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Feed Water and Rest Breaks in Beef Cattle Transport

Reynold Bergen

November 27, 2019

National Farmed Animal Health & Welfare Council
Annual Forum



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Research Facts

Research & Technology Development for the Canadian Beef Industry



Evaluating Industry Cattle Transport Practices

by Alberta Beef Producers

Project Title:	Project Code: 0022-002
Benchmarking study of current transport practices in the Alberta beef industry	Completed: April 2009
Researchers:	

Dr. Karen Schwartzkopf Genswein karen.genswein@agr.gc.ca
Karen Schwartzkopf Genswein, PhD (Agriculture and Agri-Food Canada Lethbridge)

Published:

- Journal of Animal Science – “Benchmarking study of industry practices during commercial long haul transport of cattle in Alberta, Canada” doi:10.2527/jas.2011-4770
- Journal of Animal Science – “Factors affecting body weight loss during commercial long haul transport of cattle in North America” doi:10.2527/jas.2011-4786
- Journal of Animal Science – “Relationships between transport conditions and welfare outcomes during commercial long haul transport of cattle in North America” doi:10.2527/jas.2011-4796

Background:

Most commercial cattle are hauled at least three times in their lives (home ranch to auction mart, auction mart to feedlot, feedlot to packing plant), many are shipped more often than this (e.g. cows shipped to summer pasture, grass and backgrounding cattle). Livestock transportation is regulated by the Canadian Food Inspection Agency under the federal Health of Animals Act. Although the CFIA is interested in revamping the 30 year old transport regulations, there is very little research indicating that changing current industry practices is necessary, nor what the new standards should be. Relevant industry benchmark practices are needed to measure against before the effects of transportation on cattle welfare can be meaningfully studied, or before new regulations are introduced.

These researchers surveyed loads of cattle hauled by producers and commercial truckers into, out of, or travelling within Alberta. They collected information on driver experience, trailer type, loading density, distance travelled, time in transit, frequency of feed, water and rest breaks, temperature conditions in transit, transportation delays (frequency, length and reason), animal description (type, weight, sex, age, condition), etc. to identify (a) current industry practices, and (b) potential risks that are of particular concern.



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Space allowance during commercial long distance transport of cattle in North America¹

L. A. González,^{*,†,‡} K. S. Schwartzkopf-Genswein,^{*} M. Bryan,^{*} R. Silasi,^{*} and F. Brown^{*}

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Relationships between transport conditions and welfare outcomes during commercial long haul transport of cattle in North America¹

L. A. González,^{*,†,‡} K. S. Schwartzkopf-Genswein,^{*} M. Bryan,^{*} R. Silasi,^{*} and F. Brown^{*}

^{*}Agriculture and Agri-Food Canada, Lethbridge, Alberta, Canada; and [†]University of Manitoba, Department of Animal Science, Winnipeg, Manitoba, Canada; and [‡]University of Alberta, Edmonton, Alberta, Canada

Factors affecting body weight loss during commercial long haul transport of cattle in North America¹

L. A. González,^{*,†,‡} K. S. Schwartzkopf-Genswein,^{*} M. Bryan,^{*} R. Silasi,^{*} and F. Brown^{*}

^{*}Agriculture and Agri-Food Canada, Lethbridge, Alberta, Canada; and [†]University of Manitoba, Department of Animal Science, Winnipeg, Manitoba, Canada; and [‡]University of Alberta, Edmonton, Alberta, Canada

Benchmarking study of industry practices during commercial long haul transport of cattle in Alberta, Canada¹

L. A. González,^{*,†,‡} K. S. Schwartzkopf-Genswein,^{*} M. Bryan,^{*} R. Silasi,^{*} and F. Brown^{*}

^{*}Agriculture and Agri-Food Canada, Lethbridge Research Centre, Lethbridge, T1J 4B1 AB, Canada; and [†]University of Manitoba, Department of Animal Science, Winnipeg, R3T 2N2 MB, Canada

ABSTRACT: The objective of the present study was to document current commercial practices during long haul transport (≈400 km) of cattle in Alberta through surveys delivered to truck drivers (6,152 journeys that transported 290,362 animals). The live beef export industry to the United States (89% of all journeys) had a large influence on long haul transport. This was particularly true for fat cattle going to slaughter (82%) and backgrounded feeders going to feed yards (15%). Most drivers had either limited (31% with < 2 yr) or extensive (35% > 10 yr) experience hauling cattle. The type of tractors and trailers used most frequently were those with more number of axles (quad-axle trailers pulled with push tractors) because they can accommodate extra weight. Mean (±SD) distance travelled was 1,081 ± 343 km (maximum of 2,560 km) whereas time animals spent on truck averaged 15.9 ± 6.3 h with a maximum of 45 h. However, only 3% of all journeys were greater than 30 h. The most frequent cause of delay was at the Canada-United States border crossing due to paperwork and veterinary inspections.

