Case reports: *Mycoplasma bovis* otitis in French dairy calves

M.A. ARCANGIOLI¹, W. FROUX², F. POUMARAT³, D. LE GRAND*¹

¹Université de Lyon, UMR Mycoplasmoses des Ruminants Anses-VetAgro Sup, VetAgro Sup, F-69280, Marcy l’Étoile, FRANCE.
²SCP Gilmer, Hidrio, Simon, Froux, Cabinet Vétérinaire, F-50140 Mortain, FRANCE.
³Anses, Laboratoire de Lyon, UMR Mycoplasmoses des Ruminants Anses-VetAgro Sup, F-69364 Lyon Cedex 07, FRANCE.

*Corresponding author: d.legrand@vetagro-sup.fr

**Introduction**

*Mycoplasma bovis* is a common causative agent of respiratory disease, arthritis and mastitis in cattle [3]. It is less frequently isolated in cases of subcutaneous abscesses [7], meningitis [11], kerato-conjunctivitis, abortions and salpingitis [3]. *M. bovis* has also been isolated in some cases of otitis media, alone or in association with other pathogen bacteria (*Pasteurella multocida, Arcanobacterium pyogenes*) [4]. This last entity was first described in 1991 by RADEMACHER et al. [10], and since then, few cases have been reported in USA [12], Canada [4], Japan and the United Kingdom [3] but not in France.

The short communication describes two separate outbreaks of *M. bovis* related otitis in unweaned calves from dairy herds. These are the first reported cases of *M. bovis* otitis in French dairy calves. In both instances, the source of *M. bovis* was thought to be primary respiratory disease in the herd.

**Keywords:** *Mycoplasma bovis*, otitis, dairy calves, aetiology.

**Case reports**

**FIRST OUTBREAK**

The first outbreak occurred on a dairy farm with approximately 100 Prim’ Holstein dairy cows. Replacement heifers were all raised on the farm. The calves were housed in individual pens for the first five days after birth and then regrouped into pens of ten. Calves were fed first with natural colostrum and then with milk replacer.

In December 2008, three one-month old calves presented clinical signs of otitis (bowed heads, drooping ears) associated to mild hyperthermia (39.1°C). Two of these 3 animals were sampled. *M. bovis* was isolated from ear swabs from both animals.

In the first, it was associated with *Staphylococcus* sp. and *A. pyogenes* and in the second with *Staphylococcus* sp. (Table I). One month after the clinical episode, both animals were strongly seropositive for *M. bovis* by indirect ELISA test (Kit BIO K162; Bio-X Diagnostics, Jemelle, Belgium).

Calves were treated with a steroid anti-inflammatory drug (dexamethasone, Voren; Boehringer Ingelheim, 0.08 mg/kg, intramuscularly) associated with antibiotics: danofloxacine (A180; Pfizer, 6 mg/kg, intravenously) followed by tulathromycin (Draxxin; Pfizer, 2.5 mg/kg, subcutaneously) (Table I). All three animals recovered although one has kept some sequelae (drooping ears and inclined head).

**SECOND OUTBREAK**

The second outbreak occurred on a dairy farm with 40 Normandy breed milk cows. Again, replacement heifers were all raised on the farm. Calves were housed in individual pens until they were six weeks old and then regrouped into pens of five. They were fed with natural colostrum followed by milk replacer for up to 4 weeks. After that, they received cow’s milk.

In January 2009, two 15-day to 1 month-old calves presented clinical signs of otitis. *M. bovis* was isolated in both instances. In the first calf, *M. bovis* was associated with *A. pyogenes* and *M. arginini*. Unfortunately, a standard bacteriological examination was not conducted for the second. No serological tests were carried out on these animals. Both calves were treated with gamithromycine (Zactran; Merial, 6 mg/kg, subcutaneously) and recovered without sequelae (Table I).
COMPLEMENTARY ANALYSES

Mycoplasmas were isolated on PPLO broth (Indicia Biotechnologies, Saint-Genis Argentière, France) after incubation for 7 days at 37°C in a humid atmosphere with 5% CO₂. They were identified by Membrane Filtration dot immunobinding (MF dot) as described by POUMARAT et al. [9] using specific anti-sera towards *M. bovis*, *M. alkalescens*, *M. canadense*, *M. canis*, *M. arginini*, *M. bovirhinis*, *M. bovigenitalium*, *M. species* 2D and *Acholeplasma laidlawii*.

An indirect ELISA test (Kit BIO K162; Bio-X Diagnostics, Jemelle, Belgium) was used to detect *M. bovis* antibodies in blood samples. Sera were classified as negative (0) or positive (1+ to 5+) according to the manufacturer’s instructions.

Bacteria were isolated on blood agar and identified by standard biochemical procedures and API (BioMérieux) testing.

**Discussion**

*M. bovis* is described as a primary aetiologic agent of otitis in young cattle [3]. Clinical signs are characteristic of otitis media: drooping ears, inclined heads, epiphora, and nervous signs consistent with vestibulo-cochlear infection [4, 12]. Macroscopic lesions (fibrino-purulent to caseous exsudate in one or both tympanum) are not specific [4, 12]. In the two outbreaks described here, macroscopic lesions were not observed because all of diseased calves have recovered.

The source of auricular contamination by *M. bovis* has not been clearly established, although various authors have suggested three different hypotheses: i) ingestion of contaminated colostrum or milk; ii) diffusion from a primary source in infected lungs or joints; iii) ascending infection starting from the external auditory canal [4, 12]. In both French outbreaks, we indirectly tested the first hypothesis by seeking *M. bovis* in bulk tank milk. All samples were negative. But, since infected milk cows can excrete *M. bovis* intermittently [5], this hypothesis cannot be entirely discarded. However, respiratory disease had been reported recently in both herds. Infection of the lungs could have been the primary source, followed by diffusion of *M. bovis* to the tympanum. Ascending infection, starting with the external auditory canal, has also been suggested as a source of middle ear contamination. Unlike small ruminants [8], cattle have not been reported to harbour Mycoplasmas in the external ear canal. However, HAZELL et al. [6] have isolated *M. leachii* (formerly known as *M. species* sp. serogroup 7 of Leach ) from the external ear canal of a cow belonging to a herd in which clinical mastitis caused by *M. leachii* were diagnosed. Presumably, in an infected herd, *Mycoplasma* could contaminate the external ear raising the question if the outer ear can act as an infectious reservoir in cow.

Pathogen bacteria were also associated with *M. bovis* in three of the four calves sampled, considering the 2 outbreaks described here. Although DUARTE et al. [2] reported that *A. pyogenes* is one of the aetiologic agents of otitis in cattle, FOSTER et al. [3] consider it as a secondary pathogen. By contrast, *Staphylococcus* sp. has not reported as an aetiological agent of otitis.

In both cases described here, the medical and economic consequences of *M. bovis* related otitis were moderate. However, a complete clinical, bacteriological and serological followup of the animals was suggested in order to better estimate the status of each herd with respect to *M. bovis*.

As a conclusion, this is the first report of *M. bovis* related otitis in French dairy calves. These outbreaks were identified through the national epidemiological network VIGIMYC (for VIGIance to MYCoplasmoses of ruminants). VIGIMYC monitors the distribution of Mycoplasma species isolated from clinical samples collected by veterinarians from diseased animals throughout France [1].

<table>
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<tr>
<th>Table I: Diet regimen, number of calves monitored, clinical and bacteriological findings, treatment and recovery of dairy calves with otitis media due to <em>M. bovis</em> in the 2 dairy herds in Normandie, France.</th>
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References


