Livestock haulers’ views about dairy cattle transport in Atlantic Canada

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ABSTRACT

Surplus dairy calves and cull cows are often transported from the dairy farm to a variety of destinations and may experience compromised health and welfare in the process. Increasing interest in farm animal welfare by many stakeholders, including the public and policymakers, has brought about recent changes to livestock transport regulations in Canada that have likely affected transport operations across the country. The Atlantic region may be especially affected as a result of a smaller number of farms, and geography that often requires cattle to be transported long distances. We interviewed 7 livestock haulers in Atlantic Canada regarding their attitudes toward the recent changes to the transport regulations, particularly with regard to how these changes affected their business practices and dairy cattle welfare, as well as regulatory changes pertaining to calf transport were expected to disrupt existing transport practices. Thematic analysis of interview transcripts revealed 2 themes among participants: (1) calf (and sometimes adult cow) welfare and management during transport and on the dairy farm, and (2) feasibility of transport requirements and the enforcement of the regulations, including animosity toward other haulers and the challenge of satisfying both regulatory bodies and farmer clientele. These findings provide insight into the perspectives of an important, and often overlooked, stakeholder in the dairy industry on the transport system and highlight the need for inclusion of diverse voices when creating new policy.  
Key words: drover, hauler, cull cows, regulations, calf

INTRODUCTION

In certain sectors of the livestock industry, farm animals may go through a change in ownership and location as they move along the supply chain, requiring that the animal be transported (Miranda-de la Lama et al., 2014). Transport of farm animals is usually the responsibility of intermediaries, often referred to as drovers, haulers, or livestock transporters (Ljungberg et al., 2007), who usually do not own the individual animal but are normally paid per unit, with price depending on distance traveled. Despite not having monetary interest in individual animals, a study in Denmark on sows reported that livestock haulers will reject animals they feel have compromised welfare and are not fit for transport, sometimes adjusting their management practices during transport (e.g., providing extra bedding and partitions for slightly sick or injured sows) to accommodate the animals’ needs (Thodberg et al., 2020). However, others have reported that the decision to reject animals for transport is inherently subjective, resulting in variation among haulers on whether a dairy cow is deemed fit to transport (Herskin et al., 2017). Livestock haulers are thus a key stakeholder who can profoundly influence the animals’ welfare during transport.

Within the dairy industry, 2 classes of animals routinely subjected to transport for sale or slaughter are surplus calves and cows culled from the herd. Most surplus calves, including male dairy calves and female calves that are not required as replacements in the milking herd, are transported early in life either to be slaughtered as bobby calves (Cave et al., 2005), or sold for veal or beef production (Shivley et al., 2019; Haskell, 2020). Culling, in the context of dairy, normally refers to the removal of a cow from the herd when she is no longer economically viable, with the intent of replacing her with another cow that is expected to generate more profit, often a first-lactation heifer (Hadley et al., 2006). Farmers may decide to cull a cow for a variety of reasons, including low milk production, poor reproductive performance, injury, disease, or a combination of these reasons (Bascom and Young, 1998). A culled cow is usually transported to a slaughterhouse or to a market to be resold (Stojkov et al., 2020b).

Transport is stressful for dairy cows (Hong et al., 2019), and throughout their journey they may be subject to comingling with unfamiliar animals, being deprived of food and water, being handled by various
individuals at various facilities, and being subject to environmental conditions, all of which can be of further detriment to welfare ([Stojkov et al., 2018] see also review by Edwards-Callaway et al. (2019)). Calves and cull cattle are particularly vulnerable to long-distance transport, and are more likely to become nonambulatory, experiencing a higher risk of mortality (González et al., 2012b), and having a greater rate of BW loss (González et al., 2012a) during transport compared with feeder or fat cattle. In some parts of the world, including Canada, cattle may be subjected to long-distance transport. For example, Stojkov et al. (2020b) reported that cull cows in British Columbia, Canada, were transported ~300 km, sometimes more than 1,000 km, and the majority of cows were slaughtered more than 3 d after leaving the farm. The detrimental effect of transport on cow welfare has been represented by poor condition upon arrival to slaughter facilities. Stojkov et al. (2020a) reported that 30% of cows culled from dairy farms in British Columbia arrived at the slaughter facility with “poor fitness for transport” (p. 2653). A US survey that monitored 8,601 mature cows noted that 774 of them had one or more extreme welfare problems (lameness, emaciation, or injury) upon arrival at the slaughter plant (Vogel et al., 2018). The welfare issues faced by cull cows during transport are likely exacerbated by preexisting health conditions, such as injury and illness (Cockram, 2019).