Border delays occurred on 77% of all journeys which had a mean of 1.3 ± 1.9 h and up to 15-h long. Driver rest stops and waiting to unload cattle at destination were the second most frequent and longest cause of delay. Ambient temperature across all journeys ranged from -42 to 45°C with a mean value of 18 ± 11.8°C while temperature variation within a journey was from 0 to 46°C with mean value of 15 ± 6.6°C. The proportion of dead, non-ambulatory, and lame cattle for all journeys was 0.011, 0.022, and 0.011%, respectively. The cattle transport industry showed compliance with federal regulations and to a lesser extent with recommendations. Findings showed extreme values and very large variability in transport conditions however further research is needed to assess their impact on animal welfare outcomes. Delays within the journey as a result of border crossing, weather conditions, time on truck, shrink and space allowance may play an important role in improving cattle welfare during long haul transport.

Key words: livestock; long distance, road transport, survey

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Upshot

- 9,000 loads originating from or arriving to Alberta, > 500,000 cattle
- >95% of trips lasted < 30 hours
- Overall, > 99.95% reached their destination injury free
- ***BUT*** the risk of injury was ***much*** higher in **weaned calves** and **market cows** than in **yearlings** or **fed cattle**

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CODE OF PRACTICE FOR THE CARE AND HANDLING OF FARM ANIMALS: TRANSPORTATION
REVIEW OF SCIENTIFIC RESEARCH ON PRIORITY WELFARE ISSUES

CODE OF PRACTICE FOR THE CARE AND HANDLING OF FARM ANIMALS: TRANSPORTATION

There is research which reports on the relationship between transportation and weight loss and mortality in cattle (González et al. 2012c). However, there is currently a lack of information on the effectiveness of feed and water rest stops in mitigating the negative welfare, health, and performance effects of long distance transport (Ross et al., 2016).

Cattle 7

Code of Practice for the Care and Handling of Farm Animals: Transportation March, 2018
 Review of Scientific Research on Priority Welfare Issues

ENVIRONMENTAL CONDITIONS

Time off Feed and Water	5
Rest Intervals	7
Environmental Conditions	8
Extreme Temperatures – Heat	10
Extreme Temperatures – Cold	10
Measures to Mitigate the Impact of Environmental Conditions	11
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Fiona C. Rioja-Lang Ph.D. (Research Writer)
 Research Fellow, University of Edinburgh




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R. F. Cool

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 d 0 to d 1 was reduced

Key words:

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Effect of rest stop duration during long-distance transport on welfare indicators in recently weaned beef calves¹

S. Marti, R. E. Wilde, D. Moya,² C. E. M. Heuston, F. Brown, and K. S. Schwartzkopf-Genswein³

Agriculture and Agri-Food Canada, Lethbridge Research Centre, Beef Welfare Research Group, Lethbridge, AB T1J 4B1, Canada

ABSTRACT: Forty newly weaned beef calves (260 ± 32.6 kg) were transported 15 h in a livestock trailer (7.3 by 2.1 m) on 2 separate hauls 1 wk apart (20 calves/haul) to evaluate the effect of rest stop duration on indicators of calf welfare. Immediately following the

All physiological measurements as well as BW were taken immediately prior to initial loading, at arrival at the feedlot after the 20-h event, and 48 h after the transport to the same feedlot. Hair cortisol was collected prior to the initial loading and 25 d after transportation.

Physiological and behavioral measurements

before they were unloaded at the same feedlot, for a total transport event lasting 20 h. Control calves did not have access to feed or water until the end of the 20-h transit event. Behavioral measurements included bunk attendance (min/d) and standing and lying duration (min/d) recorded for 5 h after the 20-h transport event. Physiological measurements included saliva and hair cortisol, complete blood cell count, serum NEFA, haptoglobin, and substance P concentrations.

