Exploring Factors That Influence Producer Decisions When Transporting Cull Cattle

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Acknowledgements

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Preface

In our capstone project, we used both online survey and follow-up interview to obtain producer's perceptions on factors that affect cull cattle transportation. Personal information or information identifiers were taken out from our project report to meet human ethic requirement when encounter information as stated above. Human ethics approval for both survey and follow-up interview and consent forms involved in distribution and conduction were approved by human ethics committee personnel. Overall, every session of our project was approved by human ethics. This project was the collaborative work of five capstone group numbers, and two industry mentors. The collaborated works involved in our project, including but not limited to online survey, interview, and data analysis, were distributed evenly by all five group members with help of our mentors Natalie Diether and Dr. Melissa Moggy.

Executive Summary

The Canadian cattle industry is currently facing significant challenges regarding the decisions to transport cull cattle. Transportation is one of the most stressful events cattle experience and because consumers strongly support the prevention of suffering animals, decreasing this source of stress will increase social license within the industry. The purpose of this study was to understand producer decision making and challenges faced when deciding whether or not to transport cull cattle. As well, to understand cattle producers' concerns about transportation regulations or guidelines and explore influential factors regarding culling decisions. Through the information analyzed from the 107 completed responses to an online survey distributed through various social media, and follow-up interviews with 6 producers, we were able to identity the current challenges and issues producers are facing when deciding to transport their cull cattle. We found that overall, producers were less familiar with the transport regulations (median=2, interquartile range: 1.0 to 3.0), while beef and dairy producers were more familiar with their representative Codes of Practice (median=3, interquartile range: 2.0 to 3.0 for both beef and dairy). The survey indicated that only 36% of dairy producers and 9% of beef producers perceived stage of lactation as an important consideration when deciding to transport cattle for sale. During the follow-up interviews we were able to identify that the most important consideration when transporting animals is animal health, the biggest challenge was logistics and finally, although producers found the regulations easy to read a CFIA proposed guide was still favorable with 67.3% of participants wanting one created to help assess transport fitness in cattle. The challenges and issues producers face when deciding to transport their cull cattle were identified and the findings from this study can be used to improve the welfare of cull cattle during transportation and help to maintain a sustainable cattle industry while having public transparency.

Introduction/Background

The Canadian cattle industry is currently facing significant challenges regarding the decision to transport cull cattle. Approximately 2% of all animals (including cull cattle) are transported in Canada without being in compliance with current regulations (Canada Gazette, 2016). Transportation is one of the most stressful events cattle experience in their lifetime (Schwartzkopf-Genswein et al., 2012). Various aspects of transportation affect animal welfare including: loading density, travel time, loading and unloading ramps, and vehicle design (Kara and Koyunc). Current literature is examining how these aspects of transportation are specifically affecting animal welfare; however, if an animal's condition prior to transport is compromised the aspects listed above will have a greater impact on an animal's welfare. In regards to transport fitness, it is suggested that loading decisions upon arrival are a major determinant for transport fitness (Diether, personal communication, 2017).

Cull Cattle

The decision to cull cattle is complex and many factors are considered by producers before they decide to cull an animal (Bascom and Young, 1998), such as the animal's health and disease status, reproductive problems, and behavioral problems. Cow culling involves separating cows from the main herd and sending them for auction, slaughter or death (AHDB, 2017). Disposal methods include being sent directly to slaughter, transported to an auction market for sale or from an auction market to feedlot, exported, sent to provincial/federal plants, or on-farm euthanasia. Producers can decide whether to sell cattle immediately, leave cattle in the herd and wait for increased cow prices, or separate and feed cattle a high grain diet before auction (Government of Alberta, 2017). Because the decision to cull cattle is complex and involves many factors, the actual decision to cull and/or transport cattle can be challenging and subject to producer bias. It has been shown that farmers alter their culling criteria and decisions based on sociological variables (e.g. attitudes, education, and demographics), as well as economic or biological variables such as breeding structure and genetic diversity (Fetrow et al., 2006).

Regulations and Legislations

Cattle producers are required by law to follow the federal and provincial regulations before transporting their animals (NFACC, 2013). Federal regulations include Health of Animals Regulations Part XII – Transportation, Regulations Amending the Health of Animals Regulations, and Transportation of Animals Program – Compromised Animal Policy. These regulations are enforced by the Canadian Food Inspection Agency (CFIA) through trained inspectors and veterinarians. Other regulatory bodies such as a

provincial inspector would also enforce these regulations. If a producer is not in compliance with these regulations they will be prosecuted at a provincial level through the Animal Protection Act or federally through the Criminal Code depending on severity of the offense. Additional to the mandatory regulations, there are also voluntary guidelines producers can access including the Code of Practice for the Care and Handling of Beef Cattle, the Code of Practice for the Care and Humane Handling of Dairy Cattle, and the Code of Practice for the Care and Handling of Farm Animals: Transportation. The language in the regulations is not overly complicated, however, because the regulations are vague, encompassing a variety of problems and covering all aspects of transport, producers may interpret the regulations differently. For example, the old CFIA recommendations states in the guide for assessing fitness for transport-unfit for transport, that animals cannot be transported without undue suffering because of lameness (CFIA, 2017). These animals should not be transported at all, however in the section for compromised cattle an animal is considered compromised if it is lame and can be transported with special provisions. This example shows how the regulations are hard to interpret, because identifying the point where an animal goes from being compromised to unfit for transport due to lameness is not well described. As well, lameness severity is based on producer perception which changes from producer to producer. As a whole, the Compromised Animal Policy is broad and up to individual interpretation of what they deem suitable.

Transport Fitness

The number one challenge/issue with transportation of cull cattle is fitness for transport (Grandin, 2000). When a producer decides to transport cattle they are required under federal law to determine if the cattle are fit for transport, which includes making sure the entire transportation process (loading, transit, and unloading) does not cause injury or undue stress to the cattle (CFIA, 2013). The continual consolidation of processing plants and feedlot operations has led to increased transport distances for animals. Consequently, animals may be loaded and unloaded multiple times for access to feed and water (Canada Gazette, 2016). As such, animal welfare becomes a serious concern when compromised and unfit cull cattle are transported long distances (Goldhawk et al., 2015).

Reduced transport fitness can be categorized in two ways. Compromised animals are animals with decreased capability to be transported for a long distance without suffering; they can only be transported locally with special provisions or euthanized on farm (CFIA, 2013). Unfit animals are animals that cannot withstand any kind of transportation without the chance of compromising animal welfare; they can only be transported for veterinary diagnosis or treatment (CFIA, 2013; Canada Gazette, 2016). Examples of conditions that require special provisions are bloat, blindness, cancer eye, arthritis, recent birth (within last 48 hours), and penis injury for bulls (CFIA, 2013). Cattle that have fractures, nervous system disorders, or cattle that show signs of dehydration, exhaustion, and fever are unfit and should not be transported (CFIA, 2013).

Public Perception

Culling has an important economic and social impact on the cattle industry; with up to 20% of individual cattle are culled in Alberta annually (Government of Alberta, 2017). The issue of livestock transportation is becoming more complex with the increasing demand from consumers (Simova *et al*. 2016a). From a social standpoint, the public has an overall negative attitude towards farm animal welfare, contrary to producer perceptions, which is more positive (Vanhonacker et al., 2008). The disconnect between producers and consumers gives rise to their perceptual difference of farm animal welfare. To strengthen social license with consumers the cattle industry needs to improve the ways in which cattle are treated, handled, and transported. In this context, social license refers to the level of public trust the cattle industry has from its consumer base. It does not matter how well farmers perceive they are treating their animals, without social license, producers will be subject to public scrutiny based on social expectations (Galyean et al., 2011). Therefore, having a good social license with consumers is very important for the cattle industry. As well, increased demand for public transparency should improve cattle transport by encouraging   producers to be more conscientious when transporting cattle. Knowing that the consumer's favour toward buying products with good animal welfare practices due to ethical and nutritional reasons (Harper and Makatouni, 2002) Having these decisions more in the public eye will force producers to be very careful regarding the condition the animals are in prior to transport. All producers have a common goal to sell product for a profit. If the public view the industry in a negative way, the profitability of the industry may decrease dramatically. A better understanding of producers' decision making processes when transporting cull cattle may focus future extension efforts to educate producers on transportation fitness. This may decrease the transport of compromised and unfit cattle and improve cattle welfare associated with transport.

Objective

The purpose of this study is to understand producer decision making and challenges faced when deciding whether or not to transport cull cattle. Our goal is to help Alberta Farm Animal Care's (AFAC) Compromised Cattle Benchmarking project with information collected from Western Canadian cattle producers through an online survey and follow-up interviews. To understand cattle producers' concerns and influential factors regarding culling decisions and transport regulations or guidelines. Through the information collected, we may identify the current challenges and issues producers are facing when deciding to transport their cull cattle and provide recommendations of approaches for AFAC to improve animal welfare for cattle transportation in their future project.

Materials and Methods

Survey Design

The survey was distributed using SurveyMonkey (SurveyMonkey, Ottawa, ON) and included 17 questions (Appendix III). The survey was modeled to fit the specific goals of the project with questions designed to allow insight into producer decisions on cull cattle and transportation. Producers were only required to answer the consent question, all other survey questions were voluntary and could be skipped by respondents if they wished. By giving participants a choice to skip questions, we could get as many responses as possible. At the end of the survey, producers were asked if they would be interested in a follow up interview that would go more in depth about issues surrounding transportation of cull cattle. If they responded yes, they were asked to leave their contact information.

Survey Distribution

A short description of the project and link to the survey (Appendix II), was distributed electronically via the Alberta Farm Animal Care (AFAC) newsletter, Alberta Beef Producers' newsletter: Grass Routes, and Milking Times' website for distribution. The survey was also sent out to local producers, and shared through FaceBook to Alberta Women in Agriculture and Agriculture-Food Urcareer. There was no geographical restriction for this survey as we distributed the survey to multiple online sources that may have reached respondents from other provinces within Canada. The survey was made available on the 21st of February and closed on the 14th of March.

Survey Results Analysis

The raw survey data was exported from SurveyMonkey to an excel spreadsheet where further analysis was conducted. First, the survey questions were divided into independent and dependent variables. The independent variables consisted of: 1) producer type, 2) years of experience, and 3) proximity of farm to a provincial abattoir. After exporting the raw data off of SurveyMonkey, producer types were categorized as beef, dairy, or both (mixed operation). Beef included backgrounding/stocker, purebred/seedstock, cow-calf, and feedlot. Dairy (cows producing milk) were separated out from beef because we cannot assume that dairy producers will have the same perceptions as beef producers. Also, we grouped dairy and beef producers together to see if there was a difference in perceptions between single operation type producers and multi operation type producers. As well, the years of experience results were grouped into five ranges in years (1-5, 6-15, 16-30, 31-50, 51-60) for easier data analysis. The dependent variables included the remaining survey questions except the very last question about interest in a follow-up interview. Based on the goal of exploring

producer's perceptions on cull cattle and transportation, three questions were formulated that were used for comparative analysis against selected dependent variables. From the comparative analysis, figures and tables were made to illustrate the results.

Question 1) **Does producer type affect:**

    a. The top 5 influential factors to consider when deciding to transport cattle for *sale*
    b. The top 5 influential factors to consider when deciding to transport cattle for *slaughter*
    c. The top 5 most important factors when deciding to *euthanize* on farm
    d. The top 5 factors to *consider* when transporting animals
    e. The *familiarity* of the Beef Code of Practice
        i. *Null Hypothesis (H_0):* familiarity does not differ between non-beef producers (0) and beef producers (1)
    f. The *familiarity* of the Dairy Code of Practice
        i. *Null Hypothesis (H_0):* familiarity does not differ between dairy and non-dairy producers (0) and beef producers (1)

Null Hypotheses: Producer type does not affect the influential factors for sale, slaughter, on-farm euthanasia, considerations, or familiarity with Codes of Practice

Question 2) **Does years of experience affect:**

    a. The top 5 influential factors to consider when deciding to transport cattle for *sale*
    b. The top 5 influential factors to consider when deciding to transport cattle for *slaughter*
    c. The top 5 most important factors when deciding to *euthanize* on farm
    d. The *familiarity* of the Codes of Practice
    e. The choice of contact person when unsure if an animal is fit for transport

Null Hypotheses: Years of experience does not affect influential factors for sale, slaughter, euthanasia, or familiarity of Codes of Practice or contact person

Question 3) **Does proximity of farm to nearest provincial abattoir affect:**

    a. The top 5 influential factors to consider when deciding to transport cattle for *sale*
    b. The top 5 influential factors to consider when deciding to transport cattle for *slaughter*
    c. The top 5 most important factors when deciding to *euthanize* on farm
    d. The top 5 factors to *consider* when transporting animals

e. What *disposal method(s)* do producers use for cull cattle

Null Hypotheses: Proximity to abattoir does not affect influential factors for sale, slaughter, euthanasia, considerations, or disposal method

Statistical Analysis:

Data analysis was conducted using STATA, version 13.0 (StataCorp, College Station, TX) with the help of Dr. Melissa Moggy. Statistical tests included: Fisher's Exact test, Kruskal-Wallis test, Spearman Correlation, and Mann-Whitney U-test (Appendix VI). When p-value < 0.05 the data is statistically significant and one can reject the null hypothesis (H0). P-value < 0.05 was considered significant. Results with normal distribution were presented as means $\pm$ SD. Results with non-normal distribution were presented as medians with 1st - 3rd quartiles (interquartile range (IQR)). Once data analysis was completed, results and bar graphs were exported to group members assigned to survey analysis. The results were interpreted and used to formulate additional figures and tables.

The definition and use of each statistical tests are listed below (McCrum-Gardner, 2008):

Fisher's Exact (X^2) test: a type of chi-square test used when one or more cells has an expected frequency of 5 or less. Can be used regardless of how small the expected frequency is, whereas chi-square assumes that expected frequency will be 5 or more.

Kruskal-Wallis test: Otherwise known as a non-parametric version of one-way ANOVA test, used to determine whether there are statistically significant differences between means of one independent variable and an ordinal dependent variable. If the result is adjusted for ties, the p-value will be more accurate and greater than the unadjusted p-value. If p-values are the same, it means that no ties exist.

Mann-Whitney U-test: non-parametric alternative test to the independent sample t-test, used to compare two sample means that come from same population, and test whether two sample means are equal or not. This test is used when data is ordinal or when assumptions of t-test are not met.

Once data analysis was completed, results and bar graphs were exported to group members assigned to survey analysis. The results were interpreted and used to formulate additional figures and tables.

Making Figures and Tables

Bar graphs were also formulated based on significant data from STATA to illustrate results. Pie charts and simple bar graphs were made for demographics using excel.

Interview Guide Development

Four open ended interview questions were developed that would allow one to obtain more in depth information and feedback from survey participants. An interview guide was developed to ensure consistency of each interview process and time frame (Appendix V). The goal of the interviews were to understand producer decision making and challenges faced when deciding whether or not to transport their culled cattle. The interview guide included a comprehensive script to follow while interviewing, consisting of an introduction to confirm consent and thank the producers for their participation. In addition, clarification statements, and probes to help expand and elaborate each question. Before contacting producers, a mock interview was conducted with one of the industry mentors following the interview guide to practice and gain interpersonal communication skills. The mock interview was also conducted as a preliminary trial to ensure sufficient audio recording quality.

Conducting Interviews

Once the interview questions were approved by both the industry mentors and human ethics personnel, producers that had completed the survey and indicated interest in participating in a follow-up interview were contacted. Producers were grouped based on type of operation (cow-calf, dairy, feedlot, backgrounding/stocker, and seedstock/purebred). Once categorized, 20 producers were randomly selected covering all five types of operations and be representative of all cattle producers. The selected producers were contacted either via email or phone depending on what contact information was provided. When contacted, producers were asked if they were still interested in participating. Producers who responded 'yes' were sent an email including the consent form, and available dates and times (Appendix IV). The producers could choose to have their interviews through phone call, FaceTime, or Skype. Producers who responded 'no' were removed from the interviewee list. Producers who were unavailable for an interview before March 20th were removed from interviewee list and another producer of the same type was randomly selected. Once interview times were set, it was decided that two members from the group would be present at each interview with one facilitating, and the other audio recording and taking field notes.

Analyzing Interviews

Once the interviews were conducted, each interview was transcribed and analyzed using an inductive thematic analysis to search for common themes. For this qualitative analysis, each transcribed interview was coded for each question, and codes were later condensed into common themes. The themes were coded from words or sentences mentioned by each producer in each question and categorized into general themes. Once

all of the codes were summarized for each question, a word cloud was generated through the tagul website (tagul.com) for each question.

Results and Discussion

Quantitative Analysis - Survey

From a total number of 201 responses, 107 completed the survey (53% completion rate). Out of the 106 respondents that answered type of operation question, 77 were beef producers (73%), 22 were dairy producers (21%), and 7 were both dairy and beef producers (7%) (Figure 1). Among the respondents, 102 answered the years of experience question, ranging from 1-60 years. With the largest proportion (43%) falling under the 16-30 years of experience group (Figure 2).
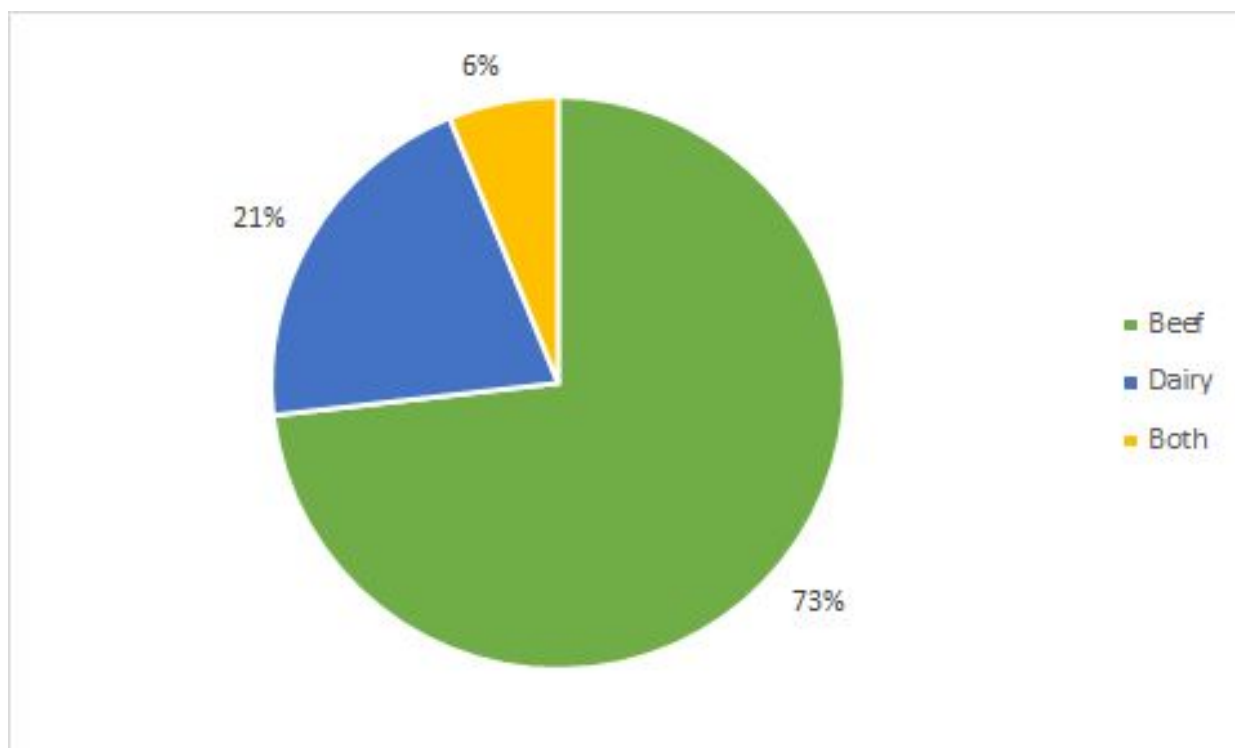
Figure 1: Producers who reported having beef, dairy, or both types of operations from producers who responded to the survey (number of respondents = 106)

This is the first study to provide information regarding producer's perceptions on factors that influence their decision making when transporting cull cattle. In our survey, the majority of producers who responded were beef producers (73%). This is not surprising as beef producers account for 85% of total number of farms with cattle in Canada and western provinces account for 75.4% of Canadian cattle inventory on feeding operations (Government of Alberta, 2012). As well, because there was no geographical restriction on

Out of the 103 respondents who answered the question regarding years of experience, 7 had 1-5 years of experience (7%), 19 had 6-15 years of experience (16%), 45 had 16-30 years of experience (44%), 27 had 31-50 years of experience (26%), and 5 had 51-60 years experience (5%) (Figure 2).
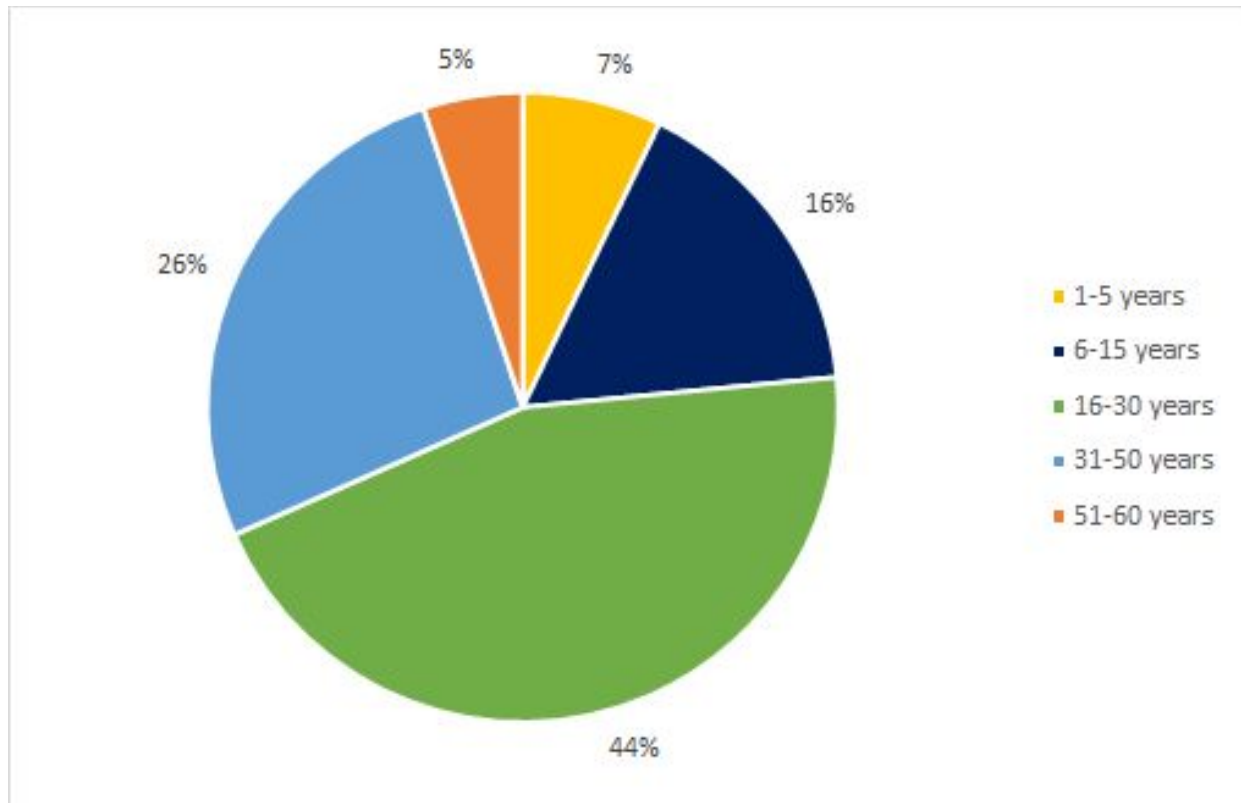
Figure 2: Years of experience for all survey respondents (number of respondents = 103)

Based on years of experience, less than 10% of producers have worked in the cattle industry for more than 50 years or for less than 5 years. The lower percentage of producers with more years of experiences in this study may be due to the online survey requiring internet access and producers with more experience may be older and have less access to the internet and therefore, the online survey, because they may not be as technologically savvy. The finding was similar to the WCCCS survey result where they reported that there were more producers over 50 years old responded via mail (61%)(Western Beef Development Centre, 2015). In the 2015 Western Canadian Cow-Calf Survey (WCCCS), the percentage of producers with ≥25 years of experience (57%) who responded was similar to this survey (56%).

Out of the 108 respondents to question about proximity of farm from nearest provincial abattoir, 78 were 1-2 hours away (72%), 17 were 3-4 hours away (16%), and 13 were 5 or more hours away (12%) (Figure 3).
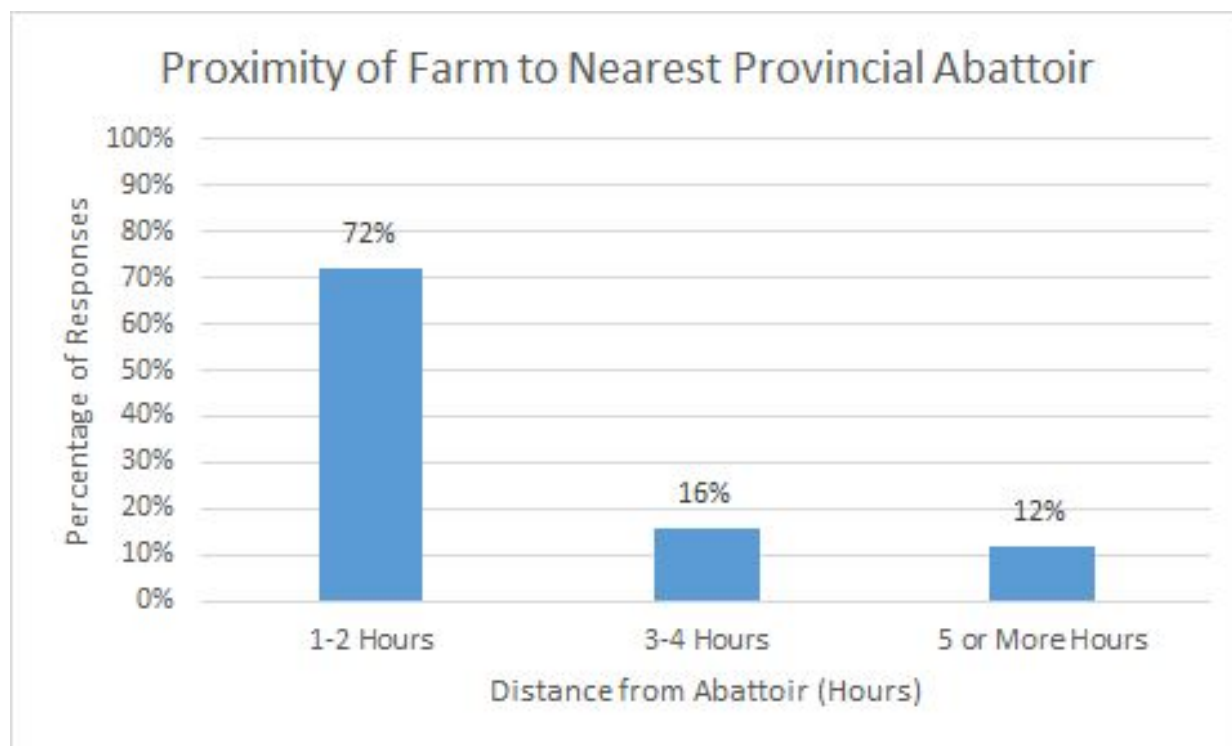
Figure 3: Proximity of farm to nearest provincial abattoir for all producers who responded to the survey (number of respondents = 108)

Of the 106 respondents that answered the question how long do you think cattle may stand in a collection pen prior to shipment for slaughter, the majority of respondents (72.6%) reported less than one week (Figure 4).
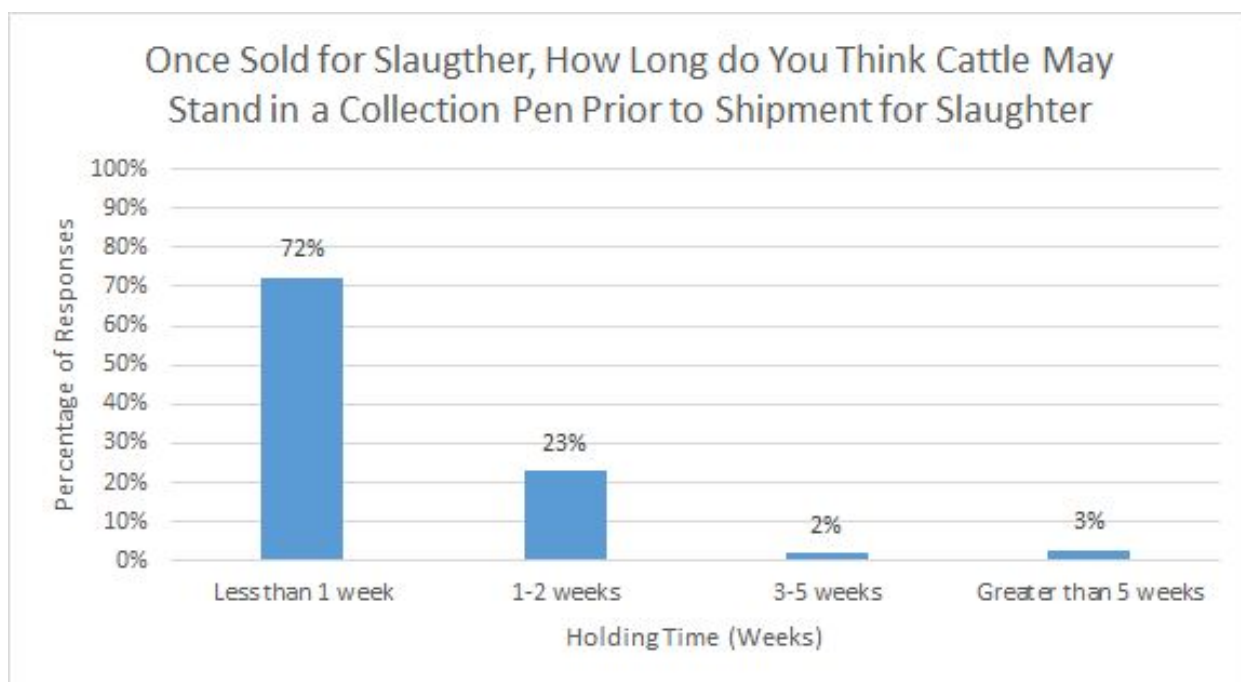
Figure 4: Percentage of responses for how long cattle stand in collection before slaughter for all producers who responded to survey (number of respondents = 105).

The majority of producers perceive that cattle may stand in a collection pen prior to slaughter for less than one week. However, cattle may stand in a collection pen for 3 to 4 weeks prior to slaughter (Diether, Personal Communication, 2017). There appears to be a misunderstanding among producers regarding holding time of cattle prior to slaughter. This may be because once sold, producers are no longer responsible for their cattle. Consequently, producers are not able to track subsequent movement of cattle after sale. Also, there is no complete or ongoing research studies focusing on holding time of cattle in collection pens prior to slaughter. The lack of information on this subject may be the reason why this misunderstanding occurs.

Out of 107 respondents who answered whether or not a CFIA guide to assess transport fitness in cattle would be helpful, 72 producers said yes (67.3%) a guide would be helpful and 35 producers said no (32.7%) a guide would not be helpful (Figure 5).
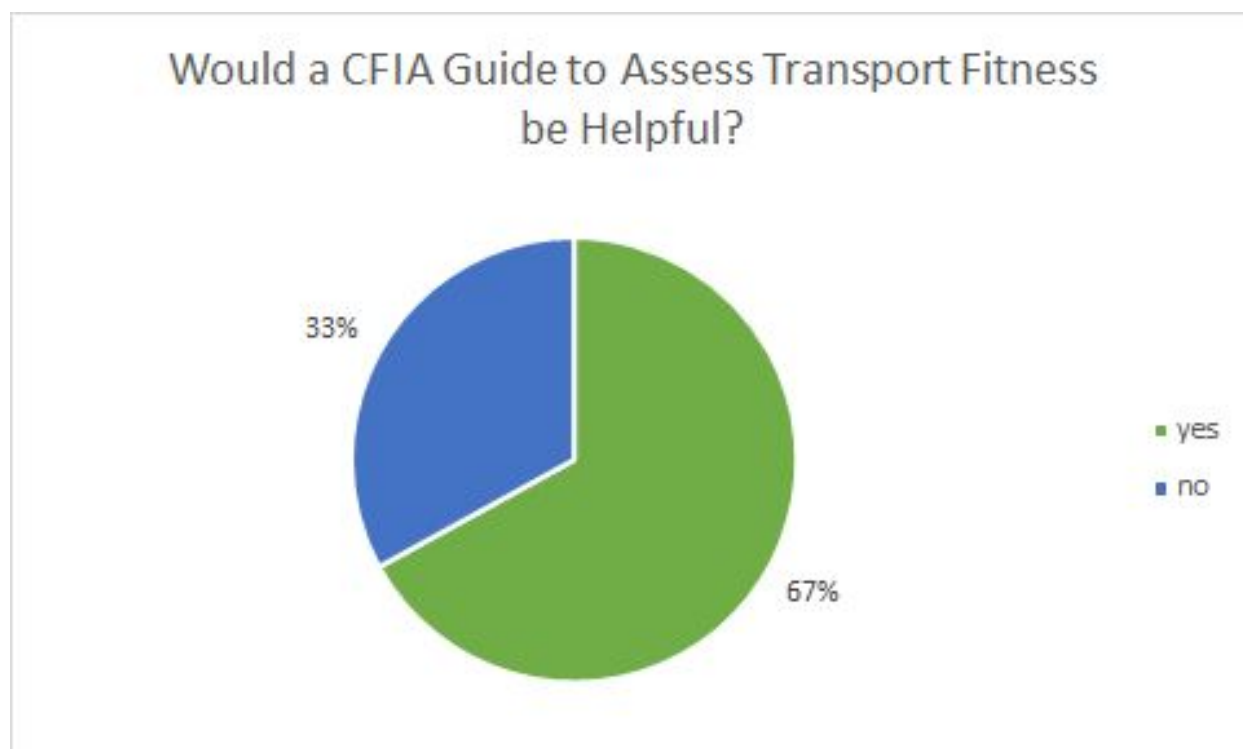
Figure 5: Perception of producers on whether or not it would be useful to have CFIA create a guide to assess transport fitness for cattle (number of respondents = 107).

Majority of producers responded in favor of a CFIA created guide to assess transport fitness of cattle and that such a guide would be helpful. This indicates that producers may have trouble determining whether or not their cattle are fit for transport even though the Codes of Practice and the transportation regulations which includes the definitions and conditions of compromised or unfit animals. As well, it might also indicate that the current guide is hard to read, lacks simplicity, and also lacks specific recommendations on special provisions or specific conditions.

