REVIEW AND ANALYSIS OF THE 2008 NATIONAL STOCKER SURVEY

by

JANELL ROE

B.S., Kansas State University, 2010

A THESIS

submitted in partial fulfillment of the requirements for the degree

MASTER OF SCIENCE

Department of Agricultural Economics
College of Agriculture

KANSAS STATE UNIVERSITY
Manhattan, Kansas

2011

Approved by:

Major Professor
Dr. Kevin Dhuyvetter

Copyright

Abstract

The 2008 National Stocker Survey defines the backgrounding/stocking of cattle as "operations where calves are grown after weaning and/or preconditioning but before the feedlot. This includes calves purchased for this purpose as well as those retained by cow-calf producers post-weaning, but before marketing or retention through the feedlot." Backgrounding offers many benefits to farmers including, but not limited to, adding value to their feedstuffs—hay, grain, etc.—by feeding it to their cattle and potentially spreading risk by increasing marketing time or engaging in contracts with feedlots. However, producers also take on increased costs as it takes more time to wean, bunk-train, vaccinate, etc. compared to other operations in the cattle industry.

This thesis attempts to analyze two studies using the 2008 National Stocker Survey. The first is how producer and operation characteristics—producer age, type of operation, income derived from backgrounding—relate to why producers find variables such as cattle prices, animal health management, marketing practices, and nutrition important. The second is how producer and operation characteristics relate to producers that use futures market contracts and options on futures. Binary and ordered logit models were used to find the statistical significance of the aforementioned studies.

Since this survey was specifically designed to profile the stocking/backgrounding industry, some of the estimated models did not add a lot of value beyond the summary statistics for the various dependent variables. That is, the ordered logit models did not identify any strong relationships given that almost all of the producers that responded to these questions found feeder cattle prices, animal health management, marketing practices, and nutrition very important, which can be seen by analyzing the summary statistics. In addition, the binary logit

models that were used for the futures market contract and options on futures models, found that the best way to pinpoint producers using either futures contracts or options was if producers were already using risk management strategies. Therefore, the survey's purpose of profiling the stocker industry may be its best use.

Table of Contents

List of Figures

List of Tables

Acknowledgements

Without the help of the following people, my thesis would have never gotten finished. First, I must thank my Major Professor, Dr. Kevin Dhuyvetter. His help was instrumental in the advancement of my thesis. Dr. Dhuyvetter spent countless hours correcting my writing and proposing ideas or thoughts that aided in the development of this study. Without his support and encouragement, I would have never made it this far.

Second, I would like to thank my committee members, Dr. Ted Schroeder and Dr. Dale Blasi. Dr. Schroeder was essential in helping me to correctly interpret my results and set-up my models. Dr. Blasi provided me with insight on questions to model and different topics that would be interesting to research. He was also one of the main contributors to the 2008 National Stocker Survey and spent many hours working to prepare it.

Third, there were several other professors that were instrumental in the progression of my thesis. I am extremely grateful for the help provided by Dr. Glynn Tonsor. Dr. Tonsor spent numerous hours teaching me how to use Limdep. He was constantly receiving emails and was always willing to help. I would also like to thank Dr. Crespi and Dr. Bergtold. They provided some insight in Limdep coding and model set-up that was essential to this study.

Fourth, I would like to thank all of the survey contributors. I would first like to thank the three 2008 National Stocker Survey partners: Elanco, BEEF Magazine (Penton Media), and Kansas State University's Animal Science Department. In addition, I would like to recognize these people from the aforementioned list of partners: Forrest Roberts, Elanco; Bruce Bye, Elanco; Carl Guthrie, Elanco; Dale Blasi, Kansas State University; Wes Ishmael, BEEF Magazine, Scott Grau, BEEF Magazine; and Wade Bollum, BEEF Magazine. Moreover, I would also like to thank the University partners that provided assistance with this survey: Nevil Speer,

Western Kentucky; Terry Engelken, Iowa State; Greg Highfill, Oklahoma State; Walt Prevatt, Auburn University; Ron Torrell, University of Nevada; Max Irsik, University of Florida; Kevin Dhuyvetter, Kansas State; Jason Sawyer, Texas A&M, Justin Rhinehart, Mississippi State; Vern Pierce, University of Missouri; and Matt Poore, North Carolina State University. Finally, I would like thank several employees from McCormick/CMA for their help as well: Suzi Sutton-Vermeulen and Matt Sutton-Vermeulen. These contributors were fundamental in the development, distribution, collection, and evaluation of the survey and its data. Without these contributors spending numerous hours working with the survey and compiling data, I would never have had the opportunity to use this survey.

Fifth, I would like to thank all of my friends in the Graduate School of Agricultural Economics. They were constantly telling me stories or jokes to keep my spirits and motivation up. I would also like to thank them for all of the great memories such as random road trips to Texas and Oklahoma, GSAE outings, and weekly stump meetings. Without their support and help, there is no way I would have made it.

Sixth, the people that deserve more thanks than I can write are my parents, Jan and Harrell, and my siblings, Josh and Jenna. My family has always been my backbone and support. Whenever I'm discouraged, they always know what to say to keep me motivated. If I hadn't had their support during this time in my life, I would never have continued my education and achieved my goals.

Finally, I would first like to thank Kansas State University and the Department of Agricultural Economics for giving me the opportunity to further my education.

Dedication

I would like to dedicate my thesis to my sister, Jenna. Even though she doesn't know it, she has shown me the true meaning of perseverance. Her support and encouragement kept me going even when I didn't think I could. She has not only been a great role-model, but a great sister as well.

Chapter 1 - Introduction

1.1 – Background

In 2008, BEEF Magazine, Kansas State University, and Elanco released one of the largest backgrounding/stocking cattle surveys in the nation: the National Stocker Survey. Questions from this survey covered a vast range of topics and included many variables, but they can be categorized into nine areas: management and operation, procurement, receiving, receiving nutrition and management, health, nutrition, marketing, risk management, and communication and education. The main purpose for conducting this survey was to profile the stocking/backgrounding industry as little information is known about this sector of the industry relative to the cow-calf and feedlot sectors.

This survey sample was selected from BEEF Magazine's mailing list and, therefore, was not random. Out of the 16,200 surveys mailed out in the contiguous 48 states, approximately 13.9% of them were returned and usable for analysis. From October 2007 to January 2008, data from the survey were collected. For summary purposes, the 48 states were divided into six regions: Mid-Atlantic or New England States, Southeast, Midwest, Southwest, West, and Far West. The usable responses from each region are as follows: 27.7% from the Midwest, 25.0% from the Southwest, 16.5% from the West, 15.3% from the Southeast, 8.5% from the Far West, and 6.9% from the Mid-Atlantic. Texas, Oklahoma, and Kansas had the highest rates of usable producer responses, while New Hampshire, Maine, Maryland, and Delaware had the lowest. The data obtained in this survey were analyzed using binary and ordered logit models in Limdep.

Backgrounding is an emerging new segment in the cattle industry because producers are able to add value to their feed resources (hay, grain, etc.) by feeding them to their cattle. This also allows for the potential to increase profit because feedlots will offer more money for a

uniform supply of cattle (Saskatchewan Agriculture, 2003). Also, cow/calf operators can enter into this market simply by retaining their calves**.** By retaining calves, producers have the potential to spread risk by increasing marketing time. Producers that background/stock their cattle can also potentially spread their risk by deciding to sell on the market or contract with feedlots (Lawrence, 2005)**.** However, producers take on the increased cost of time by having to wean, bunk-train, vaccinate, etc. compared to other sectors of the cattle industry (Saskatchewan Agriculture, 2003)**.**

The purpose of this study is to find producer characteristics that may help to explain the ways that producers think and act to better understand the backgrounding/stocker sector of the industry. The information that comes from this study could potentially help producers, extension agents, companies that produce livestock products, and others when used to target a specific audience. Moreover this information is also important for furthering research in the area of backgrounding/stocking cattle, improving existing products, creating innovative programs, and better understanding the various factors that drive producers' decisions. This information is found by estimating models to find which key variables are statistically significant. The first model quantifies the producer and operation characteristics that relate to the level of importance of specific variables. The second model tries to identify certain factors that help explain why producers use futures or options contracts. By being able to better understand producers and their reasoning, all of the aforementioned topics can be further developed to adapt more effectively and efficiently to the producers' and industry's needs.

1.2 - Objectives

The main objectives of this study are as follows:

1. To review and summarize the responses from a subset of questions in the 2008 National Stocker Survey.
2. To determine how characteristics impact how producers rank the importance of various topics/issues as they relate to their operations.
3. To investigate producer and operation characteristics that help explain producers who use futures market contracts and/or options.

In order to meet these objectives, the 2008 National Stocker Survey results were analyzed using the econometric software program Limdep. The purpose of this survey was to gather information to not only better understand backgrounding/stocking operations, but to improve programs, products, and research.

1.3 – Organization of Thesis

This section will discuss what can be found in each chapter of this thesis. Chapter one provides some background information on backgrounding/stocking cattle and the 2008 National Stocker Survey. This chapter also lists the objectives of this study and gives an outline of the following chapters. Chapter two reviews literature that is relevant to the survey analysis, models, and results of this study. Chapter three analyzes and summarizes a majority of the questions in the 2008 National Stocker Survey and provides tables and charts for further explanation. Chapter four discusses the first model of this study: producer and operation characteristics used to explain how producers rank the importance of feeder cattle prices, animal health management, marketing practices, and nutrition information. Chapter five analyzes producer and operation characteristics to determine how they relate to the producers' use of futures and options market contracts. Chapter six will provide the conclusions and implications of this study.

Chapter 2 - Literature Review

2.1 - Introduction

The purpose of this chapter is to review relevant topics to questions examined in the survey. Mainly these questions pertain to feeder cattle prices, animal health management, marketing practices, producer profit, and risk management.

2.2 – Backgrounding Cattle

The official backgrounding/stocking cattle definition given in the National Stocker Survey is "operations where calves are grown after weaning and/or preconditioning but before the feedlot. This includes calves purchased for this purpose, as well as those retained by cow-calf producers post-weaning, but before marketing or retention through the feedlot." By using stored feeds and supplementing with grain, backgrounders are able to put weight on cattle. Many producers couple this practice with stocking by having winter backgrounding and summer stocking operations. However, there are numerous other ways of stocking cattle such as continuous grazing, rotational grazing, season-long grazing, and so on. Backgrounding lengths can last anywhere from 1 to 10 months depending on producer situations. The goal when backgrounding or stocking cattle is to add weight to the animal at the lowest cost (Reda-Wilson et al., 1994).

The backgrounding sector is emerging because feedlots are finding that buying backgrounded cattle leads to a decrease in overall sickness and weaning while maintaining steady weight gains. This allows the cattle to generate more muscle and growth before they put on fat for marbling. Producers are taking advantage of backgrounding because they are finding that feedlots will offer more money for a continuous, uniform supply of cattle. However, there are two drawbacks to dealing with backgrounder/stocker cattle. First, cattle of this age usually have increased input costs for the producer as they are taking the extra time to wean and work

the cattle (Saskatchewan Agriculture**,** 2003). Second, commercial feedlots' profitability is being questioned due to the rise in feed price, mainly corn, over the past few years. Therefore, feedlots are placing less and less feeder cattle in their lots (NASS, 2010).

Backgrounding is also a production practice used by cow/calf operations. Retaining cattle can potentially give producers the advantage to benefit from advanced genetics and add value to forages and other homegrown feeds, labor, and management programs. (Lawrence, 2005). Many factors contribute to the underlying reasons as to why a cow/calf producer would want to retain and background their cattle such as risk, operation size, knowledge, and available feedstuffs. Whatever decision a cow/calf producer makes is usually based on profit (Popp et al., 1998). Generally, the more risk averse a producer is, the less likely they are going to retain their calves (Popp et al., 1998). Several other factors affect the decision for a cow/calf producer to retain and background their calves. The first issue is labor cost and the ability to come up with the cash. If a producer cannot afford to hire the extra labor needed to retain calves, then they cannot begin a backgrounding operation. Moreover, a producer may not have the money available to integrate a value-added backgrounding program. The last factor is whether the producer has the capability to manage this strategy (Popp et al., 1998).

The potential benefits of retaining ownership are vast as explained by Lawrence in his 2005 article "Alternative Retained Ownership Strategies for Cow Herds". The first and most overlooked opportunity is growth and genetic feedback information. By retaining calves, producers are able to see first-hand the growth potential of certain breeds or cross-breeds. Also, producers are potentially able to gain market flexibility and spread risk. Since producers can sell their cattle at different times, they are able to distribute both price and marketing risk. For example, feedlots may be willing to negotiate contracts for uniform lots of cattle which reduces

both price and marketing risk for the producer. Furthermore, producers can decrease cost by adding value to their forages by feeding them to cattle retained for backgrounding, as previously mentioned (Lawrence, 2005).

2.3 – Feeder Cattle Prices

Numerous studies have delved into the interworking of the feeder cattle market providing explanations for how factors such as cattle genetics, health, and age affect feeder cattle prices. The subcategory in this section discusses price differentials.

2.3.1 – Feeder Cattle Price Differentials

Buccola (1980) wrote an article about analyzing feeder cattle prices; he used break-even prices to discuss price differentials (such as weight, age, sex, etc.) in feeder cattle. One of the main assumptions of his break-even model is that buyers will not pay more for the animal than it is worth (price received minus expected costs) in the long-run and sellers will not accept less than what the animal is worth (cost to raise the animal) in the long-run. A second assumption is that the buyers of cattle are in a competitive bidding environment. Therefore, buyers and sellers together discover the price of feeder cattle. However, break-even prices are subject to change based on animal characteristics (breed, age, grade, etc.). Also, producers want to maximize profits, which are subject to change due to external situations like feed prices, slaughter cattle prices, pasture prices, etc. These external situations are the main driver causing the break-even price based on cattle weight to vary. The degree to which these external factors affect the price is based on the animal's characteristics. Using a model that simulated buyers' and sellers' break-even prices, Buccola was able to obtain the following results. First, slaughter steer prices increase both feeder cattle prices and premiums for lightweight cattle. Second, increasing corn

prices cause both feeder cattle prices and premiums for lightweight cattle to decrease (Buccola, 1980).

Another article that has laid the foundation for feeder cattle prices is "Feeder Cattle Price Differentials in Arizona Auction Markets" by Faminow and Gum (1986). Faminow and Gum developed a price model to explain price premiums or discounts based on sex, weight, and lot size in the short-run. This model resulted in several findings. The first is that crossbred cattle are discounted compared to straight-bred cattle. Second, as with Buccola's model, Faminow and Gum found that the price/weight line for steers is convex from below while the price/weight line for heifers is concave from below. Third, if farmers were to market their cattle in lots of roughly 60 head, they would receive a premium. This is consistent with the idea of shipping by truckloads. It is cheaper for truckers to have a full load rather than a half. Therefore, premiums are paid for lot sizes that can fill a truck load. There were several implications to this study. For example, when compared to a 60 head lot of cattle, price discounts were received up to $3/cwt. for cattle in small lots of less than 10 head (Faminow and Gum, 1986).

The third article that was used to help discuss the many factors affecting feeder cattle prices is by Schroeder et al. (1988). This article differs from others as the authors develop a model to see how health, presence of horns, fill, lot uniformity, time of sale during an auction, lot size, weight, condition, muscling, frame size, breed, futures price, market location, and seasonality affect feeder cattle prices. The hedonic model estimated by Schroeder et al. explained 70% of observed feeder cattle price variability (Schroeder et al., 1988).

The first result that the Schroeder et al. (1988) study found was that feeder cattle price decreased as calf weight increased. However, there is one exception. Heifers bought for breeding may see a premium when heavier. Also, in the fall there is less of a discount for heavier cattle

than in the spring. This could be due to many factors such as feeder cattle supply or feedlot demand. Second, based on animal weight, big lots of uniform cattle receive premiums of at least $6.00. For lightweight cattle, lots of 45 to 50 head of cattle that are uniform tended to get the highest premiums. Lots of heavyweight cattle with 55 to 65 head received the highest premium. These large lots of cattle correlate to truck load size. Third, animal health influenced feeder cattle price more than any of the other characteristics investigated. There were huge discounts for cattle that were in poor health, lame, or dirty. Discounts of over 20% were received if cattle were sick compared to healthy cattle, while discounts from 5% to 8% were received on old cattle. Fourth, price discounts on heavyweight lots occurred because of the presence of horned cattle. Fifth, discounts were obtained for fleshy and fat cattle. The discount was less in the fall than spring; however, thin and very thin steers received larger discounts in the fall than in the spring. Also, when compared to average-fill cattle, full-fill cattle received discounts that were smaller in the fall than in the spring. Since heifers can be used for breeding, they have larger discounts for small frames compared to frame size discounts on steers. Sixth, depending on the breed of an animal, there would either be significant discounts or premiums. Compared to Herefords, Angus, Brahman, and several other breeds received considerable discounts. Yet, relative to Herefords, certain exotic and/or whiteface crosses received premiums. The final price differential investigated dealt with time and place of sale. When evaluated with respect to the first quarter of a sale, the second and third quarters receive premiums of $1/cwt. and $2/cwt., respectively. In addition, there was a difference in prices across the regions reflecting supply and demand of each individual area (Schroeder et al., 1988).

2.4 – Marketing Practices

Feeder cattle marketing is important because it impacts the profitability of the cattle for the owner. Producers are motivated by profit and will choose the market venue that will give them the highest expected profit (Schmitz et al., 2003). To make this subject even more complicated, several other marketing venues are now available due to the birth of internet and video auctions.

2.4.1 – Marketing Venues

Marketing options in the United States have expanded in the past decade. Several options besides public auctions and private sales now exist due to technology—video and internet auctions (Schmitz et al., 2003). Internet and video auctions can be managed at the state or national level (Reda-Wilson et al., 1994). Even though auction types have expanded, not all producers participate because of economies of scale. The most common way for producers to market their cattle is through a public auction, with private sales, video auctions, and internet auctions trailing, respectively (Schmitz et al., 2003). A potential reason for the lack of popularity of internet auctions stems from the lack of technological proficiency and potential for increased expense (purchase of computer and related parts, internet upgrade if needed, video auction fees, etc.). Public auctions are still responsible for marketing over 50% of stocker cattle (Schmitz et al., 2003). Larger producers have the advantage of being able to market through video or internet auctions because they are able to supply truckloads of cattle, whereas some smaller producers do not have the volume for truckload size lots. Previous research has shown that smaller lots receive discounts (Schmitz et al., 2003). Truckload sizes of approximately 50,000 lbs. liveweight are the most profitable (Reda-Wilson et al., 1994).

Besides being able to enter into different marketing venues, there are two advantages mentioned by Schmitz et al. (2003) that larger producers receive over small producers. The first is increased returns to scale. The second is decreased transactions costs.

Producers choose the market venue that will maximize profit based on direct (transportation, commission, etc.) and indirect (reputation, quality, etc.) transaction costs. Indirect transaction costs have more of an effect on market price than direct transaction costs. However, direct costs are larger for a live auction. The largest direct cost with respect to a live auction is transportation costs; when looking at transportation costs, freight is relatively minor compared to the cost of shrink, potential sickness, and stress. While video, internet, and private auctions may have decreased transaction costs, it is important to keep in mind that small producers do not always break into these markets (Schmitz et al., 2003).

2.5 – Animal Health Management

In order to have a productive and profitable farm, animal health management is needed. Preventative procedures must be used for cattle to maintain good health and gain weight. A basic health management program would consist of buying healthy cattle, minimizing animal stress, administering vaccinations when needed, and controlling parasites (Reda-Wilson et al., 1994).

2.5.1 – Beef Feedlot Health Management Program

In Radostits' book Herd Health: Food Animal Production Medicine, he lists eight objectives for a beef feedlot health management program. The first point Radostits broaches is genetics. Buyers should purchase animals that have the genetic potential to effectively gain and grow without becoming too fleshy. Crossbreeding has become an effective way to gain the characteristics needed to produce a profitable animal. Second, producers must find a way to increase feed efficiency and gain through growth supplements and supporters; separate and treat

ill cattle; vaccinate for parasites; and use effective feeding procedures and rations. Third, farmers must reduce death rates and illness among their herds. The best way to keep these levels low is to select cattle that are in good health and have employees that are able to quickly spot and treat cattle that become sick. Radostits recommends that farmers keep records, preferably electronic, of these incidences. Fourth, producers need to optimize the medicines they use, meaning to not over-treat animals but instead catch and treat the sick cattle early. This involves having staff that are educated about diseases and illnesses and who are able to treat the animals effectively. Fifth, producers must encourage and motivate employees to ensure the highest quality of animal healthcare. Sixth, producers must have a consistent profit and the ability to invest in other opportunities, all of which depends on a producer's risk preference. Seventh, farmers need to sell a reliable product which entails an identification system, record keeping, and modest vaccinations, especially before shipment. Finally, producers should have a record keeping system that would allow veterinarians to test the drug's effectiveness (Radostits, 2001).

