Mycoplasma bovis in Dutch dairy herds with a clinical outbreak, with a focus on arthritis

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Introduction

Mycoplasma bovis (M. bovis) can cause serious illness in cattle, with mainly arthritis and mastitis in dairy cattle. Some infected animals don’t show these symptoms. Knowledge on the diagnostics and transmission of M. bovis is limited. The objective of this study was to provide insight into both diagnostics and transmission related to arthritis within dairy herds experiencing an acute clinical M. bovis outbreak in dairy cows.

Material and methods

- Acute outbreaks of mycoplasma (arthritis, mastitis) in the period February 2016 – April 2017
- Confirmed cases (see figure 1 + cultivation)
- 20 herds (3 arthritis only (see figure 1), 5 mastitis only, other both)
- Farms samples at a 3-wk intervals for 3 months
- Clinically diseased and randomly selected healthy animals (dairy cattle and young stock)
  - Blood Elisa (Bio-X, Belgium)
  - (Bulk-) milk Cultivation
  - Conjunctival fluid PCR
  - Environmental samples PCR

Results

- at T0, 48 animals had arthritis (and some also mastitis).
- antibodies were detected in 32 animals; 5 animals showed antibodies and mycoplasma detected in conjunctiva and milk
- M. bovis was detected in 33 conjunctival swabs, 24 animals showed antibodies
- at T0, in 80% of the farms M. bovis was found in the environmental samples.
  - at the end of study period,
  - in none of the twenty farms with a clinical outbreak, all animals were free of Mycoplasma
  - hardly any clinical cases were observed at that moment.

Discussion

- different diagnostics tools are available but the sensitivity varied.
  - herd diagnosis, less important than in case of individual diagnosis and decision. For herd diagnosis (pre-screening) serology or punctuations will be more advisable with immediate cooled transport to the laboratory (culture) than cultivation of mycoplasma out of milk.
  - Variation between laboratorial results of clinical cases in this study might be related to:
    - moment of sampling
    - clinical problems contributed to mycoplasma if a herd diagnosis was made.
    - separation (risk of transmission) of clinical cows from apparently non-infected cows is advisable.
    - from an ethical perspective isolation or culling of infective clinical animals at short time is advisable also.
    - investigation into better therapeutic possibilities is advisable

Figure 1. Distribution of M. bovis within and between the animals: 1) anterior airways, 2) lungs, 3) joints, 4) udder, 5) ear, to 6) companions, 7) colleagues through 8) environment, 9) young cattle and 10) human.

Figure 1. M. bovis prevalence in randomly selected calves (A), young stock (B) and dairy cows (C) on outbreak farms based on ELISA (blood), PCR (lacrimal fluid) and, for cows, individual milk culture. (1/2+ means low positive and 3/4/5+ high positive).