Producer familiarity was based on a familiarity scale: 0 (not familiar at all), 1 (slightly familiar), 2 (somewhat familiar), 3 (moderately familiar), and 4 (extremely familiar). Overall, respondents were somewhat familiar with the Health of Animals Regulations Part XII - Transportation (median=2; IQR: 1.0 to 3.0) and the Compromised Animal Policy (median=2.0; IQR: 1.0 to 3.0), and slightly familiar with the Regulations Amending the Health of Animals Regulations (median=2; IQR: 1.0 to 3.0) (Figure 6-8). Dairy producers were somewhat familiar with the Dairy Code of Practice (median=3: IQR: 2.0 to 3.0) (Figure 19) and beef producers were also somewhat familiar with the Beef Code of Practice (median=3; IQR: 2.0 to 3.0) (Figure 10).
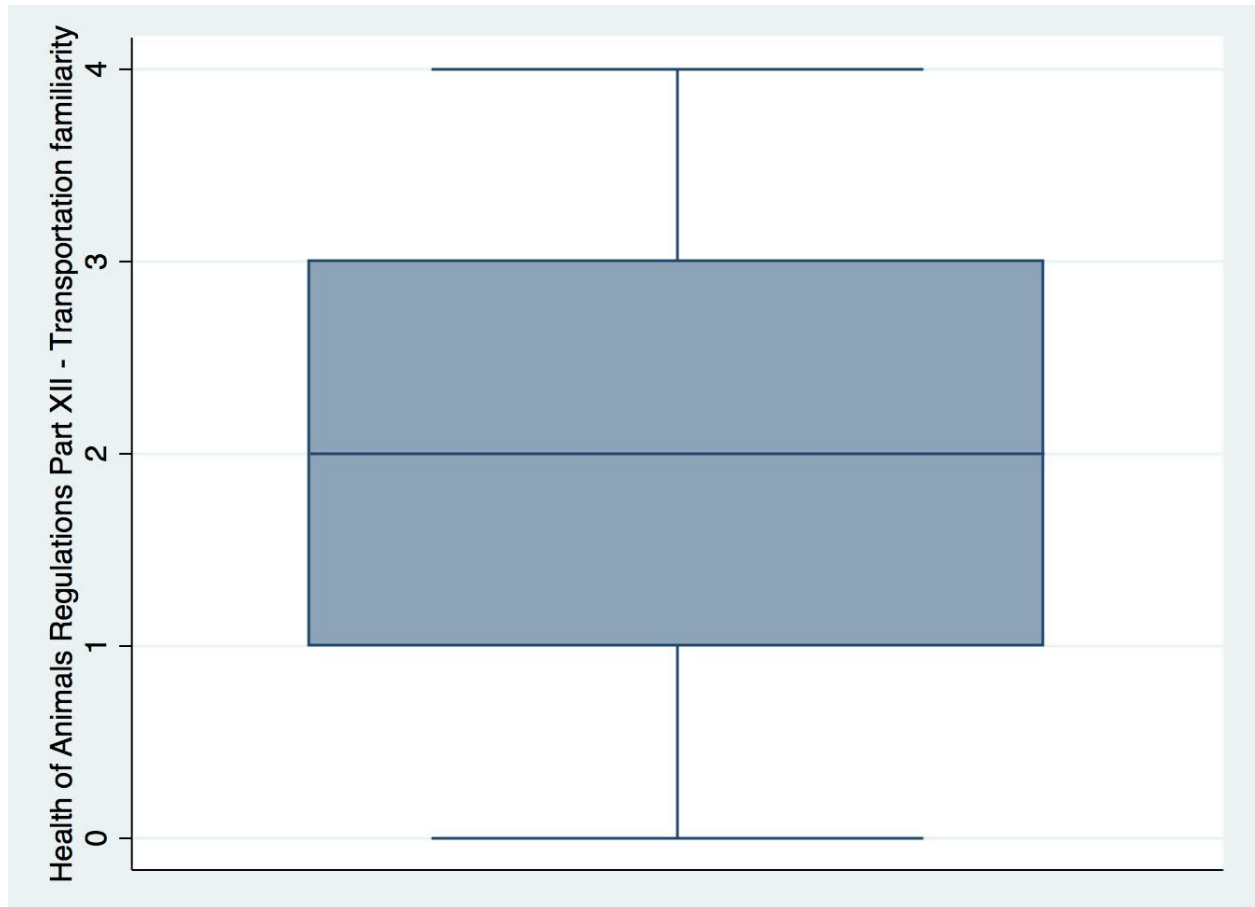
Figure 6: Boxplot representing respondents' familiarity of the Health of Animals Regulations Part XII - Transportation familiarity of all producers who responded to the survey. familiarity scale: 0 (not familiar at all), 1 (slightly familiar), 2 (somewhat familiar), 3 (moderately familiar), and 4 (extremely familiar) (number of respondents = 107)
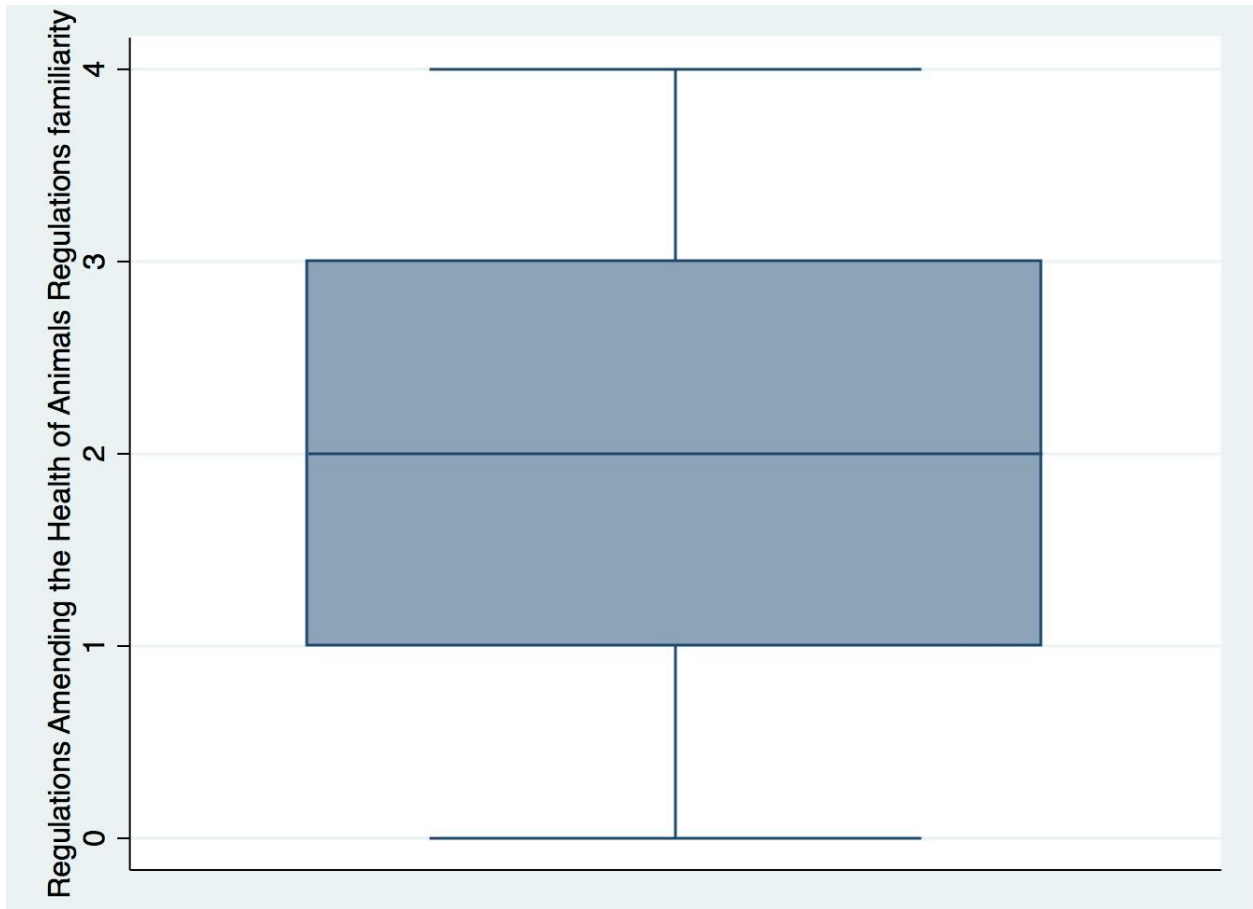
Figure 7: Boxplot representing respondents' familiarity of the Regulations Amending the Health of Animals Regulations of all producers who responded to the survey. Familiarity scale: 0 (not familiar at all), 1 (slightly familiar), 2 (somewhat familiar), 3 (moderately familiar), and 4 (extremely familiar) (number of respondents = 107)
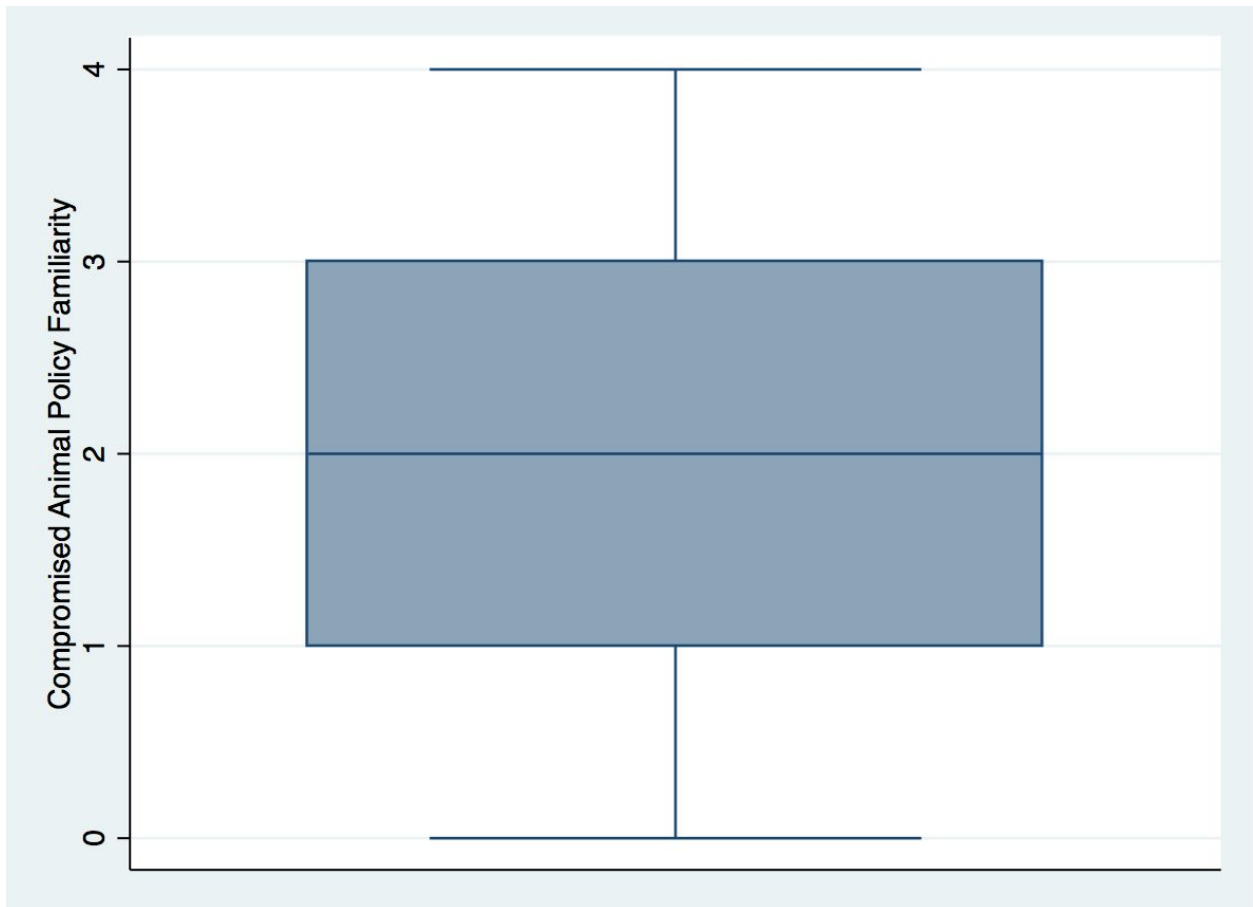
Figure 8: Boxplot representing respondents' familiarity of Compromised Animal Policy by all producers who responded to the survey. Familiarity scale: 0 (not familiar at all), 1 (slightly familiar), 2 (somewhat familiar), 3 (moderately familiar), and 4 (extremely familiar) (number of respondents = 107)
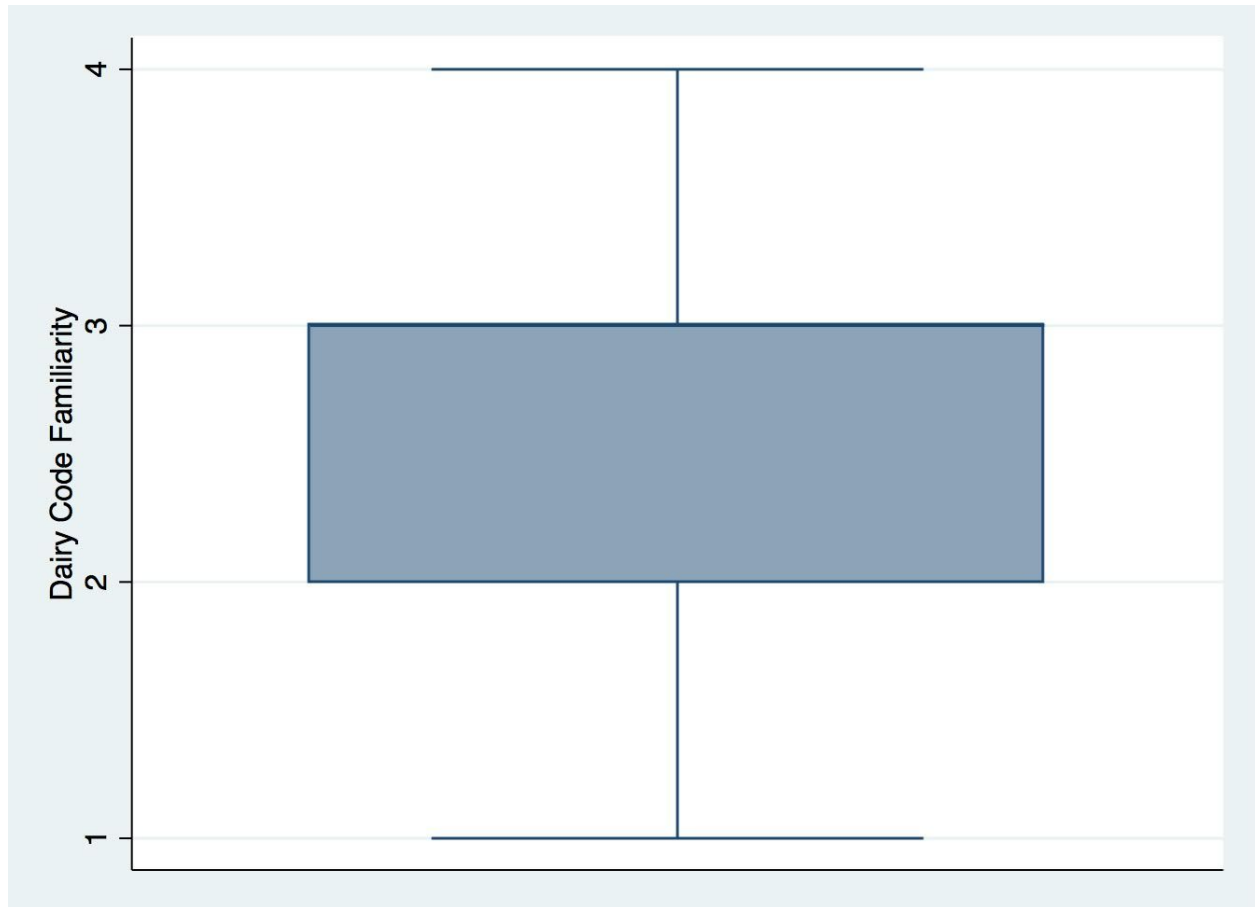
Figure 9: Boxplot representing respondents' familiarity of dairy producers with the Dairy Code of Practice. Familiarity scale: 0 (not familiar at all), 1 (slightly familiar), 2 (somewhat familiar), 3 (moderately familiar), and 4 (extremely familiar) (number of respondents = 29)
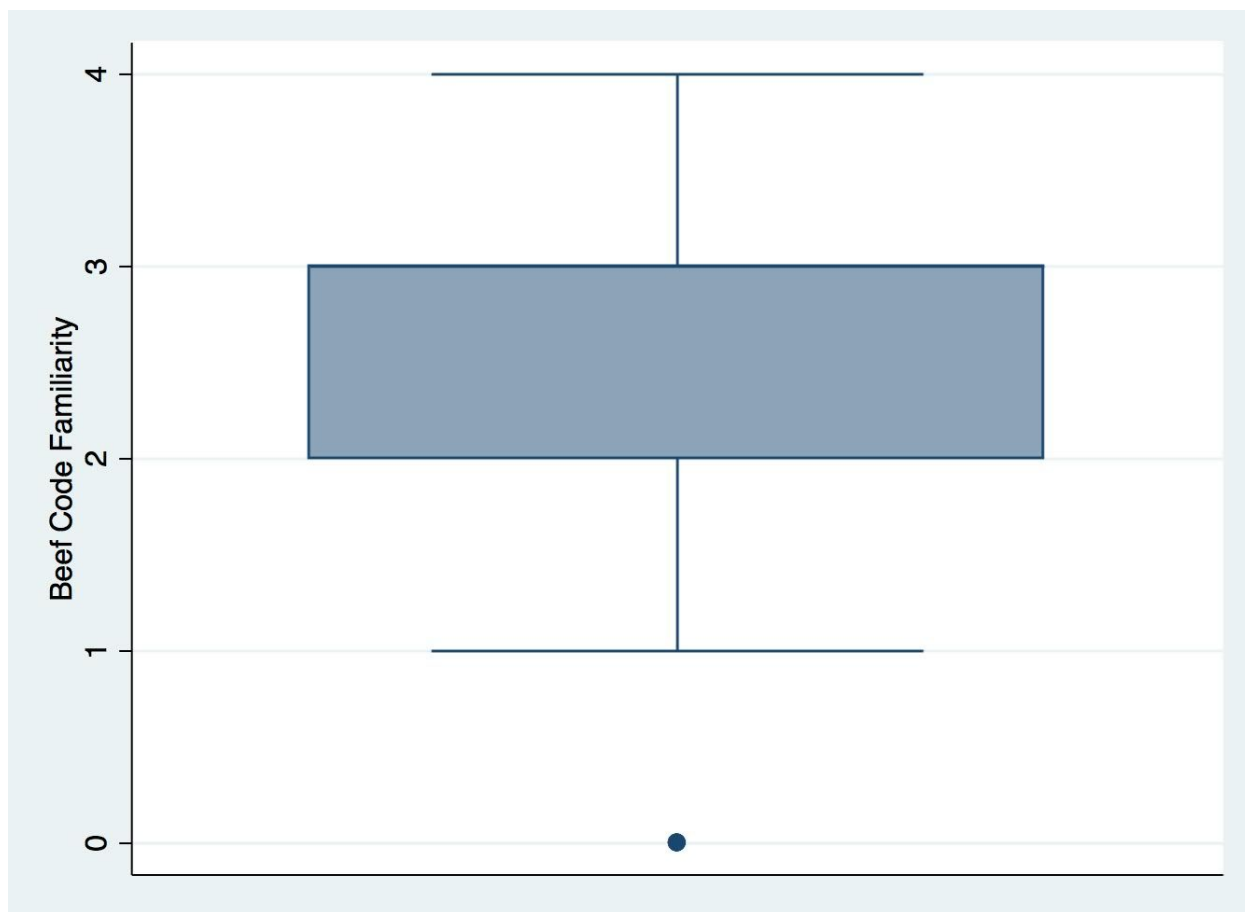
Figure 10: Boxplot representing respondents' familiarity of beef producers with the Beef Code of Practice. Familiarity scale: 0 (not familiar at all), 1 (slightly familiar), 2 (somewhat familiar), 3 (moderately familiar), and 4 (extremely familiar) (number of respondents = 82)

Producer familiarity with Codes of Practice for the Care and Handling of Dairy/Beef Cattle

There has been little research done on producer familiarity with the Codes of Practice for the Care and handling of Beef or Dairy Cattle. The Codes of Practice are intended to be used as a source of information for producers to take into consideration when deciding to transport animals and management practices in general. As such, we expected that producers would be quite familiar with the Codes of Practice and refer to it often. Based on our results, on average producers were somewhat to moderately familiar with the Codes of Practice. But based on individual producer responses, majority of producers were either slightly familiar or not familiar at all with the Dairy Code of Practice (DCOP), and somewhat to moderately familiar with the Beef Code of Practice (BCOP). Producers who were not familiar at all with the Codes of Practice may not be unaware that the Codes of Practice may be used in a court of law (FACN, 2013). Recommendations in the Codes of Practice (COP) often refer producers to a veterinarian with questions or concerns. Based on our results, majority of producers indicated they contact a veterinarian when unsure

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about transport fitness of their cattle. Therefore, to further educate producers on the Codes of Practice, extension efforts should focus on familiarizing veterinarians with the Codes of Practice that their clients use to improve veterinarian - client relationship and the industry as a whole.

Dairy producers showed a higher frequency of familiarity with the DCOP than beef producers with the BCOP (average familiarity = 3). This was because the results were not normally distributed, meaning on average dairy producers reported higher familiarity with the DCOP compared to beef producers with the BCOP. Similar to our findings for dairy producer familiarity with the DCOP, a study done by Tse (2016) found that producers ranked their knowledge of the DCOP as a score of 3 (IQR: 2-4). As for beef producer familiarity with the BCOP, similar to our results, Moggy (2016) found that beef producers are somewhat to moderately familiar with the BCOP. The results from these two studies are similar to ours, indicating that both dairy and beef producers are on average moderately familiar with their respective Code of Practice guidelines. Additionally, Moggy (2016) found that the province within which a producer was located did not affect the producers familiarity with the BCOP.

Producer familiarity with transport regulations

As our survey is the first to provide information regarding producer perceptions on factors that influence their decision making when transporting cull cattle, there is no known literature that looks at producer familiarity with transport regulations within Canada. When compared to familiarity with the Codes of Practice, producers were surprisingly less familiar with transport regulations on average (average= 2). With 14% of all producers not familiar at all with the transportation regulations. These results were concerning because producers have a legal obligation to comply with the federal transport regulations of Canada. Transport regulations are provided to enforce animal welfare by implementing it into law and the lack of familiarity among producers may indicate that compromised animals are being transported when they should not be. Extension efforts should focus on further educating producers about federal regulations, specifically the Regulations Amending the Health of Animals Regulations, as producers reported being least familiar with this regulation.

When all respondents were included, the top three most influential factors considered when transporting cattle for sale were animal's soundness/mobility (88%), animal's health/disease status (85%), and animal's body condition score (62%) (Figure 11). Similarly, the top three most influential factors considered by respondents when transporting cattle for slaughter were animal health/disease (87%), animal's soundness/mobility (84%), and animal's body condition score (73%) (Figure 12). The top three important factors respondents considered when transporting cull cattle were condition of animals (72%), trip duration (82%), and suitable flooring (72%) (Figure 13). The top three factors considered by respondents when euthanizing cattle on-farm were animal's quality of life (85%), severe injury (84%), and likelihood to recover (77%) (Figure 14).
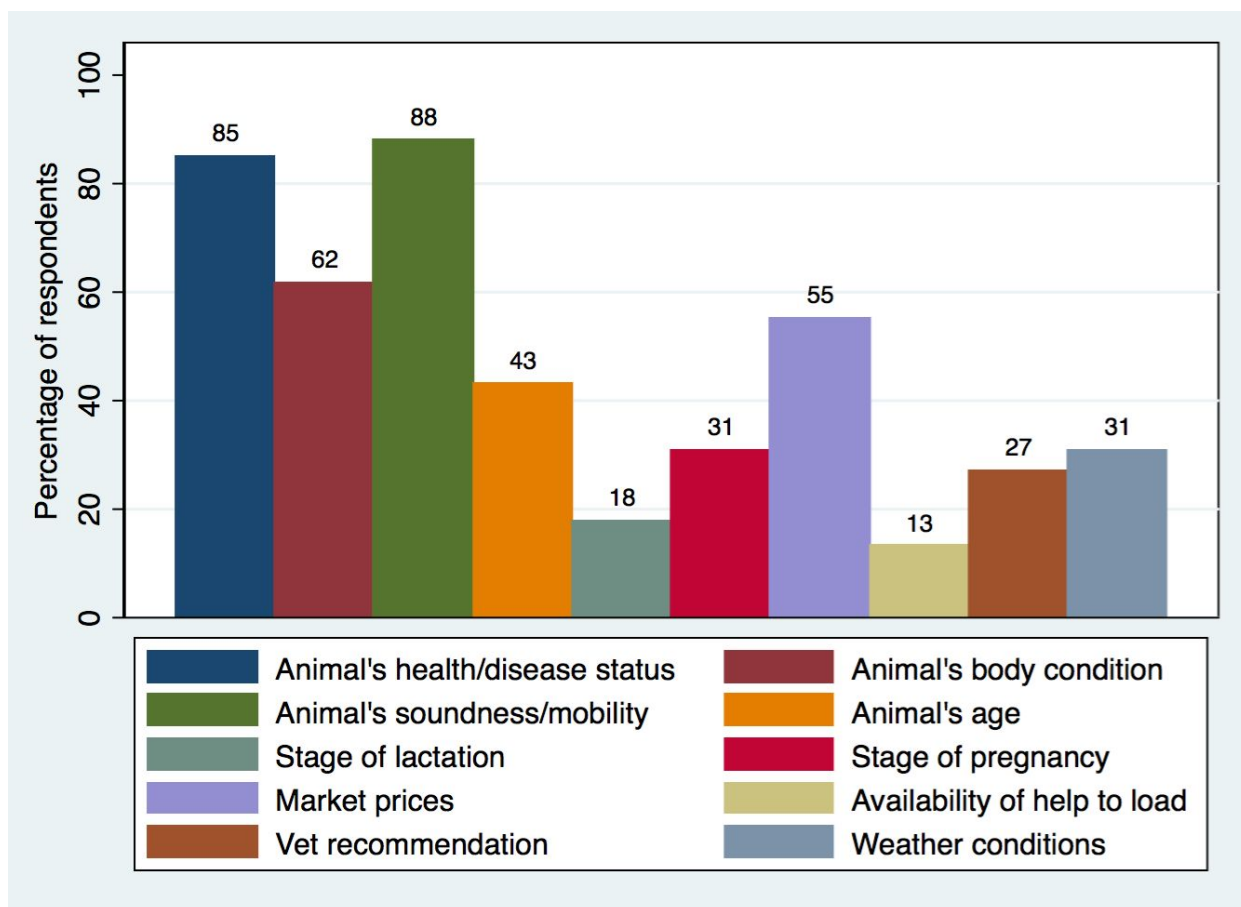
Figure 11: Bar graph of influential factors considered when transporting cattle for sale reported by survey respondents (number of respondents = 107)
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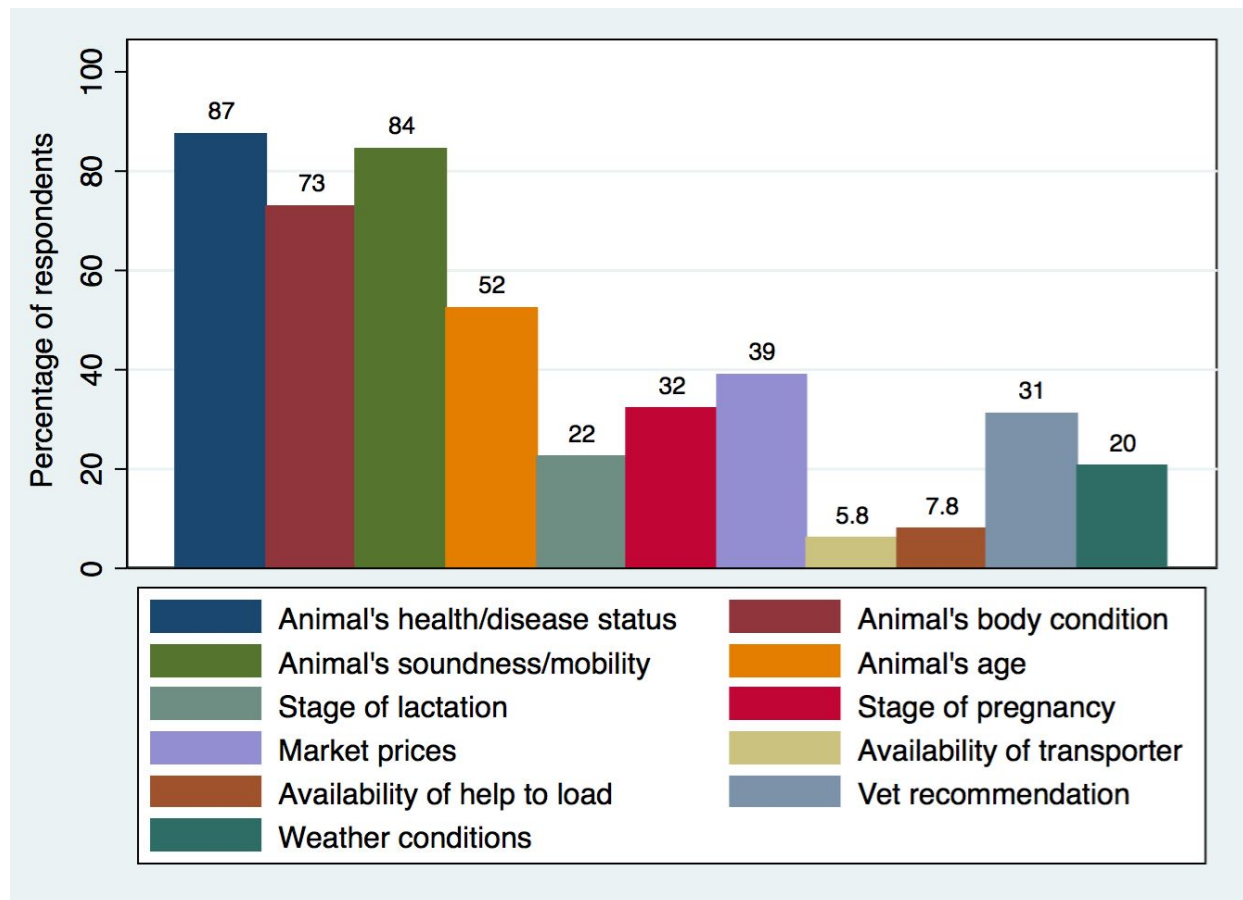
Figure 12: Bar graph of influential factors considered when transporting cattle for slaughter reported by survey respondents (number of respondents = 103) [2]

Producer perceptions on top 5 influential factors to consider when transporting cattle for sale and slaughter

Based on the survey results, all producers perceived animal's soundness and mobility, health and disease status, and body condition score as the top three influential factors when transporting cattle for both sale and slaughter. Similarly, in a study done by Spooner et al. (2012) on attitudes of Canadian beef producers towards animal welfare, producers emphasized the importance of animal health, referring to the animal's body condition score as one of the most reliable indicators of physical well-being. All three of these influential factors are addressed in "The Five Freedoms (Farm Animal Welfare Council, 1979): animals must have freedom from hunger and thirst, freedom from discomfort, freedom from pain, injury or disease, freedom to express normal behavior, and freedom from fear and distress." Thus producers should be more familiar and recognize deviations from what is "normal". Although our results showed that animal health and disease is important to producers, preliminary studies done by AFAC have shown that heavily lactating

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[2] The total percentage was greater than 100% as respondents could select more than one option

cows are still arriving at auction markets as well as animals with decreased mobility (Diether, Personal Communication, 2017). Here's a place where there is a disconnect between producers desire to maintain good welfare of animals and identification of certain conditions of animals at risk, or producers are not aware that these animals are considered compromised in the legislation prohibiting shipment for sale at auction (Dither, Personal Communication).
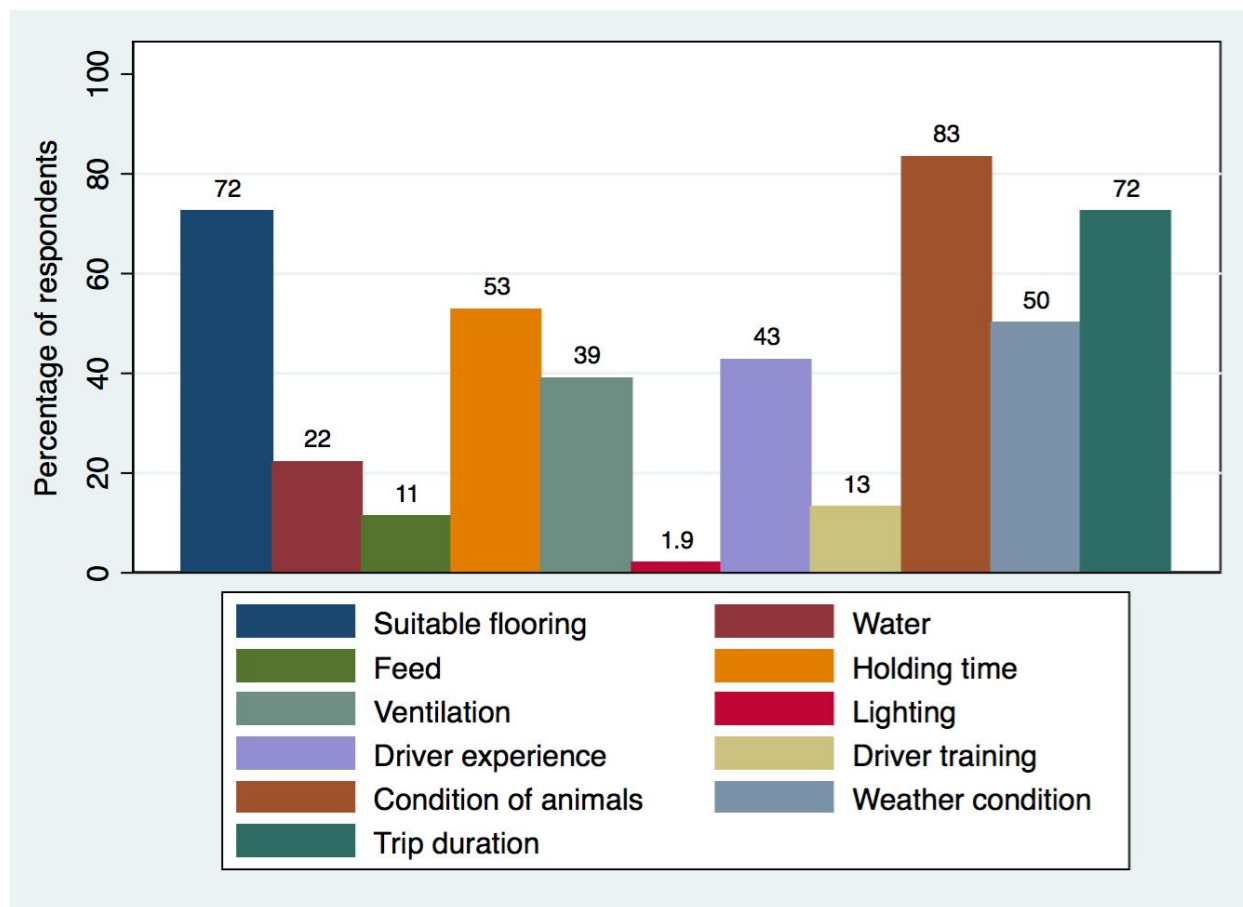
Figure 13: Bar graph of top factors to consider when transporting cull cattle reported by survey respondents (number of respondents = 108).[3]

All producers perceived condition of animals, trip duration, and suitable flooring as the top 3 important factors to consider when transporting animals. There have not been previous studies on producer perceptions on factors to consider when transporting cull cattle. It has been documented that the adverse effects of transportation vary by animal age, size, and condition. Cull cattle are more likely to become non-ambulatory during transit or arrive dead at final destination compared to calves and feeders

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[3] The total percentage was greater than 100% as respondents could select more than one option

(Schwartzkopf-Genswein et al., 2012). Similarly, Thomson et al. (2015) stated that transportation can severely compromise animal welfare of cull cattle, especially if the cattle are already suffering. Knowing this, producer's seemed to understand that it is important to consider the condition of cull cattle before transporting them. Studies have shown that transportation distance/duration has potential to significantly impact animal welfare and meat quality in beef cattle (Schwartzkopf-Genswein et al., 2012). As such, producers selecting trip duration as an important factor to consider when transporting cull cattle indicated that producers understand the implications trip duration has on animal welfare. Previous studies have shown that type of flooring (for example: concrete) is instrumental to the development of lameness in dairy cows. Lameness is one of the most serious welfare issues for dairy cows (O'Driscoll et al., 2009), therefore not surprisingly producers chose suitable flooring as one of the most important considerations when transporting cull cattle.
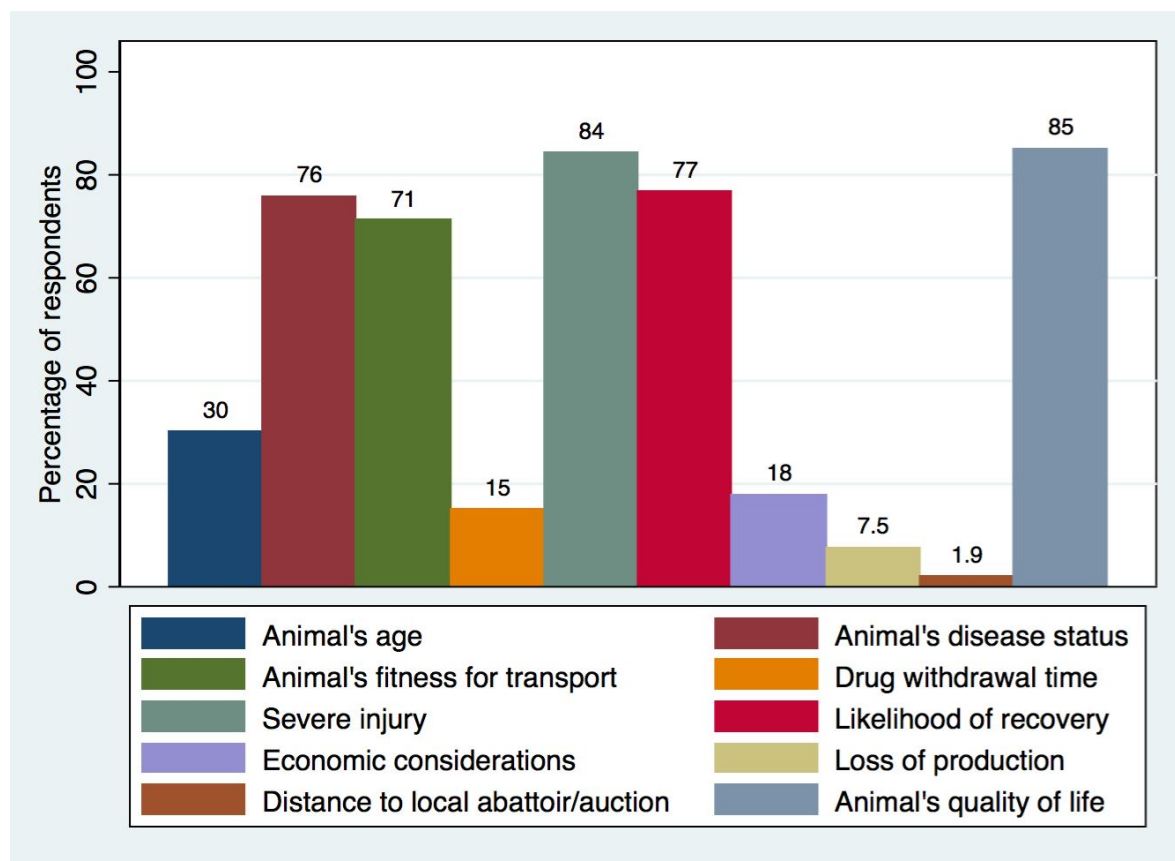
Figure 14: Bar graph of all factors considered when deciding to euthanize on farm by survey respondents (number of respondents = 107).[4]

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[4] The total percentage was greater than 100% as respondents could select more than one option

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Based on our results, majority of producers perceived animal's quality of life, severe injury, and likelihood of recovery as the top three influential factors when deciding to euthanize cattle on-farm. Similarly, Moggy (2016) found that the most common factor that influenced producers' decision to euthanize on-farm was likelihood of recovery from injury or disease (73%). The ability to transport cattle also influenced producers; for example non-ambulatory or animals with broken limbs required euthanasia (Moggy, 2016). This indicates that producers do recognize and take into consideration the animal's well-being.