2.5.2 – Cow/Calf Health Management Requirements

Cow/calf herd management programs contain many different components because of the differences across regions. In some states the stocking rate for a cow/calf pair can be two acres while in another it could be near 30 acres per pair. However, they all have several of the same components such as risk management, disease control, and productivity. In order to have an effective cow/calf health management program, nutrition, health, and reproduction must all be intertwined. The principal point is to maximize reproduction and productivity while minimizing costs (predominantly the maintenance cost of keeping females). Another extremely important factor for any health management program is nutrition. In order to achieve this, cattle handlers must be well educated and experienced to make sure that the cattle nutritional needs are met. In

addition, suitable forage, pasture, water, vitamins, and minerals are also needed to maintain nutrition (Radostits, 2001).

2.6 – Risk Management

Many factors can affect what a producer is willing to do with his cattle given the many production and financial risks involved. Risk can come in many forms from feed costs to carcass quality (Hall et al., 2003). It depends on what risk preference the producer has and how much risk they are willing to take. For example, cow/calf producers can use retained ownership as a method to potentially reduce price risk. However, Van Tassell et al. (1997) show that the more risk loving a producer is, the more likely they are to retain their calves. If a producer is risk averse, they are more likely to sell their cattle than retain them (Van Tassell et al., 1997). Producers believe that having healthy animals, producing at a low cost, sustaining credit or financial funds, and investing in off-farm enterprises are the most important risk management strategies (Hall et al., 2003).

2.6.1 – Production Risks

According to Fausti et al. (2003), there are two main categories of risk when looking at retaining ownership of steer calves: systematic and unsystematic. Systematic risk is mainly market risks such as price volatility and weather; this risk cannot usually be controlled by the producer and accounts for almost 9% of rate of return per head variability. The second type of risk is unsystematic risk or the firm's risk. This type of risk is completely controlled by the producer and is responsible for 67% of rate of return variability. Examples of unsystematic risk are animal quality and performance. Therefore, roughly 24% of the rate of return variability is not explained in this analysis (Fausti et al., 2003).

2.6.2 – Risk Management Strategies

By implementing good management practices and cost-efficient alternatives, most risks (price, production, etc.) can be decreased without help from outside resources (Fausti et al., 2003). However, there are other options for already cost-minimizing, efficient producers to consider. First, risks can be decreased if a producer is able to diversify their operation. By spreading out assets, producers are able to decrease risk and maintain a relatively constant revenue. Next, producers could contract with feedlots to potentially decrease risk and guarantee that they will be able to sell their product. However, producers will have to accept that they could potentially lose profit in order to decrease their risk (Harwood et al., 1999). Another option is Livestock Risk Protection insurance. According to Coelho et al. (2008, p. 1), "LRP is single-peril price risk insurance that provides an indemnity to insured producers if a regional cash price index falls below some insured coverage price on the end-date of the insurance policy." Although with this policy, producers are still subject to basis risk, which differs from futures risk, as the local price is compared to a regional cash index not the futures market. Finally, producers have the option of using the futures market to decrease price risk. Using several marketing tools—hedges, options, etc.—producers can potentially decrease price risk (Coelho et al., 2008).

2.7 – Profitability

The primary issue in deciding if a producer will background/stock cattle is if it will be profitable. Numerous factors affect producer profitability. One factor is marketing which is important to producer profit as it can change profitability depending on the breed, time of year, demand, etc. Another factor is costs such as feed costs, veterinary fees, maintenance and repairs, death loss, depreciation, and so on (Saskatchewan Agriculture**,** 2003).

2.7.1 – Backgrounding Profitability

Profit is determined in backgrounding by margins and weight gain. The Saskatchewan Food and Rural Revitalization Department (2003, p. 1) define margin as "the difference between the selling price and the buying price". Weight gain depends on the management, feed, breed, and pasture that the animal is grazed on. Consistency is key for these producers as feedlots desire uniform lots of cattle (Saskatchewan Agriculture**,** 2003). However, breed, days on feed, purchase month, and beginning weight also all effect profitability. From 1995 to 2008, buying cattle to background was not profitable, on average, because of cost and the ability of the calves to gain weight, but there were different ways in which 40% of the time producers did make a profit backgrounding. Moreover, in the past the profit margin has been small (Lawrence et al., 2006). The primary factor affecting profitability is feeder cattle prices. It is also the second leading cause for return variation excluding steers weighing under 700 pounds in Lawrence's 1999 study. Moreover, as the calves gain weight and age, the larger the calves impact is on producer profitability. This is mainly because the longer an animal is fed the higher their cost. Other factors affecting variability are animal performance, average daily gain, feed efficiency, and corn price. In addition, heifers are less profitable than steers (Lawrence et al., 1999).

2.8 – Summary

Many factors affect the backgrounding industry. The factors covered in this chapter were feeder cattle prices, marketing practices, health management, risk management, and profitability. Research on the aforementioned topics will help with interpreting the data and results.

Chapter 3 - Survey Description and Summary

3.1 - Introduction

This chapter describes the different components that make up the 2008 National Stocker Survey. Section two discusses the partners and contributors that made the survey possible. Section three details how and when the survey was dispersed. Sections four through twelve discuss the different types of questions in the survey. The final section briefly summarizes the survey.

3.2 - Survey Contributors

There were three primary partners in the 2008 National Stocker Survey: Beef Magazine, Elanco, and Kansas State University (predominately the Animal Science and Industry Department). Beef magazine is a principal magazine for information on all sectors of the cattle industry. Throughout the year, it publishes monthly issues plus several bonus issues and editorials specifically designed for cow/calf operators, backgrounders/stockers, veterinarians, nutritionists, and high-end cattle producers. The main topics covered by this magazine are animal production, nutrition, finance, animal health management, and market issues (www.Beefmagazine.com).

Elanco has been a major contributor in the animal health industry since 1953. They currently operate in 40 countries with over 2,000 employees supplying over 35 different products, and their products–feed additives, parasiticides, pet/livestock medicines, etc.–serve to help producers in more than 75 countries. Elanco's mission is to improve livestock and pet longevity, ensure a safe food product, and enhance protein production. This company is constantly striving to improve products through innovative technology and research (www.elanco.com).

The Animal Science and Industry (ASI) Department at Kansas State University (KSU) was founded in 1901 after breaking off of the Farming Department. This once small KSU department is now one of the largest Animal Science Departments in the nation. The ASI Department has six research facilities: beef cattle, dairy cattle, swine, poultry, horses, and sheep. Moreover, this department manages 6,500 acres and cares for roughly 2,000-3,000 head of cattle; 3,500 head of swine; 1,500 laying hens; 250 sheep; and 45 horses. In addition, this department takes pride in providing quality research and training to students, faculty, and the surrounding communities and states (www.asi.ksu.edu).

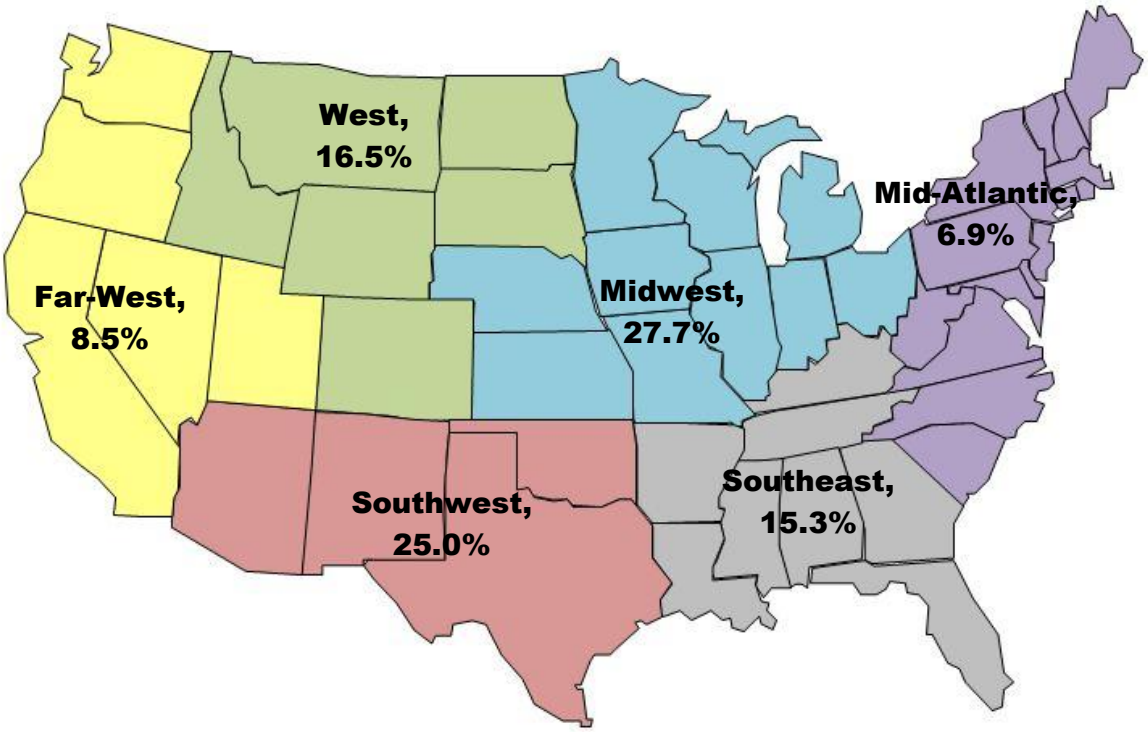
Other contributors–not partners–provided their expertise and input in matters pertaining to the survey. These contributors were: Western Kentucky University; Iowa State University; Oklahoma State University; Auburn University; University of Nevada; University of Florida; Texas A & M University; Mississippi State University; University of Missouri; North Carolina State University; and McCormick/CMA.

3.3 - Data Collection

The 2008 National Stocker Survey was mailed out to over 16,000 selected producers within the United States from BEEF Magazine's mailing list. Beginning on October 31, 2007, surveys were mailed back and data collection began. Data collection predominately continued until January 3, 2008, even though roughly 100 surveys were collected after that date. Responses were received from producers in 44 states. The contiguous 48 states were placed into six regions and the responses are summarized in Figure 3.1 below. Of the 16,200 surveys mailed, 2,248 returned surveys were deemed usable (approximately 13.9%). Producers were asked to answer questions in the following topic areas pertaining to their backgrounding/stocking operation:

management and operation; procurement; receiving; receiving nutrition and management; health, nutrition; marketing; risk management; and communication and education. A majority of the producers who responded to this survey were cow/calf producers who retained ownership of their calves by backgrounding.

Figure 3.1 2008 National Stocker Survey Response by Region



3.4 – Stocker Cattle Management/Operation Practices

This section of the survey was designed to retrieve information about a producer's management and operation. The other sectors of this survey are discussed in the following sections. For each section, the questions, variable definitions, and statistics are summarized in tables. Table 3.1 details some of the questions asked in the management and operation section of the survey.

Table 3.1 Management/Operation Practices Questions

Survey Question	Variable	N	Most Common Response	Mean	Standard Deviation
Q1	Descr. Of Operation (1=100% stocker; 2=stocker with cow/calf; 3=stocker with feedlot; 4=stocker with cow/calf and feedlot)	2248	2	2.27	1.36
Q2	Off farm job (1=No; 2=Yes)	2221	1	1.26	0.44
Q3	Farm row crops (1=No; 2=Yes)	2188	1	1.40	0.49
Q4	Run stockers year round (1=No; 2=Yes)	2179	2	1.54	0.50
Q5	I am the operation (1=Owner; 2=Manager; 3=Owner and Manager; 4=Other)	2238	3	2.08	0.98
Q6	Age (1=<25; 2=25-34; 3=35-44; 4=45-54; 5=55-64; 6=>64)	1987	6	4.70	1.19
Q7	Type of Operation (1=Family; 2=Corporate)	1966	1	1.07	0.25
Q8	Annual gross income from stocking (1=0%; 2=1-25%; 3=26-50%; 4=51-75%; 5=76-100%)	1941	3	3.26	1.09
Q9	Time purchased/managed stockers (1=5yrs or less; 2=6-10yrs; 3=11-20yrs; 4=21-30yrs; 5=31-40yrs; 6=Over 40yrs)	1903	3	3.70	1.52
Q10a	Stockers owned/managed in 2002 (1=0; 2=1-199; 3=200-499; 4=500-999; 5=1,000-2,499; 6=2,500-4,999; 7=5,000-6,999; 8=7,000-9,999; 9=10,000-19,999; 10=20,000 or more)	2165	2	2.95	1.31
Q10b	Stockers owned/managed in 2003 (1=0; 2=1-199; 3=200-499; 4=500-999; 5=1,000-2,499; 6=2,500-4,999; 7=5,000-6,999; 8=7,000-9,999; 9=10,000-19,999; 10=20,000 or more)	2157	2	2.97	1.31
Q10c	Stockers owned/managed in 2004 (1=0; 2=1-199; 3=200-499; 4=500-999; 5=1,000-2,499; 6=2,500-4,999; 7=5,000-6,999; 8=7,000-9,999; 9=10,000-19,999; 10=20,000 or more)	2168	2	3.01	1.31
Q10d	Stockers owned/managed in 2005 (1=0; 2=1-199; 3=200-499; 4=500-999; 5=1,000-2,499; 6=2,500-4,999; 7=5,000-6,999; 8=7,000-9,999; 9=10,000-19,999; 10=20,000 or more)	2184	2	3.03	1.33
Q10e	Stockers owned/managed in 2006 (1=0; 2=1-199; 3=200-499; 4=500-999; 5=1,000-2,499; 6=2,500-4,999; 7=5,000-6,999; 8=7,000-9,999; 9=10,000-19,999; 10=20,000 or more)	2191	2	3.04	1.34

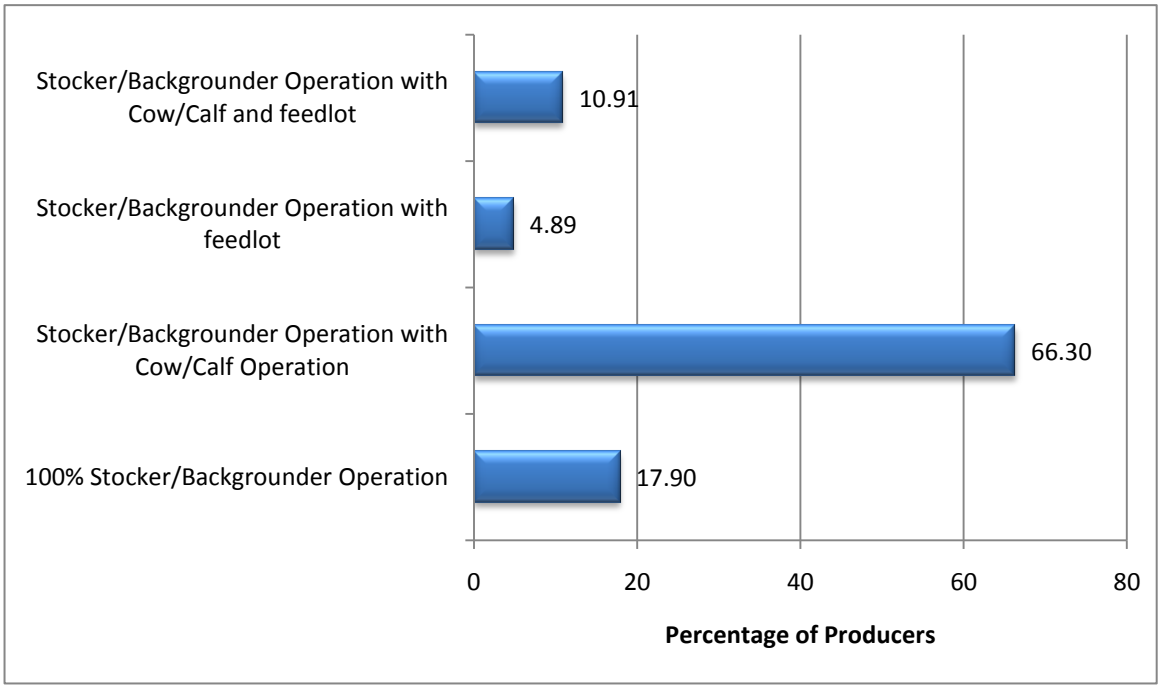
Table 3.1 Continued

Survey Question	Variable	N	Most Common Response	Mean	Standard Deviation
Q10f	Stockers owned/managed in 2007 (1=0; 2=1-199; 3=200-499; 4=500-999; 5=1,000-2,499; 6=2,500-4,999; 7=5,000-6,999; 8=7,000-9,999; 9=10,000-19,999; 10=20,000 or more)	2191	2	3.07	1.34
Q10g	Stockers owned/managed in 2008 (1=0; 2=1-199; 3=200-499; 4=500-999; 5=1,000-2,499; 6=2,500-4,999; 7=5,000-6,999; 8=7,000-9,999; 9=10,000-19,999; 10=20,000 or more)	1898	2	3.12	1.41
Q12a	% of cattle solely owned	1865		93.38	19.10
Q12b	% of cattle partnered	381		71.24	32.62
Q12c	% of cattle managed for another owner (custom)	205		62.08	32.49
Q13	% of stockers retained through harvest	1085		73.85	34.78
Q14	Length of time stockers are owned (1=30 days or less; 2=31-60 days; 3=61-90 days; 4=91-120 days; 5=121-180 days; 6=181-240 days; 7=More than 240 days)	2193	5	5.06	1.45
Q15a	Length of time stockers owned based on desired selling weight (0=No; 1=Yes)	2247	1	0.67	0.47
Q15b	Length of time stockers owned based on grazing period (0=No; 1=Yes)	2191	0	0.37	0.48
Q15c	Length of time stockers owned based on desired profit/head (0=No; 1=Yes)	2191	0	0.33	0.47
Q15d	Length of time stockers owned based on other issues (0=No; 1=Yes)	2191	0	0.09	0.29

The producers that responded to this survey were predominately cow/calf operators with a stocker operation (66.3% of producers), with 100% stocking/backgrounding operations coming in second (17.9% of producers), then stocking/backgrounding operation with cow/calf and feedlot (10.9% of producers), and lastly stocking/backgrounding operation with feedlot (4.9% of producers) (Figure 3.2). On average, 26.3% of producers have off-farm jobs, 39.7% farm row crops, and 54.5% run a stocker operation year-round. Of the respondents, 93.3% of operations are family-owned. In addition, of the 1,865 producers indicating they solely owned cattle, they

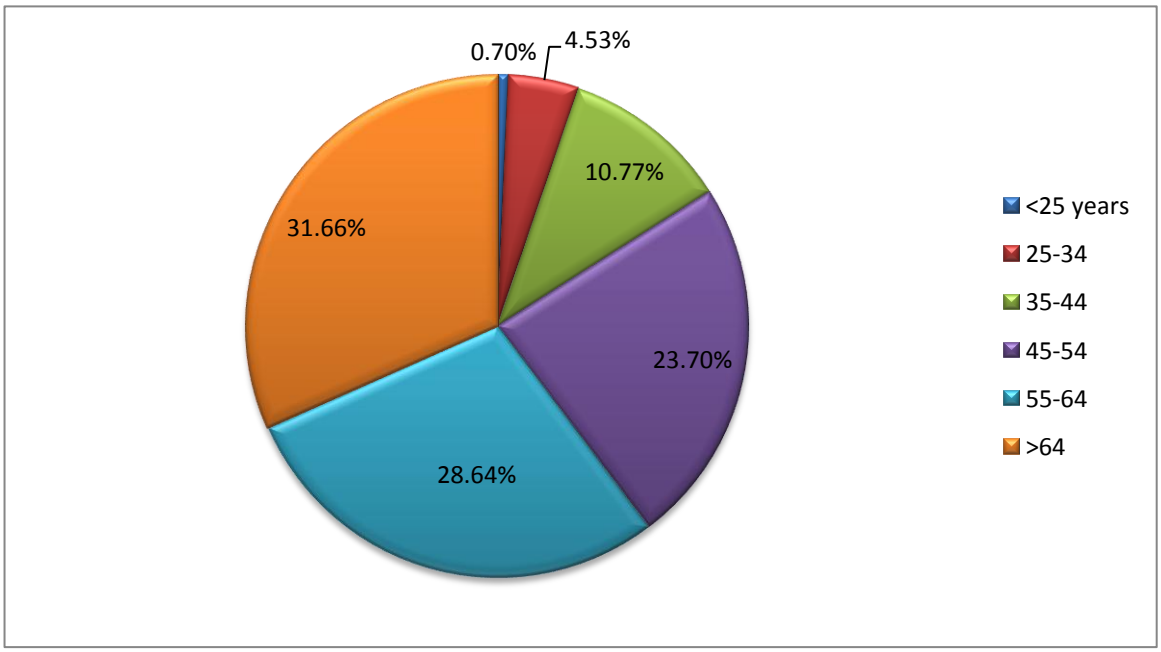
solely owned 93.4% of their cattle. Out of the 381 producers specifying they partnered on cattle, they partnered on 71.2% of their cattle, and of the 205 producers indicating they managed cattle for a different owner, they custom managed 62.1% of their cattle. The length of time producers keep their cattle is based on a desired selling weight for most producers as opposed to making that decision based on grazing period, desired profit per head, or other issues. Furthermore, of the producers responding to this question, producers retain 73.9% of their cattle through harvest.

