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# Nation-wide screening of antibodies to *Mycoplasma bovis* in Swedish dairy herds and herd characteristics associated with the infection

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## Background

*Mycoplasma (M.) bovis* is considered an emerging pathogen that causes severe disease in cattle in many countries and is poorly responsive to treatment. An increasing prevalence of the infection, suggested by preliminary data, may pose a threat to the Swedish favorable situation concerning antimicrobial resistance (AMR) in cattle herds.

In Sweden, *M. bovis* has caused severe symptoms with outbreaks of pneumonia mainly in fattening herds. Before this study, there were around 20 dairy herds and 30 fattening herds that had been diagnosed in other projects or in field work. In 2016 a national screening on bulk tank milk (BTM) was performed to determine the prevalence of *M. bovis*. The samples were analyzed with PCR and ten farms out of 3,473 were positive, 0.3 % (1). There are disadvantages with the use of PCR since the bacteriium is shed intermittently and milk from infected cows might not be included in the BTM at the time of sampling. Therefore, analyzing antibodies (ab) could provide a more correct prevalence of *M. bovis* infection in Swedish dairy herds.

## Objectives

The objectives of our study were to investigate the BTM prevalence of *M. bovis* in Swedish dairy herds by determining the presence of antibodies and *M. bovis* DNA and to study herd characteristics associated with a positive BTM sample.

## Material & Methods

Samples of BTM delivered from all dairy herds in Sweden, 3,144 herds, were obtained from the dairy routine laboratory with the help from Växa Sverige. The samples were analyzed with ID screen® indirect ELISA (IDvet, Grabels, France). High sensitivity and specificity for *M. bovis* antibodies in serum was recently shown for this newly developed ab ELISA (2). The samples were also analyzed with a real time PCR (PathoProof Mastitis Major 4, Thermo Fisher Scientific, Vantaa, Finland). Herd level data on health parameters were retrieved from the Dairy Herd Improvement database (Växa Sverige), for a period of 12 months prior to the BTM sampling. The association between the herd-level *M. bovis* antibody status (negative/positive) and each of the herd variables was first evaluated by chi-square test ($\chi^2$) for categorical variables and Student's t-test for the continuous ones. All variables with $P \leq 0.20$ were further analysed in multivariable logistic or linear regression models, correcting for biologically plausible variables.

## Results

BTM samples from 4.8 % of the herds were positive for antibodies to *M. bovis*. There were large regional differences with the proportion of ab positive herds per region ranging from 0 to 20 percent. All herds were negative on PCR analysis. For the herd characteristics there was a higher risk of antibody positivity in larger herds and there were also significant associations between antibody positivity and having a mortality of more than 0% in older calves (age 2-6 months) as well as in young stock (age 6-15 months). Moreover, there was a tendency of having a higher incidence of cows with more than 120 days between calving and final insemination in antibody positive herds compared to negative ones ($P$=0.052).

## Conclusions

This is, to our knowledge, the first time a nation-wide screening of BTM antibodies to *M. bovis* is presented using the ID screen® indirect ELISA. The results of this study indicate that *M. bovis* infections are more prevalent among Swedish dairy herds than previously recognized, and that ab ELISA may be an efficient way to detect infected herds. The association between infection status, as measured by BTM antibody ELISA, and young stock and late calf mortality suggests that *M. bovis* infection affects animal health and welfare in Swedish dairy herds.

## References


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