Transport can also compromise the welfare of surplus calves; for example, calf mortality increases with transport distances (Cave et al., 2005). Discussions among Canadian experts in dairy production revealed that male dairy calves in Canada are often transported at 3 to 7 d of age, sometimes within a day of birth, and transport can last 12 to 24 h (Wilson et al., 2020) and be in excess of 1,000 km (González et al., 2012a). Improper neonatal care can lead to diarrhea, navel disease, and failed transfer of passive immunity before transport [see review by Creutzinger et al. (2022)], which hinders calves’ ability to cope with the journey. Transport of calves at a young age also affects performance on veal farms negatively (Marcato et al., 2022a), and many calves arrive on veal farms dehydrated and with poor body condition (Renaud et al., 2018).

In February 2022, the Canadian Food Inspection Agency (CFIA) began to enforce changes in Canada’s livestock transport regulations, which include the following: (1) transport time limited to 36 h for weaned cattle with an 8-h rest stop (Canada Gazette, 2019); (2) no rest stop requirements for calves younger than 8 d of age and compromised cattle (e.g., lame but can walk on all legs, blind in both eyes); (3) transport of calves younger than 8 d of age and compromised cattle limited to 12 h, and prohibition of transport to assemblingly yards (auction markets and independent holding facilities associated with slaughter establishments); (4) isolation of compromised cattle from other animals and transport to the nearest location for slaughter or care; and (5) no reloading of calves younger than 8 d of age after being transported to their next location (Canada Gazette, 2019). The new regulations also require that lactating animals be milked every 12 h and that they not be subjected to udder engorgement, and also emphasize limiting the use of electric prods.

Transport of dairy cattle in Atlantic Canada may have been especially affected by the restrictions on transport duration, particularly in the case of surplus calves, given that the duration of transport from Atlantic Canada to Ontario and Quebec, where the majority of the veal production is situated, exceeds the maximum transport duration of 12 h. Moreover, in some parts of Canada, the lack of nearby slaughter plants sometimes requires cull cattle (which may include lactating cows) to be transported long distances. For example, cull cows originating in Newfoundland and Labrador are normally transported to Ontario, a distance of about 2,500 km (Stojkov et al., 2018). In 2021, there was only 1 slaughterhouse for cows in Atlantic Canada located in Prince Edward Island (Agriculture and Agri-Food Canada, 2021) with insufficient capacity for the entire region. Thus, before the change in regulations, many dairy cows and calves were transported to other regions in Canada and the United States for slaughter.

The perspectives of individuals responsible for transporting livestock are often overlooked. Some research has investigated Mexican livestock haulers’ attitudes toward animal welfare and transport risk factors (Valadez-Noriega et al., 2018), whereas another study surveyed Danish livestock haulers’ opinions of animal fitness for transport and management practices relevant to animal welfare (Herskin et al., 2017; Thodberg et al., 2020). To our knowledge, no research exists on Canadian livestock haulers’ attitudes toward livestock transportation. Given the recent changes to Canada’s livestock transport regulations, understanding these key stakeholders’ opinions toward these regulations, including perceived effects on animal welfare and their business enterprise, is important in understanding the broader effects of the regulations on the dairy industry. Thus, the overall objective of this study was to understand the attitudes of livestock haulers specializing in transporting dairy cows in Atlantic Canada toward the recent changes in Canada’s livestock transport regulations. This project is part of a series of studies (Ritter et al., 2022; Proudfoot et al., accepted) that focused on finding solutions that addressed the fate of surplus calves produced on dairy farms in Atlantic Canada. Thus, our primary aim was to understand the attitudes

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of the livestock haulers in terms of surplus calf welfare. However, given that the changes in transport regulations also affected the transport of cull cows, our secondary aim was to also capture their attitudes regarding their involvement in the transport of adult cows.

METHODS

This study was approved by the University of Prince Edward Island (protocol no. 6008628) and The University of British Columbia [(UBC) protocol no. H18-02880] Behavioral Research Ethics Boards. All participants were given the opportunity to provide either written or verbal consent.