Question 1) Does Producer Type Affect:

a.   *Top 5 influential factors producers consider when deciding to transport cattle for sale*

When the effect of producer type on top five influential factors was analyzed, the Fisher's Exact test showed that operation type significantly affected the selection of animal health and disease status (p=0.025) and stage of lactation (p=0.002) as one of the respondents' top 5 influential factors when deciding to transport cattle for sale (Figure 15-16). Stage of lactation, was identified as important by a larger proportion of dairy and mixed operation producers compared to beef producers when deciding to transport cattle for sale (Figure 16). Animal health and disease, was identified as important by a larger proportion of dairy and mixed operation producers compared to beef producers when deciding to transport cattle for sale (Figure 11). Producer type did not affect the significance of the other influential factors for sale (Appendix VI).
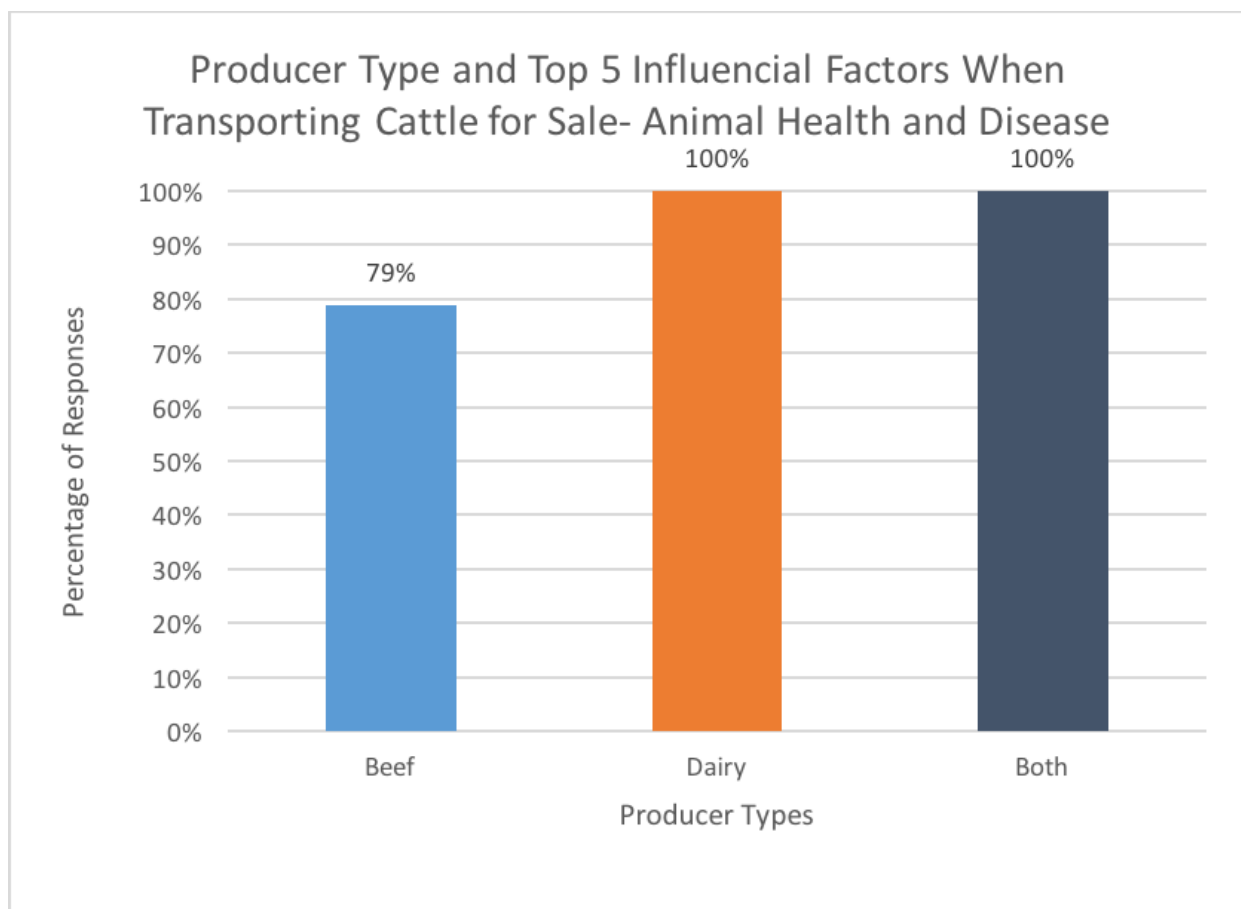
Figure 15: Bar graph of producers, by producer type, selecting animal health and disease as one of the top 5 influential factors to consider when transporting cattle for sale (number of respondents = 105).
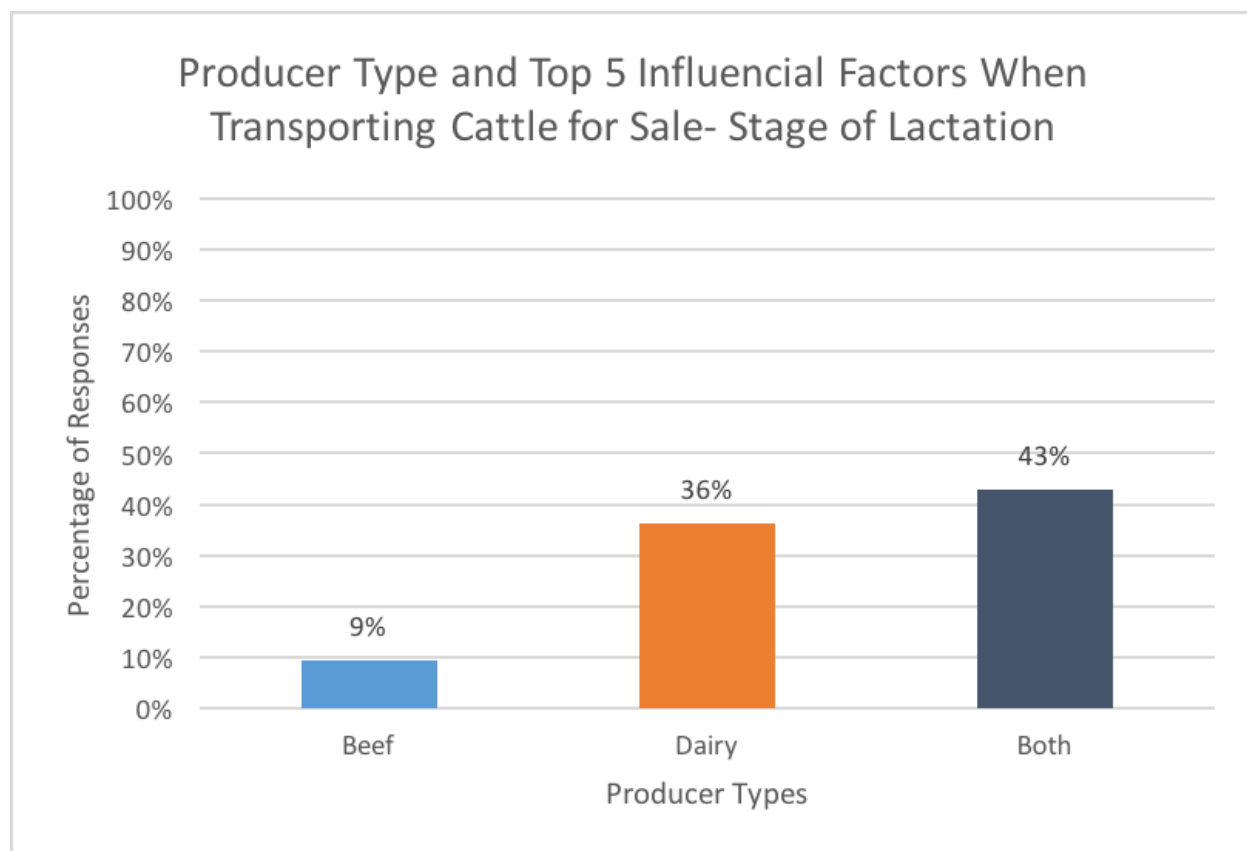
Figure 16: Bar graph of producers, by producer types, selecting stage of lactation as one of the top 5 influential factors when transporting cattle for sale (number of respondents = 105).

Fewer beef producers (79%) selected animal health and disease as an influential factor when deciding to transport cattle for sale than non-beef producers (100%). This may be due to a variety of reasons, for example: it may be important but not in their top five, or beef producers may not ship sick animals. Considering our survey population consisted of mostly beef producers, we would expect more variation in producer perceptions. The survey indicated that only 36% of dairy producers and 9% of beef producers perceived stage of lactation as an important consideration when deciding to transport cattle for sale. This is very concerning because it is clearly stated in the Codes of Practice and regulations that heavy lactating cows should not be transported and are considered compromised for transport (NFCCA, 2009). Also, fully engorged, and pendulous udders in dairy cows may be more susceptible for injury during transport which could negatively affect the animal's welfare. Further extension efforts should focus on educating dairy producers in particular, about the importance of drying off cows before transport for sale.

b. Top 5 influential factors producers consider when deciding to transport cattle for slaughter

When analyzing the effect of producer types on the top five influential factors, the Fisher's Exact test showed that the the number of respondents selecting stage of lactation for slaughter ($p<0.001$) differed by producer type (Figure 17). Stage of lactation was identified as important by a larger proportion of dairy and multiple operation producers compared to beef producers when deciding to transport cattle for slaughter. Producer type did not affect the significance of the other influential factors for slaughter (Appendix VI).
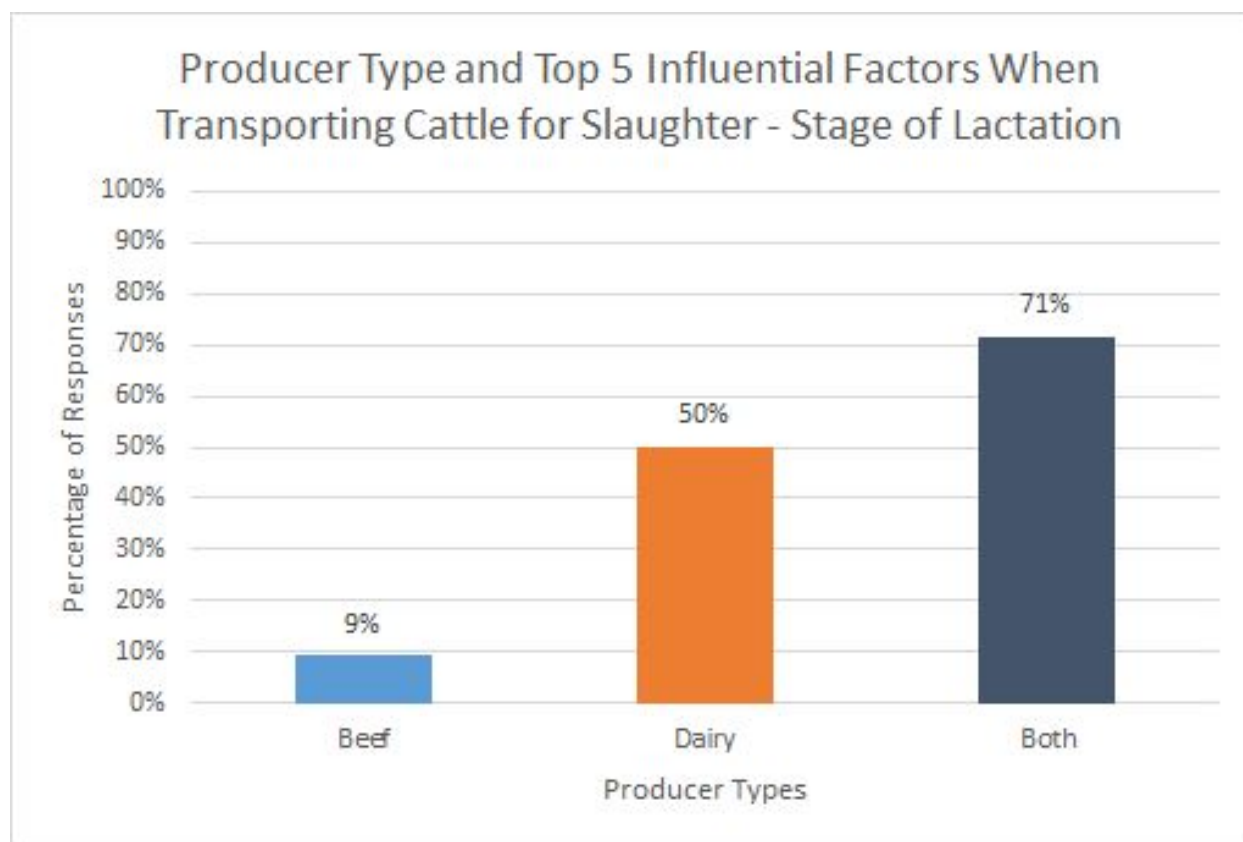
Figure 17: Bar graph of producers, by producer type, selecting stage of lactation as one of the top 5 influential factors to consider when transporting cattle for slaughter (number of respondents = 101)

Stage of lactation as an influential factor, appeared to be more important for dairy producers than beef producers based on the survey results. However, there is reason to believe that stage of lactation is less concerning when lactating cows are shipped directly for slaughter as the dairy code of practice suggests to ship heavy lactating cow directly to abattoir unless the cow is dried off (NFCCA, 2009).This is because lactating cows may not stand for transportation stress caused by a long period of subsequent transportation at auction markets.

c. The top 5 most important factors when deciding to euthanize on farm

When analyzing the effect of producer type on top five influential factors when euthanizing on farm, the Fisher's Exact test showed that the number of respondents selecting animals age ($p=0.008$) and economic considerations ($p=0.038$) as one of the respondents' top 5 influential factors differs by producer type (Figure 18-19). Animal's age, was identified as important by a larger proportion of beef and multiple operation producers compared to dairy producers when deciding to euthanize on farm (Figure 18). Economic considerations, was identified as important by a larger proportion of dairy producers compared to beef and multiple operation producers (Figure 19). Producer type did not affect the significance of the other influential factors when considering euthanizing on farm (Appendix VI).
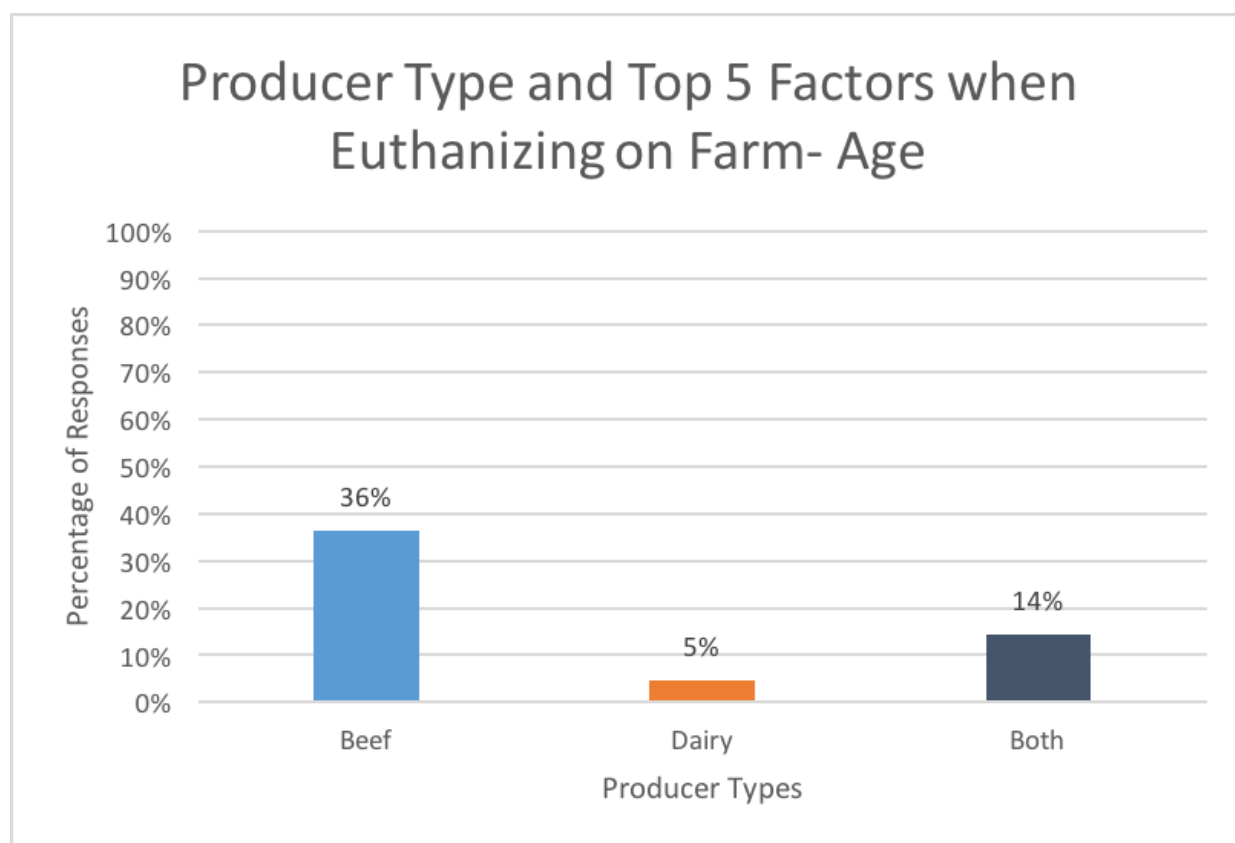
Figure 18: Bar graph of producers, by producer type, selecting age as one of the one of the top 5 factors to consider when euthanizing on-farm (number of respondents = 105)
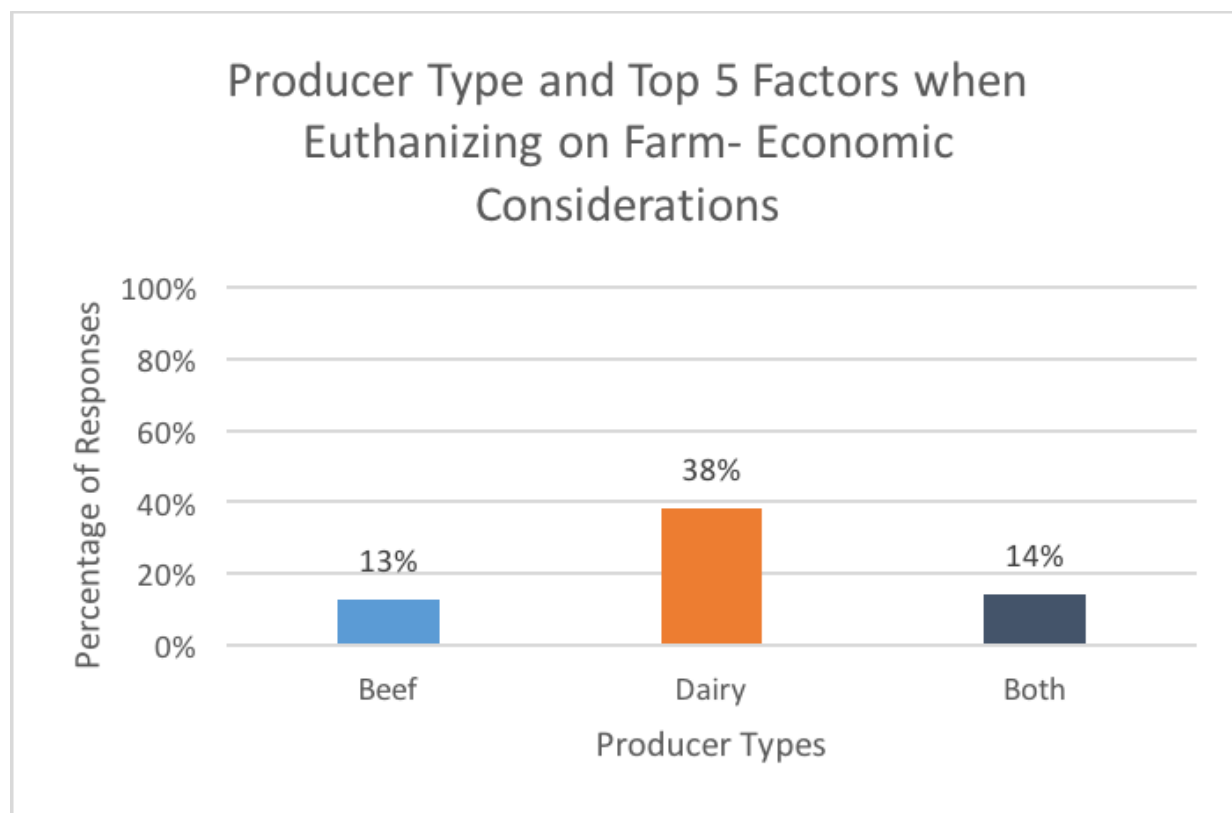
Figure 19: Bar graph of producers, by producer type, selecting economic considerations as one of the top 5 factors to consider when euthanizing on farm (number of respondents = 105).

Dairy producers and multiple operation producers perceived animal's age as less influential when deciding to euthanize cattle on-farm. This could be explained by the fact that open cows are one of the biggest reasons dairy cows are culled as they will not continue to produce milk without giving birth to a calf (GAAF, 2015). The average Canadian dairy herd conception rate was only 38% in 2007 (Ambrose and Colazo, 2007). Beef producers expressed a higher concern regarding animal's age as beef cattle are more likely to become less productive due to old age which is different compared to dairy cows (Osoro and Wright, 1992). Indicating beef producers may be more likely to euthanize a beef cow on farm due to old age compared a dairy cow by dairy and multiple operation producers. Dairy producers perceived economic considerations as more influential than beef producers based on our results. This may have been because milk from dairy cows are supply managed in Canada (CDC, 2017). For example, if a farm produces more than its quota limit and the producer could not sell that milk, the producer may cull those cows based on economic reasons.

d. The top 5 factors to consider when transporting animals

When the effect of producer types on top five influential factors was analyzed, the Fisher's Exact test showed that the number of respondents selecting driver experience (p=0.032) as one of their top 5 influential factors to consider when transporting animals differed by producer type (Figure 20). Driver experience was identified as important by a larger proportion of beef and dairy producers as mixed operation producers did not select driver experience as one of the top 5 factors to consider when transporting. Producer type did not affect the significance of the other influential factors when considering to transport (Appendix VI).
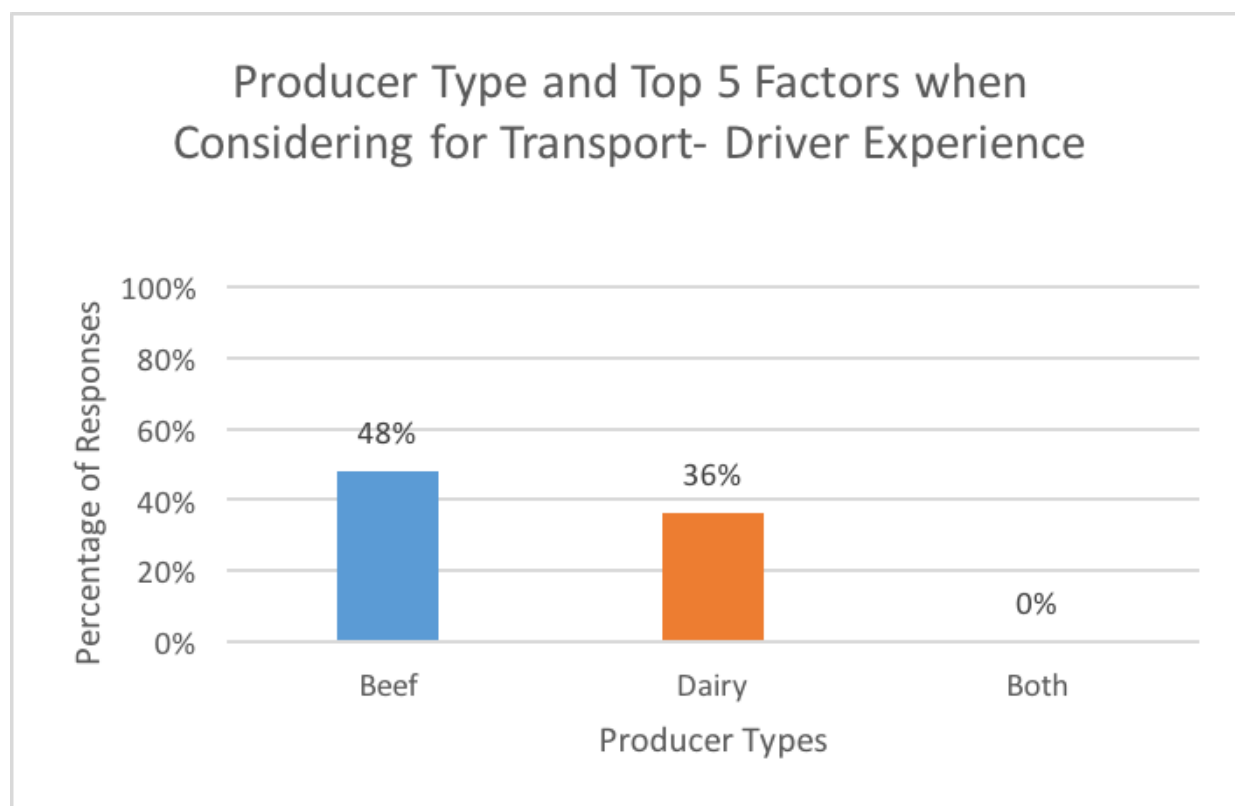
Figure 20: Bar graph of producers, by producer type, selecting driver's experience as one of the top 5 factors to consider when transporting cattle (number of respondents =106).

None of the multiple operation producers selected driver's experience as an influential factor to consider when transporting animals, indicating that multiple operation producers may not have considered driver's experience as influential as beef and dairy producers did. We cannot assume that driver's experience was not influential at all because it may not have been in their top five choice for multiple operation producers. The Majority of producers indicated that they transported their cull cattle themselves, for this reason experience level may not have been an influential factor. Overall, there are positive impacts for animal welfare when producers are considering driver's experience as influential when transporting cattle.

Previous study suggests that more experienced drivers may be more competent and vigilant with animal care, handling, and risk factors associated with reducing animal transportation stress (González et al, 2015).

e. The familiarity of the Beef Code of Practice

When the effect of producer types on the familiarity of the Beef Code of Practice (BCOP) was analyzed, the Kruskal Wallis test showed that there was a statistically significant difference in familiarity between beef producers and non-beef producers (p=0.0005) (Appendix VI). There was no statistical significance for mixed operation producers and familiarity with the BCOP (Appendix VI).

f. The familiarity of the Dairy Code of Practice

When the effect of producer types on the familiarity of the Dairy Code of Practice (DCOP) was analyzed, the Kruskal Wallis test showed that there was a statistically significant difference in familiarity between dairy producers, and non-dairy producers (p=0.0001) (Appendix VI). The Kruskal Wallis test also showed that there was a statistically significant difference between familiarity of both producers and single type producers, and multiple operation producers with the DCOP (p=0.0227) (Appendix VI).

Question 2) Does years of experience affect:
a.   The top 5 influential factors to consider when deciding to transport cattle for sale

Years of experience did not affect the significance of respondents' selection of their top 5 influential factors when deciding to transport cattle for sale (Appendix VI).

Based on the survey results, years of experience did not affect producers perception on influential factors to consider when transporting cattle for sale. The majority of producers expressed similar perceptions on the influential factors for sale. For example, the majority of producers expressed higher concerns over animal health and disease, animal BCS, and soundness and mobility compared to stage of lactation. This indicates that stage of lactation may not be considered as important as the other factors previously mentioned.

b. The top 5 influential factors to consider when deciding to transport cattle for slaughter

When the effect of years of experience on respondents' selection of top five influential factors when deciding to transport cattle for slaughter was analyzed, the Mann-Whitney U-test showed that the number of respondents selecting weather conditions (p=0.0314) differed significantly by years of experience (Figure 21). There was a statistically significant difference between the underlying distributions of years of experience in respondents that selected weather conditions and the years of experience in respondents that did not (Figure 21). Weather conditions were identified as influential by a larger proportion of respondents who had 51 to 60 years experience (Figure 21). There was a trend towards significance for animal's age

(p=0.0898) as an influential factor for slaughter indicating there may have been a difference in producer's perspective with different years of experience (Appendix VI).
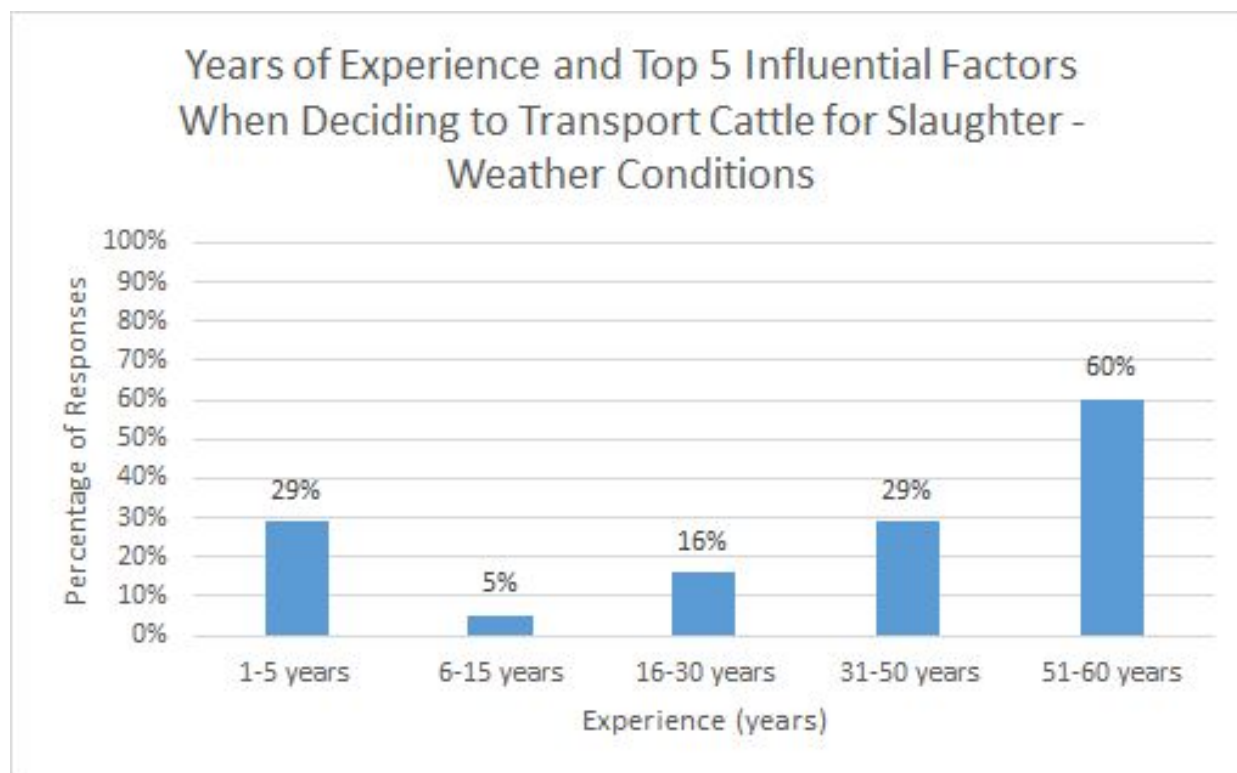
Figure 21: Bar graph of producers, by years of experience, selecting weather conditions as one of the top 5 influential factors to consider when transporting cattle for slaughter (number of respondents = 99).

Contrary to producer perceptions on influential factors for sale, years of experience did affect producer's perception on weather condition as an influential factor for slaughter. Producers with over 50 years of experience perceived weather conditions as influential compared to other producers indicating that on their operations, weather may be a major determinant as to whether or not they can transport their cull cattle compared to other producers. Based on producer perceptions, the increasing concern towards weather conditions with increasing experience also potentially indicates that years of experience affects producer decisions when deciding to transport cattle for slaughter. Producers with 1-5 years of experience that expressed higher concerns for weather conditions may be due to the fact that the welfare standards have increased over the years and are covered in the Codes of Practice for the protection of animals from harsh environment during transportation (NFACC, 2013).

c. The top 5 most important factors when deciding to euthanize on farm

When the effect of years of experience on top five important factors when deciding to euthanize on farm was analyzed, the Mann-Whitney U-test showed a statistically significant difference in the number of respondents selecting severe injury ($p=0.0021$) as one of their top 5 influential factors and the respondent's years of experience (Figure 21). A larger proportion of respondents with ≤30 years of experience indicated that severe injury was an important factor when deciding to euthanize cattle on-farm (Figure 18). Years of experience did not affect the significance of the other important factors considered for euthanasia on-farm (Appendix VI).
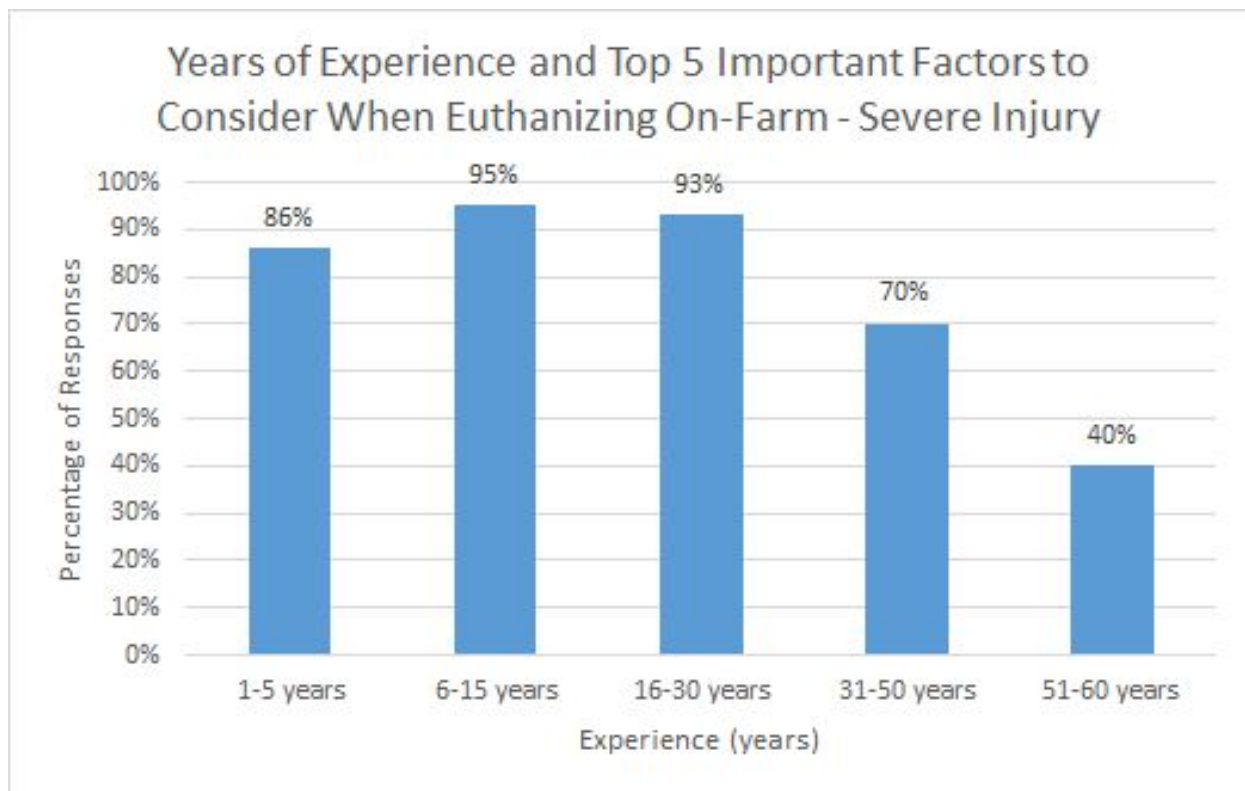
Figure 18: Bar graph of producers, by years of experience, selecting severe injury as one of the top 5 important factors to consider when euthanizing on-farm (number of respondents = 103).

