

***Haemophilus somnus* Myocarditis in a Feedlot Steer**

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In late November 1987, at a large feedlot in south-central Alberta, a pen of 304 auction market derived fall-weaned steer calves was assembled over two consecutive days from four groups. All the animals were processed within 24 h of arrival at the feedlot; they were given a modified live infectious bovine rhinotracheitis/parainfluenza-3 vaccine (IBR/PI-3, Coopers Agropharm Inc., Ajax, Ontario), a seven-way *Clostridium/Haemophilus somnus* bacterin combination (Fermicon 7 Somnugen, Boehringer Ingelheim (Canada) Ltd., Burlington, Ontario), vitamins A and D (Vitamin AD 500, MTC Pharmaceuticals Ltd., Cambridge, Ontario), and injectable ivermectin (Ivomec, MSD Agvet, Kirkland, Quebec). They were also branded, ear tagged, and had their rectal temperature taken at processing. Those calves determined to be "sick" by the feedlot personnel, based on the feedlot treatment protocol, were sorted to the hospital for treatment. Immediately after processing, the remaining cattle were moved to their destination pen, bedded and fed a feedlot ration.

We believe that *Haemophilus somnus* myocarditis is becoming an increasingly important cause of death in fall-placed calves in western Canadian feedlots

One steer that was sorted to the hospital for treatment had a persistent fever of over 40°C that was refractory to therapy. It was treated initially for five days with a trimethoprim/sulfadoxine preparation (3 mL/45 kg body weight IM, Trivetin, Coopers Agropharm Inc., Cambridge, Ontario). A three-day course of the same regime in combination with oxytetracycline (11 mg/kg body weight IM, Oxymycine LA, Langford Inc., Guelph, Ontario) beginning at day 18 in the feedlot resulted in the temperature declining to 39.9°C, but due to the poor condition of the steer it was returned to the pen holding chronically ill animals. At day 30 in the feedlot, the steer had developed signs of heart failure with ventral edema, submandibular edema, and mouth breathing. A tentative clinical diagnosis of *Haemophilus somnus* septicemia was made, with localization in the heart, resulting in secondary cardiac failure. This diagnosis was based on feedlot experience.

The animal was euthanized due to its chronic condition and poor prognosis, and a necropsy was performed. The steer was in poor body condition; the

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Figure 1. Significant lesions at necropsy were the ovoid, darkened area of *Hemophilus somnus* myocarditis in the left ventricle (solid arrows) and the fibrinous pleuritis (open arrow).

primary pathological findings were restricted to the thoracic cavity. The heart had a 1 × 2 cm ovoid, darkened, necrotic area with a pale border at the base of the papillary muscle in the left ventricular wall (Figure 1). Generalized pulmonary edema and moderate fibrinous pleuritis were present without an accompanying fibrinous pneumonia. *Haemophilus somnus* was recovered in low numbers on culture from a swab of the myocardial lesion.

Histologically, the myocardium had a large well-defined area of coagulation necrosis, with moderate focal accumulations of neutrophils, macrophages and other mononuclear cells. Bordering this area was a band of neovascularization and fibroplasia. Granular basophilia of individual myocytes was noted focally as was vascular thrombosis. The lung had a moderate fibrinous pleuritis. Neutrophils were noted in higher than normal numbers within alveolar capillaries and in alveoli. There was light focal peribronchiolar fibrosis, perivascular edema, and generalized alveolar edema.

These findings suggested that the steer had an initial septicemia which was unresponsive to antimicrobial therapy. The infection localized in the myocardium, from which *Haemophilus somnus* was isolated. The septic infarct (1) seen grossly was responsible for the clinical signs of cardiac failure in this steer.

Myocarditis has not been considered an important feedlot problem. Embolic pyogenic bacteria, such as *Actinomyces pyogenes* or *Listeria monocytogenes*, were considered to be the usual causes when myocarditis was seen. *Clostridium chauvoei* has also been listed as a differential in myocarditis (2); however, it causes a dry, black rancid-smelling lesion that is quite unique. *Haemophilus somnus* causes a pyogranulomatous reaction in the heart. The lesions are less distinct than those caused by embolic pyogenic bacteria and may easily be overlooked on a routine postmortem examination.

Haemophilus somnus is a well-known cause of vasculitis and septicemia in cattle (3). In the feedlot it causes meningitis (infectious thromboembolic meningoencephalitis) and fibrinous pneumonia, which

are both important causes of death. Based on historical and ongoing analysis of death records from two large western Canadian feedlots for the past five years (unpublished data), we believe that *Haemophilus somnus* myocarditis is becoming an increasingly important cause of death in fall-placed calves in western Canadian feedlots.

References

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