Positionality Statement

In qualitative research, the researcher acts as the data collection instrument and, as such, their identity can influence the research process (Bourke, 2014). Here we provide a positionality statement that describes our position in relation to the topic being studied (Merriam et al., 2001), and how it may influence our perceptions and representation of the data. All authors work in the field of animal health and welfare, and have either worked directly with dairy cattle or have researched topics related to the dairy industry. The lead author, Hendricks, is a 22-yr-old female undergraduate researcher at The UBC’s Animal Welfare Program and obtained her bachelor of science degree in applied animal biology from this program. She grew up in Langley, British Columbia, Canada. She did not grow up in a farming community and does not have experience working directly with cattle, which makes her background different from that of the participants. She has, however, investigated other qualitative social science topics related to the dairy industry, including surplus calf management. Proudfoot and von Keyserlingk are both professors of animal welfare, with considerable expertise in farm animal welfare, particularly dairy cattle. Although von Keyserlingk grew up on a beef cattle ranch in British Columbia and has personal experience interacting with livestock haulers, Proudfoot did not grow up on a farm, but spent 3 yr living at The UBC Dairy Education and Research Centre, which has approximately 350 lactating cows. Roche is a private research consultant (ACER Consulting Ltd.) and adjunct faculty member in the Ontario Veterinary College, University of Guelph, and has advanced degrees in epidemiology and considerable expertise in facilitation and mixed-methods research. Roche did not grow up in a farming community, but has spent the past 15 yr working in the Canadian dairy industry with farmers, their advisors and service providers, and other industry stakeholders.

Data Collection

Beginning in October 2021, we set out to conduct a series of phone interviews with individuals responsible for transporting dairy cows in Atlantic Canada. Thirteen independently operating livestock haulers were contacted from a public-facing website that advertised their availability to transport cows for a fee. After briefly describing the objective of the study, 7 individuals agreed to participate in a phone interview that lasted between 14 min and 1 h 38 min. The timing of the interviews varied, with 3 of the 7 haulers being interviewed upon initial contact, 3 interviewed after 2 follow-up contacts, and the last interviewed after 4 follow-up contacts. Interviews were conducted by Roche and were semistructured, following a preestablished discussion guide (Table 1; see Supplemental File S1, https://doi.org/10.5683/SP3/3HASKW; Hendricks et al., 2022). At the outset of the telephone interview, participants were given a high-level description of the objective and were informed that their responses would be anonymous and summarized for submission to a peer-reviewed journal. Participants were given the option of giving signed consent or simply to provide verbal consent to participate in the interview and to have the session audio-recorded. All participants consented to participate verbally.

Data Analysis

Audio recordings of the first 6 interviews were transcribed by a professional transcriptionist. As a result of transcriptionist availability, the seventh transcript was transcribed using a professional, online transcription service (Otter.ai, v2.3.20), followed by Hendricks checking the transcripts for errors alongside the raw audio file while simultaneously removing any identifying information. Such information included participant names and any locations that could be used to identify the individual. Participant names were replaced with an anonymous identification (P, followed by the number assigned to their interview).

Interview transcripts were analyzed using a thematic approach (Braun and Clarke, 2006). We used inductive analysis to identify themes emerging directly from the data, without attempting to fit the data to preexisting coding frames (Braun and Clarke, 2006). Analysis began by reading each transcript line by line and assigning short descriptors, or codes, to participants’ discussion. Analysis of the seventh interview revealed no new themes or codes compared with the previous interviews, indicating data saturation. The initial codes were then refined or combined with other codes, and codes that were deemed not relevant to the research
**Table 1. Discussion guide used by the interviewer during interviews with dairy livestock haulers (n = 7) in Atlantic Canada on their attitudes toward new livestock transport regulations in Canada**