For the survey results, it was expected that there would be no difference in producer's selecting severe injury as an important factor when deciding to euthanize on farm because if cattle's health is severely compromised, euthanasia may be the best option to end suffering of the animal. Based on the survey results, producers with ≥ 50 years of experience (40%) expressed less concern with severe injury as an important factor compared to other experience groups (86%). This may be because producers with more experience may be habituated to seeing severely injured animals on farm, for example animals with the inability to stand

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or walk, advanced cancer eye, fractured leg (irreparable), severe trauma, multiple joint infections, severe pain, or severely thin (Tarabah et al., 2016; OFAC, 2010), therefore, may not be as concerned with severe injury as an influential factor compared to other considerations. As stated by the Dairy Code of Practice (2009) that "cattle with untreatable conditions, not responding to treatment, or not fit for transport must be euthanized promptly". Choosing severe injury as an important factor indicates that majority of producers are concerned of the animal's welfare and intend to minimize suffering from injury and sickness by euthanizing cattle on-farm.

d. The choice of contact person when unsure if an animal is fit for transport

When the effect of years of experience on choice of contact person was analyzed, the Mann-Whitney U-test showed a statistical difference in the number of respondents selecting other producers (p=0.0017) as their contact person. A larger proportion of respondents with 6 to 15 years experience indicated that they would contact other producers when unsure about transport fitness of their cattle (Figure 19).
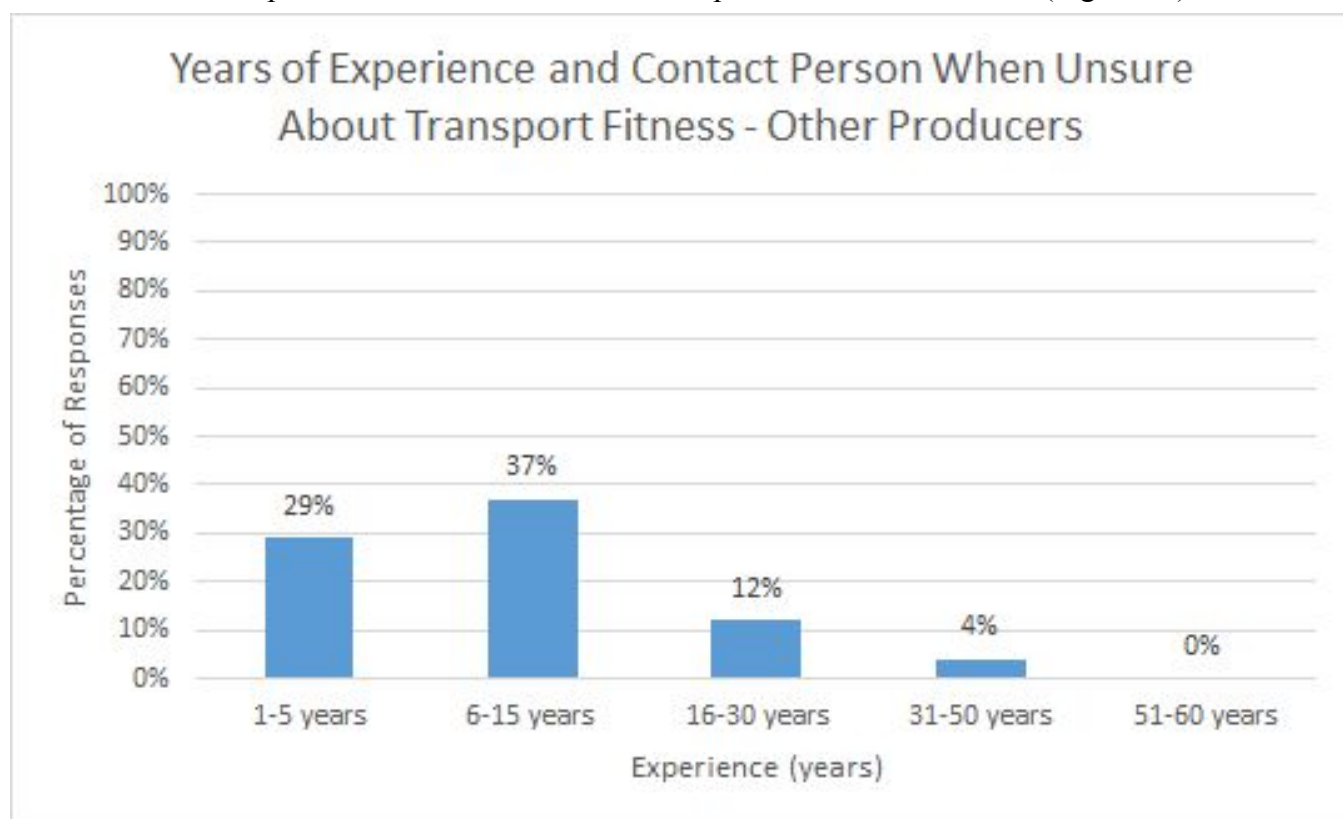
Figure 19: Bar graph of producers, by years of experience, selecting other producers as their contact person when unsure about transport fitness (number of respondents = 99).

Producers who had less experience were more likely to contact other producers compared to producers who had more experience. Indicating that producers with less experience may seek guidance from other

producers who most likely have more experience than they do and have a better understanding of transport fitness. Producers >50 years of experience did not consult other producers when unsure about transport fitness, instead by preference they chose to contact veterinarians or auction manager/owner. Veterinarians and auction managers/owners were the top two choices for contact person by producers in all experience groups. This indicates that producers trust medical professionals and auction managers/owners, and that their knowledge on transportation fitness may be influential to producers when deciding which cattle are fit for transport. However, veterinarians may be unfamiliar with the Code of Practice guidelines in regards to transportation fitness and thus, unable to provide appropriate information to producers (Moggy, 2016). The same assumption could be made about auction managers/owners as well, however, there are no completed or ongoing studies looking at auction manager/owner familiarity with transport regulations or Codes of Practice. Incorrect or insufficient information may result in compromised animal welfare because cattle may be transported that should not be. Extension efforts should focus on educating veterinarians and auction managers/owners on the transport regulations and Codes of Practice so that they can more confidently answer questions producers may have about transport fitness of cull cattle. It is also important to mention that the Alberta SPCA was the least chosen contact person among all producers. This may be because producers are concerned that the Alberta SPCA works collaboratively with peace officers and thus obligated to report any type of potential compromised welfare such as suspected animal neglect or abuse. Such acts may potentially lead to investigation of their operation (Alberta SPCA, 2017; NACF, 2013; Appendix VI).

Question 3) Does proximity to abattoir affect:

a.   The top 5 influential factors to consider when deciding to transport cattle for sale

When the effect of proximity to abattoir on top five influential factors for sale was analyzed, the Mann-Whitney U-test showed a statistically significant difference in the number of respondents selecting body condition score (BCS) (p=0.0206) as one of their top 5 influential factors (Figure 20). There was also a tendency for both market price (p=0.0869) and weather condition (p=0.0873) as influential factors when transporting for sale (Appendix VI), indicating there may have been a difference in producer's perspective based on their proximity to abattoir. Proximity to abattoir did not appear to affect the significance of the other influential factors for sale (Appendix VI).
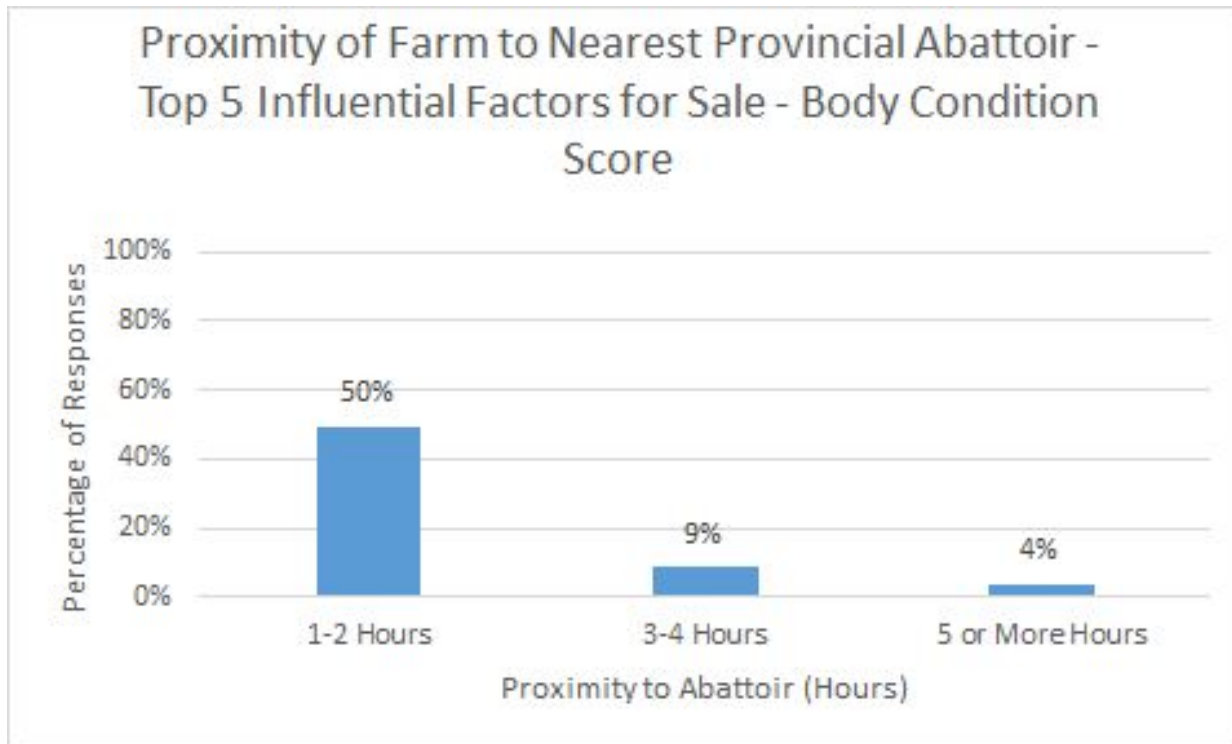
Figure 20: Bar graph of producers selecting animal body condition score as one of the top 5 influential factors to consider when transporting cattle for sale based on proximity of farm to nearest provincial abattoir (number of respondents = 105).

Based on the survey results, majority of producers are within 1-2 hours from the nearest provincial abattoir. It was surprising to find that 50% of producers between 1-2 hours away from nearest provincial abattoir perceived BCS of cattle as an influential factor to consider before transporting for sale, whereas producers much further away from an abattoir expressed much less concern over the BCS of cattle. This finding was unexpected because based on the Beef Cattle Research Council (2017), a drop of of one BCS from 3.0 to 2.0 requires a decrease of 200lbs of body weight for a 1400 lbs cow. It is highly unlikely that cull cattle would lose such a large amount of body weight if they were transported to an abattoir within 2 hours distance. Meaning transportation of short duration should not affect body condition score at slaughter. This indicates that if cattle arrived at an abattoir thin, they probably are under-conditioned before being transported. However, producers being concerned with animals BCS also indicates that they worry about the price of cattle that were transported for sale, as a higher BCS indicates higher body weight and producers will get paid in respect to weight of their cattle (BCRC, 2017).

b. The top 5 influential factors to consider when deciding to transport cattle for slaughter

When the effect of proximity to abattoir on top five influential factors was analyzed, the Mann-Whitney U-test showed that there was a statistically significant difference in the number of respondents selecting animal's health and disease status (p=0.0303) and vet recommendation/diagnosis (p=0.0095) as one of the top 5 influential factors (Figure 21-22). A larger proportion of respondents 1 to 2 hours from the nearest provincial abattoir selected animal health and disease status as influential (Figure 24). Only a small proportion of respondents who were 2 or more hours from the nearest provincial abattoir selected vet recommendation/diagnosis as influential (Figure 22). There was also a tendency for both body condition score (p=0.0894) and soundness/mobility (p=0.0956) as influential factors when transporting cattle for slaughter (Appendix VI). This trend indicates that there may have been a difference in producer's perspective based on their proximity to abattoir. Proximity to abattoir did not appear to affect the significance of the other influential factors for slaughter.
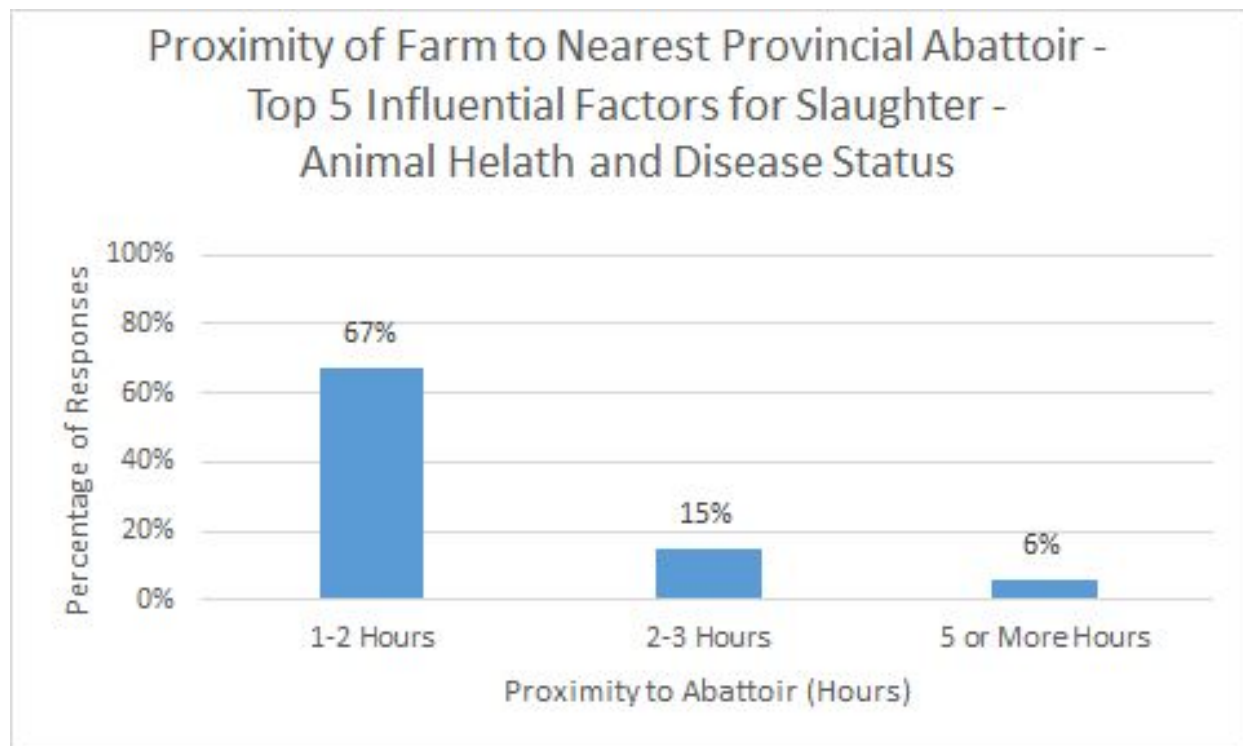
Figure 21: Bar graph of producers selecting animal health and disease as one of the top 5 influential factors to consider when transporting cattle for slaughter based on proximity of farm from nearest provincial abattoir (number of respondents = 101).
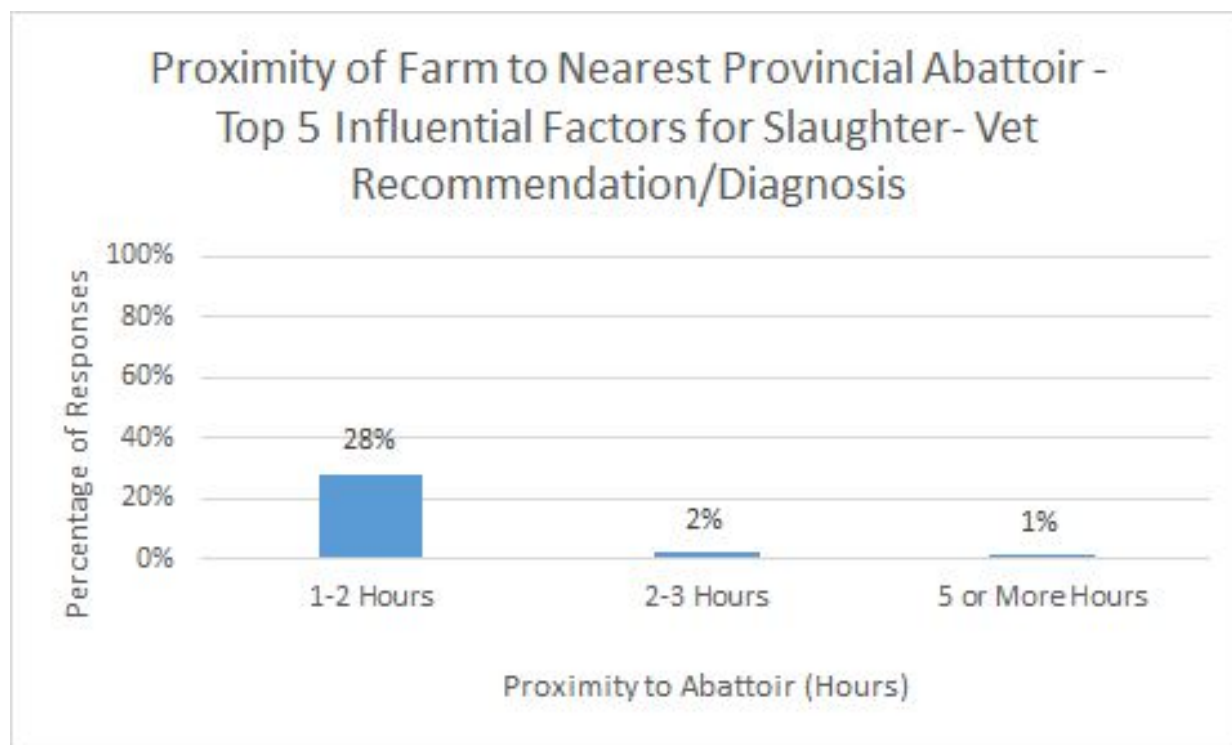
Figure 22: Bar graph of producers selecting veterinarian recommendation/diagnosis as one of the top 5 influential factors to consider when transporting cattle for slaughter based on proximity of farm from nearest provincial abattoir (number of respondents = 101).

Overall, producers located 1-2 hours from nearest provincial abattoir are concerned with animal's health and disease status and veterinary recommendation/diagnosis to a greater extent than all other producers as influential factors to consider when transporting cattle for slaughter. The significant difference in selection between producers of these influential factors may indicate that producers who are closer are more proactive and that our sample population was not representative of all producers. As well, the trend towards significance for animal's BCS indicates that producers are concerned with BCS as an influential factor for slaughter, however, concerning that the National Market Cow and Bull Quality Audit found that dairy cows were arriving at slaughtering facilities with poor BCS of 1 or 2 at an increasing rate since 1994 (Grandin, 2000). The increase in under-conditioned dairy cows arriving at slaughter facilities is concerning considering half of the producers who responded to the survey chose BCS as an influential factor for sale.

c. The top 5 most important factors when deciding to euthanize on farm

When the effect of proximity of farm to nearest provincial abattoir on top 5 important factors when deciding to euthanize on farm was analyzed, the Mann-Whitney U-test showed that the number of respondents selecting likelihood of recovery (p=0.028), and animal's quality of life (p=0.032) as one of the top 5 important factors when deciding to euthanize on farm differs by proximity of farm from nearest

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provincial abattoir (Figure 23-24). A larger proportion of respondents 1-2 hours from the nearest provincial abattoir selected both likelihood of recovery and quality of life as important (Figure 23-24).
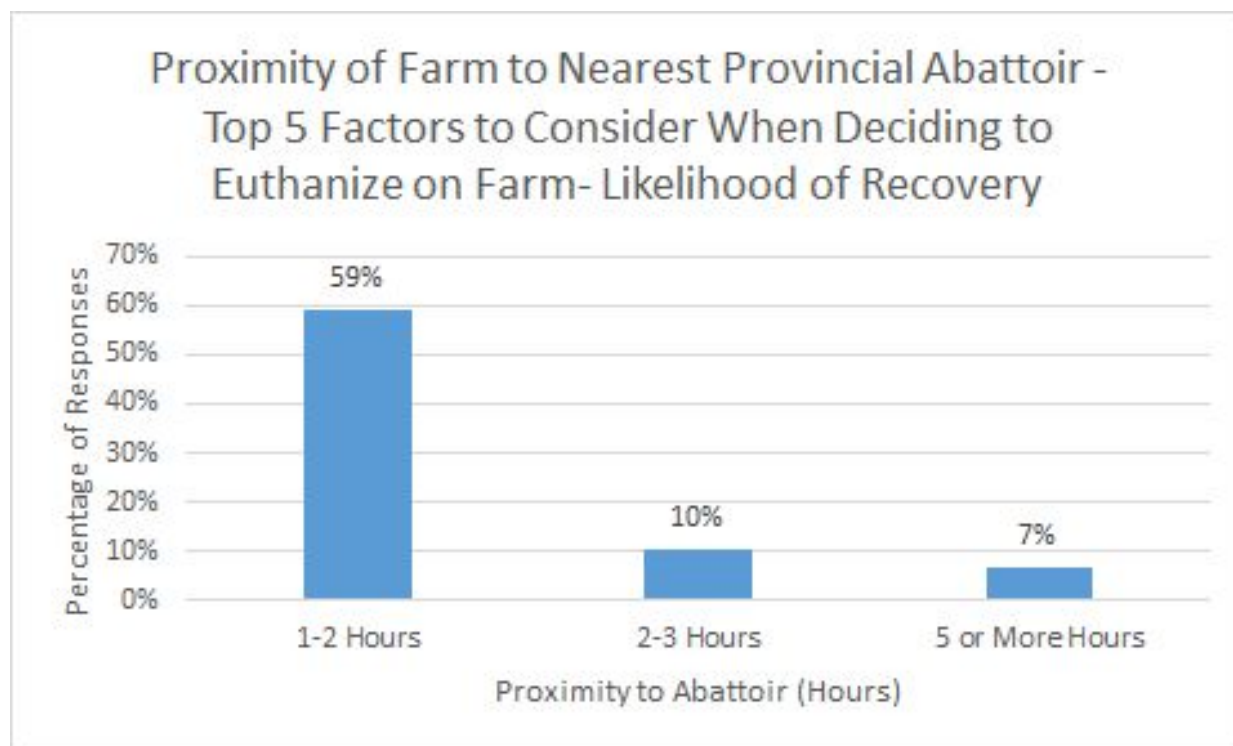
Figure 23: Bar graph of producers who selected likelihood of recovery as one of the top 5 factors to consider when deciding to euthanize on-farm based on proximity of farm to nearest provincial abattoir (number of respondents = 107).
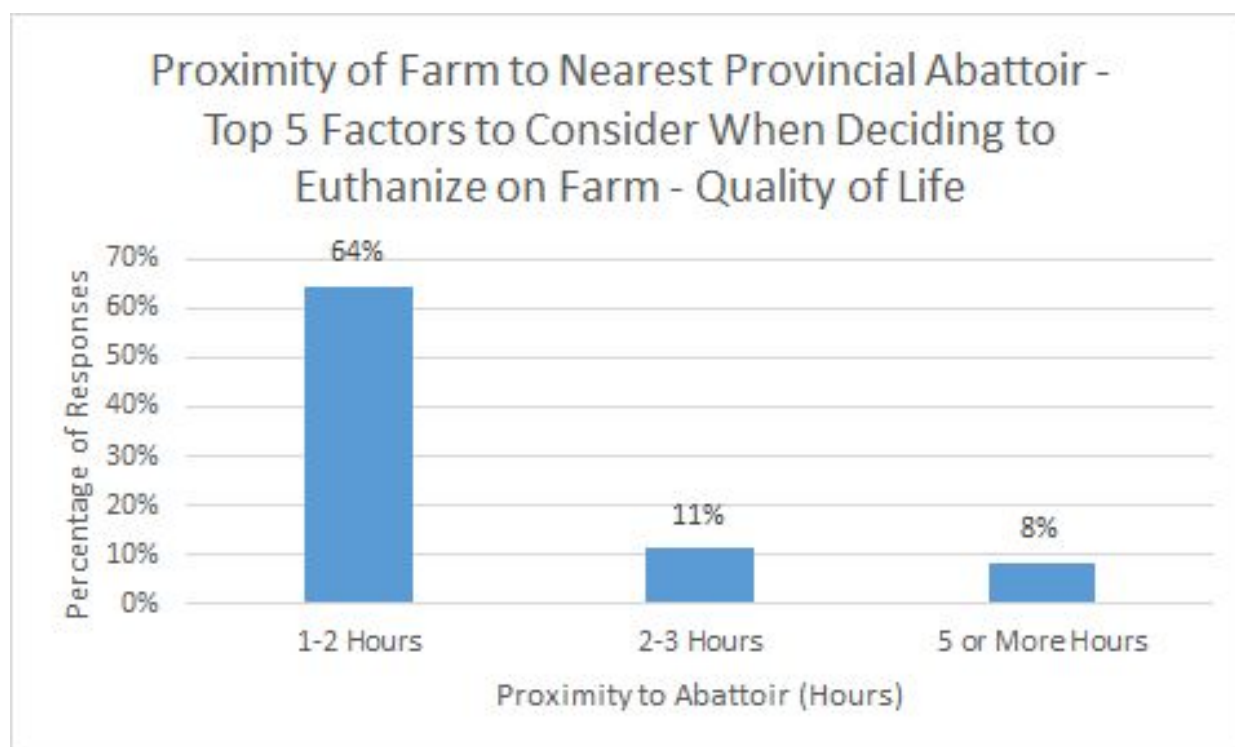
Figure 24: Bar graph of producers who selected animal's quality of life as one of the top 5 factors to consider when deciding to euthanize on farm based on proximity of farm to nearest provincial abattoir (number of respondents = 107).

Similar to the top 5 influential factors for sale and slaughter, producers who were 1-2 hours from the nearest provincial abattoir perceived animal's likelihood of recovery and animal's quality of life as more important factors to consider when euthanizing on farm compared to other experience groups. Indicating that these producers may value the likelihood of recovery and animal's quality of life to a greater extent compared to other producers who were located farther away from an abattoir. This relates to producer's concern on severe injury as an influential factor for euthanasia on-farm because euthanizing severely injured animals may be closely related to an animal's quality of life and likelihood of recovery.

d. The top 5 factors to consider when transporting animals
When the effect of proximity of farm to nearest provincial abattoir was analyzed, the Mann-Whitney U-test showed that there was a statistically significant difference in the number of respondents selecting suitable flooring ($p=0.0083$), ventilation ($p=0.0429$), driver experience ($p=0.0362$), and condition of animals ($p=0.0059$) as one of the top five factors they consider when transporting cattle (Figure 25-28). A larger proportion of respondents 1-2 hours from the nearest provincial abattoir identified these four factors as influential factors to consider for transport (Figure 25-28). Proximity to nearest provincial abattoir did not affect the significance of the other factors considered when transporting animals (Appendix VI).

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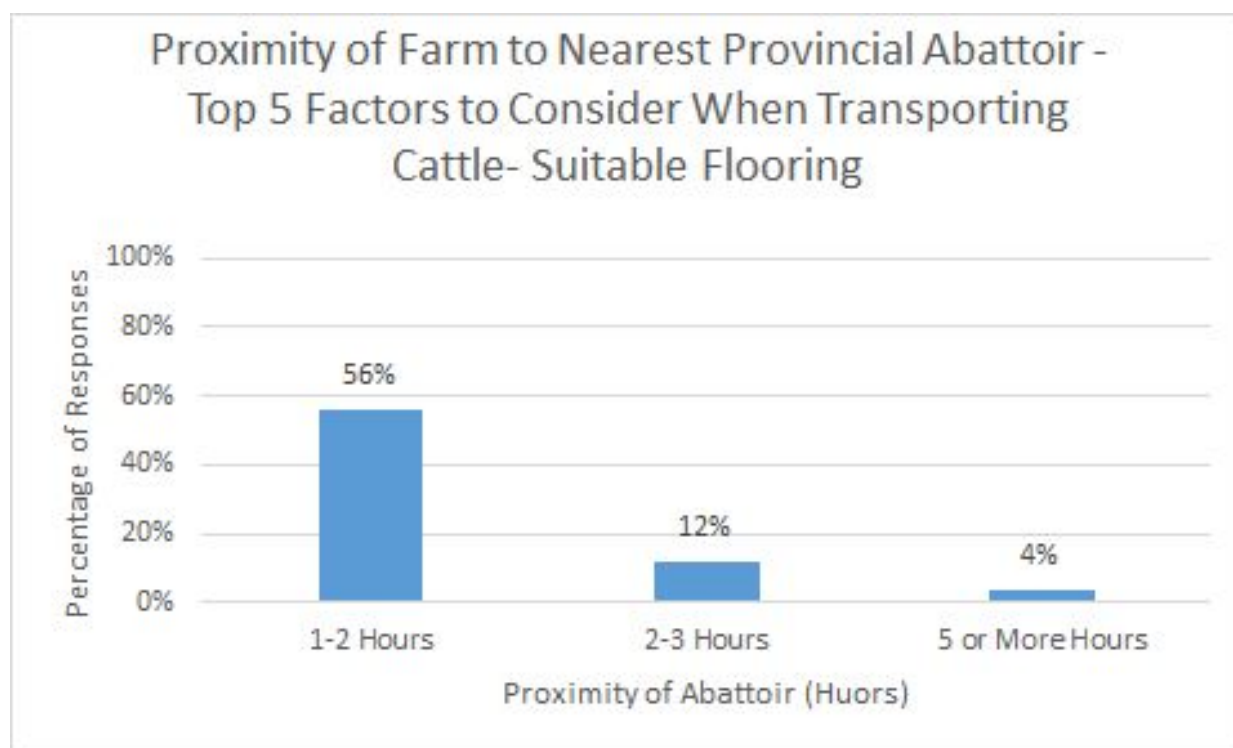
Figure 25: Bar graph of producers selecting suitable flooring as one of the top 5 factors to consider when transporting cattle based on proximity of farm to nearest provincial abattoir (number of respondents = 107).
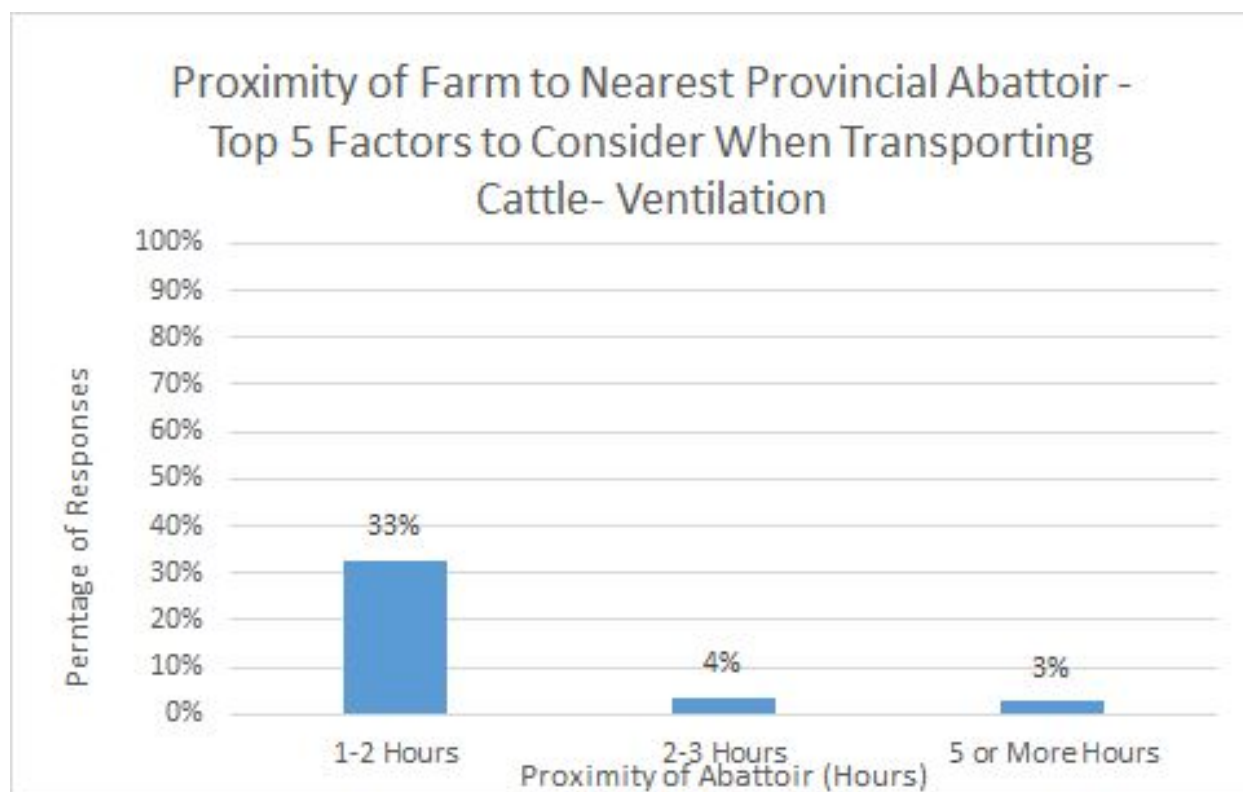
Figure 26: Bar graph of producers selecting ventilation as one of the top 5 factors to consider when transporting cattle based on proximity of farm to nearest provincial abattoir (number of respondents = 107).
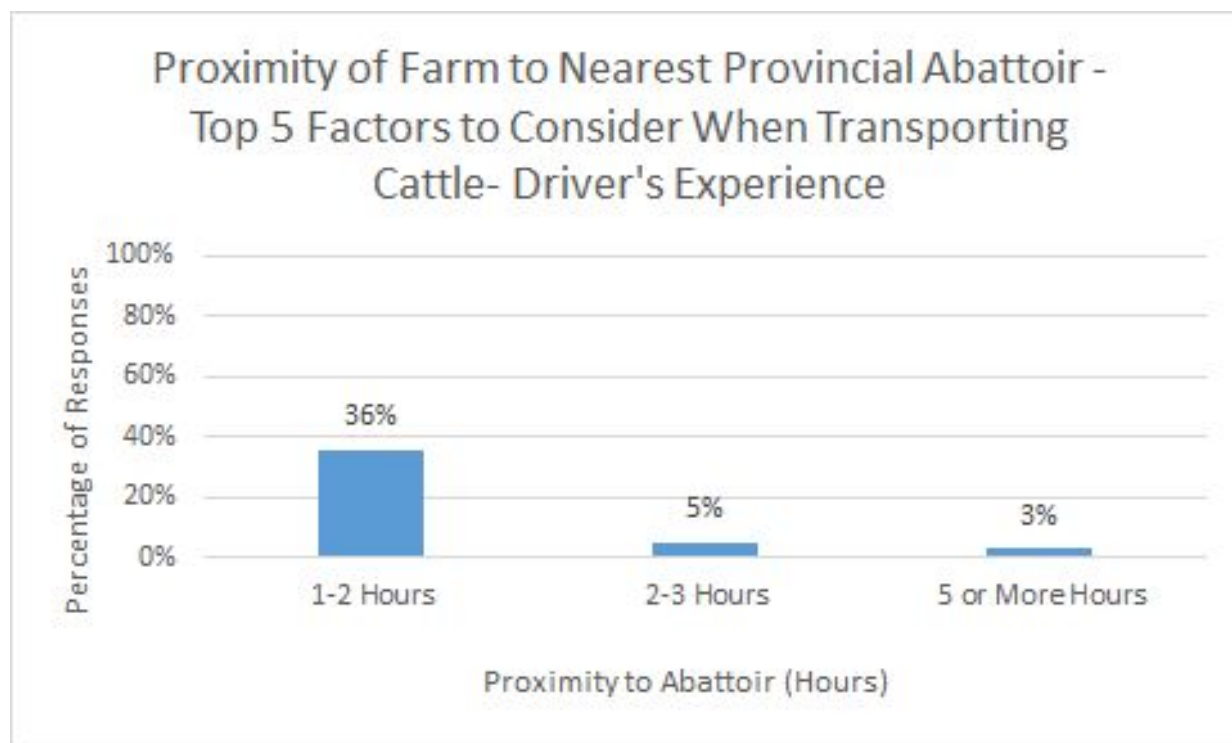
Figure 27: Bar graph of producers selecting driver's experience as one of the top 5 factors to consider when transporting cattle based on proximity of farm to nearest provincial abattoir (number of respondents = 107).

Proximity of Farm to Nearest Provincial Abattoir - Top 5 Factors to Consider When Transporting Cattle- Condition of Animals
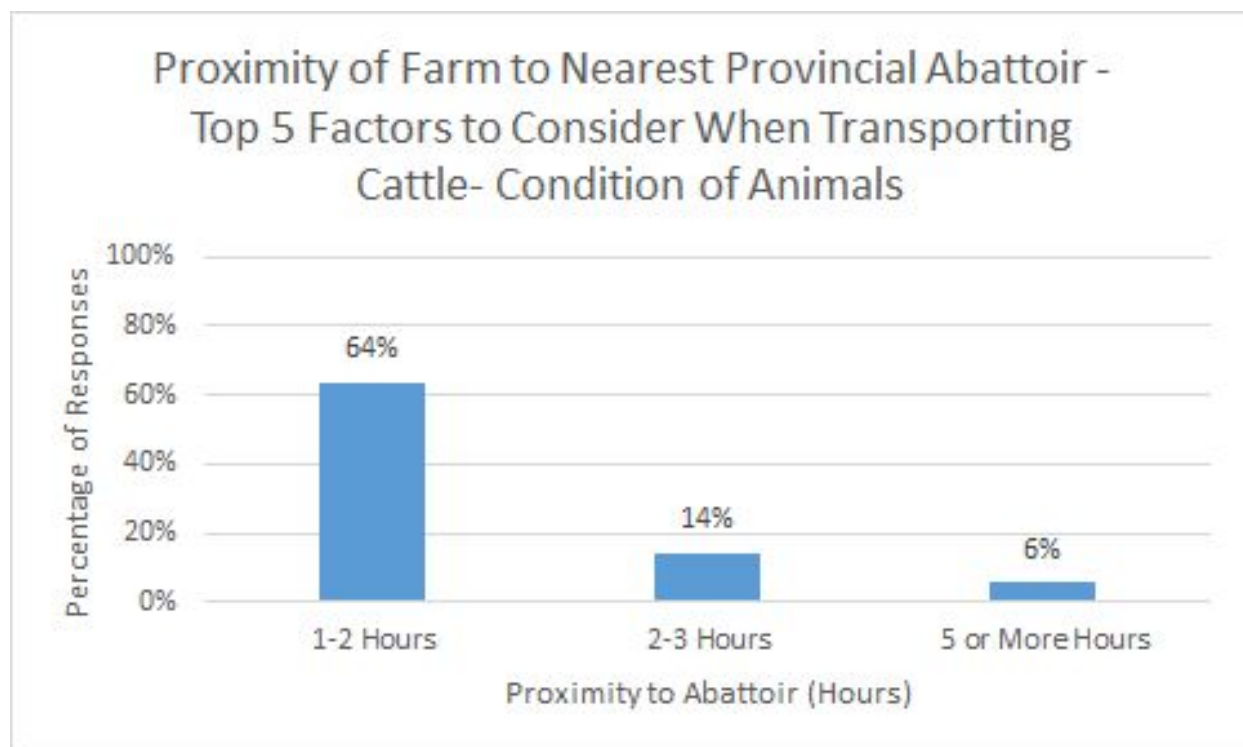
Figure 28: Bar graph of producers selecting condition of animals under top 5 factors to consider when transporting cattle based on proximity of farm to nearest provincial abattoir (number of respondents = 107).