Figure 3.2 Description of Producers Operations



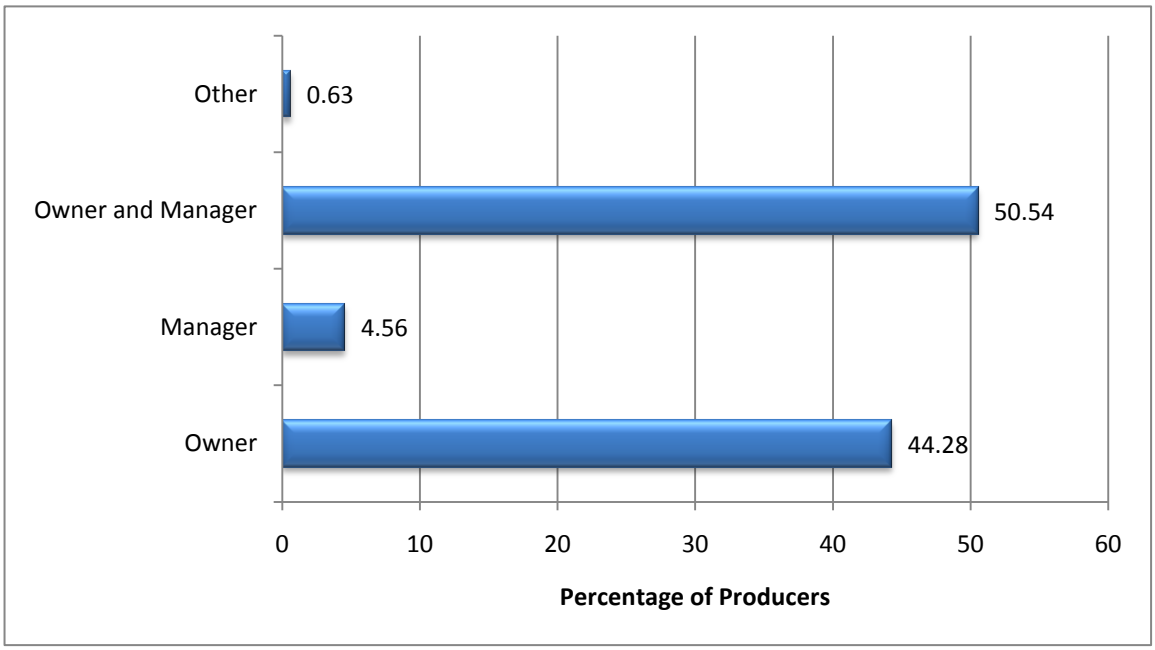
A majority of the producers responding to the survey were over the age of 55 (Figure 3.3). Only 0.7% of the producers who responded to this survey (14 producers) were under the age of 25. Producers under the age of 44 make up only 16.0% (318 producers) of the total producers in this survey. Thirty-two percent (629 producers) of respondents were over the age of 64 with producers ranging in age from 55-64 closely following at 28.6% (569 producers).

Figure 3.3 Age of Producers



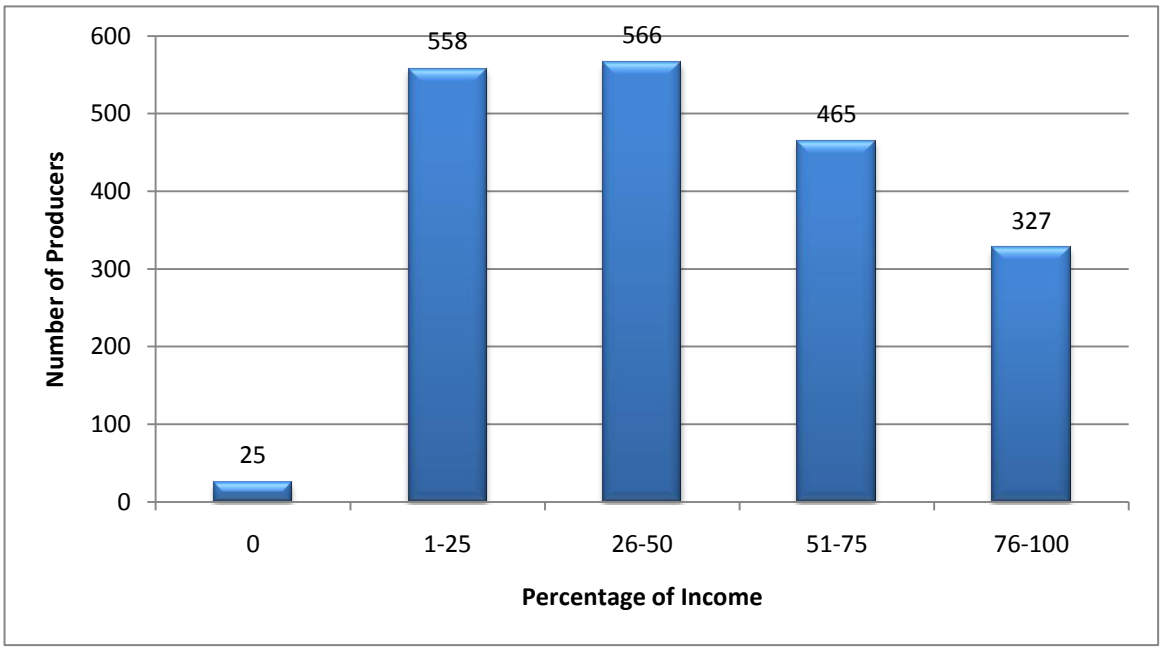
Almost half of producers both own and manage their farm (50.5% of respondents). Approximately 44.3% (991 producers) of respondents are the owners of their operations while 4.6% (102 producers) are solely the manager of their operations. Only 0.6%, or 14 respondents, are titled as something other than a manager or owner. Figure 3.4 graphically depicts these results.

Figure 3.4 Producer Title in Conjunction with the Stocker/Backgrounder Operation



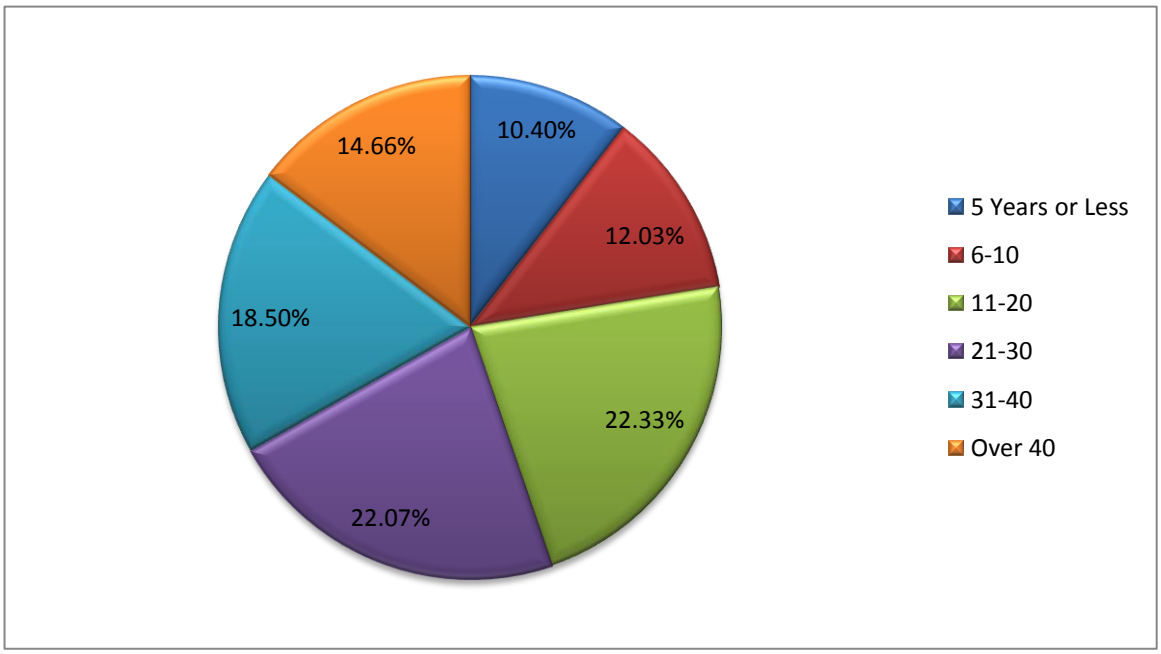
Question eight inquired about the percentage of income producers receive from stocking cattle. The gross income derived from stocking cattle for most producers (566 producers) was between 26% to 50% of their total income. Approximately 29% of producers (558 producers) get 1% to 25% of their gross income from backgrounding/stocking cattle. Less than 2%, or 25 producers, do not obtain any income from backgrounding/stocking cattle. Almost 41% of producers (792 producers) that answered this question received at least half of their gross income (50-100%) from stocking cattle (Figure 3.5).

Figure 3.5 Percentage of Annual Gross Income from Stocking/Backgrounding Cattle



On average, producers have owned and/or managed stocker cattle for 11 to 20 years. Slightly less than a fourth (22.3%, or 425 producers) of the respondents indicated they had been in the business for 11-20 years (Figure 3.6). The second most common response, with 22.1% of producers reporting, was that they have owned/managed cattle for 21 to 30 years. Approximately 33% of producers (631 producers) that responded to this question have managed cattle for over 30 years (responses 31-40 years and over 40 years combined). Producers that have managed or owned cattle for less than 10 years (responses 6-10 years and 5 years or less combined) represent almost 22% of producers that answered this question.

Figure 3.6 Breakdown of Length of Time Producers have Owned and/or Managed Stocker Cattle



Questions were asked as to how many cattle are typically owned or managed for each year from 2002 to 2007 and to report the projected number of cattle owned or managed in 2008 given the timeframe of the survey. In all years most producers reported owning or managing 1 to 199 head (Table 3.2). In general, most producers own from 1 to 500 head of stocker/backgrounder cattle during this time as shown below. As might be expected, very few producers (less than five) owned or managed more than 20,000 head of cattle annually.

Table 3.2 Breakdown of Number of Producers that Owned or Managed Stocker/Backgrounder Cattle within this Seven-Year Span by Size of Operation

	0 head	1-199 head	200-499 head	500-999 head	1,000-2,499 head	2,500-4,999 head	5,000-6,999 head	7,000-9,999 head	10,000-19,999 head	20,000+ head
2002	85	908	644	262	164	64	19	5	10	4
2003	73	899	645	272	164	65	19	6	10	4
2004	55	880	681	275	169	65	21	9	8	5
2005	58	879	686	273	172	72	20	9	10	5
2006	48	896	667	289	167	78	20	11	11	4
2007	38	874	700	279	175	74	25	10	11	5
2008	45	722	591	267	149	69	25	12	13	5

3.5 – Stocker Cattle Procurement Practices

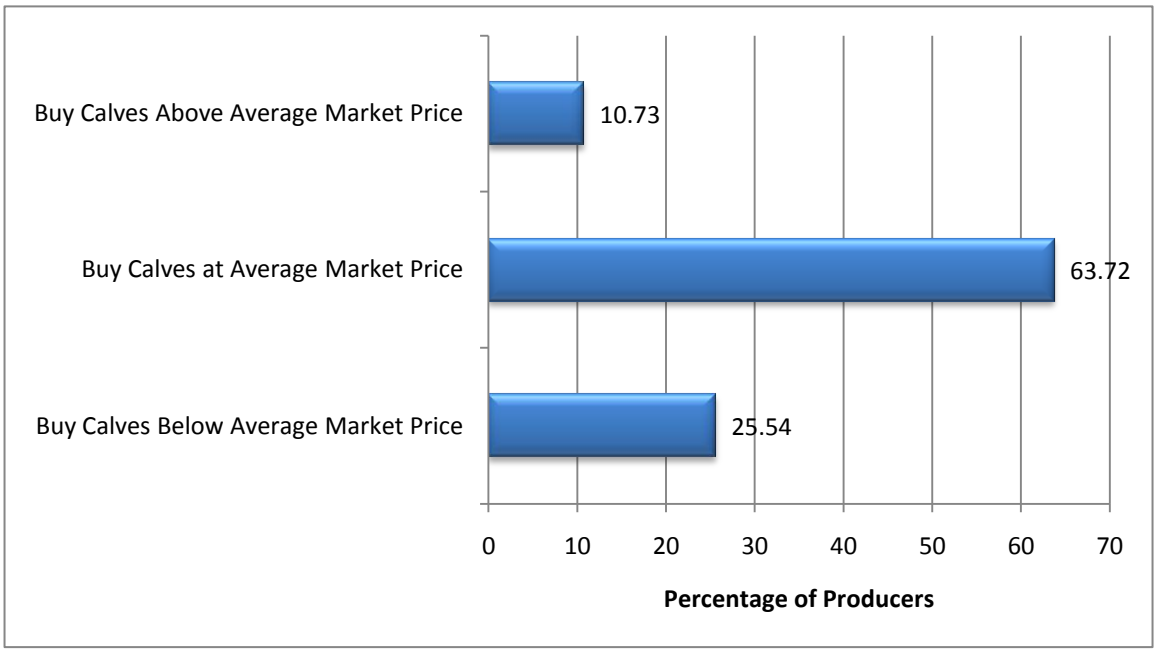
This section reports on responses to questions asked in the survey designed to gather information regarding backgrounding/stocking cattle procurement practices of producers. These questions were geared towards a producer's buying habits and other attributes about buying cattle such as source and age verification. Table 3.3 contains a sample of the questions, variable definitions, and statistics from this section of the survey.

Table 3.3 Stocker Cattle Procurement Practices Questions

Survey Question	Variable	N	Most Common Response	Mean	Standard Deviation
Q17	Stocking purchase behavior (1=buy calves below avg. market price; 2=buy calves at avg. market price; 3=buy calves above avg. market price)	1472	2	1.85	0.58
Q18	% of cattle marketed in value-added programs (1=0%; 2=1-25%; 3=26-50%; 4=51-75%; 5=76-100%)	2098	1	1.66	1.28
Q19a	% of cattle from Q18 are never implanted	803		87.47	25.52
Q19b	% of cattle from Q18 are never treated with injectible antibiotic	626		79.66	28.27
Q19c	% of cattle from Q18 are never fed an antibiotic	593		90.45	22.51
Q20a	For cattle in Q18, are they source verified (0=No; 1=Yes)	739	1	0.62	0.48
Q20b	For cattle in Q18, are they age verified (0=No; 1=Yes)	739	1	0.51	0.50
Q20c	For cattle in Q18, are they genetic verified (0=No; 1=Yes)	739	0	0.26	0.44
Q20d	For cattle in Q18, are they verified in something else (0=No; 1=Yes)	739	0	0.19	0.39
Q28	How long calves are hauled in truck/trailer (1=< 2hrs; 2=2-5hrs; 3=6-9hrs; 4=10-14hrs; 5=<14hrs)	1723	1	1.66	1.08

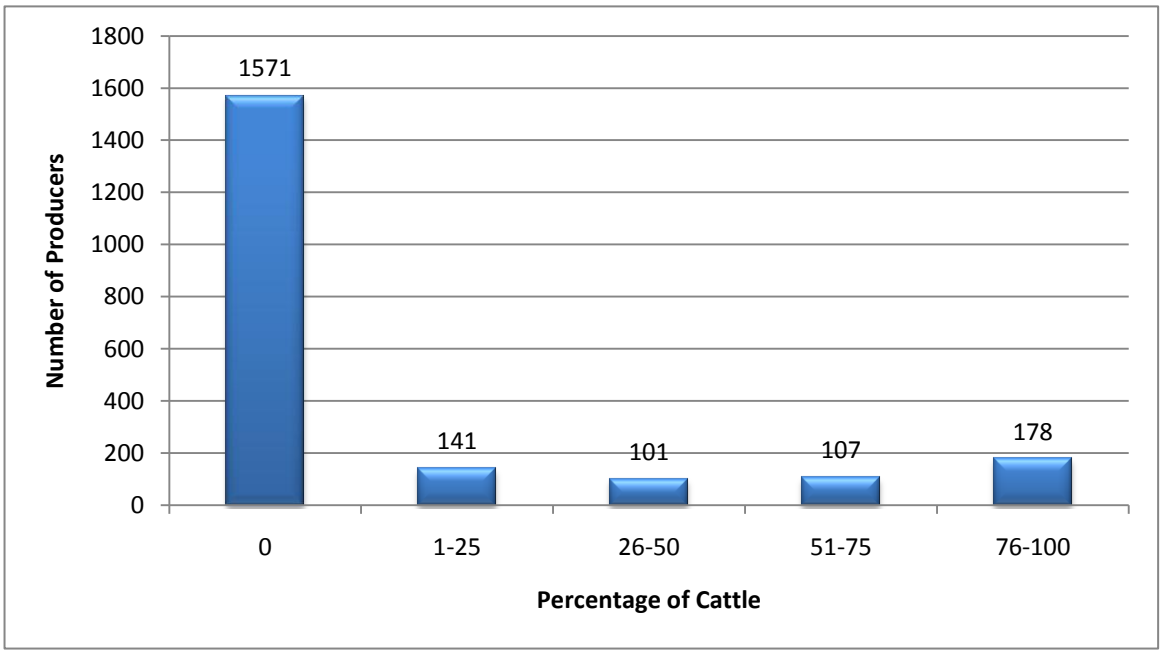
On average, most producers (63.7%) indicate they buy their cattle at the average market price (Figure 3.7). Roughly a fourth (25.5%) of producers indicated their strategy is to buy cattle below average market price. This leaves 10.7% of producers who indicated they buy cattle above average market price.

Figure 3.7 Producers Typical Procurement/Stocker Purchasing Behavior



Question 18 asked producers to identify if they market their cattle through value-added programs such as CAB, etc. A majority of producers (74.9%) indicated that they do not market their cattle through value-added programs. Of the approximately 25% of producers indicating they market cattle through a value-added program, the percentage of their cattle marketed through those programs varied considerably (Figure 3.8). Almost 6.7% (141 of 2098) of producers marketing through a value-added program reported they market between 1% and 25% of their cattle through programs such as CAB, Rancher's Renaissance, Laura's Lean, etc. Only 4.8% (101 of 2098) of value-added producers indicated they market 26% to 50% of their cattle through value-added brands. Similarly, 5.1% (107 of 2098) indicated they market from 51% to 75% of their cattle using value-added programs. Finally, 178 producers (8.5% of those marketing through value-added programs) market almost all of their cattle (76-100%) in this fashion.