<table>
<thead>
<tr>
<th>Question (Q)</th>
<th>Subquestion</th>
</tr>
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<tbody>
<tr>
<td>Q1: Tell me a little about yourself and your business.</td>
<td>Q1a: What regions do you service?</td>
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<tr>
<td>Q2: The Canadian Food Inspection Agency has developed new regulations around</td>
<td>Q1b: Describe regulations briefly if unaware; recap or revise if incomplete</td>
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<tr>
<td>livestock transportation. Are you aware of them and how they apply to you?</td>
<td>understanding.</td>
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<tr>
<td>Q3: What do you think about these regulatory changes?</td>
<td>Q2a: If yes, how did you hear about them?</td>
</tr>
<tr>
<td>Q4: How do you foresee these regulations affecting your business?</td>
<td>Q2b: Are they needed for the industry?</td>
</tr>
<tr>
<td>Q5: Have you noticed any changes among your clients in how they operate</td>
<td>Q3a: How do you think these changes are going to affect the industry as a</td>
</tr>
<tr>
<td>regarding calf transportation?</td>
<td>whole?</td>
</tr>
<tr>
<td>Q6: These changes are likely going to impact existing transport routes that</td>
<td>Q3b: What and how do you think you’ll need to change?</td>
</tr>
<tr>
<td>had calves heading West. How do you think the transport of surplus dairy</td>
<td>Q4a: What would you say are the key barriers to making these changes to</td>
</tr>
<tr>
<td>calves needs to change moving forward?</td>
<td>work within the new regulations?</td>
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<tr>
<td>Q6a: What are the different options you see emerging for calves?</td>
<td>Q5a: To what extent would you say your clients are aware of the regulatory</td>
</tr>
<tr>
<td>Q6b: What solutions do you see to ensuring that transporting calves to</td>
<td>changes as they pertain to transporting calves?</td>
</tr>
<tr>
<td>western provinces (e.g., for veal) is still possible out of the Maritimes?</td>
<td>Q5b: How often are you having the conversation about calf age?</td>
</tr>
<tr>
<td>Q6c: Dairy-beef may become a more prominent production option. How do you</td>
<td>Q5c: Are you finding that fitness for transport is now more of a</td>
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<tr>
<td>see yourself fitting into that kind of supply chain?</td>
<td>conversation at loading?</td>
</tr>
<tr>
<td>Q6d: What do you see for the next 5 to 10 years for the dairy, veal, and</td>
<td>Q6a: What are the different options you see emerging for calves?</td>
</tr>
<tr>
<td>dairy-beef sectors and your role in it?</td>
<td>Q6b: What solutions do you see to ensuring that transporting calves to</td>
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<tr>
<td></td>
<td>western provinces (e.g., for veal) is still possible out of the Maritimes?</td>
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<tr>
<td></td>
<td>(e.g., add a rest stop along the way)</td>
</tr>
<tr>
<td></td>
<td>Q6c: Dairy-beef may become a more prominent production option. How do you</td>
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<td>see yourself fitting into that kind of supply chain?</td>
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<td></td>
<td>Q6d: What do you see for the next 5 to 10 years for the dairy, veal, and</td>
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<td>dairy-beef sectors and your role in it?</td>
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Question were removed. Codes were then clustered by similarity into broader themes, resulting in an organized codebook. Intercoder reliability was conducted by Hendricks and Roche, wherein both researchers analyzed 1 transcript independently using the codebook and the coding results were compared. Both researchers met to discuss discrepancies in the coding results, and changes to the codebook were made accordingly. Hendricks then coded all the transcripts with the final version of the codebook using NVivo (version 12; QSR International Pty Ltd., https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home). A thematic map depicting the themes to be included in the manuscript was sent to the research team and all authors agreed on the final results. Quotes are used to exemplify ideas and are modified in length for clarity. Emphasis is placed on the diversity of and connection between themes rather than the quantity.

**RESULTS AND DISCUSSION**

Participants discussed 2 themes during the interviews. The first theme, animal welfare and management, includes discussion of how transport and changes to the transport system as a result of the new regulations influence cow and calf welfare, as well as challenges pertaining to calf care practices on dairy farms. The second theme, attitudes toward the regulatory system and stakeholders, describes participants’ discussion of the feasibility of some of the new transport requirements and the enforcement of these regulations, along with participants’ feelings toward other haulers and the challenge of satisfying both regulatory bodies and farmer clientele. Some of the quotes were coded under multiple subthemes; in these instances, we report them under 1 subtheme but recognize that they may be applicable to others. See Figure 1 for a thematic map of themes and subthemes.

**Animal Welfare and Management**

Given that our primary aim was to understand the attitudes of livestock haulers toward calf welfare, we first asked about this topic; however, 6 of 7 of the haulers also conveyed their thoughts on the effect of transport regulations on cull cows. As a result of this approach, participants discussed primarily the effect of transport regulations on animal welfare and management across the supply chain in relation to calves. Specifically, they spent a considerable amount of time relaying how their views on the new transport regulations, and subsequent changes in management practices during transport and on the dairy farm, relate to their views on calf welfare.