Overall, producers located 1-2 hours from nearest provincial abattoir were much more concerned with flooring, ventilation, driver's experience, and condition of animals than producers located further away as factors to consider when transporting animals. Previous studies suggests that flooring allows cattle to have better balance during transportation and reduces the chance for cattle to become agitated, restless, and anxious (Stockman et al., 2013). Ventilation is also important as it affect an animal's ability to cope with heat stress (NFACC, 2013). Driver's experience is also important and has the potential to impact animal welfare during transportation. Cull cattle have a greater risk of injury during long transportation period (Schwartzkopf-Genswein, 2012), therefore, having experienced drivers transport cattle may lower the risk of injury during transportation. Condition of an animal prior to transport is very important as it determines whether an animal will be able to stand or cope with stress that arises during transportation (González et al, 2015). For example, if cattle are compromised before loading, they may endure further suffering as they ability to cope stress is decreased. It is therefore comforting to know that majority of producers considered the above factors when transporting cull cattle.

e. What disposal method(s) do producers use for cull cattle

When analyzing the effect proximity of farm from nearest provincial abattoir on what disposal method respondents use for cull cattle, the Mann-Whitney U-test showed that there was no significant difference between the proximity of farm to nearest provincial abattoir and respondents' selection of disposal method(s) (Appendix VI).

What disposal method(s) do producers use for cull cattle

The results indicated that proximity of farm from nearest provincial abattoir does not affect what disposal method producers use for cull cattle. As there were no difference in producer's perception on how to dispose cattle, there was no need for future study on this subject.

The results and discussion section encompasses only a small portion of the entire statistical analysis we conducted. Due to the time constraints of our project we were not able to analyze and discuss all the data collected, however, we realize the importance of our survey in regards to producer perceptions on factors that influence their decisions when transporting cull cattle. We have attached our STATA output results in Appendix VI to be used for future benchmarking studies done by AFAC.

Qualitative Analysis - Interviews

From the 107 completed surveys, 30 respondents showed interest in participating in the follow up interviews (28% volunteer rate). 20 of the 30 (66.7%) were selected randomly and contacted to see if they would still be interested and schedule the time for interviews. A total of 6 producers responded with interest and completed the interviews, with 3 cow-calf producers and 3 dairy producers.

Question 1:What considerations do you make when deciding to transport your cull cattle?

Figure 29: Wordcloud representing the themes identified regarding interviewee considerations when deciding to transport their cull cattle. The sizes of the themes are based on the frequency of the code mentioned.

According to the responses from the six interviewees, a variety of themes that producers are concerned with while transporting their cull cattle were identified. Health of the animal was found to be one of the most frequently identified considerations when making culling decisions. Shipping uncompromised cattle from the farm to their destination was viewed as a way to increase cattle comfort and welfare.

Some common conditions that cause major issues before and during transportation include lameness (Randall et al., 2016), mastitis and low body condition score (BCS) (Hadley et al., 2006). The cow's history was also taken into account; for example, Interviewee #2 mentioned that

"I make that decision based on my introduction records, did that cow have a sick calf two years in a row, did it have a calf that you know wasn't the size I wanted or the quality that I wanted." (*Interviewee #2*)

Producers also indicated that they didn't ship compromised cattle to sale, stating that

"if the cattle is not going to survive the trip they wouldn't bother sending it". (*Interviewee #1*)

"I don't transport the animals if they are in poor health condition, would rather euthanize them on farm than send them out" (*Interviewee #2*)

From these answers we can observe that producers were aware of the animal's welfare during transportation. One of the reasons the interviewees mentioned not to ship compromised cattle was the market price; as well, the sale price of the animal may also be compromised if the animal was shipped in poor condition. Animals that are compromised or non-ambulatory tend to get bruised, which reduces the meat quality, therefore, reduces the price (Frimpong et al., 2014).

Producer's awareness of animal welfare and public opinion also had a great impact on interviewees' decision making. Interviewees mentioned that public concern put pressure on their decision to ship animals since public opinion tended to be directly linked to consumer demand. Many years ago, social media and large retail companies focused on product safety and how it can affect human health, which affected consumer perception about the products (Verbeke and Viaene, 2000). Nowadays, consumers still consider the quality and taste of meat as the most important features that affect their shopping behaviour than the price as found by Font-I-furnols and Guerrero (2014). Producers would usually want to increase the quality of their products, which can be done by increasing animal welfare and decrease stress of animals. Font-I-furnols and Guerrero's (2014) study also reported that a portion of consumers were willing to pay more for organic or free-range products due to environmental and ethical concerns, even if the products could be less tender than products of animal raised with traditional practice. These indicates that consumers care about what they perceived to be higher animal welfare standards, which affects their choices when buying animal products. This consumer perception has become one of the concerns for producers. Age was also mentioned a couple times during the interviews as a consideration for transportation. Interviewee #1 stated,

"before I shipped the animal, I would see if the animal is "old" or "worn out"" (*Interviewee #1)*

As suggested in Orsoro and Wright's (1992) study; for both dairy and beef industry, older cattle are more likely to be culled due to the inherent decrease in overall production and increase disease susceptibility.

Productivity was another major concern; for dairy cattle, producers make their money with cows that produce high quality and quantity milk. As mentioned by Interviewee #2 that they based their culling decisions on if her cows are "milking well" or "open".This is supported by Hadley et al.'s (2006) study that culling dairy cattle is mainly based on the health status and the overall production such as milk and butterfat. For beef producers, market price and the productiveness of the cattle are critical for culling decision. For cow-calf producers, an open cow is non-productive for at least one calving season. Therefore, it is not surprising that open cows are most likely to be culled as mentioned by Interviewee #1. Cow's with puerperal

metritis would have greatly their fertility in the future, and study by Dawod and Min (2014) showed that these cows are culled at a much higher rate, ranging from 53.33% to 100% than healthy cows (Moggy, Personal Communication, 2017). It was mentioned by the interviewees that it would cost around $2 to $7 per day per head in feed, therefore, producers tended not to keep cattle that were not producing in their herd. This is comparable to the cost found by De Vries's (2006), ranging from $2.11 to $7.46 USD per day per open cow.

In addition, transportability was also one of the concerns producers considered before transporting their cull cattle. It was mentioned by interviewee #1 that weather condition was the most important issue when deciding to transport the cattle because he lived in a remote area where the truck cannot always access if weather conditions were poor. The proximity to the auction market was also a concern.

Some producers mentioned a close proximity to the auction markets translated to a short trip duration to auction. However, the number of subsequent trips for the cattle after sale at an auction market is unpredictable and out of the producer's control. We've found from the survey that producers didn't usually know how long would the animal stay in the auction yard. Cattle can stay at the auction yard for three to four weeks or be purchased for resale and have to endure subsequent trips (Diether, Personal Communication, 2017). Another consideration is the accessibility of the truck as mentioned by Interviewee #1 and #2. While one of the producers interviewed had reliable access to transportation, others would need time to arrange for pick-up and transport of cull cattle. Therefore, producers would need to monitor their animal's condition during this time.

"You can't always keep them in solid at the top, at the peak, you know they are cull animals why you put hay into it, and feed. If…You know that it's two dollars a day per head." (Interviewee #1)

Question 2: What challenges do you find with transport decisions? Do you think transportation challenges are different based on operation size?

Figure 30: Wordcloud representing the themes identified regarding interviewee challenges with transport decisions. The sizes of the themes are based on the frequency of the code mentioned.

From the responses obtained from the six interviewees, various themes were identified encompassing the challenges interviewees faced in response to transport decisions. Most producers found that the logistics of transportability to be the greatest challenge, and transportability includes codes such as convenience, proximity to auction market, alternatives, length of the trip, diminishing supply of transportation truck, and weather condition. Half of the interviewees found health to be one of their other greatest challenge, followed by animal care, then enforcement and value.

Of the codes that were included in logistics, availability of transportation was the most mentioned by producers, whereas it was mentioned by Interviewee #1 that the weather condition was the most difficult challenge they face as they were located in a remote area, therefore it was not the availability of transportation, but if they could get in and out that was the problem.

Three interviewees responded that there were no, or there should be no challenges when it comes to transport decisions. Interviewee #5 mentioned that personally they did not have transport challenges, however, they had seen other producers face transportation challenges. When asked if they thought that transportation challenges were different based on operation size, one interviewee did not respond to the question, one said that there could be, and four responded that there are no differences in challenges. The

interviewees that responded that there should not be a difference in transportation challenges with different operation size mentioned that there are other options out there for the producers. An example from Interviewee #5 of an option the producers can use is that there were cases where smaller producers that don't have their own stock trailers getting help from their neighbours or other people. Another example of an option for producers is that there are

"professional, commercial, livestock haulers" (Interviewee #3)

available and

" I don't believe that producers should have the animals if they will not be able to properly transport the animals" (Interviewee #6)

and therefore there should not be a difference in challenges when it comes to operation size.

Question 3: What are your thoughts on the transportation regulations and what changes would you like to see?

Figure 31: Wordcloud representing the themes identified regarding interviewee thoughts on transportation regulations and what changes they would like to see. The sizes of the themes are based on the frequency of the code mentioned.

During the six interviews we identified various themes that interviewees were concerned with regarding the transportation regulations. Comprehensiveness of the transportation regulations was the most frequently mentioned theme. Most producers said that they found the regulations easy to read and that the language was not overly complicated. Interviewee #1 stating that the regulations and guidelines were user

friendly and Interviewee #2 stating that they were relatively easy easy to understand. Interviewee #6 mentioned that the regulations and guidelines were not difficult for them to read as they had been in the industry for a long time. However,

> "the biggest problem with the regulations is that you can read them and you can make people read them but you can't make people act on [them]." (*Interviewee #6*)

Reinforcing this point was a statement
> "I don't focus much on transportation regulations." (*Interviewee #3*)

Confusing and scope were the next two overall important themes for the producers. Most producers found that the regulations were confusing regarding the producer accountability or responsibility regarding the regulations. Scope was an interesting one with two producers mentioning it significantly. Encompassed in scope included the length of trip, provincial differences; the distances to abattoirs as well as differences in terrain. For example, in British Columbia due to the mountains or waterways the duration of the trip may be double compared to Alberta.

Animal care was the next frequently mentioned factor. Producers were looking at what might be in the best interest of the cattle regarding transportation times, with interviewee #2 curious about having the appropriate facilities to house the cattle in with the necessary biosecurity to facilitate following the maximum trip duration in the regulation. Interviewee #5 was most concerned about the application of the regulation. Stating that they were concerned primarily with the actions and follow through on enforcing the regulations and that they would also like to see harsher consequences for infractions. Finally, the last overall theme was awareness, with two producers concerned with the education and lack of knowledge regarding the regulations. This leads into the second part to this question which was in regards to the CFIA proposed guide assessing transport fitness. Most producers welcomed the idea in the form of either a letter sized poster or a PDF (Portable Document Format) document. We were cautioned very heavily on the use of paper due to most producers receiving loads of paper across their desks. Therefore, the PDF document would be the most effective. For those producers that stated they did not want a guide created, their reasoning was that the guides such as COP (Codes of Practice) was already there so there was no need for another one. However, those producers that said no had also said that they did not really use or follow the regulations to begin with. For example, interviewee 3 stated,

> "I don't focus much on transportation regulations" (*Interviewee #3)*

and both Interviewee #1 and #3 stated that it would be a duplicate of the regulations already in place.

Question 4 *In regards to transportation, is there anything about cull cattle transportation that wasn't mentioned in this interview that you feel is important? Questions for our project?*

Table 7: Coded themes for question 4, points the interviewees feel is important in regards to cull cattle transportation.

Awareness	Personal Experience
Public Opinion	Knowledge
Trip Uncertainty	

The responses stated in question four all related to the previous three questions. The codes from this question were included in the developed themes from the previous three questions.

Limitations

Some limitations were unavoidable in this study because of variation between each individual and the information distribution couldn't be equally perceived by each individual. Misinterpretation bias could happen when the respondents interpret the questions differently from what was intended. We tried to minimize misinterpretation bias in the survey by describing the questions as easily as we could. Interpretation bias could have been minimized by piloting the survey before we distributed it to the major issues.We've also tried to minimize the misinterpretation bias in the interview by creating a clarifying statements with the questions to help interviewees understand what we were asking.

Selection bias is unavoidable since we distributed the survey through newsletters that are read by producers who could be more proactive in animal welfare issue in the industry. We could have possibly minimized the selection bias by expanding sample size and distributing the survey to more local producers. Social desirability bias was not very obvious in our survey responses. Producers could choose not to answer any questions in the survey and during the interview if they did not want to. However, how much difference between the actual and reported familiarity of the regulations was unsure because we weren't allowed to test the producers on that. The familiarity of the regulations could be answered subjectively. We could also see quite a bit of variety on producers' answers about influential factors for transportation.

One of the limitations for the follow up interview is that we couldn't be able to interview a variety of cattle producers but only cow-calf and dairy producers were willing to participate.

Recommendations and Conclusion

The purpose of this study was to understand producer's decision making process and perceived challenges when deciding whether or not to transport cull cattle. This study was important as challenges and issues producers face when deciding to transport their cull cattle were identified. The findings from this study can be used to improve the welfare of cull cattle during transportation and also help to maintain a sustainable cattle industry while having public transparency.

From the survey, stage of lactation as an influential factor to consider when transporting animals for sale differed by producer types. This result was concerning as very few dairy producers and even less beef producers considered stage of lactation when deciding to transport cattle for sale. Animal's age as an influential factor to consider when euthanizing on farm differed by producer type. Beef producers were more concerned of animal's age than non-beef producers as age reduces reproductive performance to a greater extent in beef cattle compared to dairy cattle. Majority of producers with <50 years of experience were more likely to consult with other producers about transport fitness of cattle compared to producers with more experience. One recommendation is to further educate them by providing a guide on transportation fitness that veterinarians and auction market managers/owners could refer to as they were the top two choice of contact person for producers to consult when they are unsure if a cattle is fit for transportation. Also, as the majority of producers were unaware of the holding time of the cattle in collection pens prior to shipment for slaughter and there are no complete or ongoing research studies focusing on it, future study should also focus on this aspect.

Overall, dairy producers and beef producers were moderately familiar with their respective Codes of Practice. However, all producers were less familiar with the transportation regulations. When asked if the producers would like a guide created specifically about transport regulations, the majority of survey respondents indicated that they would prefer the guide, while the interviewees indicated that a poster Portable Document Format (PDF) was preferred.

From the interviewees' responses, it can be concluded that health was the main theme considered when they were deciding to transport their cull cattle. The second most common theme mentioned when they considered transporting their animal was the value of the animal. When the interviewees were asked what challenges they found with transport decisions, half of the interviewees noted that there were none, or that there should not be any challenges with transport decisions. It was concluded from the interviewees that the logistics that comes with transport decisions was the most challenging aspect they faced. Logistics included but was not limited to challenges such as trip uncertainty, length of trip, convenience, and weather conditions. With the amount of producers that mentioned that there were no transport decision challenges

they faced, this may be due to selection bias as the producers that agreed to the interviews may be proactive producers and therefore would not have many challenges.

When asked their thoughts on the transportation regulations and the changes they would like to see, comprehensiveness of the transportation regulations was found to be the most frequently mentioned theme. Most interviewees stated that the regulations and Codes of Practice were easy to read and understand, which may be because they have been in the industry for a long time as most interviewees had at least 20 years of experience in the industry. However, not all of them took the regulations and Codes of Practice into consideration as a guideline when transporting their animals. Even though most of the producers didn't find the regulations confusing, they still said yes to the CFIA guide, and for those that said no to a new CFIA guide, it was because they didn't think there should be a new one made, but improvements on the already existing one was prefered. Additionally, for the interviewees that said no to a new CFIA guideline, they mentioned that they already didn't really use the regulations to begin with.

For the interviews, only a few mentioned the challenges they faced whereas half also mentioned that there were no challenges. In order to get more information on the challenges the producers may be facing, there should be additional interviews conducted with a broader selection of interviewees, as this can also help decrease selection bias. Another recommendation in regards to a new CFIA guideline, if one was to be developed, a PDF form would be the most ideal and effective form because it can be easily shared and kept.

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Appendices

Appendix I

Informed Consent Form Online Survey

INFORMATION LETTER and CONSENT FORM
for Participation in Online Survey

Study Title: Exploring Factors Influencing Producer Decisions for Cull Cows

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Background

- The results of this study will be used for a Capstone project at the University of Alberta and Cattle Benchmarking Project of AFAC to work with producer groups (Alberta Milk, Alberta Beef, Alberta Cattle Feeders Association) in order to help producers understand regulations associated with challenging end-of-life decisions and associated welfare concerns.

Purpose

- The purpose of this project is to gather information regarding producers' current knowledge about transporting cull animals and what factors influence their decisions to cull cattle. This information will be used to educate producers in order to decrease the gap in knowledge between producer and processor with respect to transportation and welfare of cull cattle.

Study Procedure

- As a participant of this survey, you will be asked to answer a few questions regarding your knowledge on the regulations and how you decide to cull cattle and what are the factors affecting your decision. You do not have to answer any question if you do not want to. This survey will take around 15-20 minutes of your time.

Benefits

- Provide the Canadian cattle industry with statistically relevant, science-based information regarding the prevalence and type of conditions observed in compromised cattle arriving at auctions and abattoirs within Alberta. And to improve animal welfare before and after transportation using the information collected.

Risk

- There are no known risks associated with this survey.

Voluntary Participation

- Participation in this survey is completely voluntary.
- Participants may drop out at any time without penalty.

Confidentiality & Anonymity

- Your privacy and confidentiality will be protected throughout this study. All information collected in support of this research study will be coded to preserve participant anonymity and confidentiality, and will be summarized, in an anonymous format. At no time will any comment be attributed to any specific individual. All raw data collected during this research study will be retained by Alberta Farm Animal Care for 5 years, on an encrypted hard-drive, used under the compromised cattle benchmarking project. The final deliverable will be out before March, 2018 and ready for view.
- You may choose to withdraw your participation with this study at any time.

Further Information

- If you have any further questions regarding this study, please do not hesitate to contact Natalie Diether at nmay@ualberta.ca and 403-336-3522, or Melissa Moggy at melissa.moggy@ucalgary.ca and 587-830-1232.
- Please feel free to print a copy of this consent form for your records.
- The plan for this study has been reviewed for its adherence to ethical guidelines by a Research Ethics Board at the University of Alberta. For questions regarding participant rights and ethical conduct of research, please contact the Research Ethics Office at (780) 492-2615. If you have any further questions regarding this study, please do not hesitate to contact us.

Appendix II
Letter of Request- Description of Survey

Cull Cattle Transportation Survey

A team of University of Alberta students in Animal Health/Animal Science working alongside Alberta Farm Animal Care have developed a survey to gather information regarding producers' current knowledge about transporting cull cattle and what factors influence their decisions to cull cattle. This information will be used for their Capstone Project in Animal Health/Animal Science as well as by Alberta Farm Animal Care to identify areas for improved communication about transportation and welfare of cull cattle.

Please click the link below to take the survey! We thank you for your participation.
https://www.surveymonkey.com/r/HX3JVNR

Appendix III

Online Survey

Cull Cattle Transportation Survey

Introduction

A team of University of Alberta students in Animal Health/Animal Science working alongside Alberta Farm Animal Care have developed a survey to gather information regarding producers' current knowledge about transporting cull cattle and what factors influence their decisions to cull cattle. This information will be used for their Capstone Project in Animal Health/Animal Science as well as by Alberta Farm Animal Care to identify areas for improved communication about transportation and welfare of cull cattle. We thank you for your participation.

Please view our consent form before continuing.

* 1. Do you consent to the above terms and conditions and wish to continue with this survey?

○ Yes

○ No

2. What type of operation do you currently have? Please select all that apply.

☐ Cow-calf

☐ Feedlot

☐ Dairy

☐ Backgrounding/ Stocker

☐ Purebred/ Seedstock

3. How many years have you been a cattle producer?

4. On a scale from 1 (not familiar at all) to 5 (extremely familiar), how familiar are you with the Codes of Practice?

	Not familiar at all	Slightly familiar	Moderately familiar	Very familiar	Extremely familiar
Dairy Code of Practice	○	○	○	○	○
Beef Code of Practice	○	○	○	○	○

5. On a scale from 1 (not familiar at all) to 5 (extremely familiar), how familiar are you with the federal regulations on cattle transportation?

	Not familiar at all	Slightly familiar	Moderately familiar	Very familiar	Extremely familiar
Health of Animals Regulations Part XII - Transportation	○	○	○	○	○
Regulations Amending the Health of Animals Regulations	○	○	○	○	○
Transportation of Animals Program – Compromised Animal Policy	○	○	○	○	○

6. Would it be useful to you if the CFIA created a guide on assessing fitness for transport in cattle?

○ Yes

○ No

7. How close is the nearest provincial abattoir to your farm?

◯ 1-2 hours

◯ 3-4 hours

◯ 5 or more hours

8. What disposal method(s) do you use for cull cattle? Choose all that apply.

☐ Sale at auction market

☐ Ship directly to abattoir

☐ On-farm euthanasia

9. What factors do you consider to be most important in deciding to transport cattle for sale ? (Select your top 5 most influential factors)

	1	2	3	4	5
The animal's health and disease status	◯	◯	◯	◯	◯
The animal's body condition score	◯	◯	◯	◯	◯
The animal's soundness or mobility	◯	◯	◯	◯	◯
The animal's age	◯	◯	◯	◯	◯
Stage of lactation	◯	◯	◯	◯	◯
Stage of pregnancy	◯	◯	◯	◯	◯
Market prices	◯	◯	◯	◯	◯
Availability of help for loading/unloading	◯	◯	◯	◯	◯
Veterinarian recommendation/diagnosis	◯	◯	◯	◯	◯
Weather conditions	◯	◯	◯	◯	◯

Other (please specify)

10. What factors do you consider to be most important in deciding to transport cattle for slaughter? (Select your top 5 most influential factors)

	1	2	3	4	5
The animal's health or disease status	○	○	○	○	○
The animal's body condition score	○	○	○	○	○
The animal's soundness or mobility	○	○	○	○	○
The animal's age	○	○	○	○	○
Stage of lactation	○	○	○	○	○
Stage of pregnancy	○	○	○	○	○
Market prices	○	○	○	○	○
Availability of livestock transporter	○	○	○	○	○
Availability of help for loading/unloading	○	○	○	○	○
Veterinarian recommendation/diagnosis	○	○	○	○	○
Weather conditions	○	○	○	○	○

Other (please specify)

[   ]

11. What do you think should be considered when transporting animals? (Select your top 5)

	1	2	3	4	5
Suitable flooring	○	○	○	○	○
Water	○	○	○	○	○
Feed	○	○	○	○	○
Holding time	○	○	○	○	○
Ventilation	○	○	○	○	○
Lighting	○	○	○	○	○
Driver experience	○	○	○	○	○
Driver training	○	○	○	○	○
Condition of animals	○	○	○	○	○
Weather condition	○	○	○	○	○
Trip duration	○	○	○	○	○

12. Who do you contact with questions if you are unsure if an animal is fit for transport? (Select all that apply)

☐ Abattoir manager/owner

☐ Auction manager/owner

☐ Producer group (Eg. CCA, Alberta Milk, Alberta Beef)

☐ CFIA

☐ Meat Inspector

☐ Veterinarian

☐ Other Producers

☐ Alberta SPCA

Other (please specify)

[   ]

13. Which transportation driver is preferred for your cull cattle? (check all that apply)

☐ Certified Driver

☐ Someone you know

☐ Yourself

☐ Employee

Other (please specify)

[   ]

14. Once sold for slaughter, how long do you think cattle may stand in a collection pen prior to shipment for slaughter?

○ Less than one week

○ 1-2 weeks

○ 3-5 weeks

○ Greater than 5 weeks

15. When necessary, who usually euthanizes cattle on your operation?

○ Yourself

○ Employee

○ Manager

○ Neighbour

○ Mobile butcher

○ Veterinarian

16. What factors do you consider to be most important when deciding to euthanize on farm? (Select your top 5 most influential factors)

	1	2	3	4	6
Age	○	○	○	○	○
Disease status	○	○	○	○	○
The animal's fitness for transport	○	○	○	○	○
Drug withdrawal time	○	○	○	○	○
Severe injury	○	○	○	○	○
Likelihood of recovery	○	○	○	○	○
Economic considerations	○	○	○	○	○
Loss of production	○	○	○	○	○
Distance to local abattoir/auction	○	○	○	○	○
Animal's quality of life	○	○	○	○	○

Other (please specify)

17. Would you be willing to do a follow up one-on-one interview? We would like to discuss issues surrounding transportation of cull cattle in more detail

○ No

○ Yes (please leave contact information)

Appendix IV
Interview Consent Form

Consent to Audio Recording & Transcription

Factors Influencing Producer Decisions for Cull Cattle

Introduction and Purpose

My name is _____. I am an undergraduate student at the University of Alberta working with my faculty advisor, Dr. Paul Stothard in the faculty of ALES (Agriculture, Life, and Environmental Sciences), and industry mentors Natalie Diether and Melissa Moggy with Alberta Farm Animal Care (AFAC). I would like to invite you to take part in our research study, which is an extension to our online survey that concerns factors influencing producer decisions to transport cull cattle. The purpose of this study is to understand producer decision making and challenges faced when deciding whether or not to transport cull cattle. Your participation will help us reach this goal by providing further insight on producer perceptions of cull cattle transportation.

Procedures

If you agree to participate in this research, I will conduct an interview with you at a time and method of your choice (for example: over the phone or through skype/facetime). The interview will involve questions about cattle transportation, considerations made when deciding to transport cull cattle, and thoughts on transport regulations. The interview should last about **20-30 minutes**. With your permission, I will **audiotape and take notes during the interview**. The recording is to accurately record the information you provide, and will be used for **transcription purposes only**. If you agree to being audiotaped but feel uncomfortable at any time during the interview, the tape can be turned off at your request. Or if you don't wish to continue, you can stop and withdraw from the interview at any time.

Risks/ Discomforts

You are free to decline to answer any questions you don't wish to answer, or stop the interview at any time.

Confidentiality

Participants will be asked for oral rather than signed consent. The study data will be handled as confidentially as possible. Only our research team will be able to listen to the recordings. Transcripts of your interview may be reproduced in whole or in part for use in presentations or written products that result from this study. If results of this study are published or presented, **individual names and other personally identifiable information will not be used.**

Rights

Participation in research is completely voluntary. You are free to decline to take part in the project. You can decline to answer any questions and are free to stop taking part in the interview at any time. Whether or not you choose to participate in the research and whether or not you choose to answer a question or continue participating in the project, there will be no penalty to you.

Questions

If you have any questions about this research, please feel free to contact my mentors Natalie Diether or Melissa Moggy. They can be reached at nmay@ualberta.ca and melissa.moggy@ucalgary.ca, respectively.

If you have any questions about your rights or treatment as a research participant in this study, please contact the University of Alberta's Research Ethics Office at (780) 492-2615.

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CONSENT

By signing this form, you are agreeing to participate and allowing the researcher to audio tape you as part of this study. You will be given a copy of this consent form to keep for your own records.

_____   _____

Participant's Name (*please print*)   Date

_____

Participant's Signature

Appendix V

Interview guide

INTERVIEW GUIDE

When we call to confirm interest, let them know there will be one interviewer and another member of group silently present taking notes. Also ask permission to have Melissa or Natalie sit in if necessary.

Introduction

Good morning/afternoon, I'd like to thank you for your participation in this study. Have you gone through the consent form that was sent via email? (If yes, please verbally state your name consenting to participation in this research study and audio recording that can be used in our research. If no, read consent form to them then get verbal consent)

Final questions

General question to put them at ease: what's your favorite aspect of being a cattle producer?

1. *What considerations do you make when deciding to transport your cull cattle?*
   a. **clarifying statement** - when deciding to transport your cull cattle, expanding on your top 5 most influential factors, why are they most important to you?
   b. probe(s) - your top 5 answers were _____, can you explain why these were the most important?
   c. when you say health what do you mean?
   d. probe - could you please expand on this?

2. *What challenges do you find with transport decisions? Do you think transportation challenges are different based on operation size?*
   a. **clarifying statement -** Has there been any challenges you've faced in the past when transporting your cull cattle?
   b. probe - can you expand on some examples of challenges you've faced?
   c. probe - how did you respond to these challenges?

3. *What are your thoughts on the transportation regulations and what changes would you like to see?*
   a. **Clarifying statement -** in the survey you said you were unfamiliar with the Health of Animals Regulations part XII, has that changed since completing the survey? Can you give us insight?
   b. probe: **If they know about transport regulations:** do you find them easy to understand or confusing?

c. probe - **NO to CFIA guide**: you said no to having the CFIA create a guide for assessing transport fitness, what was the reasoning for this and is there an alternative you would like to see?

4. *In regards to transportation, is there anything about cull cattle transportation that wasn't mentioned in this interview that you feel is important?*
   a. **clarifying statement -** Do you have anything else to add about cattle transportation?
   b. probe - feelings? concerns?
   c. probe - questions about our project?

Appendix VI

Statistical Analysis in STATA

1. Does production type affect:
  - **Influential factors for sale (Chi-squared/Fisher's exact)**
    - o **Animal's health or disease status**

      `. tabulate  sale_ahd  optype, exact`

```
Influentia |
l factors  |
for sale - |
      The  |
  animal's |
health and |
   disease |          operation type
    status |    beef     dairy      both |    Total
-----------+---------------------------------+----------
         0 |      16         0         0 |       16
         1 |      60        22         7 |       89
-----------+---------------------------------+----------
     Total |      76        22         7 |      105

            Fisher's exact =                 0.025
```

    - o **Animal's BCS**

      `. tabulate sale_bcs optype, exact`

```
Influentia |
l factors  |
for sale - |
      The  |
  animal's |
     body  |
 condition |          operation type
     score |    beef     dairy      both |    Total
-----------+---------------------------------+----------
         0 |      32         8         1 |       41
         1 |      44        14         6 |       64
-----------+---------------------------------+----------
     Total |      76        22         7 |      105

            Fisher's exact =                 0.376
```

    - o **Animal's soundness/mobility**

      `. tabulate sale_soundness optype, exact`

```
Influentia |
l factors  |
for sale - |
      The  |
  animal's |
 soundness |
```

```
        or |          operation type
   mobility |     beef      dairy       both |      Total
-----------+--------------------------------+----------
         0 |       10          1          1 |         12
         1 |       66         21          6 |         93
-----------+--------------------------------+----------
     Total |       76         22          7 |        105
```

        Fisher's exact =   0.

o **Animal's age**

. tabulate sale_age optype, exact

```
Influentia |
 l factors |
for sale - |
      The  |
  animal's |          operation type
       age |     beef      dairy       both |      Total
-----------+--------------------------------+----------
         0 |       41         15          4 |         60
         1 |       35          7          3 |         45
-----------+--------------------------------+----------
     Total |       76         22          7 |        105
```

        Fisher's exact =   0.517

o **Stage of lactation**

. tabulate sale_lactation optype, exact

```
Influentia |
 l factors |
for sale - |
  Stage of |          operation type
 lactation |     beef      dairy       both |      Total
-----------+--------------------------------+----------
         0 |       69         14          4 |         87
         1 |        7          8          3 |         18
-----------+--------------------------------+----------
     Total |       76         22          7 |        105
```

        Fisher's exact =   0.002

o **Stage of pregnancy**

. tabulate sale_preg optype, exact

```
Influentia |
 l factors |
for sale - |
  Stage of |          operation type
 pregnancy |     beef      dairy       both |      Total
-----------+--------------------------------+----------
         0 |       54         14          5 |         73
         1 |       22          8          2 |         32
-----------+--------------------------------+----------
     Total |       76         22          7 |        105
```

        Fisher's exact =   0.869

o **Availability of help for loading/unloading**

. tabulate sale_loadinghelp optype, exact

```
Influentia |
 l factors |
for sale - |
Availabili |
ty of help |
       for |
loading/un |         operation type
   loading |     beef     dairy     both |      Total
-----------+--------------------------------+----------
         0 |       65        20        6 |         91
         1 |       11         2        1 |         14
-----------+--------------------------------+----------
     Total |       76        22        7 |        105

        Fisher's exact =                  0.888
```

o **Market prices**

. tabulate sale_price optype, exact

```
Influentia |
 l factors |
for sale - |
    Market |         operation type
    prices |     beef     dairy     both |      Total
-----------+--------------------------------+----------
         0 |       31        13        3 |         47
         1 |       45         9        4 |         58
-----------+--------------------------------+----------
     Total |       76        22        7 |        105

        Fisher's exact =                  0.325
```

o **Veterinarian recommendation/diagnosis**

. tabulate sale_vet optype, exact

```
Influentia |
 l factors |
for sale - |
Veterinari |
        an |
recommenda |
tion/diagn |         operation type
      osis |     beef     dairy     both |      Total
-----------+--------------------------------+----------
         0 |       58        14        5 |         77
         1 |       18         8        2 |         28
-----------+--------------------------------+----------
     Total |       76        22        7 |        105

        Fisher's exact =                  0.439
```

o **Weather conditions**

82

```
. tabulate sale_weather optype, exact

Influentia |
l factors  |
for sale - |
  Weather  |         operation type
conditions |     beef      dairy       both |      Total
-----------+---------------------------------+----------
         0 |       50         16          6 |         72
         1 |       26          6          1 |         33
-----------+---------------------------------+----------
     Total |       76         22          7 |        105

           Fisher's exact =                 0.549
```

- **Influential factors for slaughter (Chi-squared/Fisher's exact)**
  - o **Animal's health or disease status**

```
. tabulate slaughter_ahd optype, exact

Influentia  |
l factors   |
      for   |
slaughter   |
    - The   |

  animal's  |
health and  |
  disease   |         operation type
   status   |     beef      dairy       both |      Total
------------+---------------------------------+----------
         0  |       11          2          0 |         13
         1  |       63         18          7 |         88
------------+---------------------------------+----------
     Total  |       74         20          7 |        101

            Fisher's exact =                 0.674
```

  - o **Animal's BCS**

```
. tabulate slaughter_bcs optype, exact

Influentia  |
l factors   |
      for   |
slaughter   |
    - The   |
  animal's  |
     body   |
condition   |         operation type
    score   |     beef      dairy       both |      Total
------------+---------------------------------+----------
         0  |       19          6          3 |         28
         1  |       55         14          4 |         73
------------+---------------------------------+----------
     Total  |       74         20          7 |        101

            Fisher's exact =                 0.546
```

83

o **Animal's soundness/mobility**

. tabulate slaughter_soundess optype, exact

Influential factors for slaughter - The animal's soundness or mobility	operation type			
	beef	dairy	both	Total
0	12	3	1	16
1	62	17	6	85
Total	74	20	7	101

Fisher's exact =   1.000

o **Animal's age**

. tabulate slaughter_age optype, exact

Influential factors for slaughter - The animal's age	operation type			
	beef	dairy	both	Total
0	33	11	4	48
1	41	9	3	53
Total	74	20	7	101

Fisher's exact =   0.654

o **Stage of lactation**

. tabulate slaughter_lactation optype, exact

Influential factors for slaughter - Stage of lactation	operation type			
	beef	dairy	both	Total
0	67	10	2	79
1	7	10	5	22
Total	74	20	7	101

Fisher's exact =   0.000

o **Stage of pregnancy**

. tabulate slaughter_preg optype, exact

```
Influentia |
l factors |
      for |
slaughter |
- Stage of |            operation type
pregnancy |      beef       dairy        both  |      Total
-----------+---------------------------------+----------
        0 |        51          14           4  |         69
        1 |        23           6           3  |         32
-----------+---------------------------------+----------
    Total |        74          20           7  |        101

        Fisher's exact =                   0.813
```

o **Market prices**
```
. tabulate slaughter_price optype, exact
```

```
Influentia |
l factors |
      for |
slaughter |
 - Market |            operation type
   prices |      beef       dairy        both  |      Total
-----------+---------------------------------+----------
        0 |        44          13           5  |         62
        1 |        30           7           2  |         39
-----------+---------------------------------+----------
    Total |        74          20           7  |        101

        Fisher's exact =                   0.827
```

o **Availability of livestock transporter**
```
. tabulate slaughter_availtransporter optype, exact
```

```
Influentia |
l factors |
      for |
slaughter |
        - |
Availabili |
    ty of |
livestock |
transporte |            operation type
        r |      beef       dairy        both  |      Total
-----------+---------------------------------+----------
        0 |        70          19           6  |         95
        1 |         4           1           1  |          6
-----------+---------------------------------+----------
    Total |        74          20           7  |        101

        Fisher's exact =                   0.427
```

o **Availability of help for loading/unloading**
```
. tabulate slaughter_loadinghelp optype, exact
```

85

```
Influentia |
l factors |
      for |
slaughter |
        - |
Availabili |
ty of help |
      for |
loading/un |          operation type
   loading |    beef      dairy       both |     Total
-----------+----------------------------------+----------
         0 |      68         19          6 |        93
         1 |       6          1          1 |         8
-----------+----------------------------------+----------
     Total |      74         20          7 |       101

           Fisher's exact =                    0.648
```

o **Veterinarian recommendation/diagnosis**

. tabulate slaughter_vet optype, exact

```
Influentia |
l factors |
      for |
slaughter |
        - |
Veterinari |
       an |
recommenda |
tion/diagn |          operation type
      osis |    beef      dairy       both |     Total
-----------+----------------------------------+----------
         0 |      49         14          6 |        69
         1 |      25          6          1 |        32
-----------+----------------------------------+----------
     Total |      74         20          7 |       101

             Fisher's exact =                  0.666
```

o **Weather conditions**

. tabulate slaughter_weather optype, exact

```
Influentia |
l factors |
      for |
slaughter |
- Weather |          operation type
conditions |    beef      dairy       both |     Total
-----------+----------------------------------+----------
         0 |      58         17          5 |        80
         1 |      16          3          2 |        21
-----------+----------------------------------+----------
     Total |      74         20          7 |       101

           Fisher's exact =                    0.692
```

● **Considerations when transporting animals (Chi-squared/Fisher's**

exact)

o **Suitable flooring**

. tabulate consider_flooring optype, exact

Factors considered to be most important in deciding to transport cattle for slau	operation type			Total
	beef	dairy	both	
0	22	7	1	30
1	55	15	6	76
Total	77	22	7	106