(P = 0.49) 48 h after transportation. Concentration of substance P did not differ (P = 0.18) between treatments, and haptoglobin concentration tended to be greater (P = 0.07) in CON calves compared with the other treatments 48 h after arrival. Hair cortisol tended (P = 0.10) to be lower in RS5 calves compared with the other treatments. The results of this study indicate that rest stop periods ≥ 10 h did not prevent short- and long-term stress after transport in weaned calves.

Key words: beef calves, rest stop, transportation, welfare

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 doi:10.2527/jas2016.0739

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BCRC RESEARCH FACTS
BEEF CATTLE RESEARCH COUNCIL RESEARCH & TECHNOLOGY DEVELOPMENT FOR THE CANADIAN BEEF INDUSTRY

IN PROGRESS

Effect of rest stop duration and quality on the behaviour and welfare of cattle transported by road

Project Title: _____ Project Code: ANH.06.17

La Fédération des Producteurs de bovins du Québec    

Research conducted by: Dr. Robert Ross (University of Guelph) and Sonia Marti Ph.D. (University of Calgary)

Background:

Cattle transport is one of the beef industry's practices that is most visible to the public, and is facing increased public and regulatory scrutiny. It is important to have valid Canadian science to ensure that potential regulatory changes will truly benefit the animals they are designed to protect. This research will focus on the benefit of providing a rest stop during long distance transportation of feeder calves.

Objectives:

To determine the effects of varying rest stop (RS) duration, time of RS, condition of RS, and calf source on calf health and welfare.



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Objectives

	Year	AAFC Lethbridge	Commercial western calves with a rest stop in Thunder Bay en route to an Ontario feedlot
Effect of transit time and rest stop duration in conditioned calves	2018-19	4 loads x 100 calves Detailed physiology, behavior, health and performance over 30d	Behavior, health and performance of auction mart calves with an 8 or 12h rest stop
Effect of transit time and rest stop duration in preconditioned vs. freshly-weaned calves	2019-20	4 loads x 100 calves Detailed physiology, behavior, health and performance over 30d	Behavior, health and performance of ranch-direct or auction mart calves with an 8 or 12h rest stop
Effect of rest stop quality	2020-21	4 loads x 100 calves Detailed physiology, behavior, health and performance over 30d	Behavior, health and performance of auction mart calves rested with or without bedding



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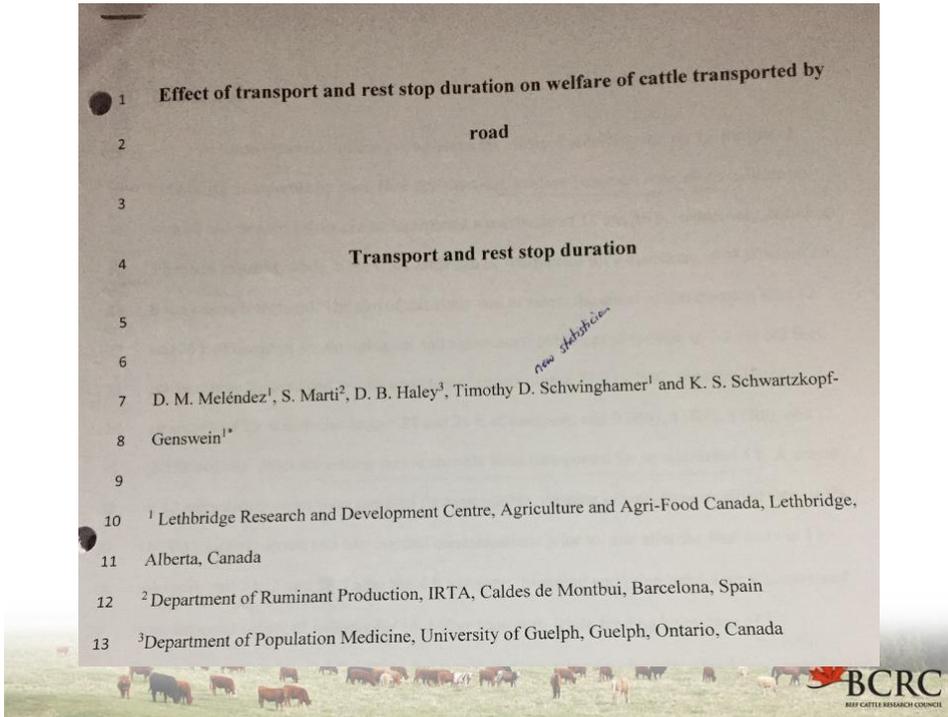
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What They Did