**Calf Welfare During Transport.** Participants discussed the effect of transport on calf welfare. Specifically, participants felt that providing a rest stop for calves was detrimental to welfare and questioned the validity of transport restrictions of both calf age and time. Participant P1 described how unloading and reloading calves at different facilities could promote the spread of disease after the start of their journey: “... and then you’re reloading those calves the next morn-
ing. Then you’re taking those calves and you’re putting them in a barn at the holding facility in Quebec, so they’re getting those diseases. And then when those calves from the holding facility get placed, they go to the farm where they’re going to be raised. They get those diseases, right? […] So, if all of a sudden, we’re unloading and loading these calves 3, 4, 5 times, that’s not what we want either.” One participant (P4) discussed the importance of transporting calves to their destination as quickly as possible: “As long as they’re well bedded […] take them as quick as you can from A to B. To me, that’s the most important.” Another participant (P7) felt that if adequate trailer conditions were provided for calves, then rest stops should not be required: “… calves have got to be fed and rested for 8 hours and then transported for 12, and then fed and rested for another 8 hours. [If] they’re comfortable and have a bed […] then those 8 hours, in my mind should be connected on with the 12 hours.” Knowles et al. (1997) argued that although feeding calves during transport provided minor benefits (such as less weight loss and dehydration), disrupting the journey to unload and feed calves at a facility could promote the spread of disease, whereas getting calves to their destination without stopping, in as little time as possible, may be a better option. Research investigating the effect of rest stops and transport durations on calves is limited, but cortisol levels of calves have been found to increase sharply within the first 2 h of transport and then stabilize throughout the journey (Kent and Ewbank, 1983), suggesting that loading may be a particularly stressful event. In contrast, recent work has reported that, regardless of whether dairy calves were transported for 6, 12, or 16 h, the experience was aversive when tested using a conditioned place aversion paradigm (Creutzinger et al., 2022). One study by Meléndez et al., (2020) found little difference between physiological and behavioral indicators of welfare (e.g., haptoglobin, cortisol, standing, lying, feeding behavior) in beef calves that were provided a rest stop of 4, 8, or 12 h, or no rest stop. However, as of February 20, 2022, Canadian transport regulations currently do not mandate rest stops for unweaned calves, simply that the maximum 12-h interval without food, water, and rest for ruminants 8 d of age and older can be exceeded by up to 4 h as long as all animal welfare outcomes are being met (Canada Gazette, 2019). In our study, haulers’ discussion of the effect of rest stops on calf welfare may have been a result of our primary research aim of investigating haulers’ attitudes toward surplus calf welfare, possibly priming our participants to consider calf welfare during rest stops even when this mandate only applies to adult cows. However, equally plausible, is that our participants may have demonstrated a misunderstanding of the transport regulations; if the latter is true, increased clarity of the regulations should be considered.

Participants discussed the connection between calf age and welfare during transport. One participant (P1) felt that, because calves were being kept on the dairy farm longer, they could handle longer transport times: “If I can get these farmers to keep these calves for 8, 10, 12 days, which in my mind is a very good thing, we’re sending the calf up the road that’s older [and]

Figure 1. Thematic map of themes and subthemes from interviews with 7 livestock haulers in Atlantic Canada on their attitudes toward new livestock transport regulations implemented in Canada in 2022. Boxes in orange represent topics within the broader theme of animal welfare and management. Boxes in green represent topics within the broader theme of attitudes toward the regulatory system and stakeholders.
that should be able to handle more of the elements. Why is it that we can’t put those calves on the truck for 15 hours a day?” In contrast, participant P2 felt that transporting calves at a younger age was better for calf health: “The best-travelled calf is at 5 days old. Some of these 2-week-old calves [...] it’s a hard thing. [...] I’m saying 5 to 7 days [because] the calves don’t have the diarrhea; they don’t have the next stage of [...] sick issues.” Calves transported at an older age (14 vs. 28 d) to veal farms demonstrated greater development of adaptive immunity (Marcato et al., 2022b), and calves transported at >5 d of age had a greater BW than calves transported at ≤5 d of age (Rot et al., 2022). Diarrhea and respiratory disease in calves on Swedish dairy farms were diagnosed at 26 and 52 d on average, respectively (Svensson et al., 2003). On Canadian and US dairy farms, calves were first treated for diarrhea and respiratory disease at 10 and 30 d on average, respectively (Windeyer et al., 2014). However, it should be noted that other work suggests that given the myriad of stressors experienced during transport, it is likely that all calves are subjected to immunosuppression, which places them at risk for disease (reviewed by Earley et al., 2017).

In addition to Canada, several other countries have created regulations about the minimum age of calves for transport. According to the European Union regulations on the protection of animals during transport and related practices (European Union, 2018), calves that are younger than 10 d of age can only be transported less than 100 km. However, some countries have stated that they will implement stricter regulations; beginning January 1, 2023, the Animal Transport Ordinance of the Federal Council of Germany began to enforce their amended regulations that call for transport of calves to occur no longer until they are 28 d of age (Federal Law Gazette, 2021). Unfortunately, some countries (e.g., the United States) have yet to revise their livestock regulations to address the specific challenges associated with transport of calves at young ages.