Fisher's exact =   0.754

o **Water**

. tabulate consider_water optype, exact

Factors considered to be most important in deciding to transport cattle for slau	operation type			Total
	beef	dairy	both	
0	61	16	5	82
1	16	6	2	24
Total	77	22	7	106

Fisher's exact =   0.655

o **Feed**

. tabulate consider_feed optype, exact

Factors considered to be most important in deciding to transport cattle for slau	operation type			Total
	beef	dairy	both	
0	67	20	7	94

```
         1 |        10           2           0 |          12
-----------+----------------------------------+----------
     Total |        77          22           7 |         106

           Fisher's exact =                      0.881
```

o **Holding time**

```
. tabulate consider_holdingtime optype, exact
```

```
   Factors |
considered |
to be most |
 important |
        in |
  deciding |
        to |
 transport |
cattle for |              operation type
      slau |     beef       dairy        both |      Total
-----------+----------------------------------+----------
         0 |        41           7           3 |          51
         1 |        36          15           4 |          55
-----------+----------------------------------+----------
     Total |        77          22           7 |         106

           Fisher's exact =                      0.216
```

o **Ventilation**

```
. tabulate consider_vent optype, exact
```

```
   Factors |
considered |
to be most |
 important |
        in |
  deciding |
        to |
 transport |
cattle for |              operation type
      slau |     beef       dairy        both |      Total
-----------+----------------------------------+----------
         0 |        47          13           5 |          65
         1 |        30           9           2 |          41
-----------+----------------------------------+----------
     Total |        77          22           7 |         106

           Fisher's exact =                      0.888
```

o **Lighting**

```
. tabulate consider_light optype, exact
```

```
   Factors |
considered |
to be most |
 important |
        in |
  deciding |
```

```
       to |
transport |
cattle for |          operation type
     slau |     beef      dairy       both |     Total
-----------+---------------------------------+----------
        0 |       75         22          7 |       104
        1 |        2          0          0 |         2
-----------+---------------------------------+----------
    Total |       77         22          7 |       106

          Fisher's exact =                  1.000
```

o **Driver experience**
```
. tabulate consider_dexp optype, exact

  Factors |
considered |
to be most |
 important |
       in |
  deciding |
       to |
transport |
cattle for |          operation type
     slau |     beef      dairy       both |     Total
-----------+---------------------------------+----------
        0 |       40         14          7 |        61
        1 |       37          8          0 |        45
-----------+---------------------------------+----------
    Total |       77         22          7 |       106

          Fisher's exact =                  0.032
```

o **Driver training**
```
. tabulate consider_dtrain optype, exact

  Factors |
considered |
to be most |
 important |
       in |
  deciding |
       to |
transport |
cattle for |          operation type
     slau |     beef      dairy       both |     Total
-----------+---------------------------------+----------
        0 |       67         19          6 |        92
        1 |       10          3          1 |        14
-----------+---------------------------------+----------
    Total |       77         22          7 |       106

          Fisher's exact =                  1.000
```

o **Condition of animals**
```
. tabulate consider_condition optype, exact
```

```
   Factors |
considered |
to be most |
 important |
        in |
  deciding |
        to |
 transport |
cattle for |          operation type
      slau |    beef       dairy        both |     Total
-----------+---------------------------------+----------
         0 |      17           1           0 |        18
         1 |      60          21           7 |        88
-----------+---------------------------------+----------
     Total |      77          22           7 |       106

          Fisher's exact =                  0.076
```

o Weather condition

. tabulate consider_weather optype, exact

```
   Factors |
considered |
to be most |
 important |
        in |
  deciding |
        to |
 transport |
cattle for |          operation type
      slau |    beef       dairy        both |     Total
-----------+---------------------------------+----------
         0 |      37          14           2 |        53
         1 |      40           8           5 |        53
-----------+---------------------------------+----------
     Total |      77          22           7 |       106

          Fisher's exact =                  0.238
```

o Trip duration

tabulate consider_trip optype, exact

```
Enumerating sample-space combinations:
stage 3:  enumerations = 1
stage 2:  enumerations = 2
stage 1:  enumerations = 0

   Factors |
considered |
to be most |
 important |
        in |
  deciding |
        to |
 transport |
```

```
cattle for |           operation type
     slau |     beef      dairy       both |      Total
----------+---------------------------------+----------
        0 |       23          5          1 |         29
        1 |       54         17          6 |         77
----------+---------------------------------+----------
    Total |       77         22          7 |        106

          Fisher's exact =                    0.695
```

- **Euthanasia factors (Chi-squared/Fisher's exact)**
  - **Age**

    . tabulate euth_age optype, exact

```
Important |
  factors |
     when |
 deciding |
       to |
 euthanize |
 on farm - |           operation type
      age |     beef      dairy       both |      Total
----------+---------------------------------+----------
        0 |       49         20          6 |         75
        1 |       28          1          1 |         30
----------+---------------------------------+----------
    Total |       77         21          7 |        105

          Fisher's exact =                    0.008
```

  - **Disease status**

    . tabulate euth_disease optype, exact

```
Important |
  factors |
     when |
 deciding |
       to |
 euthanize |
 on farm - |
  disease |           operation type
   status |     beef      dairy       both |      Total
----------+---------------------------------+----------
        0 |       22          2          1 |         25
        1 |       55         19          6 |         80
----------+---------------------------------+----------
    Total |       77         21          7 |        105

          Fisher's exact =                    0.170
```

  - **The animal's fitness for transport**

    . tabulate euth_fitness optype, exact

```
Important |
  factors |
     when |
 deciding |
```

```
       to |
 euthanize |
 on farm - |
   fitness |
       for |            operation type
 transport |     beef       dairy        both |      Total
-----------+---------------------------------+----------
         0 |       22           7           1 |         30
         1 |       55          14           6 |         75
-----------+---------------------------------+----------
     Total |       77          21           7 |        105

           Fisher's exact =                 0.751
```

o **Drug withdrawal time**

```
. tabulate euth_withdraw optype, exact
```

```
 Important |
   factors |
      when |
  deciding |
        to |
 euthanize |
 on farm - |
      meat |            operation type
withdrawal |     beef       dairy        both |      Total
-----------+---------------------------------+----------
         0 |       64          19           6 |         89
         1 |       13           2           1 |         16
-----------+---------------------------------+----------
     Total |       77          21           7 |        105

           Fisher's exact =                 0.801
```

o **Severe injury**

```
. tabulate euth_injury optype, exact
```

```
 Important |
   factors |
      when |
  deciding |
        to |
 euthanize |
 on farm - |
    severe |            operation type
    injury |     beef       dairy        both |      Total
-----------+---------------------------------+----------
         0 |       13           3           0 |         16
         1 |       64          18           7 |         89
-----------+---------------------------------+----------
     Total |       77          21           7 |        105

           Fisher's exact =                 0.715
```

o **Likelihood of recovery**

```
. tabulate euth_recovery optype, exact
```

92

```
Important |
 factors |
    when |
deciding |
      to |
euthanize |
on farm - |
likelihood |
      of |          operation type
 recovery |    beef      dairy       both |      Total
----------+--------------------------------+----------
        0 |      21          3          1 |         25
        1 |      56         18          6 |         80
----------+--------------------------------+----------
    Total |      77         21          7 |        105

         Fisher's exact =              0.521
```

o **Economic considerations**
. tabulate euth_econ optype, exact

```
Important |
 factors |
    when |
deciding |
      to |
euthanize |
on farm - |
 economic |
considerat |          operation type
    ions |    beef      dairy       both |      Total
----------+--------------------------------+----------
        0 |      67         13          6 |         86
        1 |      10          8          1 |         19
----------+--------------------------------+----------
    Total |      77         21          7 |        105

         Fisher's exact =              0.038
```

o **Loss of production**
. tabulate euth_lop optype, exact

```
Important |
 factors |
    when |
deciding |
      to |
euthanize |
on farm - |
  loss of |          operation type
production |    beef      dairy       both |      Total
----------+--------------------------------+----------
        0 |      71         20          7 |         98
        1 |       6          1          0 |          7
----------+--------------------------------+----------
    Total |      77         21          7 |        105
```

```
            Fisher's exact =                      1.000
```

o **Distance to local abattoir/auction**

```
. tabulate euth_disab optype, exact

Important |
  factors |
     when |
 deciding |
       to |
euthanize |
 on farm - |
 distance |
       to |
abattoir/a |           operation type
      uct |     beef      dairy       both |     Total
-----------+----------------------------------+----------
        0 |       75         21          7 |       103
        1 |        2          0          0 |         2
-----------+----------------------------------+----------
    Total |       77         21          7 |       105

            Fisher's exact =                      1.000
```

o **Animal's quality of life**

```
. tabulate euth_qol optype, exact

Important |
  factors |
     when |
 deciding |
       to |
euthanize |
 on farm - |
quality of |           operation type
     life |     beef      dairy       both |     Total
-----------+----------------------------------+----------
        0 |       12          4          0 |        16
        1 |       65         17          7 |        89
-----------+----------------------------------+----------
    Total |       77         21          7 |       105

            Fisher's exact =                      0.637
```

- **Familiarity with <u>their</u> COP (Kruskal-Wallis)**
    - o **Beef**

```
. kwallis bcop_fam, by(beef)
Kruskal-Wallis equality-of-populations rank test

+-----------------------+
| beef | Obs | Rank Sum |
|------+-----+----------|
|    0 |  19 |   538.50 |
|    1 |  76 |  4021.50 |
+-----------------------+

chi-squared =    12.076 with 1 d.f.
probability =     0.0005

chi-squared with ties =    13.259 with 1 d.f.
probability =     0.0003

. graph box bcop_fam, by(beef)
```


Graphs by beef

o **Dairy**

```
. kwallis dcop_fam, by(dairy)

Kruskal-Wallis equality-of-populations rank test

    +------------------------+
    | dairy | Obs | Rank Sum |
    |-------+-----+----------|
    |     0 |  73 |  2934.50 |
    |     1 |  22 |  1625.50 |
    +------------------------+

chi-squared =     25.244 with 1 d.f.
probability =      0.0001

chi-squared with ties =    26.943 with 1 d.f.
probability =      0.0001

. graph box dcop_fam, by(dairy)
```


Graphs by dairy
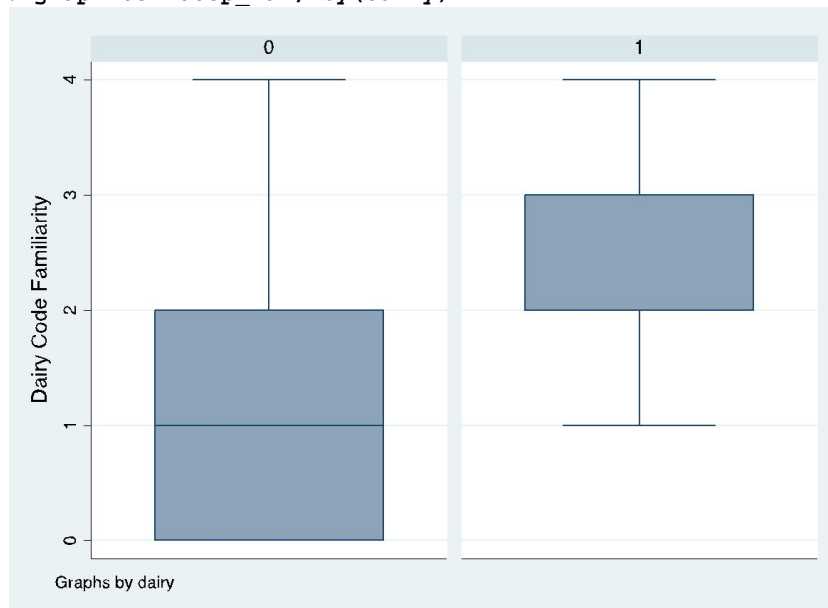
o **Both**

```
. kwallis bcop_fam, by(both)

Kruskal-Wallis equality-of-populations rank test

    +------------------------+
    | both | Obs | Rank Sum |
    |------+-----+----------|
    |    0 |  89 |  4306.00 |
    |    1 |   6 |   254.00 |
    +------------------------+
```

```
chi-squared =      0.271 with 1 d.f.
probability =      0.6029
```

`. graph box bcop_fam, by(both)`

Graphs by both
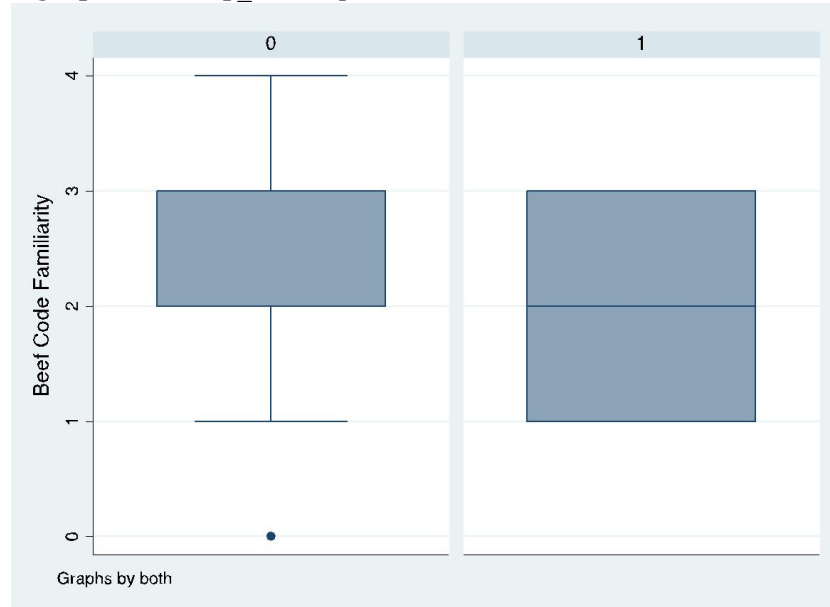
`. kwallis dcop_fam, by(both)`

Kruskal-Wallis equality-of-populations rank test

```
    +-----------------------+
    | both | Obs | Rank Sum |
    |------+-----+----------|
    |    0 |  88 |  4064.00 |
    |    1 |   7 |   496.00 |
    +-----------------------+
```

```
chi-squared =      5.195 with 1 d.f.
probability =      0.0227
```

```
chi-squared with ties =      5.545 with 1 d.f.
probability =      0.0185
```

`. graph box dcop_fam, by(both)`

97

Graphs by both
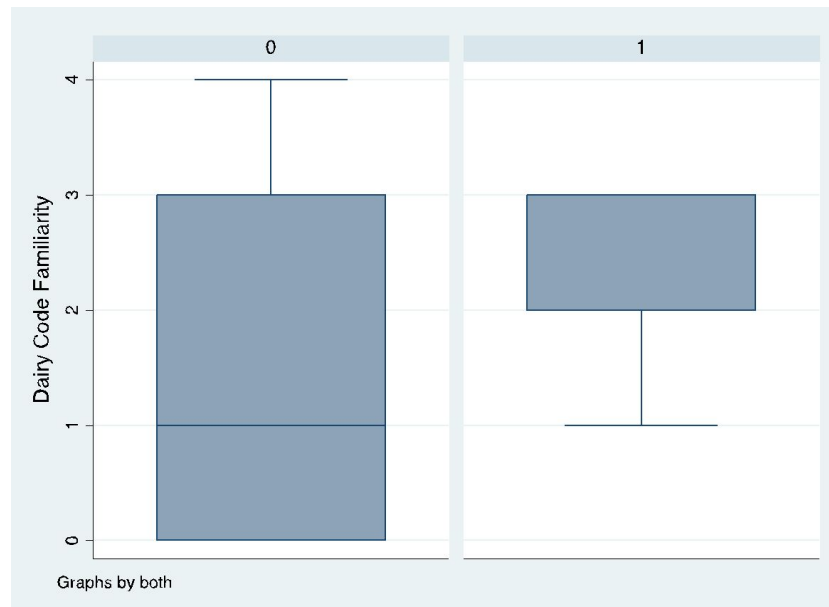
- **Familiarity with Health of Animals Regulations Part XII – Transportation (Kruskal-Wallis)**

```
. kwallis ah_reg_fam, by(optype)

Kruskal-Wallis equality-of-populations rank test

    +-------------------------+
    | optype | Obs | Rank Sum |
    |--------+-----+----------|
    |   beef |  77 |  4158.00 |
    |  dairy |  22 |  1139.00 |
    |   both |   7 |   374.00 |
    +-------------------------+

chi-squared =      0.090 with 2 d.f.
probability =      0.9561

chi-squared with ties =      0.097 with 2 d.f.
probability =      0.9527
```

- **Familiarity with Regulations amending the Health of Animals Regulations (Kruskal-Wallis)**

```
. kwallis ah_amend_fam, by(optype)
Kruskal-Wallis equality-of-populations rank test

    +-------------------------+
    | optype | Obs | Rank Sum |
    |--------+-----+----------|
    |   beef |  77 |  4127.00 |
```

```
           | dairy |  22 |  1176.00 |
           |  both |   7 |   368.00 |
           +------------------------+

    chi-squared =      0.007 with 2 d.f.
    probability =      0.9964

    chi-squared with ties =      0.008 with 2 d.f.
    probability =      0.9962
```

- **Familiarity with Transpiration of Animals Program – Compromised Animal Policy (Kruskal-Wallis)**

```
    . kwallis trans_policy_fam, by(optype)

    Kruskal-Wallis equality-of-populations rank test

        +------------------------+
        | optype | Obs | Rank Sum |
        |--------+-----+----------|
        |   beef |  77 |  3862.50 |
        |  dairy |  22 |  1408.50 |
        |   both |   7 |   400.00 |
        +------------------------+

    chi-squared =      3.583 with 2 d.f.
    probability =      0.1667

    chi-squared with ties =      3.871 with 2 d.f.
    probability =      0.1444
```

2. Does years of experience affect:

- **Influential factors for sale (Mann-Whitney U-test)**
  - **Animal's health or disease status**
    ```
    . ranksum  yr_exp_range, by(sale_ahd)

    Two-sample Wilcoxon rank-sum (Mann-Whitney) test

        sale_ahd |      obs    rank sum    expected
    -------------+---------------------------------
               0 |       15       869.5       772.5
               1 |       87      4383.5      4480.5
    -------------+---------------------------------
        combined |      102        5253        5253

    unadjusted variance     11201.25
    adjustment for ties      -1235.14
                            ----------
    adjusted variance        9966.11

    Ho: yr_exp~e(sale_ahd==0) = yr_exp~e(sale_ahd==1)
                z =     0.972
        Prob > |z| =    0.3312
    ```
  - **Animal's BCS**
    ```
    . ranksum  yr_exp_range, by(sale_bcs)
    ```

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```
Two-sample Wilcoxon rank-sum (Mann-Whitney) test

    sale_bcs |      obs    rank sum    expected
-------------+-------------------------------
           0 |       40      2186.5        2060
           1 |       62      3066.5        3193
-------------+-------------------------------
    combined |      102        5253        5253

unadjusted variance     21286.67
adjustment for ties     -2347.24
                        ----------
adjusted variance       18939.43

Ho: yr_exp~e(sale_bcs==0) = yr_exp~e(sale_bcs==1)
           z =    0.919
    Prob > |z| =    0.3580
```

o **Animal's soundness/mobility**

```
. ranksum  yr_exp_range, by(sale_soundness)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

sale_sound~s |      obs     rank sum    expected
-------------+-----------------------------------
           0 |       12          577         618
           1 |       90         4676        4635
-------------+-----------------------------------
    combined |      102         5253        5253

unadjusted variance     9270.00
adjustment for ties    -1022.18
                       ----------
adjusted variance       8247.82

Ho: yr_exp~e(sale_s~s==0) = yr_exp~e(sale_s~s==1)
            z =  -0.451
    Prob > |z| =   0.6517
```

o **Animal's age**

```
. ranksum  yr_exp_range, by(sale_age)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

    sale_age |      obs     rank sum    expected
-------------+-----------------------------------
           0 |       57       2876.5      2935.5
           1 |       45       2376.5      2317.5
-------------+-----------------------------------
    combined |      102         5253        5253

unadjusted variance    22016.25
adjustment for ties    -2427.69
                       ----------
adjusted variance      19588.56

Ho: yr_exp~e(sale_age==0) = yr_exp~e(sale_age==1)
            z =  -0.422
    Prob > |z| =   0.6734
```

o **Stage of lactation**

```
. ranksum  yr_exp_range, by(sale_lactation)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

sale_lacta~n |      obs     rank sum    expected
-------------+-----------------------------------
           0 |       85         4403      4377.5
           1 |       17          850       875.5
-------------+-----------------------------------
    combined |      102         5253        5253

unadjusted variance    12402.92
adjustment for ties    -1367.64
                       ----------
```

```
adjusted variance        11035.27

Ho: yr_exp~e(sale_l~n==0) = yr_exp~e(sale_l~n==1)
            z =    0.243
    Prob > |z| =    0.8082
```

o **Stage of pregnancy**
```
. ranksum  yr_exp_range, by(sale_preg)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

    sale_preg |       obs     rank sum     expected
--------------+---------------------------------
            0 |        70       3674.5         3605
            1 |        32       1578.5         1648
--------------+---------------------------------
     combined |       102         5253         5253

unadjusted variance    19226.67
adjustment for ties     -2120.09
                      ----------
adjusted variance       17106.58

Ho: yr_exp~e(sale_p~g==0) = yr_exp~e(sale_p~g==1)
            z =    0.531
    Prob > |z| =    0.5952
```

o **Market prices**
```
. ranksum  yr_exp_range, by(sale_price)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

   sale_price |       obs     rank sum     expected
--------------+---------------------------------
            0 |        46         2493         2369
            1 |        56         2760         2884
--------------+---------------------------------
     combined |       102         5253         5253

unadjusted variance    22110.67
adjustment for ties     -2438.10
                      ----------
adjusted variance       19672.57

Ho: yr_exp~e(sale_p~e==0) = yr_exp~e(sale_p~e==1)
            z =    0.884
    Prob > |z| =    0.3767
```

o **Availability of help for loading/unloading**
```
. ranksum  yr_exp_range, by(sale_loadinghelp)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

 sale_loadi~p |       obs     rank sum     expected
--------------+---------------------------------
            0 |        90         4588         4635
```

```
             1 |         12          665          618
-------------+-------------------------------
      combined |        102         5253         5253

unadjusted variance      9270.00
adjustment for ties      -1022.18
                        ----------
adjusted variance        8247.82

Ho: yr_exp~e(sale_l~p==0) = yr_exp~e(sale_l~p==1)
          z =   -0.518
   Prob > |z| =    0.6048
```

o **Veterinarian recommendation/diagnosis**

```
. ranksum  yr_exp_range, by(sale_vet)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

      sale_vet |       obs     rank sum     expected
-------------+-------------------------------
           0 |        75       3854.5       3862.5
           1 |        27       1398.5       1390.5
-------------+-------------------------------
      combined |       102         5253         5253

unadjusted variance     17381.25
adjustment for ties      -1916.60
                        ----------
adjusted variance       15464.65

Ho: yr_exp~e(sale_vet==0) = yr_exp~e(sale_vet==1)
          z =   -0.064
   Prob > |z| =    0.9487
```

o **Weather conditions**

```
. ranksum  yr_exp_range, by(sale_weather)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

 sale_weather |       obs     rank sum     expected
-------------+-------------------------------
           0 |        71       3518.5       3656.5
           1 |        31       1734.5       1596.5
-------------+-------------------------------
      combined |       102         5253         5253

unadjusted variance     18891.92
adjustment for ties      -2083.17
                        ----------
adjusted variance       16808.74

Ho: yr_exp~e(sale_w~r==0) = yr_exp~e(sale_w~r==1)
          z =   -1.064
   Prob > |z| =    0.2871
```

- **Influential factors for slaughter (Mann-Whitney U-test)**
  - **Animal's health or disease status**

    ```
    . ranksum  yr_exp_range, by(slaughter_ahd)

    Two-sample Wilcoxon rank-sum (Mann-Whitney) test

    slaughter_~d |      obs    rank sum    expected
    -------------+-----------------------------------
              0 |       13       504.5         650
              1 |       86      4445.5        4300
    -------------+-----------------------------------
       combined |       99        4950        4950

    unadjusted variance      9316.67
    adjustment for ties     -1020.17
                            ----------
    adjusted variance        8296.50

    Ho: yr_exp~e(slaugh~d==0) = yr_exp~e(slaugh~d==1)
              z =  -1.597
        Prob > |z| =   0.1102
    ```

  - **Animal's BCS**

    ```
    . ranksum  yr_exp_range, by(slaughter_bcs)

    Two-sample Wilcoxon rank-sum (Mann-Whitney) test

    slaughter~cs |      obs    rank sum    expected
    -------------+-----------------------------------
              0 |       27      1273.5        1350
              1 |       72      3676.5        3600
    -------------+-----------------------------------
       combined |       99        4950        4950

    unadjusted variance     16200.00
    adjustment for ties     -1773.88
                            ----------
    adjusted variance       14426.12

    Ho: yr_exp~e(slaug~cs==0) = yr_exp~e(slaug~cs==1)
              z =  -0.637
        Prob > |z| =   0.5242
    ```

  - **Animal's soundness/mobility**

    ```
    . ranksum  yr_exp_range, by(slaughter_soundess)

    Two-sample Wilcoxon rank-sum (Mann-Whitney) test

    slaughter~ss |      obs    rank sum    expected
    -------------+-----------------------------------
              0 |       16       897.5         800
              1 |       83      4052.5        4150
    -------------+-----------------------------------
       combined |       99        4950        4950

    unadjusted variance     11066.67
    adjustment for ties     -1211.79
    ```

```
                             ----------
adjusted variance         9854.88

Ho: yr_exp~e(slaug~ss==0) = yr_exp~e(slaug~ss==1)
            z =    0.982
    Prob > |z| =    0.326
```

o **Animal's age**

```
. ranksum  yr_exp_range, by(slaughter_age)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

slaughter~ge |       obs    rank sum    expected
-------------+-----------------------------------
           0 |        47      2578.5        2350
           1 |        52      2371.5        2600
-------------+-----------------------------------
    combined |        99        4950        4950

unadjusted variance    20366.67
adjustment for ties    -2230.13
                       ----------
adjusted variance      18136.54

Ho: yr_exp~e(slaug~ge==0) = yr_exp~e(slaug~ge==1)
            z =    1.697
    Prob > |z| =    0.0898
```

o **Stage of lactation**
```
ranksum  yr_exp_range, by(slaughter_lactation)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

slaughter_~n |       obs    rank sum    expected
-------------+-----------------------------------
           0 |        78        3885        3900
           1 |        21        1065        1050
-------------+-----------------------------------
    combined |        99        4950        4950

unadjusted variance    13650.00
adjustment for ties    -1494.66
                       ----------
adjusted variance      12155.34

Ho: yr_exp~e(slaugh~n==0) = yr_exp~e(slaugh~n==1)
            z =   -0.136
    Prob > |z| =    0.8918
```

o **Stage of pregnancy**
```
. ranksum  yr_exp_range, by(slaughter_preg)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

slaughter_~g |       obs    rank sum    expected
-------------+-----------------------------------
```

```
            0 |          67        3298         3350
            1 |          32        1652         1600
-------------+-------------------------------
     combined |          99        4950         4950


unadjusted variance     17866.67
adjustment for ties      -1956.38
                        ----------
adjusted variance       15910.28

Ho: yr_exp~e(slaugh~g==0) = yr_exp~e(slaugh~g==1)
          z =  -0.412
   Prob > |z| =   0.680
```

o **Market prices**

```
. ranksum  yr_exp_range, by(slaughter_price)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

slaughter~ce |        obs    rank sum     expected
-------------+-------------------------------
            0 |          60        3156         3000
            1 |          39        1794         1950
-------------+-------------------------------
     combined |          99        4950         4950


unadjusted variance     19500.00
adjustment for ties      -2135.23
                        ----------
adjusted variance       17364.77

Ho: yr_exp~e(slaug~ce==0) = yr_exp~e(slaug~ce==1)
          z =   1.184
   Prob > |z| =   0.2365
```

o **Availability of livestock transporter**

```
. ranksum  yr_exp_range, by(slaughter_availtransporter)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

slaughte~ter |        obs    rank sum     expected
-------------+-------------------------------
            0 |          93      4605.5         4650
            1 |           6       344.5          300
-------------+-------------------------------
     combined |          99        4950         4950


unadjusted variance      4650.00
adjustment for ties       -509.17
                        ----------
adjusted variance        4140.83

Ho: yr_exp~e(slau~ter==0) = yr_exp~e(slau~ter==1)
          z =  -0.692
   Prob > |z| =   0.4892
```

o **Availability of help for loading/unloading**

```
. ranksum  yr_exp_range, by(slaughter_loadinghelp)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

slaughter_~p |      obs    rank sum    expected
-------------+-----------------------------------
           0 |       91        4536        4550
           1 |        8         414         400
-------------+-----------------------------------
    combined |       99        4950        4950

unadjusted variance      6066.67
adjustment for ties      -664.29
                      ----------
adjusted variance        5402.37

Ho: yr_exp~e(slaugh~p==0) = yr_exp~e(slaugh~p==1)
           z =   -0.190
    Prob > |z| =    0.8489
```

o **Veterinarian recommendation/diagnosis**

```
. ranksum  yr_exp_range, by(slaughter_vet)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

slaughter_~t |      obs    rank sum    expected
-------------+-----------------------------------
           0 |       69        3311        3450
           1 |       30        1639        1500
-------------+-----------------------------------
    combined |       99        4950        4950

unadjusted variance     17250.00
adjustment for ties     -1888.86
                      ----------
adjusted variance       15361.14

Ho: yr_exp~e(slaugh~t==0) = yr_exp~e(slaugh~t==1)
           z =   -1.122
    Prob > |z| =    0.2621
```

o **Weather conditions**

```
. ranksum  yr_exp_range, by(slaughter_weather)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

slaugh~ather |      obs    rank sum    expected
-------------+-----------------------------------
           0 |       79        3717        3950
           1 |       20        1233        1000
-------------+-----------------------------------
    combined |       99        4950        4950

unadjusted variance     13166.67
adjustment for ties     -1441.74
                      ----------
```

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```
adjusted variance        11724.93

Ho: yr_exp~e(sl~ather==0) = yr_exp~e(sl~ather==1)
            z =  -2.152
    Prob > |z| =   0.0314
```

- **Euthanasia factors (Mann-Whitney U-test)**
    - **Age**

        `. ranksum  yr_exp_range, by(euth_age)`

        Two-sample Wilcoxon rank-sum (Mann-Whitney) test

euth_age	obs	rank sum	expected
0	73	3748	3796
1	30	1608	1560
combined	103	5356	5356

        ```
        unadjusted variance    18980.00
        adjustment for ties    -2050.34
                               ----------
        adjusted variance      16929.66

        Ho: yr_exp~e(euth_age==0) = yr_exp~e(euth_age==1)
                    z =  -0.369
            Prob > |z| =   0.7122
        ```

    - **Disease status**

        `. ranksum  yr_exp_range, by(euth_disease)`

        Two-sample Wilcoxon rank-sum (Mann-Whitney) test

euth_disease	obs	rank sum	expected
0	24	1291	1248
1	79	4065	4108
combined	103	5356	5356

        ```
        unadjusted variance    16432.00
        adjustment for ties    -1775.09
                               ----------
        adjusted variance      14656.91

        Ho: yr_exp~e(euth_d~e==0) = yr_exp~e(euth_d~e==1)
                    z =   0.355
            Prob > |z| =   0.7225
        ```

    - **The animal's fitness for transport**

        `. ranksum  yr_exp_range, by(euth_fitness)`

        Two-sample Wilcoxon rank-sum (Mann-Whitney) test

euth_fitness	obs	rank sum	expected
```

```
           0 |         30         1425         1560
           1 |         73         3931         3796
-------------+-------------------------------
    combined |        103         5356         5356

unadjusted variance      18980.00
adjustment for ties      -2050.34
                         ----------
adjusted variance        16929.66

Ho: yr_exp~e(euth_f~s==0) = yr_exp~e(euth_f~s==1)
           z =   -1.038
    Prob > |z| =   0.2995
```

o **Drug withdrawal time**

```
. ranksum  yr_exp_range, by(euth_withdraw)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

euth_withd~w |       obs     rank sum     expected
-------------+-------------------------------
           0 |         88         4538         4576
           1 |         15          818          780
-------------+-------------------------------
    combined |        103         5356         5356

unadjusted variance      11440.00
adjustment for ties      -1235.82
                         ----------
adjusted variance        10204.18

Ho: yr_exp~e(euth_w~w==0) = yr_exp~e(euth_w~w==1)
           z =   -0.376
    Prob > |z| =   0.7068
```

o **Severe injury**

```
. ranksum  yr_exp_range, by(euth_injury)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

 euth_injury |       obs     rank sum     expected
-------------+-------------------------------
           0 |         16         1151          832
           1 |         87         4205         4524
-------------+-------------------------------
    combined |        103         5356         5356

unadjusted variance      12064.00
adjustment for ties      -1303.23
                         ----------
adjusted variance        10760.77

Ho: yr_exp~e(euth_i~y==0) = yr_exp~e(euth_i~y==1)
           z =    3.075
    Prob > |z| =   0.0021
```

o **Likelihood of recovery**

```
. ranksum  yr_exp_range, by(euth_recovery)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

euth_recov~y |       obs     rank sum     expected
-------------+-----------------------------------
          0 |        24         1290         1248
          1 |        79         4066         4108
-------------+-----------------------------------
    combined |       103         5356         5356

unadjusted variance      16432.00
adjustment for ties      -1775.09
                         ----------
adjusted variance        14656.91

Ho: yr_exp~e(euth_r~y==0) = yr_exp~e(euth_r~y==1)
          z =    0.347
    Prob > |z| =    0.7287
```

o **Economic considerations**

```
. ranksum  yr_exp_range, by(euth_econ)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

   euth_econ |       obs     rank sum     expected
-------------+-----------------------------------
          0 |        85         4441         4420
          1 |        18          915          936
-------------+-----------------------------------
    combined |       103         5356         5356

unadjusted variance      13260.00
adjustment for ties      -1432.43
                         ----------
adjusted variance        11827.57

Ho: yr_exp~e(euth_e~n==0) = yr_exp~e(euth_e~n==1)
          z =    0.193
    Prob > |z| =    0.8469
```

o **Loss of production**

```
. ranksum  yr_exp_range, by(euth_lop)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

    euth_lop |       obs     rank sum     expected
-------------+-----------------------------------
          0 |        96         5086         4992
          1 |         7          270          364
-------------+-----------------------------------
    combined |       103         5356         5356

unadjusted variance       5824.00
adjustment for ties       -629.14
                         ----------
```

```
         adjusted variance        5194.86

     Ho: yr_exp~e(euth_lop==0) = yr_exp~e(euth_lop==1)
               z =     1.304
          Prob > |z| =    0.1922
```

o **Distance to local abattoir/auction**
```
     . ranksum  yr_exp_range, by(euth_disab)

     Two-sample Wilcoxon rank-sum (Mann-Whitney) test

        euth_disab |       obs     rank sum     expected
     -------------+-------------------------------
                0 |       101         5290         5252
                1 |         2           66          104
     -------------+-------------------------------
         combined |       103         5356         5356

     unadjusted variance     1750.67
     adjustment for ties      -189.12
                             ----------
     adjusted variance       1561.55

     Ho: yr_exp~e(euth_d~b==0) = yr_exp~e(euth_d~b==1)
               z =     0.962
          Prob > |z| =    0.3362
```

o **Animal's quality of life**
```
     . ranksum  yr_exp_range, by(euth_qol)

     Two-sample Wilcoxon rank-sum (Mann-Whitney) test

          euth_qol |       obs     rank sum     expected
     -------------+-------------------------------
                0 |        16          930          832
                1 |        87         4426         4524
     -------------+-------------------------------
         combined |       103         5356         5356

     unadjusted variance    12064.00
     adjustment for ties    -1303.23
                             ----------
     adjusted variance      10760.77

     Ho: yr_exp~e(euth_qol==0) = yr_exp~e(euth_qol==1)
               z =     0.945
          Prob > |z| =    0.3448
```

● **Contact person (Mann-Whitney U-test)**
o **Abattoir manager/owner**
```
     . ranksum  yr_exp_range, by(contact_abattoir)

     Two-sample Wilcoxon rank-sum (Mann-Whitney) test

        contact_ab~r |       obs     rank sum     expected
     -------------+-------------------------------
```

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```
            0 |       79       3955.5        3950
            1 |       20        994.5        1000
-------------+-------------------------------
     combined |       99        4950         4950

unadjusted variance      13166.67
adjustment for ties       -1342.07
                         ----------
adjusted variance        11824.59

Ho: yr_exp~e(contac~r==0) = yr_exp~e(contac~r==1)
          z =    0.051
    Prob > |z| =   0.9597
```

o **Auction manager/owner**

```
. ranksum  yr_exp_range, by(contact_auction)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

contact_au~n |       obs     rank sum     expected
-------------+-------------------------------
            0 |       65       3374.5        3250
            1 |       34       1575.5        1700
-------------+-------------------------------
     combined |       99        4950         4950

unadjusted variance      18416.67
adjustment for ties       -1877.20
                         ----------
adjusted variance        16539.47

Ho: yr_exp~e(contac~n==0) = yr_exp~e(contac~n==1)
          z =    0.968
    Prob > |z| =   0.3330
```

o **Producer group (Eg. CCA, Alberta Milk, Alberta Beef)**

```
. ranksum  yr_exp_range, by(contact_prodgroup)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

contact_pr~p |       obs     rank sum     expected
-------------+-------------------------------
            0 |       87       4336.5        4350
            1 |       12        613.5         600
-------------+-------------------------------
     combined |       99        4950         4950

unadjusted variance       8700.00
adjustment for ties        -886.79
                         ----------
adjusted variance         7813.21

Ho: yr_exp~e(conta~up==0) = yr_exp~e(conta~up==1)
          z =   -0.153
    Prob > |z| =   0.8786
```

o **CFIA**

```
.  ranksum  yr_exp_range, by(contact_cfia)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

contact_cfia |       obs     rank sum     expected
-------------+-------------------------------
           0 |        95       4756.5         4750
           1 |         4        193.5          200
-------------+-------------------------------
    combined |        99         4950         4950

unadjusted variance      3166.67
adjustment for ties      -322.78
                         ----------
adjusted variance        2843.89

Ho: yr_exp~e(conta~ia==0) = yr_exp~e(conta~ia==1)
            z =    0.122
    Prob > |z| =    0.9030
```

o **Meat Inspector**

```
.  ranksum  yr_exp_range, by(contact_meatinsp)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

contact_me~p |       obs     rank sum     expected
-------------+-------------------------------
           0 |        97         4821         4850
           1 |         2          129          100
-------------+-------------------------------
    combined |        99         4950         4950

unadjusted variance      1616.67
adjustment for ties      -164.79
                         ----------
adjusted variance        1451.88

Ho: yr_exp~e(conta~sp==0) = yr_exp~e(conta~sp==1)
            z =   -0.761
    Prob > |z| =    0.4466
```

o **Veterinarian**

```
.  ranksum  yr_exp_range, by(contact_vet)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

 contact_vet |       obs     rank sum     expected
-------------+-------------------------------
           0 |        30       1563.5         1500
           1 |        69       3386.5         3450
-------------+-------------------------------
    combined |        99         4950         4950

unadjusted variance     17250.00
adjustment for ties     -1758.28
                         ----------
adjusted variance       15491.72
```