Figure 3.8 Percentage of Cattle Producers Market through Value-Added Programs

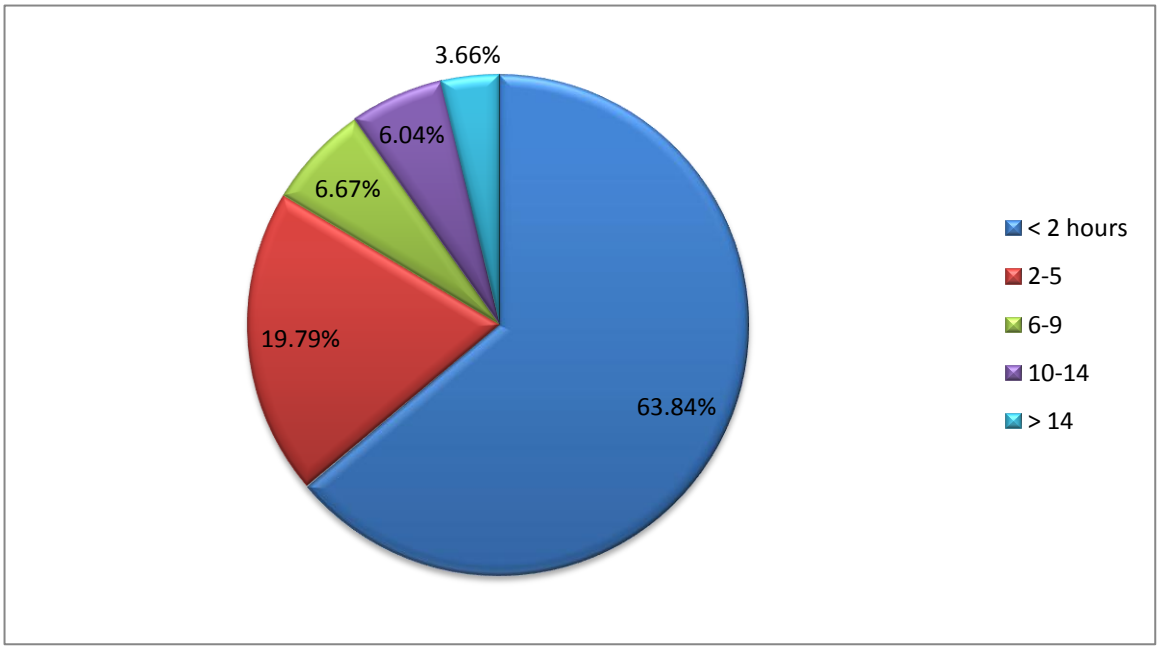


Following up on question 18 (marketing cattle through a value-added program), questions 19 and 20 ask about specific practices often associated with value-added programs. Question 19 asks for the percentages of cattle from question 18 that have never been implanted, treated with injectible antibiotics, or fed an antibiotic. From the producers that responded to question 18, 87.5% of cattle have never been implanted (803 responses), 79.7% of cattle have never been treated with an injectible antibiotic (626 responses), and 90.5% of cattle have never been fed an antibiotic (593 responses). Question 20 inquires if the cattle described in question 18 have any certified or verified attributes (739 respondents). Producers receive source verification on 62.4% of their cattle and age verification on 50.6% of their cattle from their suppliers. However, producers only receive genetic verification on 25.6% of their cattle or any other certification on 19.2% of their cattle.

Figure 3.9 shows the distribution of how long (in hours) producers typically haul their cattle from purchase place or collection point to their operation. The majority of producers

(63.8%) indicated they haul their cattle less than two hours from the place of purchase to their operation. In addition, 19.8% of the producers who responded to this question only haul their cattle 2-5 hours after purchasing. Only 6.7%, 6.0%, and 3.7% of producers haul their cattle 6-9, 10-14, or more than 14 hours, respectively.

Figure 3.9 Breakdown of Hauling Time for Purchased Stocker Calves from Collection Point to Stocker Operation



3.6 – Stocker Cattle Receiving Practices

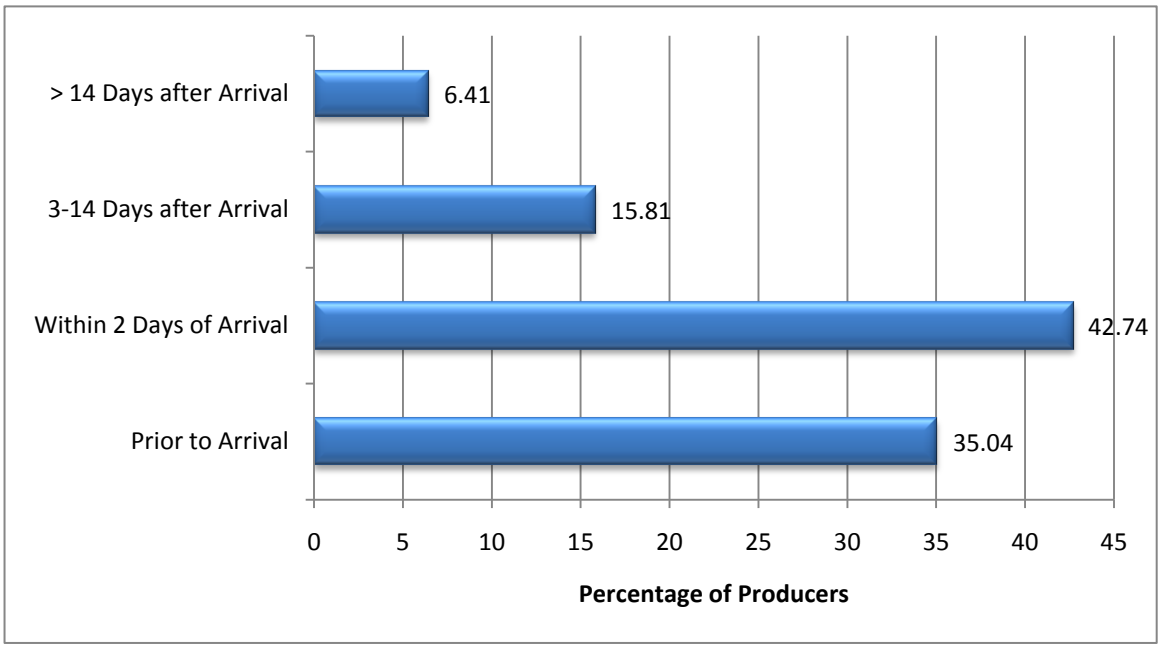
This section of the chapter reports on the section of the survey that was designed to retrieve answers from producers regarding management practices of newly arrived cattle. These questions asked about practices such as treatment of Persistently Infected Bovine Viral Diarrhea Virus (PI-BVDV) and processing time. Table 3.4 contains a sample of the questions, variable definitions, and summary statistics from specific questions in this section of the survey.

Table 3.4 Receiving Practices Questions

Survey Question	Variable	N	Most Common Response	Mean	Standard Deviation
Q30	% of cattle tested for PI-BVDV	180		70.91	38.11
Q31	If/when cattle are tested for PI-BVDV (1=Prior to arrival; 2=Within 2 days of arrival; 3=3-14 days after arrival; 4=>14 days after arrival)	234	2	1.94	0.87
Q32a	Deal with PI-BVDV positive cattle by separating and marketing at sale barn w/o identifying them (0=No; 1=Yes)	339	0	0.17	0.37
Q32b	Deal with PI-BVDV positive cattle by separating and marketing at sale barn as PI (0=No; 1=Yes)	339	0	0.19	0.39
Q32c	Deal with PI-BVDV positive cattle by separating and marketing to PI managing feedlots (0=No; 1=Yes)	339	0	0.07	0.25
Q32d	Deal with PI-BVDV positive cattle by euthanizing (0=No; 1=Yes)	339	0	0.13	0.34
Q32e	Deal with PI-BVDV positive cattle by separating and feeding yourself (0=No; 1=Yes)	339	0	0.47	0.50
Q33	When are cattle processed (1=Before shipment; 2=Never; 3=On arrival; 4=Day after arrival; 5=2-3 days after arrival; 6=4-7 days after arrival; 7=8-14 days after arrival; 8=>14 days after arrival; 9=Other)	1676	4	4.32	2.24

Of the 180 producers who responded to question 30, 70.9% of a respondent's herd was tested for PI-BVDV, but responses to this question ranged from 1% to 100%. If cattle are tested for PI-BVDV, most producers (42.7%) have them tested within two days of arrival (Figure 3.10). Almost 35.0% of producers that test cattle for PI-BVDV have them tested before they arrive on the producer's property while 15.8% of producers have their cattle tested for this disease 3 to 14 days after arrival. Less than 7% of producers take longer than 14 days to have their cattle tested for PI-BVDV.

Figure 3.10 When Do Producers have Cattle Tested for PI-BVDV



Question 32 addresses how producers deal with cattle that have tested positive for PI-BVDV. Out of the 339 respondents to this question, 16.5% of producers separate and market their cattle through the sale barn without identifying them as PI-BVDV positive; 18.9% of producers separate and market their cattle through the sale barn as PI-BVDV positive; 6.8% of producers separate and market their cattle to PI-BVDV managing feedlots; 13.0% of producers euthanize PI-BVDV positive cattle; and 46.6% of producers feed out PI-BVDV positive cattle (Figure 3.11).

Figure 3.11 Breakdown of How Producers Deal with Stocker Cattle that Test Positive for PI-BVDV

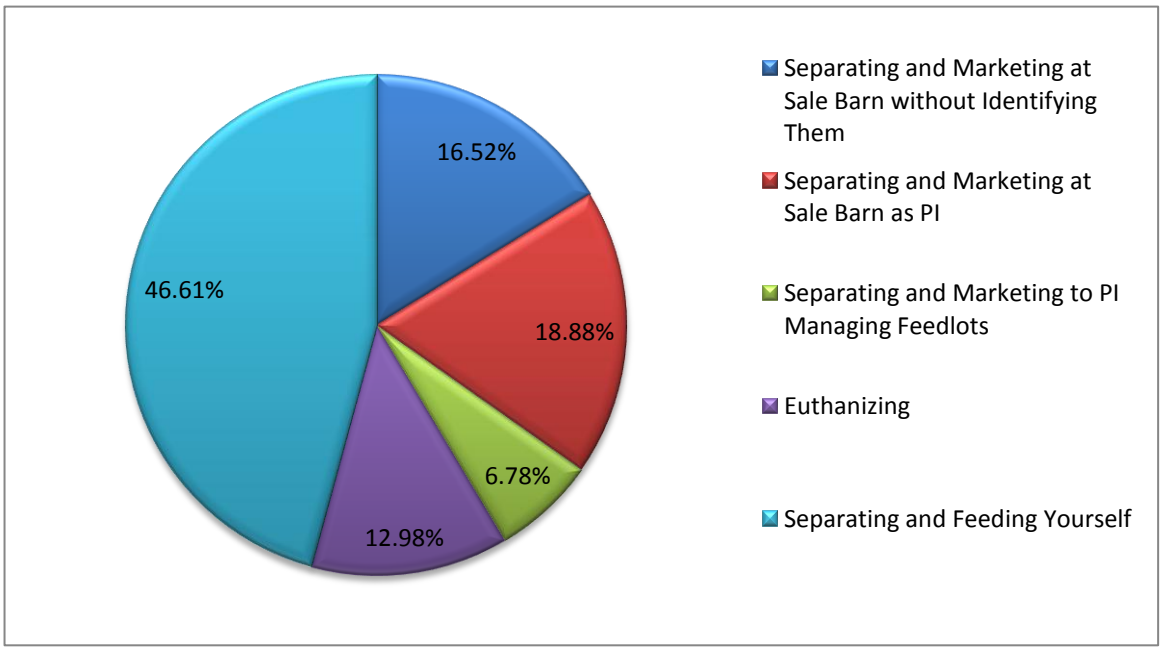
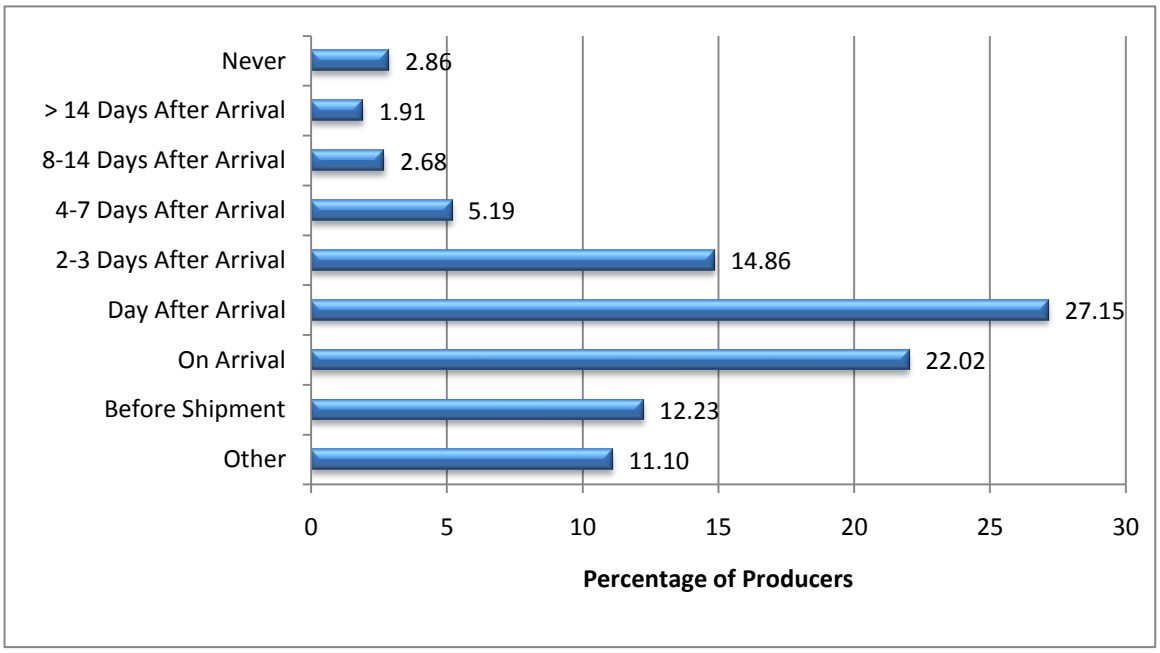


Figure 3.12 shows the distribution of when respondents indicated they processed their cattle (question 33). While 12.2% of producers indicated cattle were processed before they were shipped, most producers (27.2%) indicated their cattle were processed the day after arrival. The next most common response was the day of arrival (22.0%) followed by 2-3 days after arrival (14.9%). Thus, over three-fourths of producers indicated their cattle are processed either prior to shipment or within three days of arrival. However, this also suggests that almost a fourth of producers do not process their cattle for at least four days after they arrive or possibly the calves are never processed at all.

Figure 3.12 When Producers Process Their Cattle



3.7 – Stocker Cattle Receiving Nutrition

This section of the chapter was designed to discuss responses to questions from the receiving nutrition/management section of the survey. Specifically, survey questions about nutrition practices of their newly arrived cattle. Examples of these questions would include questions about receiving rations, feed additives, and ionophores. Table 3.5 contains a sample of the questions, variable definitions, and summary statistics from the receiving nutrition/ management section of the survey.

Table 3.5 Receiving Nutrition Questions

Survey Question	Variable	N	Most Common Response	Mean	Standard Deviation
Q35a	Within 48 hrs, cattle are put directly on pasture (0=No; 1=Yes)	1836	0	0.11	0.32
Q35b	Within 48 hrs, cattle are put directly in a dry lot (0=No; 1=Yes)	1836	0	0.44	0.50
Q35c	Within 48 hrs, cattle are put directly in a dry lot prior to pasture (0=No; 1=Yes)	1836	0	0.22	0.42
Q35d	Within 48 hrs, cattle are put directly in a small pasture to watch prior to a large pasture (0=No; 1=Yes)	1836	0	0.25	0.43
Q35e	Within 48 hrs, cattle are put directly in a small pasture to watch prior to dry lot (0=No; 1=Yes)	1836	0	0.04	0.19
Q37	Receiving ration fed to newly arrived cattle for… (1=1-7 days; 2=8-14 days; 3=15-21 days; 4=22-28 days; 5=> 28 days)	1518	2	2.75	1.42
Q38a	Do you feed Aureomycin in receiving ration (0=No; 1=Yes)	1444	0	0.45	0.50
Q38b	Do you feed Terramycin in receiving ration (0=No; 1=Yes)	1444	0	0.12	0.32
Q38c	Do you feed vitamins/minerals in receiving ration (0=No; 1=Yes)	1444	1	0.59	0.49
Q38d	Do you feed Bovatec in receiving ration (0=No; 1=Yes)	1444	0	0.25	0.43
Q38e	Do you feed V-Max in receiving ration (0=No; 1=Yes)	1444	0	0.00	0.06
Q38f	Do you feed Gainpro in receiving ration (0=No; 1=Yes)	1444	0	0.01	0.07
Q38g	Do you feed probiotics in receiving ration (0=No; 1=Yes)	1444	0	0.05	0.23
Q38h	Do you feed other additives in receiving ration (0=No; 1=Yes)	1444	0	0.04	0.19
Q38i	Do you feed Rumensin in receiving ration (0=No; 1=Yes)	1444	0	0.24	0.43
Q38j	Do you feed Deccox in receiving ration (0=No; 1=Yes)	1444	0	0.15	0.36
Q38k	Do you feed salt in receiving ration (0=No; 1=Yes)	1444	0	0.39	0.49
Q38l	Do you feed MGA in receiving ration (0=No; 1=Yes)	1444	0	0.02	0.13
Q38m	Do you feed yeast in receiving ration (0=No; 1=Yes)	1444	0	0.05	0.23

Table 3.5 Continued

Survey Question	Variable	N	Most Common Response	Mean	Standard Deviation
Q40a	Ionophores delivered to cattle by free-choice loose mineral (0=No; 1=Yes)	1218	0	0.45	0.50
Q40b	Ionophores delivered to cattle by complete commercial feed delivered daily (0=No; 1=Yes)	1218	0	0.11	0.31
Q40c	Ionophores delivered to cattle by supplement/pre-mix in mixed ration (0=No; 1=Yes)	1218	0	0.31	0.46
Q40d	Ionophores delivered to cattle by hand (0=No; 1=Yes)	1218	0	0.10	0.30
Q40e	Ionophores delivered to cattle by self-feeder (0=No; 1=Yes)	1218	0	0.07	0.26
Q40f	Ionophores delivered to cattle by free-choice block (0=No; 1=Yes)	1218	0	0.12	0.32
Q40g	Ionophores delivered to cattle by free-choice mineral tub (0=No; 1=Yes)	1218	0	0.09	0.28
Q40h	Ionophores delivered to cattle by free-choice protein tub (0=No; 1=Yes)	1218	0	0.10	0.30

Producers were asked to answer several questions about where cattle were placed upon arrival and if they were given any ionophores or feed additives. Within 48 hours of arrival, 11.5% of producers place their cattle in a pasture; 43.6% of producers place their cattle directly in a dry lot; 22.3% of producers put their cattle temporarily in a dry lot before moving to a pasture; 24.9% of producers keep calves in a grass trap (small pasture) for observation before moving to a pasture; and 3.8% of producers place their cattle in a grass trap for observation before putting them in a dry lot.

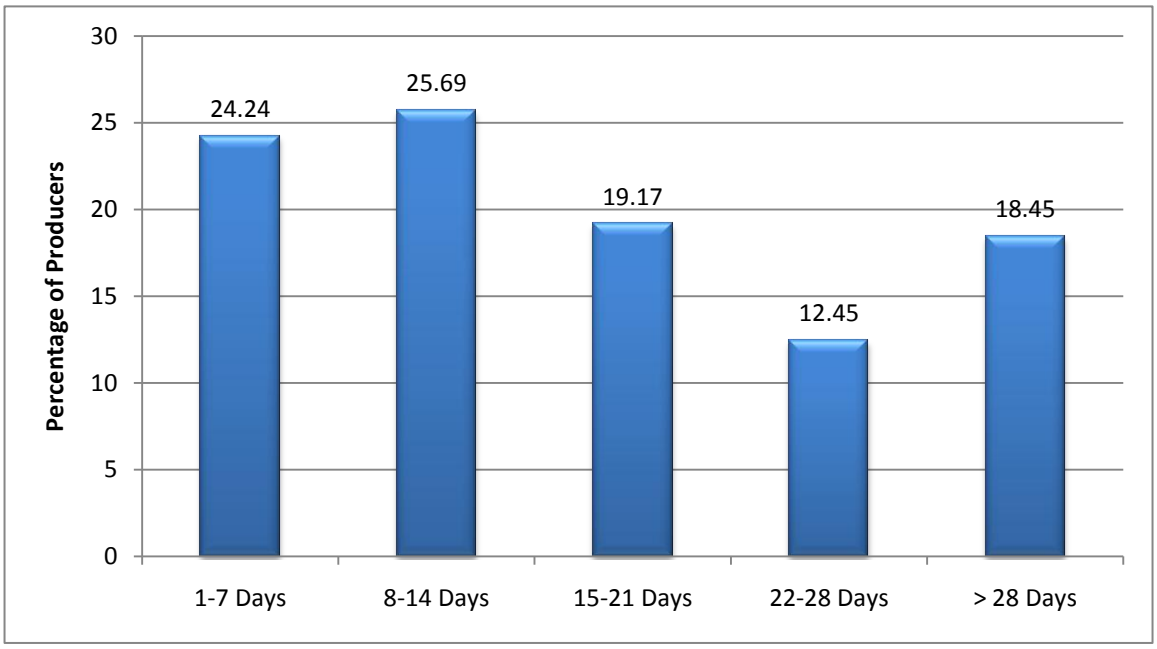
Regarding feed additives, 58.9% feed vitamins and/or minerals; 45.1% of producers feed Aureomycin; 38.8% feed salt; 24.9% feed Bovatec; 24.2% feed Rumensin; 15.2% feed Deccox; 11.8% feed Terramycin; 5.4% feed probiotics; 5.5% feed yeast; 3.9% of producers feed

something else; 1.7% feed MGA; and 0.6% feed Gainpro. No producers reported feeding V-Max to their cattle.