**Calf Care on Dairy Farms.** Here, participants discussed how the new regulations regarding calf age at transport have influenced calf euthanasia on dairy farms, whether farmers are keeping their calves for the required amount of time, and the challenge of farmers providing a low standard of care because of the low monetary value of calves. Participant P1 described the delicate balance between changes in transport regulations and its effect on calf euthanasia: “If the rules don’t change, or they change them too drastically all of a sudden, all of the calves in the Maritimes are going to have to be euthanized, and I don’t think that’s what farmers want.” Participant P4 described conflict created by the new transport regulations that could force farmers to choose between the law and animal life: “Either kill your calves or break the law. It’s that simple.” Previous research has reported that 63% of Canadian (Renaud et al., 2017) and 49% of Brazilian (Hötzel et al., 2014) dairy farmers reported euthanizing male calves on the farm. Of these farmers, 7% of Canadian (Renaud et al., 2017) and 80% of Brazilian (Hötzel et al., 2014) farmers reported sometimes using blunt force trauma, a method that is not in compliance with the Canadian Code of Practice (National Farm Animal Care Council, 2009) and is a significant welfare concern. Furthermore, recent work has indicated that public acceptance of calf euthanasia is less when the age of slaughter is <2 wk compared with >12 mo (Ritter et al., 2022). The findings of our study indicate that calf euthanasia on dairy farms could increase in the face of new transport regulations, which could have negative implications for calf welfare and the social license of the dairy industry.

There was mixed discussion about whether dairy farmers were keeping their calves on the farm for the required length of time (8 d). Participant P6 felt there had been improvement regarding the transport of neonatal calves: “We used to have calves coming in before with wet navels. [...] But now since these new rules and regulations [...] they all look like their navels are all dried off and you can tell they haven’t got the baby fat on them anymore. You can tell that they’re a week old or more.” In contrast, other participants (P3 and P5, respectively) felt that many calves were still leaving the farm earlier than what the regulations mandated: “[Farmers] want absolutely nothing to do with a Holstein bull calf. [...] Those calves are not kept for 10 days.” “There isn’t a calf in New Brunswick that stays on the farm ’til 7 days.” Previous work that surveyed dairy farmers before the latest changes to Canadian animal transport regulations found that less than a quarter of dairy farmers kept their male calves beyond 7 d of age (Renaud et al., 2017).

The difficulty of keeping calves on the dairy farm for the required length of time was attributed by some participants to the lack of monetary value of the calf. In the words of Participant P1, “It’s been more of a struggle for the financial side of it for the farmers. They’re saying, ‘If you’re only going to pay me,’ let’s say it was $50 a calf, ‘why am I keeping it?’ [...] Because they just don’t want to feed them.” One participant (P2) expressed that farmers should take better care of calves to increase their monetary value: “Farmers have got to do better job on their calves. Not expect to get big money for a piece of garbage.” In previous studies on Canadian veterinarians’ opinions of calf welfare (Sumner and von
Keyserlingk, 2018) and surplus calf care (Hendricks et al., 2022), veterinarians described a connection between poor calf care on dairy farms and low market price. In the latter study, veterinarians identified the monetary value of surplus calves as being connected to both colostrum provision and farmer decisions to euthanize calves; veterinarians also felt that creating better markets could address some of the difficulties associated with surplus calf management. The opinions of haulers in our study combined with the views of veterinarians in previous research illustrate that the connection between low monetary calf value and care provided by farmers is a concern shared by these 2 groups.

**Welfare of Compromised Cows During Transport.** Given the nature of how the interviews were undertaken, the majority of discussion around animal welfare and management revolved around calves; however, there was also some discussion of cull cow welfare. One participant (P7) felt that, in recent years, the management of cull cows had improved:

P7: I’m not proud to say it, but I remember taking ropes and you pull a down cow on the truck, and they take it up there and kill it.

Interviewer: Is it fair to say, in some ways, the industry has cleaned up on those sides?

P7: Yeah.

Another participant (P3) felt that cull cow welfare issues stemmed from management on the dairy farm: “The welfare problem was those cows before they got to the point where they were going to be loaded on a truck. Why are those cows in such bad shape that they need to go on a truck? Why do some people leave them so frigging long that they’re now a compromised animal?” Previous research on cull cow condition at livestock markets in British Columbia has found that 30% of animals were unfit for transport (Stojkov et al., 2020a), with the authors calling for better guidelines on assessing cow fitness for transport. Adhering to the new transport requirements for lactating dairy cows will require a collaborative and proactive decision-making process on behalf of the farmer and the hauler, given that fitness for transport specifically states (among other requirements) there must be no signs of udder engorgement when loaded, and the cow must be milked again or slaughtered before there is any appearance of udder engorgement before she reaches her final destination (Government of Canada, 2022). Furthermore, the reduced welfare of compromised cows as voiced by our participant indicates the need to improve on-farm euthanasia decisions; previous research has reported inconsistencies in timely euthanasia decisions among dairy producers (Wagner et al., 2020).

**Attitudes Toward Regulatory System and Stakeholders**

Participants discussed their attitudes toward the regulatory system and the stakeholders involved. This discussion consisted of the feasibility of adopting the new transport regulations, animosity toward other haulers, lack of adherence to and enforcement of regulations, and the feeling of being stuck between meeting the CFIA (the Canadian government agency responsible for enforcing the transport regulations) demands and maintaining a business relationship with farming clientele.