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```
          Ho: yr_exp~e(contac~t==0) = yr_exp~e(contac~t==1)
                  z =    0.510
              Prob > |z| =   0.6099
```

o **Other Producers**

```
. ranksum  yr_exp_range, by(contact_otherprod)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

contact_ot~d |      obs     rank sum    expected
-------------+-----------------------------------
           0 |       84         4504         4200
           1 |       15          446          750
-------------+-----------------------------------
    combined |       99         4950         4950

unadjusted variance    10500.00
adjustment for ties    -1070.26
                       ----------
adjusted variance       9429.74

Ho: yr_exp~e(contac~d==0) = yr_exp~e(contac~d==1)
        z =    3.131
    Prob > |z| =   0.0017
```

o **Alberta SPCA**

```
. ranksum  yr_exp_range, by(contact_abspca)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

contact_ab~a |      obs     rank sum    expected
-------------+-----------------------------------
           0 |       98         4933         4900
           1 |        1           17           50
-------------+-----------------------------------
    combined |       99         4950         4950

unadjusted variance      816.67
adjustment for ties      -83.24
                       ----------
adjusted variance        733.42

Ho: yr_exp~e(conta~ca==0) = yr_exp~e(conta~ca==1)
        z =    1.219
    Prob > |z| =   0.2230
```

- **Familiarity with <u>their </u>COP (Spearman correlation)**
  - o **Beef**

```
. spearman bcop_fam beef_yr_exp_range

 Number of obs =       75
Spearman's rho =        0.2012

Test of Ho: bcop_fam and beef_yr_exp_range are independent
    Prob > |t| =        0.0835
```

o **Dairy**

```
. spearman dcop_fam  dairy_yr_exp_range

 Number of obs =       20
Spearman's rho =      0.5967

Test of Ho: dcop_fam and dairy_yr_exp_range are independent
    Prob > |t| =      0.0055
```

o **Both**

```
. spearman bcop_fam  both_yr_exp_range

 Number of obs =       6
Spearman's rho =     -0.8391

Test of Ho: bcop_fam and both_yr_exp_range are independent
    Prob > |t| =      0.0367

. spearman dcop_fam  both_yr_exp_range

 Number of obs =       7
Spearman's rho =     -0.6600

Test of Ho: dcop_fam and both_yr_exp_range are independent
    Prob > |t| =      0.1067
```

- **Familiarity with Health of Animals Regulations Part XII – Transportation (Spearman Correlation)**
```
. spearman ah_reg_fam yr_exp_range

 Number of obs =      103
Spearman's rho =      0.2272

Test of Ho: ah_reg_fam and yr_exp_range are independent
    Prob > |t| =      0.0210
```

- **Familiarity with Regulations amending the Health of Animals Regulations (Spearman Correlation)**

```
. spearman ah_amend_fam yr_exp_range

 Number of obs =      103
Spearman's rho =      0.2566

Test of Ho: ah_amend_fam and yr_exp_range are independent
    Prob > |t| =      0.0089

chi-squared with ties =      0.008 with 2 d.f.
probability =     0.9962
```

- **Familiarity with Transpiration of Animals Program – Compromised**

Animal Policy (Spearman Correlation)

```
. spearman trans_policy_fam yr_exp_range

 Number of obs =      103
Spearman's rho =       0.2770

Test of Ho: trans_policy_fam and yr_exp_range are independent
     Prob > |t| =       0.0046
```

3. Does proximity to abbatoir affect:

- **Influential factors for sale (Mann-Whitney U-test)**
  - **Animal's health or disease status**

    ```
    . ranksum proximity_abattoir, by(sale_ahd)
    ```

    Two-sample Wilcoxon rank-sum (Mann-Whitney) test

sale_ahd	obs	rank sum	expected
0	16	927.5	864
1	91	4850.5	4914
combined	107	5778	5778

    ```
    unadjusted variance    13104.00
    adjustment for ties    -5146.51
                           ----------
    adjusted variance       7957.49

    Ho: proxim~r(sale_ahd==0) = proxim~r(sale_ahd==1)
              z =    0.712
        Prob > |z| =   0.4766
    ```

  - **Animal's BCS**

    ```
    . ranksum proximity_abattoir, by(sale_bcs)
    ```

    Two-sample Wilcoxon rank-sum (Mann-Whitney) test

sale_bcs	obs	rank sum	expected
0	41	2495.5	2214
1	66	3282.5	3564
combined	107	5778	5778

    ```
    unadjusted variance    24354.00
    adjustment for ties    -9564.88
                           ----------
    adjusted variance      14789.12

    Ho: proxim~r(sale_bcs==0) = proxim~r(sale_bcs==1)
              z =    2.315
        Prob > |z| =   0.0206
    ```

  - **Animal's soundness/mobility**

```
. ranksum proximity_abattoir, by(sale_soundness)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

sale_sound~s |      obs    rank sum    expected
-------------+-----------------------------------
          0 |       13       732.5         702
          1 |       94      5045.5        5076
-------------+-----------------------------------
    combined |      107        5778        5778

unadjusted variance     10998.00
adjustment for ties     -4319.40
                        ----------
adjusted variance        6678.60

Ho: proxim~r(sale_s~s==0) = proxim~r(sale_s~s==1)
          z =   0.373
   Prob > |z| =   0.7090
```

o **Animal's age**
```
. ranksum proximity_abattoir, by(sale_age)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

    sale_age |      obs    rank sum    expected
-------------+-----------------------------------
          0 |       61      3128.5        3294
          1 |       46      2649.5        2484
-------------+-----------------------------------
    combined |      107        5778        5778

unadjusted variance     25254.00
adjustment for ties     -9918.35
                        ----------
adjusted variance       15335.65

Ho: proxim~r(sale_age==0) = proxim~r(sale_age==1)
          z =  -1.336
   Prob > |z| =   0.1814
```

o **Stage of lactation**
```
. ranksum proximity_abattoir, by(sale_lactation)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

sale_lacta~n |      obs    rank sum    expected
-------------+-----------------------------------
          0 |       88        4728        4752
          1 |       19        1050        1026
-------------+-----------------------------------
    combined |      107        5778        5778

unadjusted variance     15048.00
adjustment for ties     -5910.01
                        ----------
adjusted variance        9137.99
```

```
Ho: proxim~r(sale_l~n==0) = proxim~r(sale_l~n==1)
            z =  -0.251
    Prob > |z| =   0.8018
```

o **Stage of pregnancy**

```
. ranksum proximity_abattoir, by(sale_preg)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

    sale_preg |       obs    rank sum    expected
--------------+---------------------------------
            0 |        74      3941.5        3996
            1 |        33      1836.5        1782
--------------+---------------------------------
     combined |       107        5778        5778

unadjusted variance    21978.00
adjustment for ties    -8631.72
                       ----------
adjusted variance      13346.28

Ho: proxim~r(sale_p~g==0) = proxim~r(sale_p~g==1)
            z =  -0.472
    Prob > |z| =   0.6371
```

o **Market prices**

```
. ranksum proximity_abattoir, by(sale_price)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

   sale_price |       obs    rank sum    expected
--------------+---------------------------------
            0 |        48        2805        2592
            1 |        59        2973        3186
--------------+---------------------------------
     combined |       107        5778        5778

unadjusted variance    25488.00
adjustment for ties   -10010.25
                       ----------
adjusted variance      15477.75

Ho: proxim~r(sale_p~e==0) = proxim~r(sale_p~e==1)
            z =   1.712
    Prob > |z| =   0.0869
```

o **Availability of help for loading/unloading**

```
. ranksum proximity_abattoir, by(sale_loadinghelp)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

 sale_loadi~p |       obs    rank sum    expected
--------------+---------------------------------
            0 |        93      5115.5        5022
            1 |        14       662.5         756
--------------+---------------------------------
```

```
        combined |       107       5778        5778

    unadjusted variance     11718.00
    adjustment for ties      -4602.17
                          ----------
    adjusted variance        7115.83

    Ho: proxim~r(sale_l~p==0) = proxim~r(sale_l~p==1)
              z =    1.108
        Prob > |z| =   0.2677
```

- **o** **Veterinarian recommendation/diagnosis**
  ```
  . ranksum proximity_abattoir, by(sale_vet)

  Two-sample Wilcoxon rank-sum (Mann-Whitney) test

      sale_vet |       obs    rank sum    expected
  -------------+-----------------------------------
             0 |        78        4366        4212
             1 |        29        1412        1566
  -------------+-----------------------------------
      combined |       107        5778        5778

  unadjusted variance     20358.00
  adjustment for ties      -7995.48
                        ----------
  adjusted variance       12362.52

  Ho: proxim~r(sale_vet==0) = proxim~r(sale_vet==1)
            z =    1.385
      Prob > |z| =   0.1660
  ```

- **o** **Weather conditions**
  ```
  . ranksum proximity_abattoir, by(sale_weather)

  Two-sample Wilcoxon rank-sum (Mann-Whitney) test

   sale_weather |       obs    rank sum    expected
  -------------+-----------------------------------
             0 |        74      4193.5        3996
             1 |        33      1584.5        1782
  -------------+-----------------------------------
      combined |       107        5778        5778

  unadjusted variance     21978.00
  adjustment for ties      -8631.72
                        ----------
  adjusted variance       13346.28

  Ho: proxim~r(sale_w~r==0) = proxim~r(sale_w~r==1)
            z =    1.710
      Prob > |z| =   0.0873
  ```

- **Influential factors for slaughter (Mann-Whitney U-test)**
  - **o** **Animal's health or disease status**
    ```
    . ranksum proximity_abattoir, by(slaughter_ahd)
    ```

```
Two-sample Wilcoxon rank-sum (Mann-Whitney) test

slaughter_~d |      obs     rank sum     expected
-------------+-----------------------------------
           0 |       13          844          676
           1 |       90         4512         4680
-------------+-----------------------------------
    combined |      103         5356         5356

unadjusted variance      10140.00
adjustment for ties      -4123.29
                         ----------
adjusted variance         6016.71

Ho: proxim~r(slaugh~d==0) = proxim~r(slaugh~d==1)
            z =    2.166
    Prob > |z| =   0.0303
```

o **Animal's BCS**

```
. ranksum proximity_abattoir, by(slaughter_bcs)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

slaughter~cs |      obs     rank sum     expected
-------------+-----------------------------------
           0 |       28       1632.5         1456
           1 |       75       3723.5         3900
-------------+-----------------------------------
    combined |      103         5356         5356

unadjusted variance      18200.00
adjustment for ties      -7400.77
                         ----------
adjusted variance        10799.23

Ho: proxim~r(slaug~cs==0) = proxim~r(slaug~cs==1)
            z =    1.698
    Prob > |z| =   0.0894
```

o **Animal's soundness/mobility**

```
. ranksum proximity_abattoir, by(slaughter_soundess)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

slaughter~ss |      obs     rank sum     expected
-------------+-----------------------------------
           0 |       16          973          832
           1 |       87         4383         4524
-------------+-----------------------------------
    combined |      103         5356         5356

unadjusted variance      12064.00
adjustment for ties      -4905.65
                         ----------
adjusted variance         7158.35

Ho: proxim~r(slaug~ss==0) = proxim~r(slaug~ss==1)
```

o **Animal's age**

```
. ranksum proximity_abattoir, by(slaughter_age)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

slaughter~ge |       obs      rank sum     expected
-------------+---------------------------------
           0 |        49        2638.5         2548
           1 |        54        2717.5         2808
-------------+---------------------------------
    combined |       103          5356         5356

unadjusted variance    22932.00
adjustment for ties    -9324.97
                       ----------
adjusted variance      13607.03

Ho: proxim~r(slaug~ge==0) = proxim~r(slaug~ge==1)
           z =    0.776
    Prob > |z| =    0.4378
```

o **Stage of lactation**

```
. ranksum proximity_abattoir, by(slaughter_lactation)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

slaughter_~n |       obs      rank sum     expected
-------------+---------------------------------
           0 |        80        4075.5         4160
           1 |        23        1280.5         1196
-------------+---------------------------------
    combined |       103          5356         5356

unadjusted variance    15946.67
adjustment for ties    -6484.49
                       ----------
adjusted variance       9462.18

Ho: proxim~r(slaugh~n==0) = proxim~r(slaugh~n==1)
           z =   -0.869
    Prob > |z| =    0.3850
```

o **Stage of pregnancy**

```
. ranksum proximity_abattoir, by(slaughter_preg)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

slaughter_~g |       obs      rank sum     expected
-------------+---------------------------------
           0 |        70        3755.5         3640
           1 |        33        1600.5         1716
-------------+---------------------------------
    combined |       103          5356         5356
```

```
unadjusted variance     20020.00
adjustment for ties     -8140.85
                        ----------
adjusted variance       11879.15

Ho: proxim~r(slaugh~g==0) = proxim~r(slaugh~g==1)
          z =    1.060
    Prob > |z| =   0.2893
```

o **Market prices**
   ```
   . ranksum proximity_abattoir, by(slaughter_price)

   Two-sample Wilcoxon rank-sum (Mann-Whitney) test

   slaughter~ce |      obs     rank sum     expected
   -------------+-----------------------------------
              0 |       63      3169.5         3276
              1 |       40      2186.5         2080
   -------------+-----------------------------------
       combined |      103        5356         5356

   unadjusted variance     21840.00
   adjustment for ties     -8880.93
                           ----------
   adjusted variance       12959.07

   Ho: proxim~r(slaug~ce==0) = proxim~r(slaug~ce==1)
             z =   -0.936
       Prob > |z| =   0.3495
   ```

o **Availability of livestock transporter**
   ```
   . ranksum proximity_abattoir, by(slaughter_availtransporter)

   Two-sample Wilcoxon rank-sum (Mann-Whitney) test

   slaughte~ter |      obs     rank sum     expected
   -------------+-----------------------------------
              0 |       97      5065.5         5044
              1 |        6       290.5          312
   -------------+-----------------------------------
       combined |      103        5356         5356

   unadjusted variance      5044.00
   adjustment for ties     -2051.07
                           ----------
   adjusted variance        2992.93

   Ho: proxim~r(slau~ter==0) = proxim~r(slau~ter==1)
             z =    0.393
       Prob > |z| =   0.6943
   ```

o **Availability of help for loading/unloading**
   ```
   . ranksum proximity_abattoir, by(slaughter_loadinghelp)

   Two-sample Wilcoxon rank-sum (Mann-Whitney) test
   ```

```
slaughter_~p |       obs     rank sum     expected
-------------+---------------------------------
          0 |        95         4956         4940
          1 |         8          400          416
-------------+---------------------------------
    combined |       103         5356         5356

unadjusted variance       6586.67
adjustment for ties      -2678.37
                         ----------
adjusted variance         3908.29

Ho: proxim~r(slaugh~p==0) = proxim~r(slaugh~p==1)
          z =    0.256
    Prob > |z| =    0.7980
```

o **Veterinarian recommendation/diagnosis**

```
. ranksum proximity_abattoir, by(slaughter_vet)
```

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

```
slaughter_~t |       obs     rank sum     expected
-------------+---------------------------------
          0 |        71       3972.5         3692
          1 |        32       1383.5         1664
-------------+---------------------------------
    combined |       103         5356         5356

unadjusted variance      19690.67
adjustment for ties      -8006.93
                         ----------
adjusted variance        11683.74

Ho: proxim~r(slaugh~t==0) = proxim~r(slaugh~t==1)
          z =    2.595
    Prob > |z| =    0.0095
```

o **Weather conditions**

```
. ranksum proximity_abattoir, by(slaughter_weather)
```

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

```
slaugh~ather |       obs     rank sum     expected
-------------+---------------------------------
          0 |        82         4231         4264
          1 |        21         1125         1092
-------------+---------------------------------
    combined |       103         5356         5356

unadjusted variance      14924.00
adjustment for ties      -6068.63
                         ----------
adjusted variance         8855.37

Ho: proxim~r(sl~ather==0) = proxim~r(sl~ather==1)
          z =   -0.351
```

```
    Prob > |z| =    0.7258
```

- **Euthanasia factors (Mann-Whitney U-test)**
  - **Age**

    ```
    . ranksum proximity_abattoir, by(euth_age)

    Two-sample Wilcoxon rank-sum (Mann-Whitney) test

        euth_age |      obs    rank sum    expected
    -------------+---------------------------------
               0 |       75        3952        4050
               1 |       32        1826        1728
    -------------+---------------------------------
        combined |      107        5778        5778

    unadjusted variance    21600.00
    adjustment for ties    -8483.27
                          ----------
    adjusted variance      13116.73

    Ho: proxim~r(euth_age==0) = proxim~r(euth_age==1)
             z =   -0.856
       Prob > |z| =   0.3922
    ```

  - **Disease status**

    ```
    . ranksum proximity_abattoir, by(euth_disease)

    Two-sample Wilcoxon rank-sum (Mann-Whitney) test

    euth_disease |      obs    rank sum    expected
    -------------+---------------------------------
               0 |       26      1479.5        1404
               1 |       81      4298.5        4374
    -------------+---------------------------------
        combined |      107        5778        5778

    unadjusted variance    18954.00
    adjustment for ties    -7444.07
                          ----------
    adjusted variance      11509.93

    Ho: proxim~r(euth_d~e==0) = proxim~r(euth_d~e==1)
             z =    0.704
       Prob > |z| =   0.4816
    ```

  - **The animal's fitness for transport**

    ```
    . ranksum proximity_abattoir, by(euth_fitness)

    Two-sample Wilcoxon rank-sum (Mann-Whitney) test

    euth_fitness |      obs    rank sum    expected
    -------------+---------------------------------
               0 |       31      1786.5        1674
               1 |       76      3991.5        4104
    -------------+---------------------------------
        combined |      107        5778        5778
    ```

```
unadjusted variance      21204.00
adjustment for ties      -8327.74
                         ----------
adjusted variance        12876.26

Ho: proxim~r(euth_f~s==0) = proxim~r(euth_f~s==1)
          z =    0.991
    Prob > |z| =    0.3215
```

o **Drug withdrawal time**

```
. ranksum proximity_abattoir, by(euth_withdraw)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

euth_withd~w |        obs      rank sum     expected
-------------+---------------------------------
           0 |         91       4941.5         4914
           1 |         16        836.5          864
-------------+---------------------------------
    combined |        107         5778         5778

unadjusted variance      13104.00
adjustment for ties      -5146.51
                         ----------
adjusted variance         7957.49

Ho: proxim~r(euth_w~w==0) = proxim~r(euth_w~w==1)
          z =    0.308
    Prob > |z| =    0.7579
```

o **Severe injury**

```
. ranksum proximity_abattoir, by(euth_injury)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

 euth_injury |        obs      rank sum     expected
-------------+---------------------------------
           0 |         17          905          918
           1 |         90         4873         4860
-------------+---------------------------------
    combined |        107         5778         5778

unadjusted variance      13770.00
adjustment for ties      -5408.08
                         ----------
adjusted variance         8361.92

Ho: proxim~r(euth_i~y==0) = proxim~r(euth_i~y==1)
          z =   -0.142
    Prob > |z| =    0.8870
```

o **Likelihood of recovery**

```
. ranksum proximity_abattoir, by(euth_recovery)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

euth_recov~y |      obs    rank sum    expected
-------------+-----------------------------------
          0 |       25      1582.5        1350
          1 |       82      4195.5        4428
-------------+-----------------------------------
    combined |      107        5778        5778

unadjusted variance     18450.00
adjustment for ties     -7246.12
                        ----------
adjusted variance       11203.88

Ho: proxim~r(euth_r~y==0) = proxim~r(euth_r~y==1)
          z =    2.197
    Prob > |z| =   0.0281
```

o **Economic considerations**

```
. ranksum proximity_abattoir, by(euth_econ)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

   euth_econ |      obs    rank sum    expected
-------------+-----------------------------------
          0 |       88      4618.5        4752
          1 |       19      1159.5        1026
-------------+-----------------------------------
    combined |      107        5778        5778

unadjusted variance     15048.00
adjustment for ties     -5910.01
                        ----------
adjusted variance        9137.99

Ho: proxim~r(euth_e~n==0) = proxim~r(euth_e~n==1)
          z =   -1.397
    Prob > |z| =   0.1625
```

o **Loss of production**

```
. ranksum proximity_abattoir, by(euth_lop)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

    euth_lop |      obs    rank sum    expected
-------------+-----------------------------------
          0 |       99      5352.5        5346
          1 |        8       425.5         432
-------------+-----------------------------------
    combined |      107        5778        5778

unadjusted variance      7128.00
adjustment for ties     -2799.48
                        ----------
adjusted variance        4328.52
```

```
Ho: proxim~r(euth_lop==0) = proxim~r(euth_lop==1)
            z =    0.099
    Prob > |z| =   0.9213
```

- o **Distance to local abattoir/auction**

```
. ranksum proximity_abattoir, by(euth_disab)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

   euth_disab |       obs     rank sum     expected
-------------+-----------------------------------
           0 |       105         5699         5670
           1 |         2           79          108
-------------+-----------------------------------
     combined |       107         5778         5778

unadjusted variance      1890.00
adjustment for ties      -742.29
                      ----------
adjusted variance        1147.71

Ho: proxim~r(euth_d~b==0) = proxim~r(euth_d~b==1)
            z =    0.856
    Prob > |z| =   0.3920
```

- o **Animal's quality of life**

```
. ranksum proximity_abattoir, by(euth_qol)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

     euth_qol |       obs     rank sum     expected
-------------+-----------------------------------
           0 |        16       1055.5          864
           1 |        91       4722.5         4914
-------------+-----------------------------------
     combined |       107         5778         5778

unadjusted variance     13104.00
adjustment for ties     -5146.51
                      ----------
adjusted variance        7957.49

Ho: proxim~r(euth_qol==0) = proxim~r(euth_qol==1)
            z =    2.147
    Prob > |z| =   0.0318
```

- **Considerations when transporting animals (Mann-Whitney U-test)**
  - o **Suitable flooring**

```
. ranksum proximity_abattoir, by(consider_flooring)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

  consider_f~g |       obs     rank sum     expected
-------------+-----------------------------------
           0 |        30       1937.5         1635
           1 |        78       3948.5         4251
```

127

```
-------------+------------------------------
    combined |    108         5886         5886

unadjusted variance     21255.00
adjustment for ties      -8125.91
                        ----------
adjusted variance        13129.09

Ho: proxim~r(consid~g==0) = proxim~r(consid~g==1)
         z =   2.640
   Prob > |z| =   0.0083
```

o **Water**

```
. ranksum proximity_abattoir, by(consider_water)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

consider~ter |      obs     rank sum     expected
-------------+------------------------------
           0 |       84         4498         4578
           1 |       24         1388         1308
-------------+------------------------------
    combined |      108         5886         5886

unadjusted variance     18312.00
adjustment for ties      -7000.79
                        ----------
adjusted variance        11311.21

Ho: proxim~r(cons~ter==0) = proxim~r(cons~ter==1)
         z =  -0.752
   Prob > |z| =   0.4519
```

o **Feed**

```
. ranksum proximity_abattoir, by(consider_feed)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

consider_f~d |      obs     rank sum     expected
-------------+------------------------------
           0 |       96       5239.5         5232
           1 |       12        646.5          654
-------------+------------------------------
    combined |      108         5886         5886

unadjusted variance     10464.00
adjustment for ties      -4000.45
                        ----------
adjusted variance         6463.55

Ho: proxim~r(consid~d==0) = proxim~r(consid~d==1)
         z =   0.093
   Prob > |z| =   0.9257
```

o **Holding time**

```
. ranksum proximity_abattoir, by(consider_holdingtime)
```

```
Two-sample Wilcoxon rank-sum (Mann-Whitney) test

consider_h~e |      obs    rank sum    expected
-------------+-------------------------------
           0 |       51       2597       2779.5
           1 |       57       3289       3106.5
-------------+-------------------------------
    combined |      108       5886         5886

unadjusted variance    26405.25
adjustment for ties    -10094.88
                       ----------
adjusted variance      16310.37

Ho: proxim~r(consid~e==0) = proxim~r(consid~e==1)
            z =  -1.429
    Prob > |z| =   0.1530
```

o **Ventilation**

```
. ranksum proximity_abattoir, by(consider_vent)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

consider_v~t |      obs    rank sum    expected
-------------+-------------------------------
           0 |       66      3849.5         3597
           1 |       42      2036.5         2289
-------------+-------------------------------
    combined |      108       5886         5886

unadjusted variance    25179.00
adjustment for ties    -9626.08
                       ----------
adjusted variance      15552.92

Ho: proxim~r(consi~nt==0) = proxim~r(consi~nt==1)
            z =   2.025
    Prob > |z| =   0.0429
```

o **Lighting**

```
. ranksum proximity_abattoir, by(consider_light)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

consider_l~t |      obs    rank sum    expected
-------------+-------------------------------
           0 |      106      5759.5         5777
           1 |        2       126.5          109
-------------+-------------------------------
    combined |      108       5886         5886

unadjusted variance     1925.67
adjustment for ties     -736.19
                       ----------
adjusted variance       1189.47

Ho: proxim~r(consi~ht==0) = proxim~r(consi~ht==1)
            z =  -0.507
```

```
        Prob > |z| =    0.6119
```

o Driver experience

```
. ranksum proximity_abattoir, by(consider_dexp)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

consider_d~p |      obs     rank sum     expected
-------------+-----------------------------------
          0 |       62         3644         3379
          1 |       46         2242         2507
-------------+-----------------------------------
    combined |      108         5886         5886

unadjusted variance     25905.67
adjustment for ties     -9903.89
                        ----------
adjusted variance       16001.78

Ho: proxim~r(consi~xp==0) = proxim~r(consi~xp==1)
            z =    2.095
    Prob > |z| =    0.0362
```

o Driver training

```
. ranksum proximity_abattoir, by(consider_dtrain)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

consider_d~n |      obs     rank sum     expected
-------------+-----------------------------------
          0 |       94         5113         5123
          1 |       14          773          763
-------------+-----------------------------------
    combined |      108         5886         5886

unadjusted variance     11953.67
adjustment for ties     -4569.96
                        ----------
adjusted variance        7383.71

Ho: proxim~r(consi~in==0) = proxim~r(consi~in==1)
            z =   -0.116
    Prob > |z| =    0.9074
```

o Condition of animals

```
. ranksum proximity_abattoir, by(consider_condition)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

consider_c~n |      obs     rank sum     expected
-------------+-----------------------------------
          0 |       18       1243.5          981
          1 |       90       4642.5         4905
-------------+-----------------------------------
    combined |      108         5886         5886
```

```
unadjusted variance      14715.00
adjustment for ties      -5625.63
                        ----------
adjusted variance         9089.37

Ho: proxim~r(consi~on==0) = proxim~r(consi~on==1)
          z =    2.753
    Prob > |z| =   0.0059
```

o **Weather condition**
```
. ranksum proximity_abattoir, by(consider_weather)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

consider~her |      obs    rank sum    expected
-------------+-------------------------------
           0 |       54        3028        2943
           1 |       54        2858        2943
-------------+-------------------------------
    combined |      108        5886        5886

unadjusted variance      26487.00
adjustment for ties     -10126.14
                        ----------
adjusted variance        16360.86

Ho: proxim~r(cons~her==0) = proxim~r(cons~her==1)
          z =    0.665
    Prob > |z| =   0.5063
```

o **Trip duration**
```
. ranksum proximity_abattoir, by(consider_trip)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

consider_t~p |      obs    rank sum    expected
-------------+-------------------------------
           0 |       30        1515        1635
           1 |       78        4371        4251
-------------+-------------------------------
    combined |      108        5886        5886

unadjusted variance      21255.00
adjustment for ties      -8125.91
                        ----------
adjusted variance        13129.09

Ho: proxim~r(consi~ip==0) = proxim~r(consi~ip==1)
          z =   -1.047
    Prob > |z| =   0.2950
```

- **Disposal method (Mann-Whitney U-test)**
  - o **Sale at auction market**
```
. ranksum proximity_abattoir, by(disposal_auction)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test
```

```
disposal_a~n |       obs     rank sum     expected
-------------+-------------------------------------
           0 |        15          912           810
           1 |        92         4866          4968
-------------+-------------------------------------
    combined |       107         5778          5778

unadjusted variance      12420.00
adjustment for ties      -4699.93
                         ----------
adjusted variance         7720.07

Ho: proxim~r(dispos~n==0) = proxim~r(dispos~n==1)
          z =    1.161
   Prob > |z| =   0.2457
```

o **Ship directly to an abattoir**
```
. ranksum proximity_abattoir, by(disposal_abattoir)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

disposal_a~r |       obs     rank sum     expected
-------------+-------------------------------------
           0 |        51         2816          2754
           1 |        56         2962          3024
-------------+-------------------------------------
    combined |       107         5778          5778

unadjusted variance      25704.00
adjustment for ties      -9726.82
                         ----------
adjusted variance        15977.18

Ho: proxim~r(dispos~r==0) = proxim~r(dispos~r==1)
          z =    0.491
   Prob > |z| =   0.6238
```

o **On-farm euthanasia**
```
. ranksum proximity_abattoir, by(disposal_farm)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

disposal_f~m |       obs     rank sum     expected
-------------+-------------------------------------
           0 |        25         1349          1350
           1 |        82         4429          4428
-------------+-------------------------------------
    combined |       107         5778          5778

unadjusted variance      18450.00
adjustment for ties      -6981.78
                         ----------
adjusted variance        11468.22

