

Oral presentation

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## Causes of bovine abortion, stillbirth and neonatal death in Finland 1999–2006

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The aim of this retrospective study was to reveal the causes of bovine abortions, stillbirths and neonatal deaths in Finland. All cases submitted for necropsy to laboratories of the Finnish Food Safety Authority Evira between 1999 and 2006 were included. A total of 434 cases were received, of which the majority (336) were obtained as routine laboratory diagnostic service and additional 98 cases from two research projects. The production type was available in 242 cases, of which 55% were from dairy farms and 45% beef cow-calf farms. A total of 271 entire fetuses, 147 stillborn or neonatal calves dead within the first 24 hours and sixteen tissue samples were obtained. Placental tissue was available in 116 cases (26%).

A full necropsy was performed to fetuses and calves including sample collection for histopathology, bacteriology and virology as appropriate. Conventional bacteriological methods were used for culturing aerobic, anaerobic, and microaerophilic bacteria, fungi, salmonella, campylobacteria, and staining for brucella. Since 2004 detection of mycoplasma was performed (total n = 146). BVD (n = 188) and IBR (n = 188) viruses were isolated in cell culture and serology was used for BVD, IBR and bovine parvovirus for 48, 50, and 93 samples, respectively.

Macroscopic or microscopic lesions were detected in 48% (136/286) of abortions and in 70% (103/148) of still-

births or neonatal calves. Inflammatory lesions suggesting bacterial infection were detected in 30% (85/286) of fetuses and in 14% (20/148) of stillbirths. Bacteriological isolation considered as significant was made in 26% of fetuses and 10% of stillbirths.

The most common infectious agents isolated from abortions were *Arcanobacterium pyogenes* (27/280, 10% of cultured samples), *Bacillus licheniformis* (15/280, 5%), *Listeria monocytogenes* (13/280, 5%), and *Ureaplasma diversum* (12/93, 13%). Five cases were culture positive for fungi or yeasts (5/249, 2%). Other bacteria such as *Escherichia coli* (4), *Staphylococcus* spp. (2), *Fusobacterium* spp. (1), *Bordetella* sp. (1), *Salmonella* sp. (1), and *Pseudomonas* sp. (1) were found occasionally. In neonatal calves *Bacillus licheniformis* (7/140, 5%) was the most common bacterial isolation, followed by *Escherichia coli* (3), *Staphylococcus* sp. (3) and *Arcanobacterium pyogenes* (1), *Streptococcus* sp. (1) and *Mannheimia varigena* (1). *Neospora caninum* was diagnosed from three cases showing encephalitis or myositis.

None of the samples were positive for BVD or IBR viruses, neither their antibodies. Parvovirus antibodies were common (58%, 56/93), however no pathological lesions were associated with parvovirus seropositivity. Thus the significance of this finding remains questionable.

Congenital malformations were recorded in 7% (21/286) of abortions and in 10% (14/148) of neonatal deaths. Most common were heart defects (1% in fetuses and 4% in neonatal calves) and hydrocephalus (2% in fetuses and 1% in neonatal calves). All anomalies were recorded although they possibly were not the cause of the death. Twinning was recorded in 15 cases. Maceration or mummification without a specific cause was detected in ten fetuses (3%). Thyroid hyperplasia was recorded in four fetuses (1%) and in eight (5%) stillborne calves. Asfyksia, fetal fluid aspiration or oedematous or traumatic lesions indicating dystocia were recorded as cause of death in 63/148 (43%) still borne or neonatal calves.

Our results suggest that the most common causes of prenatal or neonatal death in Finnish calves are sporadic intrauterine bacterial infections, dystocia and congenital anomalies. *Ureaplasma diversum* has been cultured from abortion samples only for three years, and seems to be one of the most common causes of sporadic abortions. This might be due to introduction of *Ureaplasma* into previously uninfected herds. Several causative agents which are common in many countries are either rare such as BVD and salmonella or Finland is free of them (IBR and brucellosis).

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