Of producers delivering ionophores to their stocker cattle, 45.5% deliver ionophores to their cattle by free-choice loose mineral; 10.9% by complete commercial feed delivered daily; 31.2% by supplement/pre-mix included in mixed ration; 10.1% by hand; 7.4% through a self-feeder; 11.7% of producers supplement by free choice block; 8.7% deliver through a free choice mineral tub; and 9.9% of producers deliver ionophores through a free choice protein tub.

Question 37 asked producers to provide information on the length of time calves are fed a receiving ration. As shown in Figure 3.13, approximately half of the producers feed a receiving diet to their newly arrived cattle for 14 days or less, split about equally between feeding 1-7 days (24.2%) and 8-14 days (25.7%). The other half of producers reported they provide a receiving diet to new calves for greater than 14 days: 19.2% (15-21 days), 12.5% (22-28 days), and 18.5% (over 28 days).

Figure 3.13 Length of Time Receiving Ration is Fed to Calves



3.8 – Stocker Cattle Health

This part of the chapter reviews questions from the survey that asked producers about animal health management procedures. Questions involving the following topics can be found in this section: veterinarian consultations, Bovine Respiratory Disease (BRD) pull rate, death loss, and illness prevention. Table 3.6 contains a sample of the questions, variable definitions, and summary statistics from the section health section of the survey.

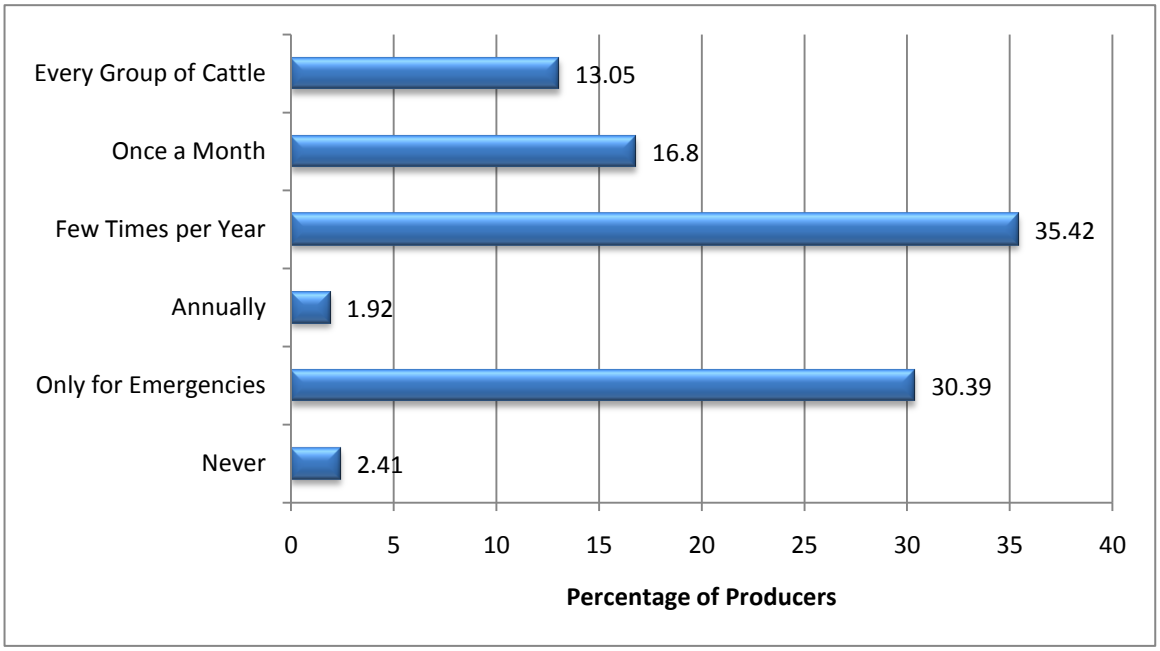
Table 3.6 Health Questions

Survey Question	Variable	N	Most Common Response	Mean	Standard Deviation
Q44	Frequency of consultations with veterinarian (1=Never; 2=Only for emergencies; 3=Annually; 4=Few times per year; 5=Once a month; 6=Every group of cattle)	2030	4	3.73	1.44
Q46	Typical BRD pull rate w/in first month (1=<5%; 2=5-10%; 3=11-20%;4=21-30%; 5=31-50%; 6=>50%)	1760	1	1.67	1.04
Q47	After pulling/treating BRD, then you (1=Send calves to hospital pen; 2=Return to home group)	1659	1	1.46	0.50
Q48	Death loss within 90 days of arrival (1=<1%; 2=1-3%; 3=4-5%; 4=>5%)	1830	1	1.52	0.64
Q49a	% of stockers typically treated for pneumonia/resp. diseases	1730		14.59	24.44
Q49b	% of stockers typically treated for mycoplasma pneumonia	404		9.37	21.23
Q49c	% of stockers typically treated for castration infection	334		9.07	24.37
Q49d	% of stockers typically treated for dehorning complications	176		9.42	24.50
Q49e	% of stockers typically treated for coccidiosis	652		16.26	31.66
Q49f	% of stockers typically treated for arthritis	90		5.67	17.07
Q49g	% of stockers typically treated for bloat	640		4.45	15.30
Q49h	% of stockers typically treated for flies	888		84.44	31.35
Q49i	% of stockers typically treated for footrot/lameness/joint problems	1155		4.30	11.10
Q49j	% of stockers typically treated for lice/grubs	1043		89.74	28.28
Q49k	% of stockers typically treated for eye problems	1151		9.98	21.68
Q49l	% of stockers typically treated for abscesses/wounds	537		4.48	15.54
Q49m	% of stockers typically treated for internal parasites	517		79.88	38.23
Q49n	% of stockers typically treated for scours/diarrhea	712		8.79	19.49
Q49o	% of stockers typically treated for adverse reactions to health products	164		7.16	19.11

The majority of producers only consult a veterinarian a few times per year (35.4% of respondents) or for emergencies only (30.4% of respondents) (Figure 3.14). However, 16.8% of producers consult with a veterinarian once a month and 13.1% of producers consult a

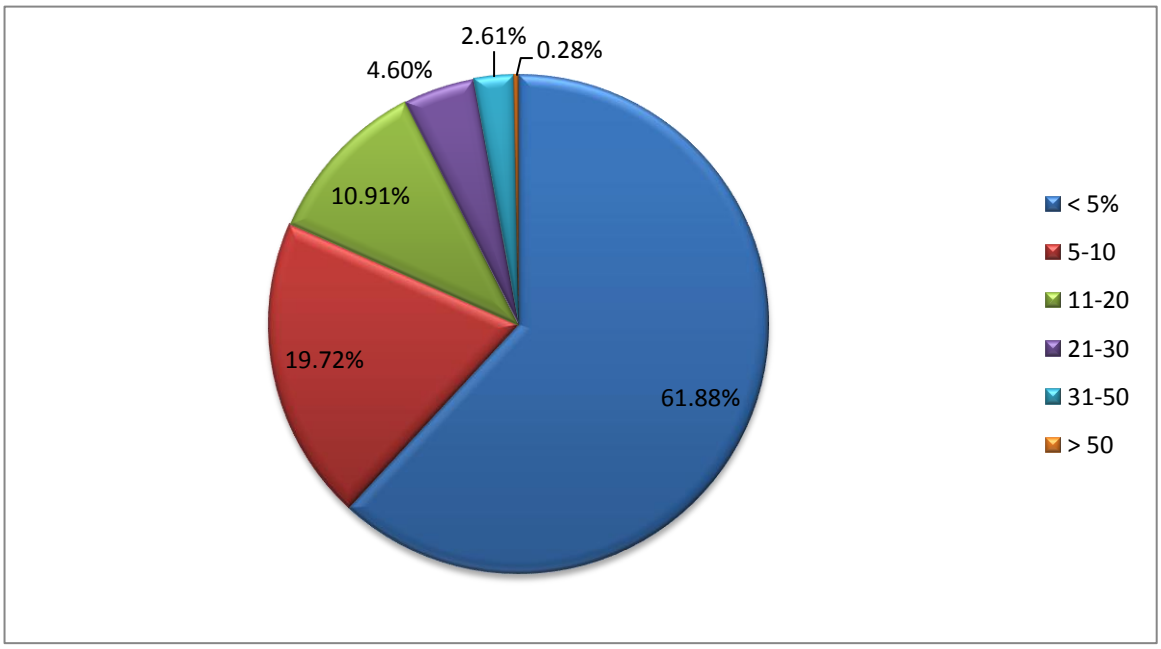
veterinarian for every group of cattle. Less than 5% of producers either never seek advice from a veterinarian (2.4% of respondents) or only consult a veterinarian annually (1.9% of respondents).

Figure 3.14 How Often Producers Consult Veterinarians



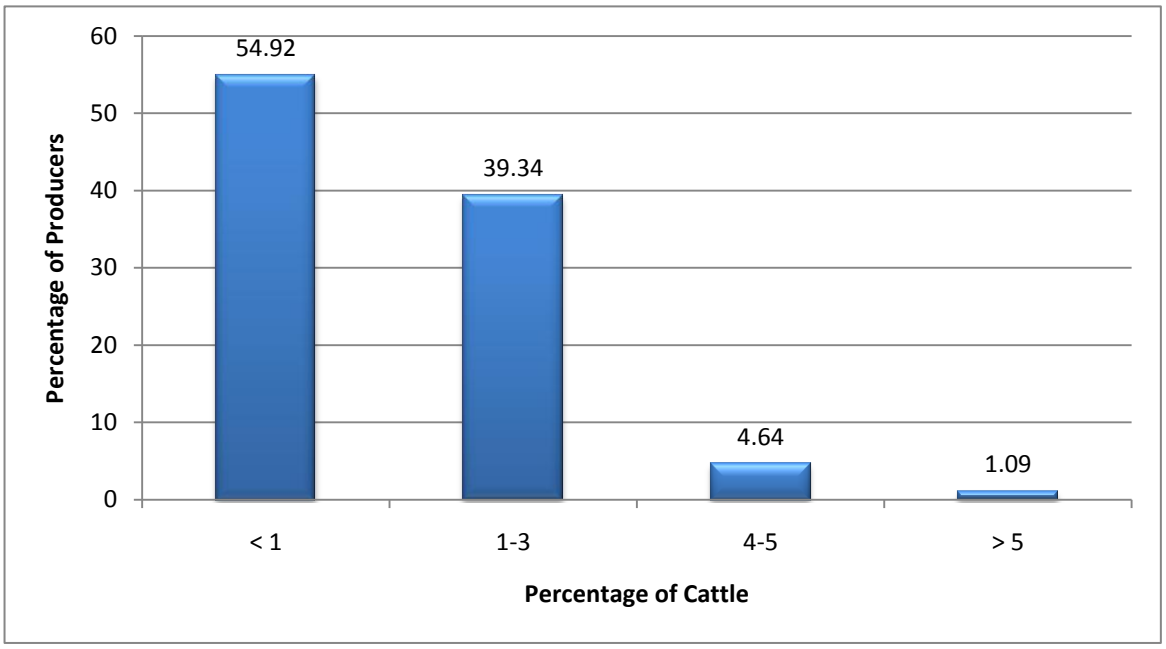
Roughly 61.9% of producers pull less than 5% of their cattle within the first month due to BRD (Figure 3.15). Almost 19.7% of producers pull between 5% and 10% of their cattle because of BRD within the first month. Around 10.9% of producers have to pull 11-20% of their cattle due to BRD. Only 4.6% , 2.6%, and 0.3% of producers pull 21-30%, 31-50%, and more than 50%, respectively, of their calves due to BRD within the first month. If cattle are pulled and treated for BRD, slightly over half of respondents prefer to place calves in a hospital pen (54.4% of producers) rather than return to the home group (45.6% of producers).

Figure 3.15 Distribution of Producers Pulling Cattle for BRD within the First Month by Pull-Rate



Question 46 asked producers to identify their percentage of death loss within the first 90 days of arrival. Most producers (54.9% of respondents) had a death loss of less than 1% within the first 90 days of arrival. Moreover, 39.3% of producers had a typical death loss between 1-3% within 90 days of arrival. As shown in Figure 3.16, less than 6% of producers had greater than a 4% death loss within 90 days of arriving, with most of those (4.6%) having a death loss between 4-5%.

Figure 3.16 Typical Death Loss within First 90 Days of Arrival



Question 49 asked producers to identify specific conditions that they typically treat their cattle for. On average, the percentage of respondents reported treating these conditions: coccidiosis (16.3% of cattle), pneumonia or respiratory diseases (14.6% of cattle), eye problems (10.0% of cattle), dehorning complications (9.4% of cattle), mycoplasma pneumonia (9.4% of cattle), castration infection (9.1% of cattle), scours or diarrhea (8.8% of cattle), adverse reactions to health products (7.2% of cattle), arthritis (5.7% of cattle), abscesses or wounds (4.5% of cattle), bloat (4.5% of cattle), and footrot/lameness/joint problems (4.3% of cattle). However, a much higher percentage of stocker cattle, across producer herds, were treated for lice or grubs (89.7% of cattle), flies (84.4% of cattle), and internal parasites (79.9% of cattle).

3.9 – Stocker Cattle Nutrition

This section of the chapter discusses the single question (question 56) asked in the nutrition section of the survey (additional nutrition-related questions were asked about receiving

cattle in an earlier section). Table 3.7 identifies the question, variable definition, and summary statistics from the nutrition section of the survey.

Table 3.7 Nutrition Question

Survey Question	Variable	N	Most Common Response	Mean	Standard Deviation
Q56	% of stocker cattle producer's limit feed to	631		86.85	27.14

Producers were asked to identify the percentage of their stocker cattle that they limit feed. Over 600 producers responded to this question, and on average, they limit feed to roughly 86.9% (range from 1% to 100%) of their stocker cattle.

3.10 – Stocker Cattle Marketing

This section of the chapter evaluates questions pertaining to the cattle marketing section of the survey. An example of the type of questions contained in this section is what sources of market information producers rely most upon. Table 3.8 below contains a sample of the questions, variable definitions, and summary statistics from the marketing section of the survey.

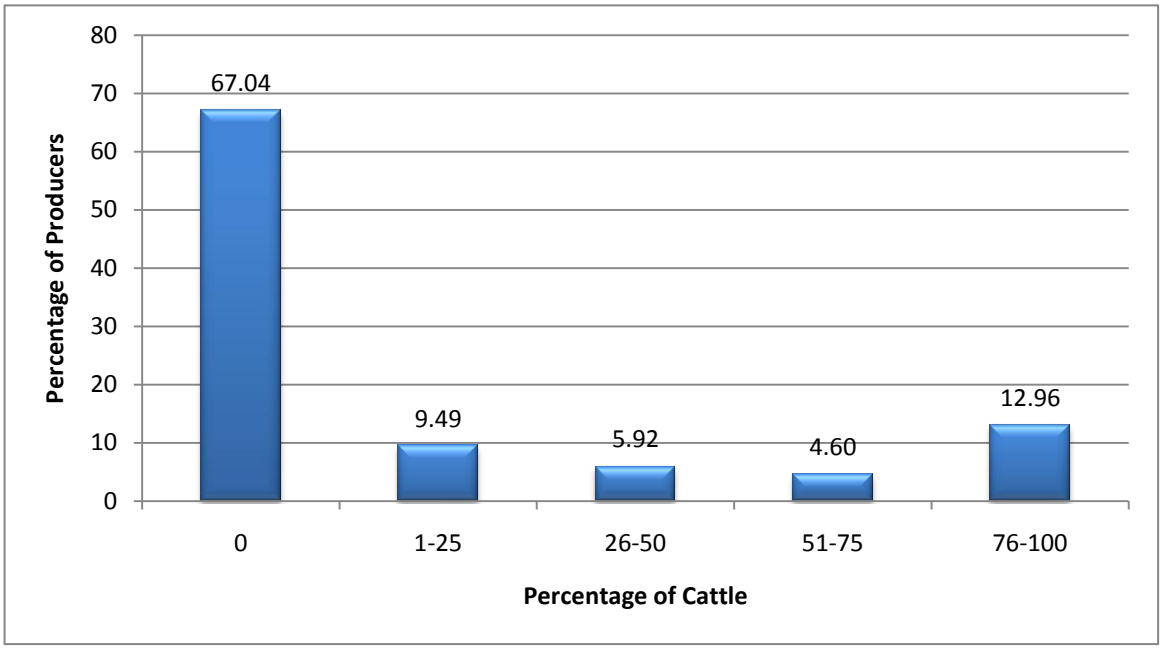
Table 3.8 Marketing Questions

Survey Question	Variable	N	Most Common Response	Mean	Standard Deviation
Q58a	% of stocker cattle that you receive feedlot performance data (1=0%; 2=1-25%; 3=26-50%; 4=51-75%; 5=76-100%)	2045	1	1.87	1.44
Q58b	% of stocker cattle that you receive carcass data (1=0%; 2=1-25%; 3=26-50%; 4=51-75%; 5=76-100%)	1960	1	1.65	1.25
Q59a	Producers get information from Cattle-Fax (0=No; 1=Yes)	2061	0	0.20	0.40
Q59b	Producers get information from USDA report (0=No; 1=Yes)	2061	0	0.37	0.48
Q59c	Producers get information from DTN (0=No; 1=Yes)	2061	0	0.21	0.41
Q59d	Producers get information from local sale barn (0=No; 1=Yes)	2061	1	0.61	0.49
Q59e	Producers get information from order buyer (0=No; 1=Yes)	2061	0	0.26	0.44
Q59f	Producers get information from State Association (0=No; 1=Yes)	2061	0	0.08	0.28
Q59g	Producers get information from Chicago Mercantile Exchange (0=No; 1=Yes)	2061	0	0.28	0.45
Q59h	Producers get information from other stocker producers (0=No; 1=Yes)	2061	0	0.16	0.36
Q59i	Producers get information from stocker publications and electronic newsletters (0=No; 1=Yes)	2061	0	0.38	0.48
Q59j	Producers get information from local newspaper (0=No; 1=Yes)	2061	0	0.21	0.41
Q59k	Producers get information from other sources (0=No; 1=Yes)	2061	0	0.07	0.26

Producers were asked to identify the percentage of cattle they receive feedlot performance data on. A majority of producers (67.0%) received no feedlot performance data on their cattle (Figure 3.17). The second most common answer with 13.0% of producers responding indicated that they received feedlot performance data on 76-100% of their cattle. In addition,

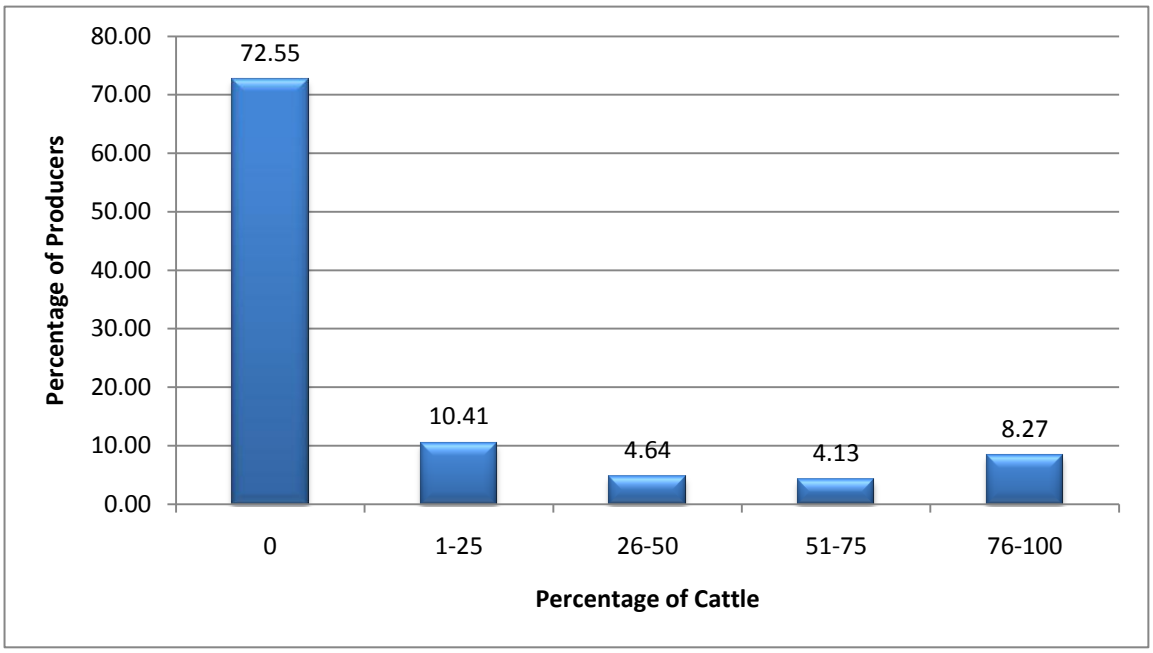
9.5% producers obtained performance data on 1-25% of their stocker cattle. Only 5.9% and 4.6% of producers receive 26-50% and 51-75% of their cattle feedlot performance data, respectively.