Ho: proxim~r(dispos~m==0) = proxim~r(dispos~m==1)
          z =   -0.009
```

```
Prob > |z| =    0.9925
```

Interview 1.

1.

…..Already pick up before just wanted us to call again in 2 minutes due to phone problem

S: Hello

1: Yep, you betcha, This is (interviewee).

S: Do you have time at this moment to do this?

1: Yup, you bet ya, just got to get my phone back to the office

S: OK, Thank you very much, Um I just want to ask you if you have gone through the consent form that I sent you via the email?

1: Okay. Let me get into my email here just a bit. Come on. You have sent one already, have you?

S: yeah, I sent one through the email, and it's the first one.

1: Okay. I need to go received.

S: Do you want me to send you another one right now?

1: I am just getting into my email now. Oh there, dumped received. It was yesterday you sent it wasn't it?

S: Yesterday?

1: I thought it was yesterday that I received it

S: um, I sent it 4 days ago on March 10th

1: Okay. Right there! In person cattle transport thing. That one?

S: Yep.

1: Yep, you betcha.

S: Have you read through the consent form or do you want me to go through it right now?

1: yep, I will just read really quick.

S: Ok

1: you bet. Okay.

S: So do you agree with the consent form?

1: Oh, I can't get it to open.

S: you can not get it open?

1: nope

S: Okay, I can just go through it really quick right now

1: Sure, you betcha.

S: Sure, so the introduction of our purpose is, so we are undergraduate student of U Alberta and we are working with AFAC, which is Alberta Farm Animal Care. And we would like to invite you to take part in our research study. This is an extension to our online survey that concerns factors influencing producer decisions to transport cull cattle.

1: Yep

S: And the purpose of this study is to understand producer decision making and challenges faced when deciding whether or not to transport cull cattle. And your participation will help us to reach this goal by providing further insight on producer perceptions.

1: Ok

S: So our procedure is to…Um if you agree to participate in this research, I will conduct an interview with you at the time… oh this is already. Yep so this interview will involve questions about cattle transportation, consideration made when deciding to transport cull cattle, and thought on transport regulations.

1: yep

S: Ok, so this interview will take maximum about 20 to 30 minutes.

1: you betcha.

S: So with your permission. I will audiotape and take notes during the interview. And this record is only to accurately record the information you provide and we will be using this for transcription purpose only and it will be anonymous.

1: Yep

S: ok, so if you agree being audiotaped but feel uncomfortable at anything during the interview, the tape can be turned off at your request.

1: okay

S: Or if you don't wish to continue. You can stop us from the interview at anytime.

1: Okay

S: Ok, so also you are free to decline to answer any questions you don't wish to answer. Or stop the interview at anytime.

1: Okay

S: So participant will be asked for oral rather than signed consent.

1: Yep.

S: So this data will be used as confidentially as possible. And only our research team will be able to listen to our recordings. And transcripts of your interview may be reproduced and hold or in part for used for presentations or written products that resulted from our study. So, it the results of this study are published or presented, the individual names and other personally identifiable information will not be used.

1: Ok

S: So, participation in the research is completely voluntary and you are free to decline to participate in the project. And you are free to decline to answer any questions and are free to stop talking and taking part in the interview at anytime. Whether or not you choose to participate in the research and whether or not you choose to answer questions or continuing participate in the project there will be not penalty to you. So if you have any questions about this research, please feel free to contact our mentors Natalie and Melissa, and this I can email it to you later on. Its in the consent form.

1: okay

S: So, do you agree with all these statements?

1: Yes

S: okay, Can I grab your verbal consent?

1: Yes, I consent.

S: Ok, thank you very much, I will start the interview. Just first of all, what's your favorite aspect of being a cattle producer?

1: What's my what? Sorry?

S: what's your favorite aspect of being a cattle producer?

1: My favorite?

S: yeah, what do you like about being a cattle producer.

1: what do I like about? Oh, the freedom of being my own boss is one. Um, and just like raising animals, like the husbandry like picking up cattle, it makes me happy when they are happy.
   S: yeah, that sounds very reasonable. And also, so we are just starting with the actual interview questions right now. It will consist of 4 main questions, and the first one is what consideration do you make when deciding to transport you cull cattle?

1: Um…Is there any value in my animal? Is it worth transporting? If it's not gonna live to the trip why you send it? Um…and that's the priority I will decide is that is there any value to keep them on my ranch? You know it's that why I am culling it, is it old? Is it sick? Is it worn out? Is it just not sit in my…(interrupted by incoming call)…4 years old and have lots of life left and I but I am not gonna bother feeding it. Somebody else might, you know it's not a distressed animal. It's…you know I am culling on my herd anything it's not pregnant. It's not necessarily that the animal is worn out.

S: Um, so you have answered that..um your top choices of the most influential factors that you transporting the animals are body condition score, weather conditions and soundness or mobility, and market price. Um, why do you think these are most important to you?

1: Well. Where I ranch, if the weather condition is crappy you can't get in there. Like I can't ship them if I wanted to. Um, market price, you know, on the other end of it, if you need to get rid of it you need to get rid of it. You can't always keep them in solid at the top, at the peak, you know they are cull animals why you put hay into it, and feed. If…You know that it's 2 dollars a day per head. It's market (tucket) reflected later. So.

S: So your top choices, one of them is the BCS, So the animal's health is very important to you as well?

1: well you know I am selling open cows, it's not worn out, it's not lame, it's nothing wrong with them. It's gotta be a good condition to sell to somebody else.

S: Ok, thank you very much. So our second question is what challenges do you find with transport decisions and do you think transportation challenges are different based on operation size?

1: Yes, like I live in a very remote area. Sometimes for me getting…It's not the availability of transport, it's the possibility of getting in and out. Like a little bit of rain, a little bit of snow, it doesn't happen. I actually own a livestock transport company, and you know the accessibility of the trucks I've got is 47 trucks of culling cattle. Sometimes the weather just won't let me into my yard.

S: Ok, so how do you face this challenge, so you were saying that the weather condition is affecting your transportation decision, how do you solve this?

1: to solve it, I am pretty spoiled in the fact that I can just about to get a truck on demand. Like I've got enough for them that whatever day the weather holds, I can get the truck in. I don't need to schedule the truck two and three weeks.

S: yeah, that's really good for you

1: Also for the challenge, you know we are closed to so many auction markets, you know we got…, we got two in (location), we got (location). I don't need to worry about what date the sale it is, cause I can just go to different sale. That's how why the weather makes the biggest decision

I made when I ship.

S: ok, thank you very much so the third question is, what are your thought on transportation regulations? And what changes would you like to see?

1: I think the transport rules are pretty comprehensive, um, Like the different classes are sitting all that in there. I've read those a few times, it is comprehensive like people don't ship the distressed animals that they used to 20-25 years ago. It's hundreds of time better than that used to be. Um… the one thing that I don't understand is the CCIA tags that were required to have any animals. That for the transporters, the they are responsible to ensure that those tags are in those animals. How the transporters can be responsible for that? I don't understand. They showed up at my place 10 O'clock at night. It's dark. They can't see a tags in them. You know it's…the hold the transporters are accountable on CCIA tags that's one thing I don't get.

S: Thank you, And also I've seen that you answered no to having CFIA create a guide to accessing transport fitness, um what was the reasoning for these?

1: well Actually that a little bit of why we invented the wheel like a you know that all that already in there, Codes of practice COP is preaching it, why do it twice, why do it again? It's already in there, it's very comprehensive guideline. It's not…In that it is a guideline it's not a regulation I guess.

S: Yeah, so do you find these regulations guidelines easy to understand or confusing?

1: the COP is very easy to understand. It's a very user friendly program.

S: okay, thank you very much. And also, for the last question, in regards to transportation, Is there anything about cull cattle transportation that wasn't mentioned in this interview that you feel it's important?

1: Um… Not really actually, It's a pretty comprehensive survey.

S: Okay, thank you, so also do you have any feelings, any concerns about this interview, or any questions about our project?

1: not yet, I might have some when it's done, that would be interesting to know more about it.

S: Sure, if you want further information I might be able to…when we have finished our final deliverable, we might be able to send you via email.

1: Okay

S: Thank you very much for your participation. And enjoy the rest of your day.

1: You bet, superb, thank you!

S: Bye.

Appendix VIII

Interview 2.

2.

2: Hello

S: Hi, is this (name of interviewee) ?

2: Yes, it is

S: Hi (interviewee), it's (students name) calling from the university

2: Oh, right damn I forgot hahahaha

S: Is this still a good time you?

2: AH, well I'm actually driving in my pickup but I have hands free so it's probably no better time than now

S: Okay sounds good, before we get started did you have a chance to read through the consent form that I sent you?

2: Oh poop, yes, I did and I didn't send it to you, did I? can I send it to you when I get home?

S: I can actually get your verbal consent right now if that's okay

2: oh okay alright

S: So just so you know we are recording the conversation so what I need you to do is I need you to state your name, the date, and that you are okay for us to record the conversation and that we can use the recording.

2: Okay well then you better tell me what the date is.. is it the 15th?

S: Today is the 17th

2: oh my goodness hahahaha okay so its (name of interviewee), its March 17th 2017 and I am completely happy to participate in this survey and share my information.

S: Awesome thank you so much. I just wanted to thank you before we start for your participation we really appreciate it. It's really helping us out. So are you ready to get started with the questions?

2: I'm ready bear in mind I'm in British Columbia so if I don't answer it's because I dropped out of cell service

S: All good. So, our first question is what is your favorite aspect of being a cattle producer?

2: Ohhh my goodness that is kinda a double-edged sword isn't it. Well I am actually a 4th generation cattle producer so it's a lifestyle that I've um that I've embraced of course since I was born and it's a lifestyle that I've umm I appreciate and that I want to continue. One of the greatest joys I think of ranching is the ability to manage the land and your livestock and leave it there for future generations.

S: Oh definitely. Awesome, so onto the first question of the actual survey. When deciding to transport your cull cattle, expanding on your most… your top 5 influential factors which were Health and disease, soundness and mobility, body condition score, market price, and age. Why were these most important to you compared to the other ones that were listed?

2: well because I am in my pickup I don't even have the list of the other ones so I am just going to …

S: do you want me to read the other ones?

2: No, no that's okay because I mean I know how I made the decision to um cull my cattle. So because I am a cow calf producer and I'm in British Columbia my cattle are on my home ranch from approximately November until ummm they are right around my home headquarters from about November until April. For the next couple of months they are on very large open grazing pastures and from the first of July to near the end of October they are nowhere near my home they are on what we call crown range in British Columbia. Uh government grazing land and so its all open and no fence, no way you are going to catch them. So, I make my decisions on what cattle I am going to get rid of in the fall when they come home. And I make that decision based on my introduction records, did that cow have a sick calf two years in a row, did it have a calf that you know wasn't the size I wanted or the quality that I wanted. That's actually one of my very first considerations in making the first cut on my cows. And then I look at the health of the cow, was it um, is it getting lame, does it have a bit of arthritis something like that. Do I want to have it next year and that's the next decision. If I have anything that's compromised its put down at my place. I don't worry about making a decision on that type of thing. If there was some type of disease that was out breaking those would be put down on my place so. While health of the animal is a consideration it's that it is important, the fact remains that I would not be sending anything that was compromised to a sale.

S: Awesome, thank you so much. So, question number two is, what challenges do you find with regards to transport decisions and do you have any examples of challenges that you've faced before?

2: umm I don't really think I face any challenges with transport decisions other than the number of trucking companies is decreasing so, um for myself I use a contracted large cattle liner to hull my cattle to and from my summer range. The rest of the time any small moves I do myself in my 20-foot stock trailer. My calves that go to market I also, because I am a cow calf person I also market those in the fall and they all go on the main transport company. I deal with, I'm kinda picky with who I deal with, I want to make sure that he has a good reputation and that he is looking after my cattle and transporting them in a way I would myself, so I deal with the same transporting company, the same guy all the time.

S: Okay. Do you think transportation challenges are different based on your operation size?

2: well I think they could be, I have a couple hundred head so I have the ability to like hire a cattle liner for the large loads and then I do have a proper trailer and I will admit I have seen lots of smaller devices that maybe aren't quite conducive to hauling cattle. I will share, back to the other question, I will share that I had umm seven cows loaded in my stock trailer and delivered them to the sale which is about 2.5 hours from me so I hauled them myself. So, I stopped a couple times, I could feel them shifting around in the trailer. So, when I got to the stock yards to open the door, one of the cows was sitting down, like just resting in the very back of the trailer. And all the other cows were in front of her not doing anything and wouldn't you know it there was a, as I backed in a CFIA inspection lady there. And I'm thinking Oh my good grief I hope nothing happens, the cows don't all run over top of this cow as she decides to get up. Well she had been sitting there so long and been in a trailer that that it's, they can't really, if they decide to sit down for whatever reason they aren't just going to jump right up so once she decided to get up she was a tiny bit lame and oh my goodness the number of questions that I got asked from that inspection

agent lady were unreal to me because there had been no abuse or anything like that of the cow so. That may be a challenge I find is overzealous enforcement people that maybe aren't as familiar with the industry as they should be.

S: okay that's interesting, thank you for that. So, question number three is you said that you were very familiar with the beef code of, moderately familiar with the dairy code of practice, and extremely familiar with the beef code of practice and regulations. What are your thoughts on the regulations and are there any changes that you would want to see with them?

2: well because I'm a director on the BC cattlemen's, I had just finished participating In a discussion on the transport regs (regulations). So, I don't know if there could be any changes, I guess a concern I had was the length of time cattle could be in a liner or in transport. And while I completely agree that I um my god you don't want cattle standing there hours and hours and hours and hours you also need to be cognisant of the fact that British Columbia is a far more challenging province to transport livestock in then a lot of the others just because of our distances. So, I'll give you an example, if you were a producer on Vancouver Island and you had a load of little baby dairy calves and they were going to Alberta. I mean just the time that you are sitting on the ferry getting across and then going might be exceeding some of these proposed timelines for transport. And ah you really have to think twice about whether offloading them during the journey is in the best interest of everybody just because of the facilities that need to be available and the biosecurity and all that. It's just something to think about, that's, that's all.

S: One more question in regard to them, do you find them easy to understand or confusing at all?

2: No, I think they are relatively easy to understand but whether the average producer knows what they are, or looks at them or applies them to their own self. That's probably doubtful

S: Kay, and then you also answered yes to a proposed CFIA guide for assessing transport fitness. If you were to receive a guide what form would be most helpful to you. So, for example a pamphlet, poster, brochure, or a PDF document?

2: ummm probably a PDF document. Umm I am also involved in my local and regional associations and I have a tendency to share more stuff than maybe people want to get from me sometimes. So, having a PDF document would be something that I could easily share. I would be able to store it myself and print it off whenever I needed it for my own review.

S: Awesome, so the last question of our survey is in regards to transportation is there anything about cull cattle transportation that wasn't mentioned that you feel is important?

2: No, no I think it pretty well covered it. You know I really believe that the biggest thing about the transport of animals is somehow making producers themselves more aware of it because we are under far greater scrutiny from the general public. And I think where the public sees things that they might construe as not up to code is of course when a large liner goes by or a large liner is parked somewhere. As opposed to when somebody just hauling a couple of head of animals so somehow, I think my own industry has to get greater information out there to their own producers. And then I don't know whose responsibility it is to get information to producers who don't belong to any organization whatsoever. There just somebody that has 20 acres and has decided oh maybe I'll just raise 10 cows. Cause I think those are a lot of the instances unfortunately where you do see things that might go wrong. Especially when it's somebody that is trying to rescue a cow that they thought shouldn't be sold for slaughter or those kinda things. Cause once you stray off into that area there is far too many opportunities for things not to be

according to the rules. So to speak.

S: For sure. Do you have any last questions about the project that we are doing or any questions for us?

2: No, I think it's a good project and I look forward to seeing what your results are.

S: Well thank you so much for taking the time to contact us, is there any last questions or anything before I let you go?

2: Nope that's great I will continue my journey home and you have a nice day.

S: Thank you (interviewee) and you to

2: Bye, bye

S: Bye

Appendix IX
Interview 3.

3: Good morning, (interviewee) speaking

S: Hi (interviewee)! Is this...ummm this is (student) speaking, I'm calling in regards to the follow up interview?

3: Okay

S: Okay, have you have the chance to go over the consent form that was sent via email?

3: I did

S: Okay, umm I just need you to verbally say your name, the date and that you agree to be audio recorded today and that your audio recordings may be used for our research.

3: Good morning, my name's (interviewee), it's Monday March the 20th and I do agree to...letting this audio recording happening and used for your purposes

S: Okay, thank you… so I have (student) here with me, she's going to be taking some field notes while we do this interview, is that ok with you?

3: Yeah

S: Okay, sounds good..I'm just going to start with a general question, umm what's your favorite aspect of being a cattle producer?

3: Hahaha, ummm I...I don't know, can you say there's a favorite aspect of being a cattle producer or…?

S: Or like…

3: It's just something… I mean, I was born into the dairy industry so… it's just something we've always done...ummm

S: What like one thing that you really like… about what you do?

3: Oh I think uhhhh… watching a new heifer calf being born.

S: Okay, sounds good...So I'm just going to start with our first question...just expanding on your top, top, top 5 influential factors for slaughter, which were lactation, market prices, body condition score, health or disease and soundness or mobility, why were these factors most important to you compared to the other choices?

3. Run those 5 again please

S: Sure, uh lactation, market prices, body condition score, health or disease status, and soundness or mobility

3. What was the last one?

S; Soundness or mobility

3. Oh yeah...

S: Yeah... so why were they the most important to you when you are considering to transport your culled cattle

3. Well often our culling decision is based on the cow's production... so...her production would,...is important if she's milking well and she... is open for example...ummm she sticks around...umm. Market price… I'm not so sure if I reflect on it if that should be in second but anyhow, umm

body condition score...it's, it's a point that you would look at, you know if a cow's... milking less and she, her body condition is going from a 3 to a 4 then it's time to get rid of her...umm...in a big... you know, the health of the animal...clearly...ummm, if an animal looks like she could be developing a health issue, that's another reason to get rid of her prior to it becoming more... umm compromising... , and mobility, many animals are culled today because of feet and leg issues so...regardless of how well they are lactating...if the animal has umm a foot issue that is determined to be on treatment then culling her is an appropriate strategy...

S: Ok umm what diseases are you most worried about with your cattle?

3: ...oh well i think...diseases umm primarily mastitis would be...umm...an issue with dairy, dairy herd...ummm and I and and and I don't know if you would describe... hoof induced? as being a disease but occasionally a cow will develop a condition in her foot that just will not recover...so...foot issues...I wouldn't necessarily describe it as a disease as such but it is a metabolic disorder that would cause them to… have compromise their mobility and thus they need to be shipped sooner than later…

S: Ok thank you… so for our second question...we asked, what challenges do you find with transport decisions, and do you think transportation challenges are different based on operation size?

3: Repeat please

S: What challenges do you find with transport decisions, and what do you think, or do you think transportation challenges are different based on operation size?

3: ….well i don't think there are much...or many challenges with regards to transportation...umm and the dairy operation we run...we've got a truck and a stock trailer so...and and and all my culled cows go to a collection yard here in (location) so... ummm...transporting the animal if shes mobile is not a challenge… and… I don't know if it makes a significant difference how large the dairy operation is... i would submit many dairy farmers have their own stock trailers and can transport an animal either to a collection yard or the auction mart, and and if you don't have if own, there's many… professional, commercial, livestock haulers so...there's no challenge to transporting an animal to market.

S: Ok, thank you… so for our third question, we are wanting to know...what are your thoughts on transportation regulations and what changes would you like to see?

3: ...So the question… my thoughts on transportation regulations?

S: Yeah, and what changes you would like to see in them

3: well to be honest, we don't focus much on transportation regulations...and I guess... there might be a reference here to the time...an animal can be on a transport vehicle between stops or between leaving the farm and the final destination...but my cows are...said earlier, go to a collection yard here in (location) so...my cows are on my trailer for about 20 minutes before they get to the collection yard and and and they are … and even in the (location) area if you bring your cattle to the auction mart… we as producers have limited control over how long the animal might be truck feeded from a collection yard in (location) or the auction mart to its final destination and... though I'm not all that familiar with transportation regulations, and im not … and and such... I'm not concerned about pushing for changes in those regulations.

S: Okay… umm so, one of the questions was...would you be, find it useful to have a CFIA guide create, like a guideline for assessing transport fitness, you had said no to this on the survey, I was

just wondering what the reasoning for this was or like is there an alternative you would like to see?

3: Run that one by me again (student)

S: Yeah so, on the survey we asked if you would find it useful to have, for the CFIA to create a guide for assessing transport fitness, you had said no to this, I was just wondering if there was a reasoning for this? Or if there's like an alternative you would like to see?

3: ...Oooh okay, so with regards to the CFIA developing a guide on a decision tree, I would submit that that umm the decision tree guide has already been made...so...ummm… that it would be a duplicate of something that already exists

S: Okay, ummm thank you...for the last question, in regard...sorry, in regards to transportation is there anything about cull cattle transportation that wasn't mentioned in this interview that you feel is important?

3: …..I'mmm,... you know the issue of...transporting culled cows ummm and I think there needs to be a recognition that ummm the dairy farmer will impl...in that bit I will submit my case is quite similar to most ummm we deliver our animal needed to a collection yard and or an auction mart...and we have no control of.. The timelines from that point to… the cows' final destination… which would be… I would define it as slaughter… so you know, the timeline...ummm it's difficult for the primary producer to understand it … and it's impossible for him to control it. I would.. I bring my cows to a collection yard… I... often ask the operator where these animals are going and and ummm how long before they're slaughtered and ummm that's one of the reason's why I use him...he'll...my cows… will be delivered to his yard site ummm within hours, or at the most.. The day before... they are anticipated to be... trucked to another destination so...ummm… and you know i can keep them on my yard 'til they're going to be shipped from the… collection agent...and so so i think in that regard you know, you try and minimize...umm the transport time or the transition time of these cattle but you know the primary producer is not... in control… there are other players in this chain that have an impact on that timeline

S: okay, thank you, just final question, do you have any questions about our project... for us? That we could answer for you?

3: ummm so… what are you learning and what's your perception at the moment? ummm … what do you ...how are you responding to the… the work you've done so far?

S: Ummmm

3: Do you perceive that there's a significant issue that you want to...have identified or.. You anticipate the coming to light here?

S: Well we are currently working with a few mentors...that work with AFAC, they have a larger benchmarking project going right now… and so what we are doing for them is we're just getting some like scientific umm data, like we did a survey for them and we are doing these interviews.. And then we are creating a consultants report for them… so that they can then do a extension project to maybe educate producers on the transport regulations… ummmm so… that's maybe one of the issues that they are seeing right now… is that producers aren't always familiar or find the transportation regulations confusing so that's something that we are trying to help them understand and get better insight on.

3: So… I, I, I, I struggle to understand… ummm transportation regulations and and and how producers might find that difficult ummm

S: Yeah… I think it's more.. Like...theres the… there's the codes of practice and then the federal regulations so ummm I think.. Umm we are trying to understand if it's ummm confusing for producers to when they are reading it and like assessing their cattle… so that's...ummm like we are wanting to know… how, what they, what producers think and like how it can be better handled or written so that it's easier for producers.

3: ...I'm gonna argue that you should… you know… there need's to be a distinction between… when a producer makes the decision to cull an animal that's…that, that is the point, you know the transportation regulations are… to… that's a motor vehicle you know getting from point A to point B that's… ummm I, I… you know… I'm not convinced that focusing on the regulations is is ummm… focusing on transportation regulations is… is the right question…

S: Okay…

3: You know, the question should be.. Are these animals fit…. To be transported...so so… and and and that's a...I would argue a different question than transportation regulations… and and you know… it just might be a matter of understanding... the definition... Ummm… does that make sense to you?

S: Yeah! It does, totally. Ummm is there anything else you'd like to bring up... or???

3: Nope

S: Okay, I'd like to thank you for your participation today… and I hope you have a great day

3: Thank you very much

S: Thank you! Bye.

3: Bye

Appendix X

Interview 4.

4: Hello

S: Hi, is this (interviewee)?

4: Yep

S: This is (student) calling from the university about the interview. Is this still a good time?

4: Yep, this would work.

S: Awesome, so I just want to thank you for your participation in this study. We really appreciate your response. Um before we start the interview just to let you know if there is any question that you do not want to answer or you would like to skip what we would like you to do is to tell us that and we would move onto the next question. You do not have to answer any of the questions.

4: Ok

S: Um so, we will start off with the general question, what is your favorite aspect of being a dairy producer?

4: I just like to work on cows so.

S: Ok, um, so the first question would be when deciding to transport your cull cattle, um expanding on your top 5, which were age, body condition score, soundness or mobility, health and disease and stage of lactation, um why are these most important to you compare to the other ones that were listed?

4: First of all, I only ship the good cows, if they don't look proper to me, I just keep them on the farm. We either euthanize them or we put them out in a corral for a bit. So, until they get better condition, or walk better, so.

S: Okay. So, number 2 would be, what challenges do you find with transport decisions?

4: I don't find really any challenges with it. It's easy enough for you to access the cattle first and go from there right, so.

S: Ok, do you think that the challenges are different based on operation size?

4: Um, not really. It would be the same right? You don't want to bring garbage away. And if you don't want to eat it or ship it why make someone else do it right, so.

S: yep, okay. So you said in the survey that you were slightly familiar with regulations, very familiar with the dairy COP and slightly familiar beef COP. What are your thoughts on these regulations and are there any changes that you would like to see to them?

4: No, I think they are good tools, they give you a lot of information.

S: K, and you responded yes to the CFIA guide in the survey for accessing transport fitness, if you were to receive a guide, what form would be most helpful? For example, a pamphlet, a poster, a brochure, or PDF document.

4: Um, poster.

S: And for our final question, was there anything else that wasn't mentioned in the interview or the survey that you feel is important?

4: Nope, it was pretty thorough, so.

S: Do you have anything else to add? Or any questions regarding our project?

4: No, should be good.

S: okay, thank you for your time, we really appreciated.

4: Ok, no problem.

S: okay, thank you.

Appendix XI

Interview 5.

5

5: Hello

S: Hi, is this (interviewee)?

5: Hi

S:Hi this is (student)! I am just calling um for the interview?

5: Yes

S:Are you still available and interested for the interview right now?

5: Yeah, no, that's good

S: Awesome, um, so before we start, I just want to let you know that I have... (student) here with me.

5: Ok

S: She is also part of the group, and she'll just be here to kind of help me take notes and things like that.

5: Ok

S:Have u read over the consent form?

5: umm Yeah, sure

S: Ok, yeah I can go over it if you would like

5: Umm... No that's fine, I assume it's all...in order

S: Ok, awesome, so before we start I just need to a verbal consent from you...so umm if you can just state your name, the date, and consent for us to record and use the information from the interview

5: Oh ok, umm (interviewee), umm it's ummm March 16th 2017 and I do give my consent

S: Awesome, thank you so much, umm so let's start with the interview, so umm the first question… what consider... umm sorry, that's the wrong one... ok so, what your favorite aspect of being a cattle producer?

5: What is my favorite... aspect of being a producer?

S: Yeah

5: Ummm… seeing cows enjoying their food.

S: Ok, is there anything that you like about being a cattle producer?

5: Ummm yeah, seeing new calves born

S: Oh yeah, cool

5: The cycle of life I guess, I don't like the end of it, but the beginning.

S: Ummm so our next question is… when deciding to transfer your culled cattle, ummm expanding from your top 5 most influential factors from the survey, which were... the availability of transporters, market price, lactation, pregnancy, and weather, so why are these the most important to you compared to the other ones that were also listed in the survey?

5: Sorry is your question is.. like why do you ship cows?

S: Like, why, for the top 5 most influential factors that you've chosen from the survey

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5: Yeah

S: So what considerations you make when you want to decide to transport your culled cattle,

5: Oh. oh yea

S: Of the 5 most influential factors you've chosen, why were these ones the most important to you compared to the other ones that were also listed.

5: Oh. Okay. umm what's important for, well...umm, like if I ship a cow what I look at right?

S: Mmhmm yeah

5: Yeah umm, what I look at is body condition,

S: Ok

5: And the amount of milk umm, what it still produces...cause' I actually, I don't ship cows that produce too much milk

S: Ohh, ok

5: So yeah and of course body condition does kind of have a correlation with that

S: Mmhmm

5: If they ship cows, they are going to be cows that are umm done milking, to put it that way

S: Mhmm

5: Ummm, yeah... That's actually the biggest thing I look at, ummm I don't ship sick cows

S: Ok

5: And nothing like that so… err sick cow, you move a cow that sick, then you can't do anything to it anyway

S: Mhmm... so, what challenges do you find with transport decisions, do you think transport challenges are different based on operation size?

5: Like for how many intake (you take?)…you mean?

S: Yeah, like, size of the operation compared, errr do you think ummm the transportation challenges will be different compared to a small operation or a big one.

5: Yeah, well yes and no, I know some smaller producers will umm uh, for example have like a neighbour or somebody else, pick them up, ehhh, just like in a stock trailer, like if they didn't, don't have one or stuff like that, umm, to be honest and yeah, I don't think it makes much different.

S: Mmm ok

5: Between sizes and operation

S: Ok, and um has there been any challenges that you faced in the past when transporting your culled cattle?

5: Ummm, well not for myself, but seeing other producers, ummm bringing cows away, like a , I call this to the auction "net"?, and yeah, seeing that other producers are not delivering... quality, to put it that way

S: Ahhh, ok,.. Umm so in the survey you said that you were slightly familiar with the regulations amending the health of animal regulations, has this changed since completing the survey or can you give us any insight?

5: Ummmm yeah. But. Well not since I've taken the survey, umm, did that my perspectives has changed on it ummmm I yeah. Sounds maybe weird, I treat my cows kinda like people, so ummm if I think it's not right, like if I wouldn't do it to another person, then I don't do that to the

cow either , umm that sounds maybe a little weird, and this is how I train my staff too. Ummm they all need to be umm a little bit...have care for this cow cause' it's alive too right?

S: Mhmm

5: It has feelings...well feeling but it feels pain as well, that's what I mean. So since the survey, no, my perspective has not changed, to be honest with you

S: Ok..ummm so you've also answered that you are very familiar or moderately familiar with the codes of practice, so overall do you find them easy to understand or confusing?

5: Ummm they are pretty straight forward

S: Ok

5: Yeah.

S: And ummm, so in the survey you've also answered that you would like the CFIA to create a guideline for assess transport fitness, so if you were to receive a guide, what form would be most help to you?

5: Ummmm a very simple, to put it that way, like nothing elaborate, just a umm I..what i see umm happening like when cows are dropped off like at an auction, in my opinion they should not be there yet or they should not be coming through the ring, I know there's other options out there for these cows, umm whether you keep them at the farms longer or they go straight to an abattoir.

S: Mhmm

5: Umm I know these options are out there and umm so yeah to umm to make umm like guidelines, very short... short and sweet, to put it that way

S: So if there is such as umm a pamphlet, a poster, brochures or booklets, which one would you umm prefer?

5: Um probably like umm… like a pamphlet

S: A pamphlet? Ok

5: Like...the smaller the better, ummm just like umm even a one page...like a umm what I have seen other umm umm umm like for example in alberta milk they'll give like a laminated pamphlet that you can just hang somewhere

S: Oh ok

5: Like a one side, and then it stays clean and it's up there, and when people walk by a few times or nothing to do, they'll read it.

S: Mhhmm

5: If it's just a pamphlet, it gets thrown in with all the other stuff, to put it that way

S: Yeah

5: And it won't get looked at anymore

S: Yeah ok...Ummm in regards to transportation, is there anything about cull cattle transportation that wasn't mentioned in this interview that you feel is… is important?

5: Umm no. not that..not that I, that'd stick out to me anyway

S: Ok, so is there any like umm feelings or concerns about cattle transportation?

5: Well, umm... umm... like um I think you, you're on the, on the right track already, you ask umm like for a pamphlet or like a booklet or something simple, I think just..umm...some people I just... yeah, umm if they haven't been informed about it. They might not even realize they're doing something not correct

S: Mhmm

5: You know what i mean?

S: Yeah

5: So I think just a...umm...a little bit of education, it doesn't have to be very hard...just something very simple, and I think that will get the message out...umm, and then you get people talking about it, and then it's, I think then it's easy enough, it will fall into place after that

S: Umm so just to end our interview, do you have any questions about our project or any questions for us?

5: Ummm...well, umm, is there anything you guys are doing, like you're doing the project like to find out, about cull cattle transport,

S: Yes

5: Do you.. umm...like are you able to use this as... umm... information..like umm bring information out to producers or auctions or anything like that?

S: Umm yes, well for our project we're actually just ummm, yeah we're looking at all these informations, and we are working with a bigger benchmark project that the AFAC is working on...so what we will be doing is...we will be compiling all these information... we will make them into like... umm...a consultant's report, and we will give all these information to AFAC and then..

5: Ohhh ok

S: they will then use these information and have further… extended project

5: Ooh ok good, no cause' yeah if you're doing work and you have found some answers or common… responses from producers, like what they are looking for or what could help them...umm if it , if it doesn't go anywhere...that... that was my question, like, but it's going to AFAC…

S: Yeah, yeah so...

5: Ok good

S: So yeah umm, we are working for… with AFAC right now, so all the info that we get, we will compile them all and give it all to AFAC

5: Ooh okay, good

S: Yeah

5: That's actually my only question…

S: Ohhh ok.. Perfect...ok thank you again for your interest and participation in our project, we really appreciate it!

5: yes , no worries, ok so good, we're good

S: Umm so, have a good day! Alright, thank you!!!

5: Ok, thank you very much, bye bye

S: Bye

Appendix XII

Interview 6.

6.

S: So what I need you to do is state your name, the date and the, your consent for us to record and use your information during the interview recording.

6: name and date and what else sorry?

S: and you give us consent to use and uh record and use the information

6: Okay. Right now?

S: Yes please

6: okay, my name is (interviewee) and its umm march the 15th 2017 and I definitely give you consent to take down my information and use it

S: Awesome. Thank you. I just want to thank you first for your participation in our study. We really appreciate it.

6: if nobody participated you wouldn't get to study anything.

S: Oh yeah hahah. So, um for our first question it's what's your favorite aspect of being a cattle producer?

6: ummm, probably my favorite aspect of being a cattle producer is the actual planning and working on new genetics and figuring out what genetics are best put with what animals. Kinda that side of it is something I really enjoy.

S: oh that sounds really cool. So, to start with our interview, when deciding to transport your culled cattle, expanding on your top 5 most influential facts from the survey which were vet recommendations, stage of pregnancy, animal age, the stage of lactation and soundness or mobility. Why are these choices most important to you compared to the other ones that were listed in the survey?

6: well, because I think they are most important for the comfort of the of the animal and I think that is probably the most important thing you have to think about when you are transporting. And so all of those things affect comfort of your animal.

S: Okay, So are uh next question. So, what challenges do you find with transport decisions. Like do you think transportation challenges are different based on operation size?

6: Uh, you almost have two questions there.

S: haha yeah two in one.

6: And that last question I hadn't really thought about, about you know about operation size. Ummm, I think that one of things that is pretty important as a cattle producer is that we probably need to be very cognisant of the fact that everybody is watching us. What we do here, and umm, everybody is an animal lover, and cattle are animals. Kinda to a lot of people just like a dog. So you know um, I think that umm it's pretty important that we umm, treat our animals. UHH I

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don't want to come across as a tree hugger or anything cause I'm not. But I think that we need to be very, very careful how we handle our cattle, and I think transporting them to wherever they are going needs to be done in the most humane manner for them. So, if it's forty below they should stay home. Do you know what I'm saying. Umm if they have a broken leg, maybe there is a better way to deal with moving them. Such as euthanasia, you know what I am saying. Like I think that kinda are most important thing that we need to think of and partly because the world is watching. Is kinda why I say that, because the world is watching and it's not gonna watch less, it's going to watch more. As our world becomes so much more in tune and/or watches so much because we can. We have all the technology that can watch what everybody else is doing. So, we need to be really careful how we treat our animals or the world is going to turn on us. That's kinda my, anyway. So your other question which was talking about is there a difference between a big operation and a small.

S: uh yeah kinda like if if you think there will be any challenges, difference in transportation challenges compared to like a smaller operation size or like a bigger company kind of.

6: yeah I know what you are saying. I don't think there should hahaha because I don't think you should have animals if you don't have a way to properly transport them. And so, it doesn't really matter if you have 10 or if you have 200. I personally think that it should be the same.

S: Do you have any examples of some challenges that you might have faced in the past when transporting your culled cattle and like how did you kinda respond to these challenges?

6: well you know, I think that we are pretty realistic about our cattle. and I think that if the animal is not very ambulatory it doesn't leave here. So, I'm not trying to sell and/or recapture some finances because by hauling to an abattoir for instance, I do not believe that we as a farm really carry that shouldn't be. I feel very confident about that. That we are not ourselves, like we will but an animal down if we feel it's in distress before we try to do anything else. Does that answer that question at all?

S: Yeah it's does thank you. And umm for the next question, in the survey you said that very familiar with the beef code of practice and the animal regulations. So, what are your thoughts on the regulations and what changes would you like to see?

6: yeah you know the biggest problem with regulations is that you can read them and you can make people read them but you can't make people act on it and there is no way to police it. So, I think it's a I mean the only time you can police it is if someone gets caught. Someone sees something and they report you and/or you get caught hauling something that you shouldn't be hauling. I don't know I really don't have any good ideas for you. I really feel like regulations fell like they are just rules to be broken hey. I actually think it's a matter of conscious myself. I think that is one of our problems with society is that our conscious levels have come down. We aren't as conscientious enough I don't think we feel badly about some things. And I think that is why we do things that we shouldn't do. So, as far as the safety rules go, they have to be in place because if you were to be caught there has to be a rule that says you can be, you can be spanked for it right? um that you can be punished, that's the word sorry. So, my thinking is, is that, I think, I don't think they need to go any further than what they got, do you understand what I'm saying? I don't think they need to be tougher, more explicit of the rules that they've got going. I just feel that it's such a challenge to make people abide by them sorry. I don't know how you make people abide by them. Cause obviously, we have rules about speeding and we can't make

people abide by that either right?

S: very true, very true, that is so true. So, when you reading the codes of practice or the regulations, do you find them easy to understand or confusing?

6: no, they aren't confusing to me, but I've been in the business a long time. I mean I've trained as a health technician, I test for the green certificate because the kids need to know them or they need to at least have read them over. So, they can answer questions that we present to them on the green certificate program. So, I kinda know them so I don't find them hard, I don't find the language hard to understand. They aren't using language I don't understand so I don't have trouble with it.

S: So, in this survey you said you would like to have a CFIA created guideline assessing transport fitness. So, if you were to receive a guideline which form would be more useful. Such as a pamphlet, brochures, booklet, or anything else?

6: Good question… you know I think ummm, I think the best thing for me, I'm a binder person. So, if you came into my house I have binders for everything. It's my way of tracking, it's my filing cabinet. And so, I use 10x11 sheets of paper all the time, that's what goes into my binders. So, to me I think that size would be the most beneficial to me personally. A piece of paper size, and you can make it into a poster, probably big enough. That's what I would recommended. Pamphlets around here tend to go into file 13. Yeah and too big of posters aren't good either. You know, a number of years ago they send out a, through ah, quality starts here program. If you have heard of that program. It's the program that the uh government has tried to get a bunch of us producers to follow and it talks about practice on how to give needles and stuff. They would send out, they did send out a 9x or a regular page size poster that talked about where to give needles in the neck and on cattle. And I have to say I like the size and I stuck it up in my pump-house. You know, it was appropriate. It was appropriate size. Big posters are not appropriate. They are too big.

S: Okay great. So, for are final question in regards to transportation is there anything in regards to cull cattle transportation that was not mentioned in this interview that you feel is important?

6: Mhmmm

S: Like any feelings or concerns or anything else you would like to add about transportation?

6: well you know you only really know what you yourself do hey. Like I don't work in an abattoir and I don't work at the auction mart so I don't see what they see. Like have you guys been interviewing anybody from those places.

S: I don't think we have, we have one coming up that's just dairy and then a possible one for feedlot but….

6: well I was just thinking you know, I know what I do. And umm I kinda know what my neighbours do. Like a little bit. But if you start talking to people who work at auction marts and/or abattoirs' they must see it all right?

S: Yeah…

6: like they must see a bunch of stuff that the rest of the world doesn't see. Anyway, I'm just making that comment because I don't think I see. I don't really see a lot of things I'm not happy with because I don't see it. So, you guys need to be talking to… your preaching to the choir a little bit… well you're not preaching but I'm not the one that needs to be taught how to transport cattle. You know what I'm saying. Cause I think. I don't know if I have ever had a downed

animal in a trailer… ever. And one of the other things that we have been very careful at is I never haul my cattle if I can help it in big trucks. Like we are a purebred operation, I run 300 head of cows, nearly 400. We sell 80 bulls a year off this farm. So I've got quite a few numbers but you know I could hire a big truck to haul my heifers to pasture in one big load, I choose not to do that. I choose to haul them in loads of 10. Takes longer but it's much safer for my cattle. And I, that's my choice. And I've always felt that way that the big liner loads are hard on cattle. Now it's not efficient, right? But if you're talking cattle safety I think they're safer. So, that's just an observation from my perspective that I feel we have always made a very concerted effort to treat our cattle safely. As safely as we possibly can.

S: Do you also have any questions about our project or any questions for us?

6: umm whose, is it like for ah. Are you doing it for a master's degree or anything?

S: this is for our capstone project. So we're in final year of school for our undergrad so it's our final project for our degree that we are doing this for and we have partnered with AFAC. And we are kind of a branch off of their project that they are working on right now.

6: So what. By doing these interviews and getting some information who are you presenting it to?

S: so we will be presenting it to our professor that is teaching the class. And then all the other industry mentors, so there is 5 projects total and all of them have different mentors so all the mentors that can come will be there. And I think there is some industry professionals to.

6: okay.

S: and then we also have to write a guide for the group that we are working with and give them our recommendations on what we have found.

6: okay so you are actually going to come up with a recommendation?

S: mhmm, so, what AFAC is hoping from us is they are hoping I believe to take the information from both the survey and interviews and they are hoping to do an additional project on their project to create a guide. Hopefully if they can get the funding for it.

6: Yeah, umm you know I'm going to make one little comment.

S: sure

6: and you know cause you are talking about trying to present the information that you got to the world really. And by the world I mean the cattle world right. The world that it is affecting. So, I wonder if you know how many pieces of paper come across my desk.

S: probably a ton.

6: Well I have been in the business for 35 years. So 35 years ago we started farming and I have reims of paper compared to 35 years ago. And I guess I'm just saying be very careful how much more paper you send across our desk. Because I worry it's not going to have an effect. I guess I'm thinking your presentation of what you've found, think about how you are going to present it to us cattle people.

S: So, do you think other than a transport fitness guide it would be more beneficial in a classroom setting, where you have someone talking to you about it? Or as in a PDF version where you can have it on your computer so it's not another piece of paper?

6: I agree on that. I think we need more of that, we need more of the ability to file stuff on our computer we can just go click on it. It's just a thought cause I'm just so tired of pieces of paper. Paper is … and I know I'm in the purebred business so I have more paper than most people but it doesn't matter it's still huge the paper. My mailbox is very full all the time. Yeah it's crazy and it

just gets shuffled you know what I mean. Oh, I'll look at that later and then you have a stack

S: And then nothing gets read.

6: So, I don't know if it's any better or not but I am a little concerned that you are going to start printing a bunch of stuff that people will never look at. So your challenge I guess is to look at how to present the information you found to me in a way that I will look at it.

S: good point

6: Cause I am concerned and I'll give you an example the companies that provide us with all the different herbicides and pesticides that we use in the cropping part of our farm they continually send us stuff through the mail in postcard form, they've dreamt up all kinds of things to get our attention. Throw away, throw away, throw away. I'm sorry I think my husband buys the product because the guy he deals with at crop protection services talks to him about all the different products and then they make a decision. It's not because of that piece of paper that came into our mailbox. That piece of paper that comes in the mailbox hits the garbage pretty fast. They have all kinds of money so if they want to waste it on that that's fine. But I know what happens on our farm my husband never looks at it. Never never. And do you know how many pieces of paper come though that's a herbicide or pesticide or representing some kind of product for our grain farm. Its way worse than the cattle side. We don't get near as much stuff with the cattle side.

S: So, when you say come out and talk to you guys are they sending someone out to talk to you in person or is this over the phone where you are having a phone conversation.

6: Well the people that supply us with our fertilizer and all that we have a guy that oversees us. He's our guy that we go to and say we are going to grow this, this and this and what do you think about this and he'll come up with different ideas because you have to keep up with changing up your herbicides and rotating them. And it's his job to do that. But at the same time those companies like ELANCO continuously bombard you saying here use this product I'm just thinking be careful how you want to present it to us the farmer because do you want it to be hitting the garbage after you do all that work? You've got something really important to tell us I would be sad if it hit the garbage. That's all I'm saying.

S: yeah, well that's really good feedback. Thank you.

6: You're welcome. Are you done with me hahaha

S: yeah unless you have any more questions for us

6: No I think I've talked your ear off

S: well we really appreciate you taking the time and talking to us and giving us your feedback. It's really going to help us out.

6: sounds good thank you.

S: Thank you, Bye, have a good day.