- 320 Angus, Simmental steers
- 7 to 8 months of age
- 258 ± 23.9 kg (570 ± 53 lbs)
- Arrived at AAFC Oct. 16
 - Vaccinated, metaphylaxis, parasite control, adapted to feed
- Transported Nov. 4
- Weaned for 2.5 weeks = “conditioned”, not “pre-conditioned”



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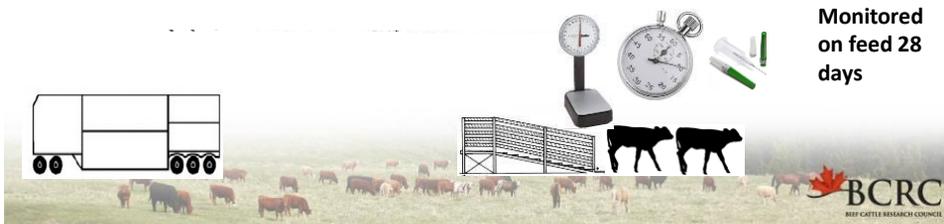
What They Did



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(0,) 4, 8 or 12 h rest

4 h transport



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Growth / performance

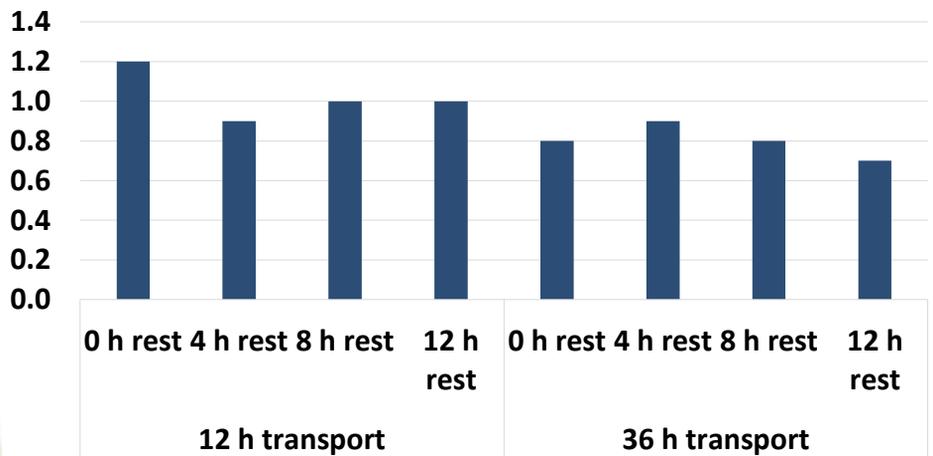
Weight (post)
Shrink
Intake adjusted shrink
ADG
Intake