Figure 3.17 Breakdown of the Percentage of Stocker Cattle that Producers Receive Feedlot Performance Data On



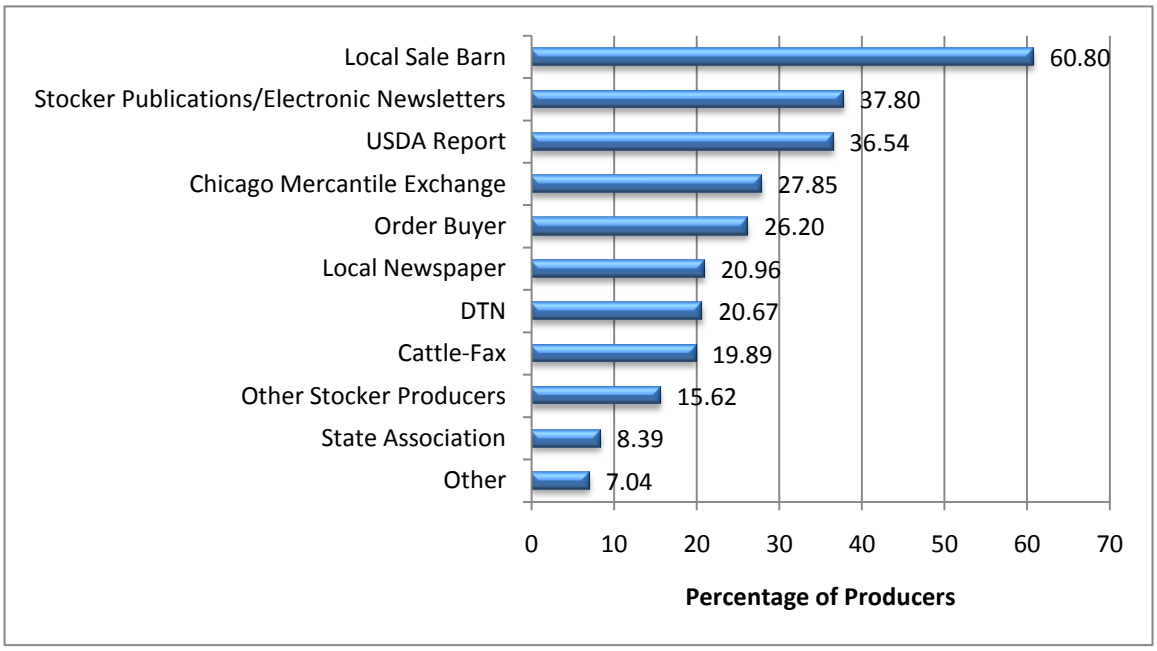
Similar to the question above regarding feedlot performance data, a majority of producers (72.5%) do not receive carcass data on their stocker cattle either (Figure 3.18). Only, 10.4% of respondents indicated they collect carcass data on 1-25% of their stocker cattle, while 8.3% indicated they obtain carcass data on 76-100% of their stocker cattle. Less than 5% of producers who responded to this question said that they received data on 26-50% (4.6% of respondents) and 51-75% (4.1% of respondents) of their cattle.

Figure 3.18 Breakdown of the Percentage of Stocker Cattle that Producers Receive Carcass Data On



Of the 2,061 producers responding to the question about sources of market information used (question 59), the majority (60.8%) indicated they rely upon the local sale barn. The next two most common sources identified were stocker publications or electronic newsletters (37.8% of respondents) and USDA reports (36.5% of respondents). The market information sources producers rely upon least are other sources (7.0% of respondents), state assocations (8.4% of respondents), and other stocker producers (15.6% of resondents). Figure 3.19 summarizes the results for all of the sources of information that were identified in question 59.

Figure 3.19 Sources of Market Information Producers Rely Upon



3.11 – Risk Management

This section of the chapter refers to a section in the survey that asked producers to answer questions on how they handle risk management. The questions included in the risk management section have to do with the adoption of new technologies and risk management practices. Table 3.9 contains a sample of the questions, variable definitions, and summary statistics from the risk management section of the survey.

Table 3.9 Risk Management Questions

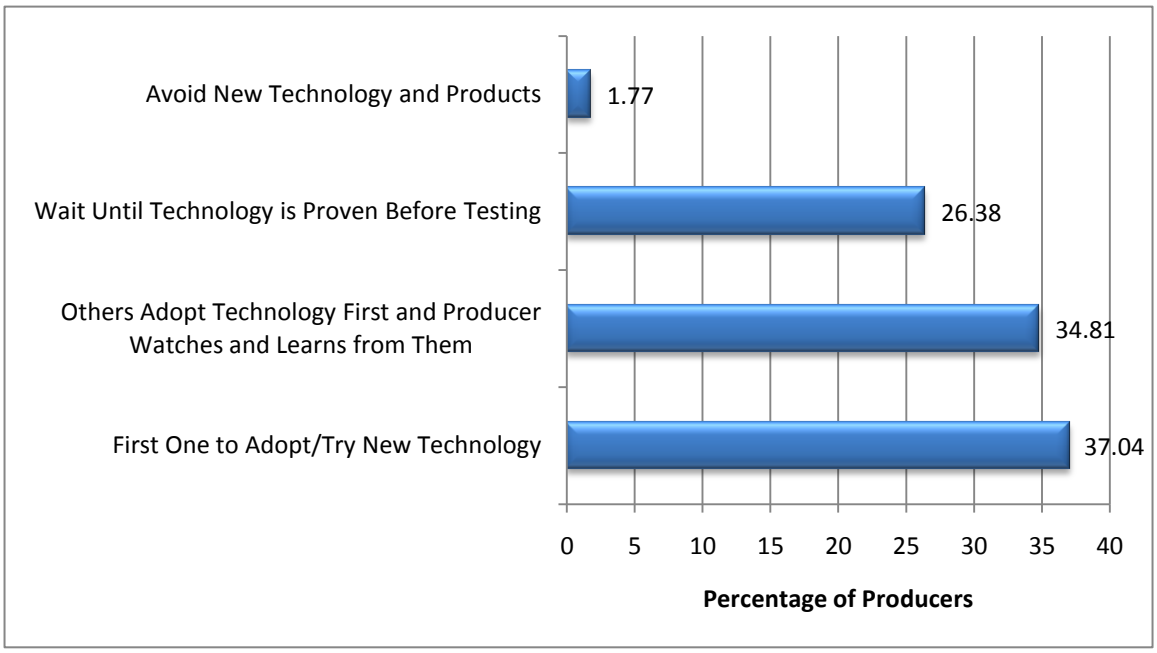
Survey Question	Variable	N	Most Common Response	Mean	Standard Deviation
Q60a	Producers buy high quality cattle to manage market risk (0=No; 1=Yes)	1609	0	0.49	0.50
Q60b	Producers focus on low cost production to manage market risk (0=No; 1=Yes)	1609	1	0.66	0.48
Q60c	Producers forward contract inputs/outputs to manage market risk (0=No; 1=Yes)	1609	0	0.13	0.33
Q60d	Producers use futures contracts to manage market risk (0=No; 1=Yes)	1609	0	0.18	0.39
Q60e	Producers use Livestock Risk Protection Insurance to manage market risk (0=No; 1=Yes)	1609	0	0.03	0.16
Q60f	Producers use Livestock Gross Margin Insurance to manage market risk (0=No; 1=Yes)	1609	0	0.00	0.07
Q60g	Producers buy cheap cattle to manage market risk (0=No; 1=Yes)	1609	0	0.16	0.37
Q60h	Producers use options to manage market risk (0=No; 1=Yes)	1609	0	0.13	0.34
Q60i	Producers retain ownership to manage market risk (0=No; 1=Yes)	1609	0	0.23	0.42
Q60j	Producers have a custom operation to manage market risk (0=No; 1=Yes)	1609	0	0.09	0.29
Q60k	Producers use other practices to manage market risk (0=No; 1=Yes)	1609	0	0.04	0.20
Q61	How producers test/adopt new technology (1=first one to adopt/try new tech.; 2=others adopt tech. first and you watch/learn from them; 3=wait till tech. is proven before testing; 4=avoid new tech.)	1698	1	1.93	0.84

Question 60 asked producers to identify all of the practices that they use to manage market risk. A majority of producers (65.5% of respondents) concentrated on keeping their production costs low to help manage risk. No producers (0% of respondents) indicated that they use Livestock Gross Margin (LGM) Insurance to manage risk. Other management practices that producers used were buying high quality cattle (49.2% of respondents); retaining ownership (22.8% of respondents); futures contracting (18.2% of respondents); buying cheap cattle (16.2%

of respondents); using options (13.3% of respondents); forward contracting inputs or outputs (12.6% of respondents); custom operating (9.1% of respondents); using other risk management practices (4.2% of respondents); and using Livestock Risk Protection (LRP) price insurance (2.7% of respondents). The results to this question are interesting as most research recommends that producers participate in price-risk strategies not production or cost oriented risk strategies as shown above by producers choosing cost control and buying high quality cattle as the two most applied risk management strategies. A study by Mark et al. (2000) found that feeder cattle prices comprise a larger portion of producer profitability than factors such as animal productivity, corn prices, and so on. This implies that producers should focus on price-risk management strategies more than production or cost oriented risk strategies, which is opposite of the results in question 60 above.

With regard to the question about technology adoption (question 61), the most common response was that producers indicated they were the first person in their area to try new products and technologies (37.0% of respondents) (Figure 3.20). However, almost as many producers (34.8% of respondents) indicated that they watch and learn from other producers who adopt technology first. Slightly over a fourth of producers (26.4%) indicated they wait until a technology is proven before they were willing to test it. Less than 2% of producers indicated they avoid new technology and products altogether.

Figure 3.20 How Producers Test and/or Adopt New Products and Technologies for their Operations



3.12 – Communication and Education

This section of the chapter refers to the communication and education section of the survey. The questions included in this section have to do with how much producers trust certain sources of information or how important certain topics are. Table 3.10 contains a sample of the questions, variable definitions, and summary statistics from the communication and education section of the survey.

Table 3.10 Communication and Education Questions

Survey Question	Variable	N	Most Common Response	Mean	Standard Deviation
62a	How much do you trust animal health manufacturer sales representatives (1=Low to 7=High)	1858	4	3.66	1.51
62b	How much do you trust animal health manufacturer technical service representatives (1=Low to 7=High)	1799	4	3.86	1.53
62c	How much do you trust animal health distributor representatives (1=Low to 7=High)	1787	4	3.81	1.53
62d	How much do you trust beef industry trade journals (1=Low to 7=High)	1838	4	4.34	1.43
62e	How much do you trust extension agents (1=Low to 7=High)	1820	4	4.27	1.78
62f	How much do you trust feed company sales representatives (1=Low to 7=High)	1814	4	3.60	1.51
62g	How much do you trust feed company technical service representatives (1=Low to 7=High)	1739	4	3.81	1.53
62h	How much do you trust your local veterinarian (1=Low to 7=High)	1964	7	5.78	1.44
62i	How much do you trust non-local (consulting) veterinarian (1=Low to 7=High)	1608	6	4.43	1.83
62j	How much do you trust other stocker producers (1=Low to 7=High)	1760	6	4.77	1.49
62k	How much do you trust order buyers (1=Low to 7=High)	1711	4	3.57	1.64
62l	How much do you trust state livestock association (1=Low to 7=High)	1701	4	3.86	1.67
62m	How much do you trust stocker specific trade journal (1=Low to 7=High)	1685	4	4.08	1.56
62n	How much do you trust University professors or area/state extension specialists (1=Low to 7=High)	1794	6	4.43	1.81
65a	How important are feeder cattle prices to you (1=Low to 7=High)	1830	7	6.43	1.03
65b	How important are animal health management to you (1=Low to 7=High)	1751	7	6.30	1.02
65c	How important is basis to you (1=Low to 7=High)	1648	7	4.60	1.98
65d	How important is borrowing money to you (1=Low to 7=High)	1666	7	4.73	2.14

Table 3.10 Continued

Survey Question	Variable	N	Most Common Response	Mean	Standard Deviation
65e	How important is cattle procurement to you (1=Low to 7=High)	1598	7	4.86	1.95
65f	How important are environmental regulations to you (1=Low to 7=High)	1671	7	4.89	1.77
65g	How important are establishing contractual relationsips with buyers to you (1=Low to 7=High)	1653	7	4.86	2.01
65h	How important are establishing contractual relationships with suppliers to you (1=Low to 7=High)	1608	7	4.54	2.01
65i	How important is finding labor to you (1=Low to 7=High)	1660	7	4.40	2.12
65j	How important are the impact of stocker practices on beef quality to you (1=Low to 7=High)	1624	7	5.51	1.50
65k	How important is keeping labor to you (1=Low to 7=High)	1641	7	4.52	2.21
65l	How important are marketing practices to you (1=Low to 7=High)	1658	7	5.80	1.41
65m	How important is nutrition to you (1=Low to 7=High)	1703	7	6.21	1.08
65n	How important are trends in land values to you (1=Low to 7=High)	1699	7	5.32	1.83
66a	Is the ability to borrow money limiting your ability to compete in the stocker business w/in the next 5 yrs (1=Low to 7=High)	1729	1	3.39	2.05
66b	Is the availability of cattle that fit your operation limiting your ability to compete in the stocker business w/in the next 5 yrs (1=Low to 7=High)	1724	1	3.68	1.98
66c	Are environmental regulations limiting your ability to compete in the stocker business w/in the next 5 yrs (1=Low to 7=High)	1737	4	4.34	1.91
66d	Are health management costs limiting your ability to compete in the stocker business w/in the next 5 yrs (1=Low to 7=High)	1735	4	4.66	1.71
66e	Is labor availability limiting your ability to compete in the stocker business w/in the next 5 yrs (1=Low to 7=High)	1731	1	3.93	3.05
66f	Is labor cost limiting your ability to compete in the stocker business w/in the next 5 yrs (1=Low to 7=High)	1721	4	4.14	2.06

Table 3.10 Continued

Survey Question	Variable	N	Most Common Response	Mean	Standard Deviation
66g	Is land available for lease limiting your ability to compete in the stocker business w/in the next 5 yrs (1=Low to 7=High)	1735	7	4.67	2.18
66h	Is land purchase price limiting your ability to compete in the stocker business w/in the next 5 yrs (1=Low to 7=High)	1737	7	5.05	2.22
66i	Is land lease price limiting your ability to compete in the stocker business w/in the next 5 yrs (1=Low to 7=High)	1720	7	4.92	2.10
66j	Is marketing cost limiting your ability to compete in the stocker business w/in the next 5 yrs (1=Low to 7=High)	1705	4	4.49	1.75
66k	Is procurement cost limiting your ability to compete in the stocker business w/in the next 5 yrs (1=Low to 7=High)	1621	4	3.93	1.86
66l	Is urban encroachment limiting your ability to compete in the stocker business w/in the next 5 yrs (1=Low to 7=High)	1680	1	3.79	2.28
66m	Is managing price risk limiting your ability to compete in the stocker business w/in the next 5 yrs (1=Low to 7=High)	1668	4	4.52	1.80
66n	Is weather limiting your ability to compete in the stocker business w/in the next 5 yrs (1=Low to 7=High)	1768	7	5.29	1.69
66o	Are input (feed) costs limiting your ability to compete in the stocker business w/in the next 5 yrs (1=Low to 7=High)	1763	7	5.71	1.43
66p	Are other input (fertilizer) costs limiting your ability to compete in the stocker business w/in the next 5 yrs (1=Low to 7=High)	1725	7	5.57	1.75
66q	Are risk management tools for managing price risk limiting your ability to compete in the stocker business w/in the next 5 yrs (1=Low to 7=High)	1656	4	4.29	1.77
66r	Is age/physical limitations limiting your ability to compete in the stocker business w/in the next 5 yrs (1=Low to 7=High)	1797	7	4.72	2.05

Table 3.10 Continued

Survey Question	Variable	N	Most Common Response	Mean	Standard Deviation
66s	Are cattle health problems limiting your ability to compete in the stocker business w/in the next 5 yrs (1=Low to 7=High)	1725	4	4.47	1.83
66t	Is potential return on investment limiting your ability to compete in the stocker business w/in the next 5 yrs (1=Low to 7=High)	1738	7	5.53	1.57
66u	Are other issues limiting your ability to compete in the stocker business w/in the next 5 yrs (1=Low to 7=High)	184	7	5.22	1.96

Table 3.11 reports how many producers responded to each of the seven levels of trust when looking at question 62—i.e., how much producers trust the listed sources of stocker management information. The most common response to how much producers trust animal health manufacturer sales representatives, animal health manufacturer technical service representatives, animal health distributor representatives, beef industry trade journal, extension agents, feed company sales representatives, feed company technical service representatives, order buyers, state livestock associations, and stocker specific trade journals is a 4 (the mid-point range on a scale of 1 (low trust) to 7 (high trust)). This means that producers had a medium-level of trust for the aforementioned sources. Producers trusted their local veterinarian the most, as the most common response was a 7. However, they also have a high level of trust (level 6) for non-local veterinarians, other stocker producers, and University professors or state/area extension specialists.

Table 3.11 Rating of How Producers Trust Various Sources of Stocker Management Information

	Trust						
	Low						High
Variable	1	2	3	4	5	6	7
	Percentage of Responses						
Animal Health Manufacturer Sales Rep.	11	11	18	36	13	7	4
Animal Health Manufacturer Technical Service Rep.	9	9	17	34	16	10	5
Animal Health Distributor Rep.	10	9	17	34	15	10	4
Beef Industry Trade Journal	5	5	12	31	26	15	5
Extension Agents	12	7	10	22	20	21	8
Feed Company Sales Representatives	12	11	21	31	15	7	3
Feed Company Technical Services Rep.	10	9	18	31	17	10	4
My Local Veterinarian	3	2	2	11	12	31	39
Non-Local Veterinarian	11	6	9	22	16	23	12
Other Stocker Producers	5	3	8	24	25	25	10
Order Buyer	15	12	18	28	14	9	4
State Livestock Association	14	9	13	29	19	13	4
Stocker Specific Trade Journal	10	6	14	29	23	14	4
University Professors/Area or State Ext. Specialists	11	5	10	21	18	24	11

Producers were asked to identify how important information related to several listed topics was to them. Table 3.12 lists the percentage of producers who responded to each topic and how important they thought it was. The most common response to each topic listed below was a 7 meaning that information on all topics identified is very important to producers.

