



“Pathological Examination of Three Selected Syndromes of Feedlot Cattle”

STUDYING UNUSUAL FEEDLOT MORTALITIES

PROJECT NO.: 0005-019

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Background: The beef industry tends to focus on diseases that have the greatest apparent impact on productivity and profitability. For example, since bovine respiratory disease syndrome is a leading cause of death in feedlots, post-mortem examinations of feeder cattle tend to focus on the lungs and airways. Less attention may be paid to rare illnesses that have unusual symptoms, or post-mortems that reveal less common abnormalities.

Objectives: To determine if there are any serious underlying health issues that cause animals to:

1. Not appear sick, while not eating or gaining weight early in the feeding period. The post-mortem often does not find an obvious cause (poor-doers);
2. Have difficulties moving or getting up. A post-mortem may not find a joint injury or evidence of grain overload (central nervous system (CNS) disease); or
3. Suddenly die of unusual heart failure. There may be no post-mortem evidence of infection, heart defects, or a heart attack (cardiovascular).

What they did: These researchers worked with participating feedlots to perform detailed post-mortems on cattle dying with any of the three syndromes described above. Numerous tissue

samples were collected for detailed microscopic and laboratory examination. Feedlot information (days on feed, sex, and treatment history) were combined with the veterinary findings for each syndrome to help identify the most likely cause(s) of each syndrome. This project was later narrowed in focus to Central Nervous System (CNS) disease-related mortalities, in part due to the potential of emerging zoonotic disease, and in part because “apparent CNS disease” often becomes a “catch-all” category for mysterious deaths.

What they learned: A total of 134 cases were examined post-mortem during the initial phase of the project, although only 73 cases fit into the categories of interest for this project (poor-doers, CNS, cardiovascular). These cases were examined by UCVM faculty and their colleagues. The in depth analysis of CNS disease, involved the examination of 54 more cases. This examination included analysis of the cerebral spinal fluid for specific biomarkers to aid in diagnosis.

Of the three syndromes investigated, CNS disease was the most prevalent with 55 cases, followed by poor-doers with 11, and cardiovascular disease with 7 cases. Despite the low diagnostic success rate (44% of cases did not receive a definitive diagnosis), some valuable information was obtained:

- The main causes of poor doing animals in the feedlot were either bovine virus diarrhea (BVD) or parasitism.

- Cardiovascular abnormalities were associated with *Histophilus somni*, BVD or parasites.
- CNS disease was caused by clostridial disease (2 cases), *Histophilus somni* (10 cases), parasites (1 case), polio encephalomalacia (2 cases), non-suppurative encephalitis (3 cases), and abscesses (2 cases).
- In addition, 4 cases were identified as having a condition, possibly genetic in nature, similar to human multiple sclerosis (MS) that has never before been reported in Canadian cattle.

The in-depth analysis of CNS disease revealed 4 animals with congenital defects, 10 cases with an infectious cause (primarily bacterial meningitis), 15 animals suffering from lead poisoning, sulfur-induced polioencephalomalacia or sodium intoxication, 7 cases of non-sulfur induced polioencephalomalacia, 2 animals with nervous coccidiosis, and 6 animals with the previously undescribed MS-like condition.

What it means: This project allowed for very specific insight into feedlot mortalities that have unusual symptoms or less common abnormalities. This project did not identify a threat of emerging disease, although it did describe a previously unknown condition. Greater knowledge about these types of mortalities provides feedlot operators with more knowledge about possible disease causes that may need to be managed in a different way. The CNS-focused part of the project demonstrated that a more precise and detailed examination of CNS disease at necropsy yields diagnoses that were difficult to obtain in the past. The majority of conditions affecting feedlot cattle that mimic CNS disease symptoms are due to avoidable toxins. For example, sulfur-induced polioencephalomalacia can be prevented by testing the water and feed for abnormally high sulfur levels. Lead exposure can be avoided by ensuring that engine batteries are not stored where cattle have access or where they may end up in the feed truck, and ensuring that fresh water is available at all times prevents sodium intoxication.

Anytime a definitive diagnosis can be reached, cattle managers are in a better position to recognize, prevent and manage the condition. Without specific diagnoses, certain causes of mortality may go unnoticed and continue to occur. This project provides information on some of the lesser-diagnosed syndromes that feedlot managers should keep an eye out for.



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