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Growth / performance

ADG



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Physiological measures

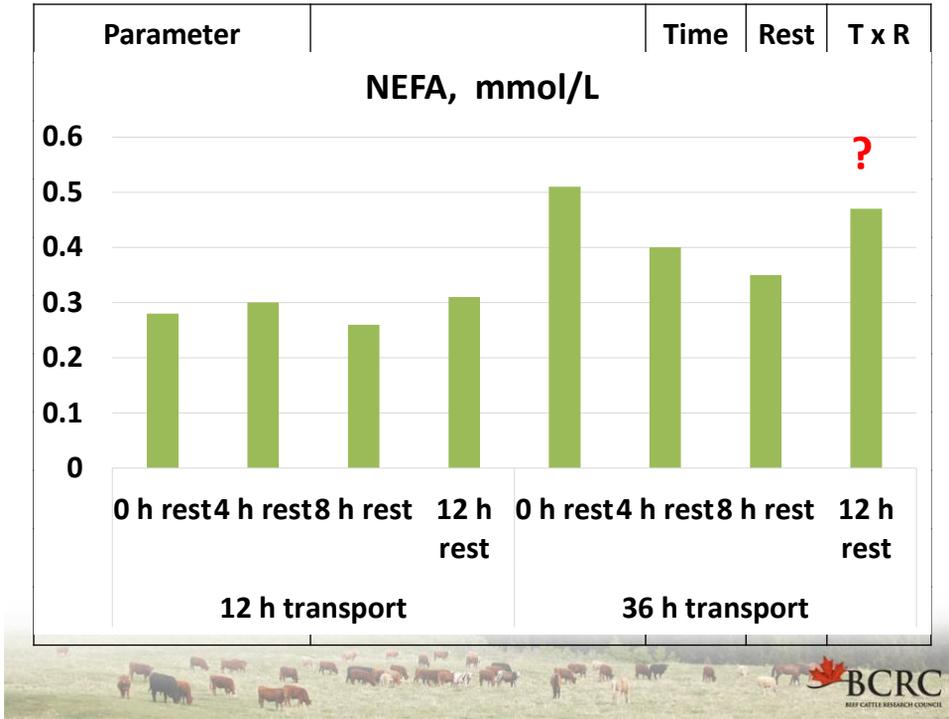


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Parameter		Time	Rest	T x R
Serum cortisol	Acute stress	0.12	0.58	0.67
Hair cortisol	Chronic stress	0.57	0.14	0.24
Creatine kinase	Muscle damage, fatigue	0.13	0.07	0.54
Lactate	Muscle damage	0.82	0.38	0.88
NEFA	Energy deficit	< 0.01	0.01	0.05
Haptoglobin	Inflammation	0.05	0.96	0.74
Hematocrit	Dehydration	0.77	0.34	0.36
White blood cells	Immune challenge	0.28	0.82	0.92
Lymphocytes	Immune challenge	0.43	0.33	0.78
Rectal temperature	Immune challenge	0.05	0.09	0.06

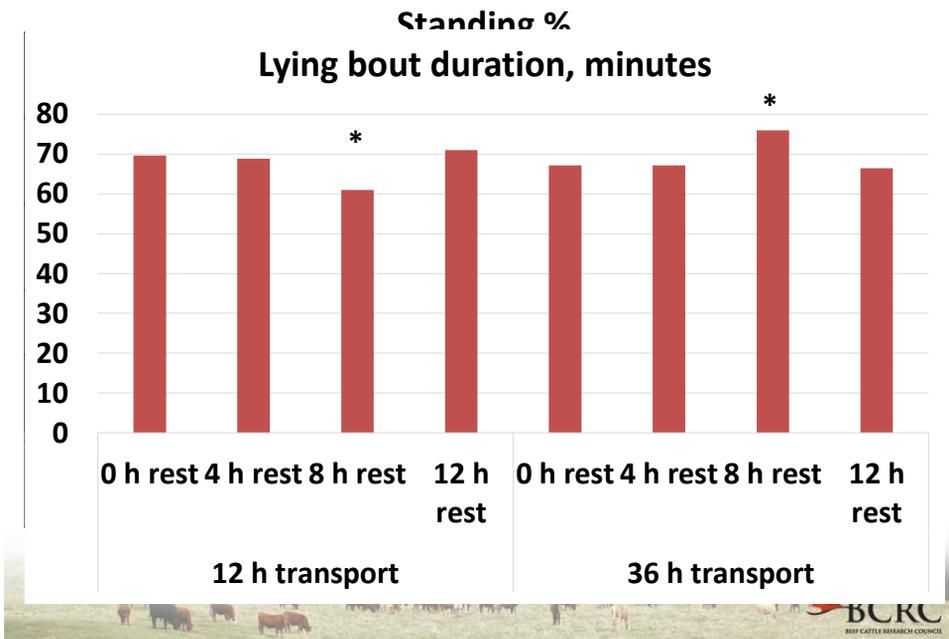


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Behavioral Measurements



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Health Outcomes

- **0% mortality**
- **2.5% morbidity (8 head; 1 pinkeye, 1 footrot, 6 fever)**
- **Not associated with treatment groups**



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Conclusions

- **“with the exception of NEFA, rest stops did not have a consistent effect on physiological and behavioral parameters, contrary to what was expected.”**
- **“conditioned calves benefit from a shorter transport duration, but did not have reduced indicators of fatigue, dehydration, stress or immune status following a rest stop after 12 and 36 h of transportation.”**
- **“Future studies are needed to assess if newly weaned beef calves benefit from rest stops”**



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Questions?

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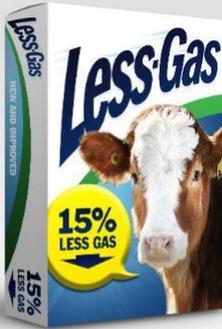
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In Canada, producing 1kg of beef now creates 15% less greenhouse gases than in 1981, due to improved production practices.

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