Table 3.12 The Importance of Specific Topics to Producers

	Importance						
	Low						High
Variable	1	2	3	4	5	6	7
	Percentage of Responses						
Feeder Cattle Prices	1	0	0	4	8	21	66
Animal Health Management	1	0	0	6	10	25	57
Basis	12	6	7	19	17	15	23
Borrowing Money	14	6	6	14	13	16	30
Cattle Procurement	11	5	6	17	17	18	27
Environmental Regulations	7	4	7	22	19	18	24
Est. Contractual Relationships with Buyers	12	5	6	13	16	20	27
Est. Contractual Relationships with Suppliers	14	6	7	17	17	18	21
Finding Labor	16	9	8	14	15	16	23
Impact of Stocker Practices on Been Quality	3	2	3	14	18	27	32
Keeping Labor	17	8	7	12	12	17	27
Marketing Practices	3	1	2	9	16	28	40
Nutrition	1	0	1	6	12	28	52
Trends in Land Values	7	3	5	14	15	19	38

Question 66 asked producers to identify and rank those factors that they believe would have the most influence on their ability to compete in the stocker business in the next five years. There were several factors that producers considered low risk when looking into their ability to compete for the next five years in the backgrounding business (level 1): borrowing money (28% of respondents), finding cattle that fit their operations (21% of respondents), availability of labor (19% of respondents), and urban encroachment (26% of respondents). Moreover, producers considered the following variables to be of medium risk (level 4): environmental regulations (21% of respondents), health management costs (23% of respondents), labor cost (18% of respondents), marketing cost (25% of respondents), procurement cost (25% of respondents), management of price risk (24% of respondents), risk management tools for price risk management (27% of respondents), and cattle health issues (21% of respondents). Finally, land available for lease (28% of respondents), land purchase price (42% of respondents), land lease

price (31% of respondents), weather (32% of producers), input costs (37% of respondents), other input costs (41% of respondents), age or physical limitations (27% of respondents), potential return on investment (36% of respondents), and other issues (41% of respondents) were the factors that producers considered high risk in being able to compete in the next five years (level 7). Table 3.13 reports the percentage of producers responding to each risk level for each of the factors identified.

Table 3.13 The Level of Risk Certain Factors Have on the Ability to Compete in the Stocker Business for the Next Five Years

	Risk						
	Low						High
Variable	1	2	3	4	5	6	7
	Percentage of Responses						
Ability to Borrow Money	28	14	11	18	11	8	11
Availability of Cattle that Fit the Producer's Operation	21	13	13	18	15	10	11
Environmental Regulations	11	9	11	21	16	15	17
Health Management Costs	7	5	9	23	21	17	17
Labor Availability	19	11	12	19	13	12	15
Labor Cost	17	9	10	18	14	15	17
Land Available for Lease	16	7	6	12	12	19	28
Land Purchase Price	14	6	5	8	9	16	42
Land Lease Price	13	6	5	11	13	21	31
Marketing Cost	8	7	10	25	19	15	16
Procurement Cost	15	11	12	25	16	10	12
Urban Encroachment	26	12	9	11	10	12	19
Managing Price Risk	9	6	9	24	18	17	16
Weather	5	4	5	16	18	21	32
Input Costs	2	2	3	10	17	29	37
Other Input Costs	6	3	3	10	12	23	42
Risk Management Tools for Managing Price Risk	11	7	10	27	19	14	13
My Age or Physical Limitations	12	7	7	16	15	16	27
Cattle Health Problems	8	9	12	21	17	16	17
Potential Return on Investment	3	3	5	15	14	26	36
Other	9	3	3	20	10	14	41

3.4 – Summary

This chapter was designed to discuss where the data for the 2008 National Stocker Survey came from and give a sample of the questions asked in the survey as well as report summary statistics for a subset of the questions asked. Portions of these data will be used to further develop models that allow the data to be analyzed to address the objectives of this study.

Chapter 4 - Producer and Operation Characteristics Related to Factors Producers Find Important: Model Specifications

4.1 – Introduction

This chapter will reveal how producer and operation characteristics such as producer age, type of operation, and gross income derived from backgrounding impact how producers rank the importance of information related to feeder cattle prices, animal health management, marketing practices, and nutrition. The next section describes the ordered logit model. Section 4.3 describes the methods used to discover the four areas of question 65 listed in chapter 3 that are statistically different than the other parts of the question. Sections 4.4 through 4.7 describe the models in detail and discuss the findings from each model. Finally, section 4.8 reports the results of a sensitivity analysis that was done for each model tested.

4.2 – Ordered Logit Model

An ordered choice model is used for questions that have an ordinal ranking (Hill et al., 2011). In addition, an ordered logit model has a logistically distributed error term (Greene, 1997). The empirical modeling of an ordered logit model can be seen below.

(1) $y_i^* = \beta_i' \alpha + \epsilon_i$

The y* is an unobserved variable and the subscript *i* represents the individual respondents. What can be seen is:

(2) $y_i = 0 \; if \; y_i^* \leq \mu,$

(3) $y_i = 1 \; if \; \mu \leq \; y_i^* \leq \delta,$

(4) $y_i = 2 \; if \; \delta \leq \; y_i^* \leq \rho,$

$\vdots \qquad\qquad \vdots$

(5) $y_i = J \; if \; \varphi_{-1} \leq \; y_i^* \; .$

All of the $\mu, \delta,$ and ρ are unknown parameters that are estimated with the β variable. The respondents feelings or perceptions are measured using the α variable and error term,∈. The *J* represents the categories of responses and *i* stands for the individual producers. As previously mentioned, the error term is logistically distributed which means the probabilities can be found by:

$$(6) \quad Prob(y_i = 0) = Prob(\beta_i'\alpha + \epsilon_i \leq \mu),$$

$$(7) \quad Prob(y_i = 1) = Prob(\beta_i'\alpha + \epsilon_i \leq \delta) - Prob(\beta_i'\alpha + \epsilon_i \leq \mu),$$

$$(8) \quad Prob(y_i = 2) = Prob(\beta_i'\alpha + \epsilon_i) \leq \rho) - (Prob(\beta_i'\alpha + \epsilon_i) \leq \delta),$$

$$\vdots$$

$$(9) \quad Prob(y_i = J) = Prob(\varphi_{-1} \leq \beta_i'\alpha + \epsilon_i).$$

The marginal probabilities can be calculated with $\varphi_0 = -\infty$ and $\varphi_J = \infty$:

$$(10) \quad \frac{\partial Prob(y_i = J)}{\partial \beta_i^J} = -\alpha_j \left[\frac{e^{\beta_J'\alpha - \varphi_J}}{(1+e^{\beta_J'\alpha - \varphi_J})^2} - \frac{e^{\beta_J'\alpha - \varphi_{J-1}}}{(1+e^{\beta_J'\alpha - \varphi_{J-1}})^2} \right].$$

The following sections will elaborate as to which equation is being used as well as provide summary statistics, model design, and results.

4.3 – Statistical Significance of Importance Factors

Question 65 has 14 different topics that producers were asked to assign values of importance to. The importance scale ranges from 1 to 7, with 1 being low and 7 being high. A Wilcoxon test was used to see if there was statistical significance (95% Confidence Interval) between each of the factors given the measurement scale. The Wilcoxon signed-rank test is used when there are two categorical variables and a measurement variable or if there is a non-normal distribution (McDonald, 2009). This test was used to conduct pair-wise tests on all of the

combinations of the 14 question responses. There were four topics from question 65 that were all statistically different from the others (Appendix B shows the p-values from the Wilcoxon test). They were feeder cattle prices, animal health management, marketing practices, and nutrition. Therefore, these four topics were the questions that were included for further analysis and are examined in the following sections.

4.4 – Producer Characteristics Relating to the Importance of Feeder Cattle Prices: Model Specifications

The purpose of this section is to quantify the relationship between producer characteristics and how important a producer finds feeder cattle prices. In the following discussion, any variable that is statistically significant at the 95% confidence level is referred to as being significant (i.e., those having a p-value less than or equal to 0.05). The following subsections further develop and explain the aforementioned model.

4.4.1 – Feeder Cattle Prices Empirical Model

The ordinal ranked scale for this question was from 1 to 7, with 1 being of low importance and 7 being of high importance. A majority of producers (66.0% of respondents) ranked feeder cattle prices as a 7 meaning that this topic is very important to them. The empirical form of the ordered logit model (explained in equations 1-10) is as follows:

(11) $$Q65a = \beta_0 + \beta_1 Sbwithcc + \beta_2 Sbwithft + \beta_3 Sbwithcf + \beta_4 Offfrmjb + \beta_5 Sbyrrnd + \beta_6 Manager + \beta_7 Ownmnger + \beta_8 Other + \beta_9 Age + \beta_{10} Famorcor + \beta_{11} Sbgrsinc + \beta_{12} Retainow + \beta_{13} Sbtime + \beta_{14} Belmrktp + \beta_{15} Atmrktp + \beta_{16} Himrktp + \beta_{17} Valueadd + \beta_{18} Mrktinfo + e$$.

In the above equation (11), $Q65a$ is the dependent variable and the independent variables are described as:

- *Sbwithcc*=Binary variable equal to 1 if the operation is a stocker/backgrounder operation combined with a cow/calf operation, 0 otherwise,
- *Sbwithft*=Binary variable equal to 1 if the operation is a stocker/backgrounder operation combined with a feedlot, 0 otherwise,
- *Sbwithcf*=Binary variable equal to 1 if the operation is a stocker/backgrounder operation with cow/calf and feedlot, 0 otherwise,
- *Offfrmjb*=Binary variable equal to 1 if producer has an off-farm job, 0 otherwise,
- *Sbyrrnd*=Binary variable equal to 1 if producer runs stockers/backgrounders year round, 0 otherwise,
- *Manager*=Binary variable equal to 1 if the producer is the manager, 0 otherwise,
- *Ownmnger*=Binary variable equal to 1 if the producer is the owner and manager, 0 otherwise,
- *Other*=Binary variable equal to 1 if the producer is something other than an owner or manager, 0 otherwise,
- *Age*=Age of the producer,
- *Famorcor*=Binary variable equal to 1 if the operation is a corporate operation, 0 if the operation is a family operation,
- *Sbgrsinc*=Percentage of gross income derived from the stocker/backgrounder operation,
- *Retainow*=Percentage of stocker/backgrounder cattle that producer retains ownership of through harvest,
- *Sbtime*=Average length of time producer owns/manages a typical group of stockers/backgrounders,

- *Belmrktp*=Binary variable equal to 1 if the producer typically buys calves below average market price, 0 otherwise,
- *Atmrktp*=Binary variable equal to 1 if the producer typically buys calves at average market price, 0 otherwise,
- *Himrktp*=Binary variable equal to 1 if the producer typically buys calves above average market price, 0 otherwise,
- *Valueadd*=Percentage of cattle producer typically markets through value-added programs,
- *Mrktinfo*=Number of sources of market information producer relies most upon.

Given the feeder cattle prices model, the default operations are producers that own pure stocker/backgrounder cattle operations, producers that do not have an off-farm job, producers that are the operation owners, producers that have a family operation, and producers that did not indicate or did not know their typical procurement/purchasing behavior. The above variables were used to estimate the model in Section 4.4.2.

4.4.2 – Feeder Cattle Prices Estimated Equation and Results

In order to relate the independent (explanatory) variables to the importance of feeder cattle prices, an ordered logit was used. The model results are reported in Table 4.1. The marginal probabilities estimated measure how probabilities are expected to change given a one-unit change in the explanatory variables evaluated at their means. The marginal probabilities should sum to zero as the change in one probability will cause opposite, incremental effects on some of the others. Therefore, if a probability were to increase, there would be an incremental decrease in the others such that the probabilities for all choices sum to zero. Since binary variables are either one or zero, they do not have marginal probabilities. However, the change in

probabilities for the binary variables when they are equal to one and zero are shown. By holding the continuous variables at their means and binary variables at zero, the percentage change can be estimated.

Table 4.1 Ordered Logit Estimates for the Importance of Feeder Cattle Prices Model (1=Not Important to 7=Very Important)

Variable	Parameter Estimate	P-Value	1	2	3	4	5	6	7
Intercept	4.492	<.0001	Probabilities						
Sbwithcc=1	-0.316	0.042	0.008	0.001	0.002	0.029	0.060	0.189	0.710
Sbwithcc = 0	Default		0.006	0.001	0.002	0.022	0.046	0.154	0.770
Sbwithft = 1	-0.530	0.074	0.010	0.001	0.003	0.036	0.072	0.214	0.664
Sbwithft = 0	Default		0.006	0.001	0.002	0.022	0.046	0.154	0.770
Sbwithcf = 1	-0.407	0.036	0.009	0.001	0.002	0.032	0.065	0.200	0.691
Sbwithcf = 0	Default		0.006	0.001	0.002	0.022	0.046	0.154	0.770
Offfrmjb = 1	-0.132	0.297	0.007	0.001	0.002	0.024	0.052	0.168	0.746
offfrmjb = 0	Default		0.006	0.001	0.002	0.022	0.046	0.154	0.770
Sbyrrnd = 1	-0.040	0.746	0.006	0.001	0.002	0.022	0.048	0.158	0.763
Sbyrrnd = 0	Default		0.006	0.001	0.002	0.022	0.046	0.154	0.770
Manager = 1	-0.767	0.004	0.013	0.002	0.003	0.044	0.088	0.241	0.609
Manager = 0	Default		0.006	0.001	0.002	0.022	0.046	0.154	0.770
Ownmnger = 1	-0.173	0.136	0.007	0.001	0.002	0.025	0.053	0.173	0.738
Ownmnger = 0	Default		0.006	0.001	0.002	0.022	0.046	0.154	0.770
Other = 1	-0.940	0.168	0.015	0.002	0.004	0.052	0.100	0.259	0.567
Other = 0	Default		0.006	0.001	0.002	0.022	0.046	0.154	0.770
Famorcor = 1	0.040	0.866	0.006	0.001	0.001	0.021	0.044	0.150	0.777
Famorcor = 0	Default		0.006	0.001	0.002	0.022	0.046	0.154	0.770
Belmrktp = 1	-0.089	0.611	0.007	0.001	0.002	0.024	0.050	0.163	0.754
Belmrktp = 0	Default		0.006	0.001	0.002	0.022	0.046	0.154	0.770
Atmrktp = 1	-0.084	0.550	0.007	0.001	0.002	0.023	0.049	0.163	0.755
Atmrktp = 0	Default		0.006	0.001	0.002	0.022	0.046	0.154	0.770
Himrktp = 1	-0.042	0.854	0.006	0.001	0.002	0.022	0.048	0.158	0.763
Himrktp = 0	Default		0.006	0.001	0.002	0.022	0.046	0.154	0.770

Table 4.1 Continued

Variable	Parameter Estimate	P-Value	1	2	3	4	5	6	7
			Marginal Probabilities (at default = 0)						
Age	-0.003	0.517	0.000	0.000	0.000	0.000	0.000	0.000	-0.001
Sbgrsinc	0.010	0.000	0.000	0.000	0.000	0.000	0.000	-0.001	0.002
Retainow	0.001	0.550	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sbtime	0.001	0.232	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Valueadd	-0.002	0.382	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mrktinfo	0.069	0.052	0.000	0.000	0.000	-0.001	-0.003	-0.007	0.012
Summary Statistics									
McFadden Pseudo R-Squared				0.017					
Number of Observations				1458					
Percentage of Producers Correctly Predicted				66.0%					
P-Value Associated with Chi-Square				<0.001					

This model was estimated with 1,458 observations. Roughly 1.1% of the respondents chose response one, 0.3% chose response two, 0.3% chose response three, 3.8% chose response four, 7.7% chose response five, 20.8% chose response six, and 66.0% chose response seven. Even though the R-square is low, the model is still statistically significant and correctly predicted 66.0% of the producers that responded to this question. This is concerning as the same amount of producers that were correctly predicted was equivalent to the percentage of producers that responded with a seven meaning that the only producers accurately predicted were the ones responding with a seven.

The majority of producers that background/stock cattle as well as have cow/calf pairs find feeder cattle prices very important (71.0% for response 7). On average, pure backgrounders/stockers (default) also found feeder cattle prices very important (77.0% for response 7). Thus, pure backgrounders/stockers are more likely to view feeder cattle prices as being very important compared to backgrounders/stockers that also have cow/calf operations.

This could be due to the fact that cow/calf owners retaining their cattle are potentially spreading price risk versus producers that only own background/stock cattle.

Producers that background/stock cattle and have cow/calf pairs with feedlots find feeder cattle prices to be very important (69.1% for response 7). Thus, as with the previous result discussed, pure backgrounders/stockers without a cow/calf operation and a feedlot are more likely to view feeder cattle prices as being very important compared to backgrounders/stockers with cow/calf operations and feedlots. Therefore, if a person were to ask producers that owned backgrounder/stocker cattle or producers that owned backgrounder/stocker cattle with a cow/calf operation and feedlot, the producers that owned only backgrounder/stocker cattle would be more likely to say that feeder cattle prices are very important than other types of operations. This could be due to the fact that a backgrounder/stocker and cow/calf operation with a feedlot is decreasing their price risk due to the retention of their cattle and thus are slightly less concerned about cattle prices.

On average, managers of backgrounding/stocking operations find feeder cattle prices to be very important (60.9% for response 7). Additionally, owners of backgrounding/stocking operations (default) on average find feeder cattle prices to be very important (77.0% for response 7) as well. Thus, as would be expected, owners of backgrounding/stocking operations are more likely to view feeder cattle prices as very important compared to managers.

The marginal probabilities associated with the continuous variables are all very small in magnitude and thus these variables have little impact on how a producer might rank the importance of feeder cattle price information. While small in magnitude, the continuous variable of gross income from backgrounding/stocking cattle (Sbgrsinc) was statistically significant.

Since the values go from negative to positive, it would appear that the larger the producers' income the more important the producer views feeder cattle prices.

The number of market sources of information a producer relies upon variable (Mrktinfo) was statistically significant at the 90% confidence level. Therefore, the more sources of market information a producer relies upon the more likely they are to view feeder cattle prices as important. For every added source of market information (at or around the mean) they will increase the probability of choosing a seven by 1.2%. This example can be used to interpret the marginal probabilities associated with the rest of the continuous variables reported in Table 4.1.

4.5 – Producer Characteristics Relating to the Importance of Animal Health Management: Model Specifications

The purpose of this section is to quantify the relationship between how important animal health management is to a producer and certain producer and operation characteristics. A 95% confidence level was used to report if independent variables were statistically significant unless otherwise stated. The following subsections further develop and explain this model.

4.5.1 – Animal Health Management Empirical Model

Approximately 82.4% of producers that responded to this question said that animal health management is important to them (responses 6 and 7). This question also has an ordinal ranked scale from 1 to 7, with 1 being of low importance and 7 being of high importance. The ordered logit model (explained in equations 1-10) regression is as follows:

(12) $Q65b = \beta_0 + \beta_1 Sbwithcc + \beta_2 Sbwithft + \beta_3 Sbwithcf + \beta_4 Sbyrrnd + \beta_5 Famorcor + \beta_6 Belmrktp + \beta_7 Atmrktp + \beta_8 Himrktp + \beta_9 Vetemerg + \beta_{10} Vetyear + \beta_{11} Vetfew + \beta_{12} Vetmnth + \beta_{13} Vetgrp + \beta_{14} Pllrt5 + \beta_{15} Pllrt11 + \beta_{16} Pllrt21 + \beta_{17} Pllrt31 + \beta_{18} Pllrt50 + \beta_{19} Dthlss1 + \beta_{20} Dthlss4 + \beta_{21} Dthlss5 + \beta_{22} Age + \beta_{23} Sbgrsinc + \beta_{24} Retainow + \beta_{25} Sbtime + \beta_{26} Valueadd + e$.

In the above equation (12), $Q65b$ is the dependent variable and the remaining variables are the explanatory variables. As some of the variables in (12) have been defined in the previous section, only the undefined variables are explained below:

- *Vetemerg*=Binary variable equal to 1 if a producer only consults a veterinarian in emergencies, 0 otherwise,
- *Vetyear*=Binary variable equal to 1 if a producer only consults a veterinarian once a year, 0 otherwise,
- *Vetfew*=Binary variable equal to 1 if a producer consults a veterinarian a couple of times per year, 0 otherwise,
- *Vetmnth*=Binary variable equal to 1 if a producer consults a veterinarian once a month, 0 otherwise,
- *Vetgrp*=Binary variable equal to 1 if a producer consults a veterinarian for every group of cattle, 0 otherwise,
- *Pllrt5*= Binary variable equal to 1 if the typical pull rate within the first month due to BRD is between 5-10%, 0 otherwise,
- *Pllrt11*= Binary variable equal to 1 if the typical pull rate within the first month due to BRD is between 11-20%, 0 otherwise,

- *Pllrt21*= Binary variable equal to 1 if the typical pull rate within the first month due to BRD is between 21-30%, 0 otherwise,
- *Pllrt31*= Binary variable equal to 1 if the typical pull rate within the first month due to BRD is between 31-50%, 0 otherwise,
- *Pllrt50*= Binary variable equal to 1 if the typical pull rate within the first month due to BRD is more than 50%, 0 otherwise,
- *Dthlss1*=Binary variable equal to 1 if death loss within 90 days of arrival is between 1-3%, 0 otherwise,
- *Dthlss4*=Binary variable equal to 1 if death loss within 90 days of arrival is between 4-5%, 0 otherwise,
- *Dthlss1*=Binary variable equal to 1 if the death loss within 90 days of arrival is greater than 5%, 0 otherwise.

