Mycoplasma bovis antibody testing in purchase protocol to reduce circulation between farms

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Background & Objectives

Mycoplasma bovis' importance as a causal pathogen of pneumonia, arthritis, mastitis, and other diseases has been well established in the last decades. In Belgium, a steady increase in *M. bovis*' presence has been noticed in bovine herds: in 2009, only 1.5% of dairy farms tested positive on culture of bulk tank milk (BTM) (1), while in 2011, already 11% of calves sold to the veal sector (corresponding with about 11% of herds) had antibodies at arrival (2), and in 2016, 32% of all dairy farms had either PCR or antibody positive BTM samples (3). This increase is worrying, given the enormous economic impact a *M. bovis*' introduction and circulation can have on a farm. The main cause of the increase is probably the purchase of carriers, given the enormous amount of cattle trade in Belgium: between 2005-2009, 40% of the cattle born in Belgian farms changed farms at least once (4).

As detecting carriers is not evident, given the intermittent excretion and existence of asymptomatic carriers, it is currently recommended to not purchase antibody positive animals to avoid *M. bovis* introduction in negative herds. To determine the risk of purchase of *M. bovis* antibody positive animals in Belgian herds, this study aimed to determine the number of animals testing antibody-positive at purchase.

Materials & methods

Throughout 2021, *M. bovis* antibodies were determined on every purchase protocol requested at 2 reference laboratories (ARSIA & DGZ), using a *M. bovis* antibody ELISA (BIO K432, Bio-X Diagnostics S.A., Belgium).

Results

In total, blood samples of 76285 animals were analyzed, of which 14.96 % (n= 11416) tested positive on *M. bovis* antibodies. One thousand two hundred twenty-seven animals were retested approx. 30 days after the first sample. Of these, 87,8 % kept the same result, 5,9 % seroconverted and 6,3 % seroreverted.

Conclusions

There is a non-negligible risk in introducing possible *M. bovis* carriers in seronegative herds trough purchase. There was 6,3 % seroreversion after 30 days, which could be due to antibodies truly dropping underneath the test limit, given the poor persistence time of *M. bovis* antibodies (5), or presence of false positives even with a test specificity of 97 %. For the seroconversion rate, the argument is different: probably, the 5.9 % conversion is only partially due to true seroconversion, but also due to the poorer sensitivity of the test used (Se 80.95%).

Given the possible presence of false negatives and the poor persistence of antibodies, it is quite possible that a part of the animals from *M. bovis* positive farms were missed in the first analysis. As such, it is advisable for *M. bovis* negative herds to test purchased animals twice, both at the beginning and the end of the 30-day quarantine, before releasing them in the herd. If either test is positive, the animal should be considered at-risk. Another option would be to test- or interpret testing on herd-level instead of animal level.

In conclusion, further research to identify *M. bovis* carriers, or development of farm-level testing procedures is sorely needed to stop the introduction of *M. bovis* into seronegative farms.

References

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