS INDIRECT; with this cut-off, the DSe was estimated to be 78.6% and the DSp was 98.5%.					**Cut-offs evaluation**
4) Lönsjö J. (2020). **Evaluation of ELISA and qPCR assays for detection of *Mycoplasma bovis* in milk from ruminants**. http://lup.lub.lu.se/student-papers/record/9020393	• Experimental evaluation of the ID Screen® MYCOPLASMA BOVIS INDIRECT Elisa to diagnose *M. bovis* infection on Bulk Tank Milk (BTM) samples. ~~Two~~ positive **BTM samples** were used for this evaluation. • *Results*: using the ID Screen MYCOPLASMA BOVIS INDIRECT, the 2 samples were found positive, with high repeatability and intermediate precision. ***Based on the results in this project, the ID Screen MYCOPLASMA BOVIS INDIRECT could be used when screening bulk tank milk.* (sic)**					

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SERUM SAMPLES

5) Marquetoux N. *et al.* (2023). **Evaluation of the accuracy of the IDvet serological test for *Mycoplasma bovis* infection in cattle using latent class analysis of paired serum ELISA and quantitative real-time PCR on tonsillar swabs sampled at slaughter**. PLoS ONE 18(5): e0285598.	• Evaluation of the accuracy of the ID Screen® MYCOPLASMA BOVIS INDIRECT Elisa in cattle. Sera from infected cattle (n=99 542) were tested and results were analyzed using latent class analysis. A theoretically free-disease population was also evaluated (n=20 174 animals). The positivity threshold recommended by the manufacturer was S/P%=60, whereas the Programme used a higher "epidemiological" threshold of SP%=90 to maximize the specificity at the individual sample level. • *Results:* -apparent seroprevalence was 1.8% with the kit positivity threshold set at S/P%=60 and 1.1% at the epidemiological interpretation threshold (S/P%=90) -with the threshold S/P%=90: in the infected population: sensitivity and specificity were 72.8%, and 97.7% respectively. in the theoretically free population, sensitivity and specificity were 66.6% and 99.9%, respectively. ***Our results confirm that the ID Screen® MYCOPLASMA BOVIS INDIRECT Elisa test is an appropriate tool for determining exposure and infection status of herds, both to delimit and confirm the absence of M. bovis.* (sic)**					**Cut-off modification**
6) Veldhuis A. *et al.* (2023). **Bayesian diagnostic test evaluation and true prevalence estimation of *Mycoplasma bovis* in dairy herds.** Preventive Veterinary Medicine, 216, 105946.	• This study estimates sensitivity and specificity of the ID Screen® MYCOPLASMA BOVIS INDIRECT Elisa and another commercially available ELISA test (kit A, Bio-X Diagnostics). The true *M. bovis* herd prevalence was estimated using different Bayesian latent class models. 7305 serum samples from 415 herds were first investigated using kit A; then, 1799 serum samples from 100 herds were also tested with the ID Screen® MYCOPLASMA BOVIS INDIRECT Elisa. • *Results*: A Bayesian latent class model using the paired test results estimated a sensitivity of 14.1% and a specificity of 97.2% for kit A . Sensitivity and specificity for the ID Screen® MYCOPLASMA BOVIS INDIRECT ELISA were estimated at 92.5% and 99.3%, respectively. **The ID Screen® MYCOPLASMA BOVIS INDIRECT Elisa test performs better than the BioX test.**			**Comparison with competitors**		

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7) Andersson A. M. *et al*. (2019). **A European inter-laboratory trial to evaluate the performance of three serological methods for diagnosis of *Mycoplasma bovis* infection in cattle using latent class analysis**. BMC veterinary research, 15(1), 1-10.	• A network of researchers from six European countries participated in an interlaboratory trial, to evaluate the sensitivity (Se) and specificity (Sp) of the ID Screen® MYCOPLASMA BOVIS INDIRECT Elisa and another commercial Elisa kit (Bio-X Diagnostics) for diagnosis of *M. bovis* infection. Western blot analyses (WB) performed by one of the participating laboratories were used as a third diagnostic test in the statistical evaluation of Se and Sp values using latent class analysis. • *Results*: The Se of WB, the ID Screen® MYCOPLASMA BOVIS INDIRECT Elisa, and the Bio-X Elisa were determined to be 91.8%, 93.5% and 49.1% respectively, and corresponding Sp of the three tests were 99.6%, 98.6% and 89.6%, respectively. ***The ID Screen® MYCOPLASMA BOVIS INDIRECT Elisa showed high consistency with WB and performed with higher precision and accuracy than the Bio-X Elisa*. (sic)**	Correlation with other techniques	Comparison with competitors			

MILK AND SERUM SAMPLES

8) Petersen M. B. *et al.* (2020). **Field experience of antibody testing against *Mycoplasma bovis* in adult cows in commercial Danish dairy cattle herds**. Pathogens, 9 (8), 637.	• The objectives of this study were to: (1) gain and share experience of using the ID Screen® MYCOPLASMA BOVIS INDIRECT Elisa in adult dairy cows under field conditions; (2) determine the correlation between antibody levels in milk and serum and (3) compare the ID screen® results with those of another commercial ELISA kit (kit A, Bio-X Diagnostics). Paired serum and milk samples were collected from 270 cows. • *Results*: The ID Screen® MYCOPLASMA BOVIS INDIRECT Elisa tested nearly all cows positive while kit A tested very few cows positive; a concordance correlation coefficient of 0.66% was found between the ID screen serum and milk results. **The ID Screen® MYCOPLASMA BOVIS INDIRECT Elisa is valid for adult dairy cows in field conditions and is a much more sensitive test than BioX with a high correlation between serum and milk values. Strong responses observed in milk samples from individual cows indicate a potential use of the test on bulk milk samples for herd-level diagnosis.**					Performance evaluation

