*Brief communication*

# Septicaemic listeriosis in reindeer calves – a case report

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*Abstract*: *Listeria monocytogenes* was isolated from 4 reindeer calves as a nearly pure growth from several internal organs, pointing to a septicaemic form of listeriosis. The calves were born in a calving corral. Silage feeding was considered the most probable source of the infection.

**Key words:** *Listeria monocytogenes*, *Rangifer*.

**Rangifer,** 26 (1): 25 - 28

## Introduction

*Listeria monocytogenes* is a widespread organism which can cause disease in many wild and domestic animal species, especially ruminants, sheep, goats and cattle being most commonly affected. Listeriosis is regularly found also in Finnish cattle. There are three forms of listeriosis: encephalitis, abortion and septicaemia (Low & Donachie, 1997). Septicaemia is relatively uncommon and usually occurs only in neonates as an extension of intrauterine infection (Low & Donachie, 1997). In addition, *L. monocytogenes* can cause eye infections and keratitis in ruminants (Nightingale *et al.,* 2004). To our knowledge this is the first report of listeriosis in semi-domesticated reindeer calves (*Rangifer tarandus tarandus* L.) in Finland.

## The case in Finnish reindeer

In May 2005 the septicaemic form of listeriosis was found in four reindeer calves in connection with a calf mortality study conducted by Finnish Game and Fisheries Research Institute. The affected animals were born in a single calving corral situated in the southeastern part of the Finnish reindeer management area on 12th – 16th May. The calves had died at ages of 5, 9, 10 and 11 days, two inside the corral before release, and the other two ca. 1 - 2 km from the corral, being discovered 6 and 10 days after release by means of mortality indicating radio-transmitters (Bjärvall & Franzén, 1981). One of the dams had shown mild symptoms of illness during the winter prior to parturition, and had been confined to its own enclosure for the period of ill-

ness. After parturition, the female lost weight and the owner noticed some vaginal discharge, a sign of intrauterine inflammation, although the afterbirth had been expelled normally *post partum*.

The calving corral was approximately 2 hectares in size, including 0,5 ha of recently fenced fresh area. The older part of the corral had been used for winter-feeding for several years, but this was the first year when the winter-feeding period (January-April) had been extended into the calving period (May). Altogether 90 pregnant females remained in the corralled area after winter-feeding for a subsequent intense follow-up of calving and marking of the newborn calves with radiocollars. During the corralling period the females were fed on grass silage, dry hay, reindeer lichen and commercial reindeer pellets (Poro-Elo, Suomen Rehu, Finland). The grass silage had been harvested in late June 2004, preserved with molasses and stored in a covered stack. Silage was removed from the diet in mid-May, coinciding with the peak in calving, and replaced with additional dry hay. Salt licks as a mineral supplement and either snow or water were available *ad lib*. In addition to the supplementary feeding, the animals were actively browsing the undergrowth in the fresh corral section.

## Investigations and identification

Tissue samples were taken from the calves at the preliminary necropsy at the reindeer research station of the Finnish Game and Fisheries Research Institute, frozen and sent to the National Veterinary and Food Research Institute, where histological and bacteriological examinations were performed. No specific signs of listeriosis were seen in a macroscopic examination of the visceral organs, but lesions typical of listeriosis were observed histologically. The most significant lesions were detected in the liver, including multiple foci of hepatocellular necrosis with infiltration of inflammatory cells, mainly neutrophilic granulocytes. Necrotic foci with neutrophilic granulocytes were also noted in the lungs and occasionally in the spleen. The brain tissue was not examined histologically because of severe autolysis.

In the bacteriological examination *Listeria monocytogenes* was isolated from all calves from the following internal organs: Calf 1: lung; Calf 2: liver and spleen (brain, lung and kidney cultures were overgrown by *Proteus* sp.); Calf 3: brain, lung, liver, spleen and umbilical cord; Calf 4: lung, kidney and spleen (brain culture was overgrown by *Proteus* sp.). The growth was rich, nearly pure cultures, pointing to septicaemia. The identification of the bacterium as *L. monocytogenes* was based on the following characteristics: small transparent colonies surrounded by a narrow zone of β-haemolysis on bovine blood agar in 24 hours, tumbling motility when incubated at 21°C, detection of Gram-positive short rods with a characteristic arrangement in Gram staining, a positive result in the catalase test, acid produced from L-rhamnose but not from D-xylose, a weak positive reaction in a CAMP test with *Staphylococcus aureus* but none with *Rhodococcus equi*.

## Uncommon disease in reindeer

*Listeria monocytogenes* infections in sheep and cattle have most commonly been associated with silage feeding (Low & Donachie 1997). Improperly fermented silage initially contaminated with soil can allow the amplification of *L. monocytogenes* to high numbers (Nightingale *et al*., 2004). On the other hand, the numbers of *L. monocytogenes* in soil and crops to which farm animals may be directly exposed through grazing are thought to be too small to cause infection (Nightingale *et al*., 2004).

According to the reindeer owner, the reindeer lichen fed to the dams was contaminated with soil and the dams were reluctant to eat it. On the other hand, the owner had not noticed anything unusual in the quality of the silage. Unfortunately there was no silage or reindeer lichen left for bacteriological examination. Nevertheless, since silage feeding has commonly been associated with listerial infections over the years, it should be considered the most probable source of the infection in this case, too.

We found only two previous reports on septicaemic listeriosis in semi-domesticated reindeer calves: a 2-day-old calf at a zoo in the United States (Evans & Watson, 1987) and a 7-day-old calf with concurrent fatal listeriosis, zygomycosis and aspergillosis at a reindeer farm in Hokkaido, Japan (Yokota *et al*., 2004). According to the diagnostic data of the National Veterinary and Food Research Institute (for the years 1999-2005), necrotic hepatitis caused by *Listeria monocytogenes* was diagnosed in one adult reindeer in Finland in 2002. No septicaemia or any other form of listeriosis has been found earlier in

semi-domesticated reindeer calves in Finland. Accordingly, it seems that listeriosis is a relatively uncommon disease in the Finnish reindeer stock.

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*Manuscript received 2 January, 2006*
*accepted 8 May, 2006*


*Listeria monocytogenes* -bakteerin aiheuttama verenmyrkytys poronvasoilla – tapausselostus


*Tiivistelmä*: Toukokuussa 2005 Suomen poronhoitoalueen kaakkoisosassa sijaitsevassa vasotustarhassa kuoli neljä poronvasaa pian syntymän jälkeen 5-11 päivän ikäisinä. Kaikkien vasojen kuolinsyyksi todettiin *Listeria monocytogenes* -bakteerin aiheuttama verenmyrkytys. Tartunnan todennäköisin lähde oli vaatimien lisäruokinnassa käytetty säilörehu. Kyseessä on ensimmäinen poronvasoilla todettu *Listeria monocytogenes* -bakteerin aiheuttama verenmyrkytys Suomessa.