



RESEARCH FACTS

RESEARCH & TECHNOLOGY DEVELOPMENT FOR THE CANADIAN BEEF INDUSTRY



Transporting Market Cows Safely in Winter

Project Title:

Effect of transport conditions on indicators of animal welfare for fat cattle and market cows in Canada

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Project Code:

ANH.10.11

Completed:

December 2013

Published:

- [Trailer temperature and humidity during winter transport of cattle in Canada and evaluation of indicators used to assess the welfare of cull beef cows before and after transport.](#); Journal of Animal Science 3639-53

Background:

[Benchmarking research](#) in 2009, funded by the Alberta Beef Producers, found that over 99.9% of loads of cattle transported within Alberta did not show any signs of negative outcomes (lameness, injury or death) in transit. Weaned calves and market cows were found to be at higher risk of negative outcomes than yearlings or fed cattle. Because market cows tend to be older, thinner and weaker than feeder and fat cattle, they are at higher risk of bruising during handling and tiring during transport. Transported heifers are also believed to be at higher risk of becoming dark cutters due to activity associated with estrus. Researchers found that transport stress is more pronounced during extreme cold weather.

Objectives:

To evaluate the role of transportation on welfare and carcass quality for market cows under Canadian winter conditions, as well as develop science-based recommendations regarding best management practices for transport of cull cows in cold weather conditions.

What they did:

Between January 4 and April 30, 2013, commercial truckers hauled 673 cull beef cows weighing 1517lb in 17 tri- and quad-axle trailer loads from southwestern Manitoba to a packing plant in central Alberta. At the driver's discretion, side boards were used to protect animals from the weather.

Data loggers on the ceiling of each compartment (except the nose) and outside of the trailers were used to record temperature and humidity. In some trailers, accelerometers attached below the nose, belly and back and on the ceiling of the belly and back compartments recorded vertical (up-and-down), lateral (side-to-side) and horizontal (forward-and-backward) jolts (e.g. braking, cornering) and vibrations 200 times per second.

Based on the [Recommended Animal Handling Guidelines and Audit Guide](#) developed by the American Meat Institute, cows were assessed for temperament (calm, restless, nervous, flighty, or aggressive), body condition score, lameness, injuries and other health conditions. Handler (e.g. shouting, prod use) and animal behaviour (e.g. slips, falls, walking, running) were also recorded. RFID tags were scanned to track which cows were in each compartment. Bruise size and location (rib, back, loin, round, tailhead) were recorded after slaughter.

What they learned:

Most trips lasted nearly 14 hours, ranging from 12 to 18 hours. Temperature averaged 4°C and ranged from -33°C to 20°C. Side boards were used on 88% of the loads. More boards were used at colder temperatures. On average, fewer than 25% of punch holes were covered when temperatures averaged 2°C; half to two thirds were covered when temperatures averaged -5°C, and 80% or more were covered when temperatures averaged -11°C.

Boarding is intended to protect animals from wind chill and increase temperatures inside the trailer. This did happen when the trucks were waiting to unload; when more boards were used, air temperatures and humidity were higher inside the trailer compared to outside air conditions. This suggests that animal body heat and moisture from exhaled breath, sweat and manure built up inside parked trailers when more boards were used. But at highway speeds, more heavily boarded trailers were actually less humid than the outside air. This suggests that boarding might increase, not reduce, airflow through the moving trailer. More research is necessary to know whether boarding benefits animal comfort during transport.

Accelerometers indicated that vertical motion was similar in all compartments, lateral motion was greatest in the back, and horizontal motion was greatest in the nose, back and doghouse. The most severely bruised carcasses came from cows traveling in the doghouse, but this may be because of the compartment's dimensions rather than motion alone. The risk of bruising was higher in cows that waited longer before unloading. Overall, 80% of cull cow carcasses were bruised, with 18% showing severe bruising and 14% showing bruising in more than one area of the carcass.

Fifty percent of loads carried at least one cow that was compromised at loading. Sixty percent of loads carried one or more compromised cows at unloading. Three cows (0.4%) went down and were euthanized on the trailer.

What it means:

Cull cows must be transported carefully. Knowing what and where our problems are is the first step to fixing them. A cow's condition at loading heavily influences whether she will reach her destination safely. Canada's [Code of Practice for the Care and Handling of Beef Cattle](#) requires that compromised cattle (e.g. cancer eye, lame, open wound, lumpjaw, etc.) only be transported for treatment or directly to local slaughter. They must be segregated from unfamiliar animals, in a rear compartment, with extra bedding. Make culling decisions sooner than later, evaluate cow condition carefully, and only load cows that are fit for the trip.

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