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EPIDEMIOLOGICAL STUDIES

MILK SAMPLES

9) Hurri E. *et al.* (2024). **A longitudinal study of the dynamics of *Mycoplasma bovis* antibody status in primiparous cows and bulk tank milk in Swedish dairy herds**. Journal of Dairy Science.	• The presence of *M. bovis* antibodies in **Bulk Tank Milk** (BTM) and in milk from primiparous (PP) cows on 4 sampling occasions over 2 years was investigated using the ID Screen® MYCOPLASMA BOVIS INDIRECT Elisa. 145 herds participated in the study. • *Results*: The apparent herd-level prevalence of *M. bovis* infection based on antibodies in BTM was 17%. With the addition of PP cows, the prevalence increased to 28%.	
10) Hayajneh F.M.F. *et al.* (2024). **Epidemiological Investigations of *Mycoplasma bovis*-Associated Mastitis in Dairy Animals along with Analysis of Interleukin-6 (IL-6) as a Potential Diagnostic Marker**. International Journal of Veterinary Science. Int J Vet Sci, 13(1), 120-126.	• 384 milk samples were collected to check the presence of mastitis using Surf Field Mastitis Test (SFMT). All these samples were further evaluated for *Mycoplasma bovis* using the ID Screen® MYCOPLASMA BOVIS INDIRECT Elisa, PCR, and LAMP assay. • *Results*: 45.57% of animals were positive for mastitis through SFMT and a prevalence of 20.83% was recorded through ELISA. LAMP assay confirmed only three samples for *Mycoplasma bovis* from all the ELISA-positive animals. None of the samples was positive for PCR.	Correlation with other techniques
11) Hurri E. *et al.* (2022). **Herd-level prevalence of *Mycoplasma bovis* in Swedish dairy herds determined by antibody ELISA and PCR on bulk tank milk and herd characteristics associated with seropositivity**. Journal of Dairy Science, 105(9), 7764-7772.	• **Bulk tank milk** (BTM) samples from dairy herds (n = 3069) were collected and analyzed with the ID Screen® MYCOPLASMA BOVIS INDIRECT Elisa and PCR. • *Results*: The apparent herd-level prevalence of *M. bovis* infection based on antibodies in BTM was 4.8%, with large regional differences ranging from 0 to 20%. None of the BTM samples were positive by PCR. **Analyzing BTM antibodies to *M. bovis* is a useful screening tool in the field whereas analyzing BTM by PCR seems unsuitable.**	Correlation with other techniques
12) McAloon C.I. *et al.* (2022). **Seroprevalence of *Mycoplasma bovis* in bulk milk samples in Irish dairy herds and risk factors associated with herd seropositive status**. Journal of Dairy Science, 105(6), 5410-5419.	• **Bulk tank milk (BTM)** samples from dairy herds (n = 1313) were collected and analyzed with the ID Screen® MYCOPLASMA BOVIS INDIRECT Elisa. • *Results*: 588 of the 1313 BTM samples were positive for *M. bovis*, providing an apparent herd prevalence of 45%.	

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13) Mc Carthy M. C. *et al.* (2021). **Longitudinal prevalence of antibodies to endemic pathogens in bulk tank milk samples from dairy herds engaged or not in contract heifer rearing**. Frontiers in Veterinary Science, 1415.	• **Bulk milk samples** (BTM) from dairy herds were screened using the ID Screen® MYCOPLASMA BOVIS INDIRECT Elisa. • *Results*: prevalence of *M. bovis* antibodies in BTM was 0.43% and 30% in 2019, and 2020 respectively.	

SERUM SAMPLES

14) Oucheriah Y. *et al.* (2022). **Prevalence of *Mycoplasma bovis* in Algeria and Characterisation of the Isolated Clones**. Frontiers in Veterinary Science, 9.	• To assess the presence (direct detection) and circulation (indirect detection) of *M. bovis*, broncho-alveolar lavage fluids (BALF) and serum samples were collected from both diseased (n=175) and healthy calves (n=176). The ID Screen® MYCOPLASMA BOVIS INDIRECT Elisa was used for the detection of specific antibodies in all the sera whereas BALF from the diseased calves were tested by RT-PCR. • *Results*: -individual prevalence of *M. bovis* antibodies was 69%. 76% of the healthy calves were seropositive, whereas 61% of the diseased calves were seropositive. -Rt-PCR detected *M.bovis* in 58% of BALF samples; the proportion of rt-PCR positive animals was 62% (66/107) and 53% (36/68) in seropositive and seronegative animals, respectively. ***In our population, we found a slightly higher proportion of healthy-but-seropositive calves than diseased-and-seropositive calves. The kit used here is known to be highly sensitive and thus to detect any contact with M. bovis or circulation in a herd (seroconversion after exposure) rather than indicating true clinical infection of the animal. This means that the serological results of the calves studied here may not be correlated with clinical status but with time of sampling after onset of on-farm infection. Given the relatively long time needed for antibodies to appear (9 to 21 days after infection), diseased animals might not yet have all been seropositive at the time of sampling.*** **(sic)**	**Correlation with other techniques**

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