**Feasibility of Transport Regulations.** Participants felt that the new restrictions on transport duration (36 h for adult cows and 12 h for unweaned calves and compromised cows) were too short and difficult to meet. For example, Participant P2 stated, “A big problem here in Nova Scotia is the hours. Before, everything was just right, and then they changed the hours, and so then it was too short.” Similarly, Participant P1 explained that meeting the transport duration requirements while also providing adequate rest time for the truck driver was challenging and could affect the transport of calves to certain locations: “I think on Google it’s 11 hours and 57 minutes from my barn door to the barn door where they go […] , but the trucker has to get out, have a stretch... use the bathroom... have a coffee, right? Like there’s just no possible way that the calves will be able to be shipped to Quebec if they do mandate that 12-hour rule.” A potential concern is that driver rest time could be sacrificed if haulers are struggling to meet the transport time requirements. Driver fatigue is thought to be the major cause of many commercial livestock truck accidents in North America (Woods and Grandin, 2008; Miranda-de la Lama et al., 2011), and such accidents could increase if drivers are not provided adequate time to rest throughout their journey.

**Animosity Toward Other Haulers.** Participants expressed their opinions about other haulers in the cattle transport business. The majority of these opinions were negative, with the belief that some haulers operate dishonestly or that there existed unhealthy competition between businesses. In the words of one participant (P6), “…in the cattle business, the drovers, they want everything kept secret. They don’t want this person knowing where I got that animal, because next thing you know, another drover’s going to go in there and try to take it.” Another participant (P5) described profit motive and lack of care for animals among haulers: “I can’t speak for anyone else other than the group that’s in my area, but they do not [care] about the animals. […] It’s all about profit when it comes down to it.”
Participant P5 also stated the desire to see consequences inflicted by regulators on individuals in the industry who mistreated animals: “I would love to see CFIA have more teeth to these guys that are abusing animals. […] Because they’ve been profiting for 20 years over the mistreatment of animals. [That’s] just not right.”

**Lack of Adherence and Enforcement.** Participants expanded on their hostility toward other haulers by revealing that many haulers were not adhering to the transport regulations. As one participant (P5) described, “I know those other [haulers] are pulling every trick, and doing everything that they’re not supposed to do and [CFIA] never [catches] them because they know CFIA’s 9 to 5, right? If they run through in the middle of the night and run too long, then nothing’s ever said. And they’re just a bunch of gangsters anyway.” Participant P7 expressed similar thoughts and felt that haulers who follow the regulatory requirements face greater consequences than haulers who do not: “CFIA works from 8 to 5. And these guys are working 5 to 8. They’re working all night and getting the job done. And, and then you think of all [the haulers] that are trying to do it the right way. We’re the ones that get hammered.”

**Conflict Between Regulations and Farmers.** Haulers expressed frustration about having to meet the demands of the CFIA while also maintaining a business relationship with farmers. They also described having to adopt the responsibility of educating farmers on fitness for transport. One participant (P3) felt that they were unfairly responsible for educating farmers on the fitness for transport of an animal: “Very unfortunate that I’m put in that position with none of my own doing. I didn’t ask for that and CFIA made it […] where it was my responsibility to teach the farmers in my area what’s right and what’s wrong. But at the same time, it’s against the law for me to tell anybody any kind of a medical opinion on an animal.” Participant P3 also felt that dealing with animals that were unfit for transport because of a lack of animal care provided by farmers was, unfairly, the responsibility of haulers: “Some people will let an animal get to a point where that animal really, legally, can’t be trucked. […] So then [the responsibility lands] on the transporters. If I go to a guy’s place and he’s got a cow that’s not fit for the trip I’m supposed to just donate my time to the cause, […] tell him why she can’t make the trip.” Another participant (P1) described that refusing calves that were under the legal age of transport puts haulers in a bad light: “I’m the drover. I’m going to do business with you. I have to be the good guy. You’re the bad guy [if] you’re saying, ‘Jeez, I can’t take the calf until next week.’” Here the participant described challenges arising from conflict between different actors. Similar conflict has been described by farm veterinarians, including difficulty making decisions because of the perception of the farmer as a “customer” (Dürnberger, 2020).

Some research has identified differences in perceptions of fit for transport between farmers and transporters. For example, Dahl-Pedersen et al. (2018) found that farmers’ and livestock haulers’ assessments of dairy cow fitness for transport were not similar, and in some cases, a lower proportion of farmers considered the cows unfit for transport compared with haulers. In a survey of Danish cattle farmers, one-third reported feeling doubt about a cow’s fitness for transport at least sometimes, one-quarter reported seeking the opinion of livestock haulers on fitness for transport, and others stated that they particularly valued the opinion of livestock haulers (Dahl-Pedersen, 2022), indicating the influential role of livestock haulers in decision making related to cow fitness for transport. However, farmers are also responsible for such decisions. A recent survey of cull cow management practices in Ontario found that more than a quarter of farmers did not report assessing cow fitness before transport, and although the majority of farmers reported having a standard operating procedure for cull cow management, less than half of those farmers indicated that they used this procedure every time a cow was transported from the farm (Marshall et al., 2022).

**Future Directions, Recommendations, and Limitations**

The findings of this study illustrate areas needing improvement in terms of communication between regulatory bodies and other members of the dairy industry. Lack of adherence to transport regulations was described by our participants as occurring among both farmers and haulers in Atlantic Canada. As described by May (2005), the motivations of groups of people to comply with regulatory arrangements are affected by the interaction between the regulatory framework and the context within which it is embedded. Thus, a social contract that draws upon shared expectations from the regulated and the regulators is needed to achieve adherence, rather than simply enforcement. In the case of the livestock haulers in Atlantic Canada, our work brings attention to the fact that many of our participants, who are clearly in a position to affect animal welfare during transport, do not view themselves as part of a larger social contract, which is worrisome given that transport of any livestock species comes with inherent risks to animal welfare that are easily exacerbated when poor decisions are made. Farmers, livestock haulers, retailers, and other food supply chain stakeholders are recognizing increasingly that public concern for
good animal welfare begins on the farm and ends when the animal is slaughtered (Velarde and Dalmau, 2012); meat consumers have also expressed their concern about livestock welfare during transportation [Australia (Buddle et al., 2018)]. The recent announcement in the European Union on January 20, 2022, that members of the European Parliament voted overwhelmingly in favor that farm animals must be better protected during transport (Vilkas, 2022) will further increase pressure that other countries also ensure high standards of welfare during transport.

The opinion held by haulers in our study that transport of calves at an older age may be of detriment to calf welfare is in opposition to movement in several parts of the world toward calf transport at an older age and shorter transport duration. For example, in the United Kingdom and European Union, transport times cannot exceed 8 h and calves must be at least 14 d old (European Union, 2005). Thus, we strongly recommend that it must be a priority to find solutions that bring this important stakeholder into the fold of those who collectively are responsible for the welfare of dairy cows in Canada. Failure to do so places the entire dairy industry at odds with public expectations concerning farm animal welfare (Spooner et al., 2014; Weary et al., 2016). However, it should be noted that public opposition of certain farming practices, including issues pertaining to livestock transport, may result in some people electing to “vote with their wallet” by refusing to buy “dairy” products that are produced in ways they do not approve (von Keyserlingk et al., 2013, p. 5418); thus, directly affecting dairy farmers and less so livestock haulers as the latter’s income is not directly connected to consumer decisions. Therefore, we recommend that movement toward cattle transport practices that align with public expectations, such as fitness for transport decisions, should involve leadership from dairy farmers, regardless of what point along the supply chain the animals are when transported.

Our goal was to provide insight into the opinions of livestock haulers in Atlantic Canada in response to the changes in the Canadian federal livestock transportation regulations that were first introduced in 2019 and then enforced as of February 2022. However, a limitation of this study is that our sample size was limited to 7 haulers, and our participants were from one region in Canada. Thus, our work is not intended to be generalizable and may not be representative of views of other haulers in Atlantic Canada or haulers in other regions of the country. We therefore encourage future research to investigate the perspectives of livestock haulers in other regions, especially other regions of Canada and other countries that have recently or are in the process of altering their livestock transport regulations, to gain a better understanding of how these changes affect livestock haulers.

CONCLUSIONS

We interviewed 7 livestock haulers in Atlantic Canada to gain a preliminary understanding of the views of this stakeholder on recent changes to Canada’s livestock transport regulations. Participants identified several aspects of Canada’s new transport regulations that could affect animal welfare negatively, and described a lack of adherence to current transport regulations by both other haulers and farmers. The disconnect between haulers’ opinions and the changes made to Canada’s livestock transport regulations illustrates a need for better communication between haulers and regulatory bodies. Participants also felt unfairly responsible for upholding the requirements for livestock transport, particularly in teaching farmers about cow fitness for transport, highlighting the need for better training of farmers on livestock fitness for transport and education on the transport regulations. Participants also felt hostile toward others in their profession, indicating a lack of community and unity within the livestock transport industry in this region. The findings of this study exemplify the importance of inclusion of voice during decision-making processes within the dairy industry.

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