Given the animal health management model, the default operations for the above variables are producers that never consult a veterinarian, producers whose pull rate is less than 5% due to BRD within the first month of arrival, and producers whose death loss is less than 5% within the first 90 days of arrival. The variables listed above, along with others previously defined, were used to estimate the animal health management model in Section 4.5.2.

4.5.2 – Animal Health Management Estimated Equation and Results

An ordered logit model was used to relate the independent (explanatory) variables to the importance of animal health management (Table 4.2). Similar to the feeder cattle prices model, both marginal and binary probabilities are used to examine this model.

Table 4.2 Ordered Logit Estimates of the Importance of Animal Health Management Model (1=Not Important to 7=Very Important)

Variable	Parameter Estimate	P-Value	1	2	3	4	5	6	7
Intercept	4.673	<.0001	Probabilities						
Sbwithcc=1	-0.261	0.079	0.007	0.003	0.007	0.071	0.127	0.292	0.494
Sbwithcc = 0	Default		0.005	0.002	0.005	0.056	0.105	0.268	0.559
Sbwithft = 1	-0.190	0.503	0.006	0.002	0.006	0.066	0.121	0.286	0.512
Sbwithft = 0	Default		0.005	0.002	0.005	0.056	0.105	0.268	0.559
Sbwithcf = 1	-0.178	0.413	0.006	0.002	0.006	0.066	0.120	0.285	0.515
Sbwithcf = 0	Default		0.005	0.002	0.005	0.056	0.105	0.268	0.559
Sbyrrnd = 1	0.271	0.022	0.004	0.002	0.004	0.043	0.085	0.238	0.624
Sbyrrnd = 0	Default		0.005	0.002	0.005	0.056	0.105	0.268	0.559
Famorcor = 1	-0.298	0.149	0.007	0.003	0.007	0.073	0.130	0.295	0.485
Famorcor = 0	Default		0.005	0.002	0.005	0.056	0.105	0.268	0.559
Belmrktp = 1	-0.123	0.473	0.006	0.002	0.006	0.062	0.115	0.280	0.529
Belmrktp = 0	Default		0.005	0.002	0.005	0.056	0.105	0.268	0.559
Atmrktp = 1	0.051	0.710	0.005	0.002	0.005	0.053	0.101	0.262	0.572
Atmrktp = 0	Default		0.005	0.002	0.005	0.056	0.105	0.268	0.559
Himrktp = 1	-0.237	0.284	0.007	0.003	0.007	0.069	0.125	0.290	0.500
Himrktp = 0	Default		0.005	0.002	0.005	0.056	0.105	0.268	0.559
Vetemerg=1	-0.013	0.950	0.005	0.002	0.005	0.056	0.106	0.269	0.556
Vetemerg=0	Default		0.005	0.002	0.005	0.056	0.105	0.268	0.559
Vetyear=1	-0.107	0.798	0.006	0.002	0.006	0.062	0.114	0.278	0.532
Vetyear=0	Default		0.005	0.002	0.005	0.056	0.105	0.268	0.559
Vetfew=1	0.068	0.743	0.005	0.002	0.005	0.052	0.100	0.260	0.576
Vetfew=0	Default		0.005	0.002	0.005	0.056	0.105	0.268	0.559
Vetmnth=1	0.048	0.831	0.005	0.002	0.005	0.053	0.101	0.262	0.571
Vetmnth=0	Default		0.005	0.002	0.005	0.056	0.105	0.268	0.559
Vetgrp=1	0.873	0.001	0.002	0.001	0.002	0.024	0.051	0.167	0.752
Vetgrp=0	Default		0.005	0.002	0.005	0.056	0.105	0.268	0.559

Table 4.2 Continued

Variable	Parameter Estimate	P-Value	1	2	3	4	5	6	7
Pllrt5=1	0.030	0.843	0.005	0.002	0.005	0.054	0.103	0.264	0.566
Pllrt5=0	Default		0.005	0.002	0.005	0.056	0.105	0.268	0.559
Pllrt11=1	0.097	0.635	0.005	0.002	0.005	0.051	0.097	0.257	0.583
Pllrt11=0	Default		0.005	0.002	0.005	0.056	0.105	0.268	0.559
Pllrt21=1	0.739	0.022	0.003	0.001	0.003	0.028	0.057	0.183	0.726
Pllrt21=0	Default		0.005	0.002	0.005	0.056	0.105	0.268	0.559
Pllrt31=1	0.900	0.047	0.002	0.001	0.002	0.024	0.050	0.164	0.757
Pllrt31=0	Default		0.005	0.002	0.005	0.056	0.105	0.268	0.559
Pllrt50=1	0.950	0.416	0.002	0.001	0.002	0.023	0.047	0.159	0.766
Pllrt50=0	Default		0.005	0.002	0.005	0.056	0.105	0.268	0.559
Dthlss1=1	-0.187	0.141	0.006	0.002	0.006	0.066	0.120	0.286	0.512
Dthlss1=0	Default		0.005	0.002	0.005	0.056	0.105	0.268	0.559
Dthlss4=1	-0.199	0.485	0.007	0.002	0.007	0.067	0.121	0.287	0.509
Dthlss4=0	Default		0.005	0.002	0.005	0.056	0.105	0.268	0.559
Dthlss5=1	0.151	0.808	0.005	0.002	0.005	0.049	0.093	0.251	0.596
Dthlss5=0	Default		0.005	0.002	0.005	0.056	0.105	0.268	0.559
			Marginal Probabilities (at default = 0)						
Age	0.004	0.364	0.000	0.000	0.000	0.000	0.000	0.000	0.001
Sbgrsinc	0.007	0.001	0.000	0.000	0.000	0.000	-0.001	-0.001	0.002
Retainow	-0.002	0.177	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sbtime	0.000	0.499	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Valueadd	0.000	0.891	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Summary Statistics									
McFadden Pseudo R-Squared				0.024					
Number of Observations				1419					
Percentage of Producers Correctly Predicted				56.4%					
P-Value Associated with Chi-Square				<.001					

This model was estimated with a total of 1,419 observations. This model had 7.2% of the producers respond with a four or below, 10.4% of the producers respond with a five, 25.3% of the producers respond with a six, and 57.1% of the producers respond with a seven. Although this model accurately predicted 56.4% of the producers that responded to this question and was

statistically significant, it had a very low R-square. Similar to the feeder cattle prices model, this model also only predicted the producers that responded with a seven.

Almost all producers that run stocker/backgrounder cattle year round (Sbyrrnd) find animal health management very important (62.4% for response 7). The same can be said for producers that do not run backgrounder/stocker cattle year round (default) as most of them (55.9%) find animal health management very important. As expected, it would appear that producers that run backgrounder/stockers year round are more likely to find animal health management very important (response 7) than producers that do not run backgrounder/stockers year round.

Not surprisingly, almost all producers who consult a veterinarian for every group of cattle (75.2%) find animal health management very important (response 7). However, many (55.9%) producers who never consult a veterinarian (default) also find animal health management very important. On the other hand, producers who consult a veterinarian for every group of cattle are more likely to view animal health management as very important (response 7) than producers who never consult a veterinarian.

The vast majority of backgrounding/stocking producers whose typical pull rate for BRD is 21-30% within the first month after arrival (72.6%) find animal health management very important (response 7). Also, the majority (55.9%) of backgrounding/stocking producers whose pull rate is less than 5% due to BRD within the first month after arrival (default) find animal health management very important (response 7). Thus, while all groups rank animal health management very import, producers whose pull rates are 21-30% are more likely to view animal health management as important versus producers whose pull rates are less than 5%. However, a majority of producers (75.7%) that had a pull rate between 31-50% within the first month due to

BRD also found animal health management very important (response 7). All in all, producers with a pull rates of less than 5%, are less likely to view animal health management as very important (response 7) than producers whose pull rate is between 31-50%. This result was as expected because the higher the pull rate due to BRD within the first month the more health issues a producer has and the more they would be expected to care about animal health management. Producers' decisions are driven by profit and the higher the pull rate the more likely they are losing money and increasing their concern about animal health management.

As expected, the percentage of gross income a producer receives from stocking/backgrounding cattle variable (Sbgrsinc) was statistically significant and positive. While incremental, the variables change from negative to positive suggesting that the larger the portion of producer's income derived from stocking/backgrounding the more important the producer will view animal health management.

4.6 – Producer Characteristics Relating to the Importance of Marketing Practices: Model Specifications

The purpose of this section is to quantify the relationship between how important marketing practices are to producers and certain producer characteristics. A 95% confidence level was used to report variables that were statistically significant unless otherwise acknowledged. The following subsections further develop and explain the marketing practices model.

4.6.1 – Marketing Practices Empirical Model

Of the producers that responded to this question, 68.5% of the producers said that marketing practices are important to them (responses 6 and 7). Similar to the above models, this question also has an ordinal ranked scale from 1 to 7, with 1 being of low importance and 7

being of high importance. The ordered logit model (explained in equations 1-10) regression is as follows:

(13) $Q65l = \beta_0 + \beta_1 Sbwithcc + \beta_2 Sbwithft + \beta_3 Sbwithcf + \beta_4 Offfrmjb + \beta_5 Sbyrrnd + \beta_6 Manager + \beta_7 Ownmnger + \beta_8 Other + \beta_9 Age + \beta_{10} Famorcor + \beta_{11} Sbgrsinc + \beta_{12} Retainow + \beta_{13} Sbtime + \beta_{14} Belmrktp + \beta_{15} Atmrktp + \beta_{16} Himrktp + \beta_{17} Valueadd + \beta_{18} Mrktinfo + \beta_{19} Tech2 + \beta_{20} Tech3 + \beta_{21} Technone + e$.

In equation 13, $Q65l$ is the dependent variable and the remaining variables are the explanatory variables. As some of these variables have been defined in the previous section, only the undefined variables will be explained below:

- *Tech2*=Binary variable equal to 1 if a producer lets other producers test new technology first and then watch and learn from them, 0 otherwise,
- *Technone*= Binary variable equal to 1 if a producer avoids or is resistant to new technology (question 61 responses 3 and 4), 0 otherwise.

The default operation for the above variables is producers who are the first to adopt or test new technology. The variables listed above along with those defined in previous sections were used to develop the marketing practices model in Section 4.6.2.

4.6.2 – Marketing Practices Estimated Equation and Results

To estimate the relationship between the explanatory variables and the importance of marketing practices, an ordered logit model was used (Table 4.3). Similar to aforementioned models, both marginal and binary probabilities are used to examine the marketing practices model.

Table 4.3 Ordered Logit Estimates of the Importance of Marketing Practices Model (1=Not Important to 7=Very Important)

Variable	Parameter Estimate	P-Value	1	2	3	4	5	6	7
Intercept	3.421	<.0001	Probabilities						
Sbwithcc=1	-0.253	0.062	0.031	0.010	0.021	0.097	0.181	0.293	0.366
Sbwithcc = 0	Default		0.024	0.008	0.016	0.080	0.158	0.287	0.426
Sbwithft = 1	-0.193	0.494	0.029	0.010	0.019	0.093	0.176	0.293	0.380
Sbwithft = 0	Default		0.024	0.008	0.016	0.080	0.158	0.287	0.426
Sbwithcf = 1	-0.156	0.440	0.028	0.009	0.019	0.090	0.173	0.292	0.389
Sbwithcf = 0	Default		0.024	0.008	0.016	0.080	0.158	0.287	0.426
Offfrmjb = 1	0.009	0.937	0.000	0.008	0.016	0.079	0.157	0.287	0.429
Offfrmjb = 0	Default		0.024	0.008	0.016	0.080	0.158	0.287	0.426
Sbyrrnd = 1	0.300	0.007	0.018	0.006	0.012	0.062	0.131	0.270	0.501
Sbyrrnd = 0	Default		0.024	0.008	0.016	0.080	0.158	0.287	0.426
Manager = 1	-0.186	0.453	0.029	0.010	0.019	0.092	0.175	0.293	0.382
Manager = 0	Default		0.024	0.008	0.016	0.080	0.158	0.287	0.426
Ownmnger = 1	0.038	0.718	0.023	0.008	0.016	0.077	0.155	0.286	0.436
Ownmnger = 0	Default		0.024	0.008	0.016	0.080	0.158	0.287	0.426
Other = 1	0.850	0.256	0.011	0.004	0.007	0.038	0.087	0.219	0.635
Other = 0	Default		0.024	0.008	0.016	0.080	0.158	0.287	0.426
Famorcor = 1	-0.223	0.286	0.030	0.010	0.020	0.095	0.179	0.293	0.373
Famorcor = 0	Default		0.024	0.008	0.016	0.080	0.158	0.287	0.426
Belmrktp = 1	0.015	0.927	0.024	0.008	0.016	0.079	0.157	0.287	0.430
Belmrktp = 0	Default		0.024	0.008	0.016	0.080	0.158	0.287	0.426
Atmrktp = 1	0.069	0.596	0.023	0.008	0.015	0.075	0.152	0.284	0.443
Atmrktp = 0	Default		0.024	0.008	0.016	0.080	0.158	0.287	0.426

Table 4.3 Continued

Variable	Parameter Estimate	P-Value	1	2	3	4	5	6	7
Himrktp = 1	0.150	0.475	0.021	0.007	0.014	0.070	0.144	0.280	0.463
Himrktp = 0	Default		0.024	0.008	0.016	0.080	0.158	0.287	0.426
Tech2 = 1	-0.359	0.002	0.035	0.011	0.023	0.106	0.191	0.293	0.341
Tech2 = 0	Default		0.024	0.008	0.016	0.080	0.158	0.287	0.426
Technone = 1	-0.226	0.086	0.030	0.010	0.020	0.095	0.179	0.293	0.372
Technone = 0	Default		0.024	0.008	0.016	0.080	0.158	0.287	0.426
							Marginal Probabilities (at default = 0)		
Age	-0.002	0.738	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sbgrsinc	0.002	0.244	0.000	0.000	0.000	0.000	0.000	0.000	0.001
Retainow	-0.002	0.198	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sbtime	-0.001	0.329	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Valueadd	0.006	0.003	0.000	0.000	0.000	0.000	-0.001	0.000	0.001
Mrktinfo	0.120	0.000	-0.003	-0.001	-0.002	-0.008	-0.011	-0.005	0.029
Summary Statistics									
McFadden Pseudo R-Squared				0.016					
Number of Observations				1419					
Percentage of Producers Correctly Predicted				40.0%					
P-Value Associated with Chi-Square				<.001					

Of the producers that responded to this question, 3.0% chose response one, 0.9% chose response two, 2.1% chose response three, 9.3% chose response four, 16.2% chose response five, 28.4% chose response six, and 40.1% chose response seven. The model was estimated using 1,419 observations and accurately predicted 40.0% of the producers who responded to this question. However, this is concerning as the model predominately predicted the producers that responded with a seven. Similar to the two models above, this model is statistically significant but has a low R-square.

On average, producers who background/stock year round find marketing practices very important (77.1% chose responses 6 and 7). A majority of producers who do not background/stock year round (default) also find marketing practices very important (71.3%

chose responses 6 and 7). As expected, producers who do background/stock year round are more likely to find marketing practices very important (response 6 and 7) than producers who do not background/stock year round.

Producers who wait for others in their area to be the first to adopt new technology, and then watch and learn from their experiences find marketing practices very important (63.4% chose responses 6 and 7). Likewise, the majority of producers who are the first to adopt new technology in their areas (default) find marketing practices very important (71.3% chose responses 6 and 7). Thus, producers that are early adopters of new technology are more likely to view marketing practices as very important compared to producers who only adopt new technology after watching others and learning from their experiences. This question is a form of discovering a producer's risk preference. A producer that adopts new technology first is more risk loving while a producer that waits is more risk averse. Therefore, the more risk loving a producer is the more likely they are to view marketing practices as important, relative to producers that are more risk averse. This result is as expected because risk loving producers would be more willing to take on the risks associated with marketing practices, and, thus, view marketing practices as very important.

The first continuous variable that was statistically significant was the cattle that are marketed through value-added branded beef programs variable (Valueadd). Examples of value-added programs are Certified Angus Beef (CAB) and Rancher's Renaissance. Even though the marginal probabilities are small, they show that the more cattle that are marketed through value-added branded beef programs, the more important marketing practices are to producers.

The second continuous variable that was statistically significant was the amount of market information sources a producer relies upon (Mrktinfo). As expected, the more sources of

market information that producers rely upon, the more important marketing practices are to those producers. If the sources of market information a producer relies upon increases by one (from the mean), there is a 2.9% greater probability that the producer will indicate that marketing practices are very important (response 7). If producers were to increase their reliance upon market information sources by one (from the mean), there is a 1.1% lower probability that the producer will indicate that marketing practices are slightly important (response 5).

4.7 – Producer Characteristics Relating to the Importance of Nutrition: Model Specifications

The purpose of this section is to discover the relationship between how important nutrition is to producers and certain producer characteristics. A 95% confidence level was used to report variables that were statistically significant unless otherwise acknowledged. The following subsections further develop and explain the nutrition model.

4.7.1 – Nutrition Empirical Model

Of the producers that responded to this question, 80.3% of the producers said that marketing practices are important to them (responses 6 and 7). Resembling the above models, this question also has an ordinal ranked scale from 1 to 7, with 1 being of low importance and 7 being of high importance. The ordered logit model (explained in equations 1-10) regression is as follows:

(14) $Q65m = \beta_0 + \beta_1 Sbwithcc + \beta_2 Sbwithft + \beta_3 Sbwithcf + \beta_4 Sbyrrnd + \beta_5 Famorcor + \beta_6 Belmrktp + \beta_7 Atmrktp + \beta_8 Himrktp + \beta_9 Manager + \beta_{10} Ownmnger + \beta_{11} Other + \beta_{12} Dthlss1 + \beta_{13} Dthlss4 + \beta_{14} Dthlss5 + \beta_{15} Age + \beta_{16} Sbgrsinc + \beta_{17} Retainow + \beta_{18} Sbtime + \beta_{19} Valueadd + \beta_{20} Mrktinfo + e$.

In equation 14 above, $Q65m$ is the dependent variable with the rest of the variables being independent variables. All of the independent variables in the nutrition model have been defined in the previous sections, thus there are no variable definitions in this section. The variables shown in equation 14 were used to develop the nutrition model in Section 4.7.2.

4.7.2 – Nutrition Estimated Equation and Results

An ordered logit model was used to quantify the relationship between the independent variables and how producers ranked the importance of nutrition (Table 4.4). Similar to the aforementioned models, both marginal and binary probabilities were used to examine this model.

Table 4.4 Ordered Logit Estimates of the Importance of Nutrition Model (1=Not Important to 7=Very Important)

Variable	Parameter Estimate	P-Value	1	2	3	4	5	6	7
Intercept	4.434	<.0001	Probabilities						
Sbwithcc=1	-0.174	0.218	0.007	0.004	0.009	0.050	0.134	0.300	0.497
Sbwithcc = 0	Default		0.006	0.003	0.008	0.043	0.117	0.283	0.541
Sbwithft = 1	-0.157	0.575	0.007	0.004	0.009	0.049	0.132	0.298	0.501
Sbwithft = 0	Default		0.006	0.003	0.008	0.043	0.117	0.283	0.541
Sbwithcf = 1	0.163	0.443	0.005	0.003	0.006	0.037	0.103	0.265	0.581
Sbwithcf = 0	Default		0.006	0.003	0.008	0.043	0.117	0.283	0.541
Sbyrrnd = 1	0.379	0.001	0.004	0.002	0.005	0.030	0.087	0.240	0.632
Sbyrrnd = 0	Default		0.006	0.003	0.008	0.043	0.117	0.283	0.541
Manager = 1	-0.057	0.824	0.006	0.003	0.008	0.045	0.123	0.289	0.526
Manager = 0	Default		0.006	0.003	0.008	0.043	0.117	0.283	0.541
Ownmnger = 1	-0.148	0.174	0.007	0.004	0.009	0.049	0.131	0.298	0.504
Ownmnger = 0	Default		0.006	0.003	0.008	0.043	0.117	0.283	0.541
Other = 1	1.053	0.203	0.002	0.001	0.003	0.016	0.048	0.159	0.771
Other = 0	Default		0.006	0.003	0.008	0.043	0.117	0.283	0.541
Famorcor = 1	0.034	0.877	0.005	0.003	0.007	0.041	0.114	0.280	0.549
Famorcor = 0	Default		0.006	0.003	0.008	0.043	0.117	0.283	0.541
Belmrktp = 1	-0.077	0.643	0.006	0.003	0.008	0.046	0.124	0.291	0.521
Belmrktp = 0	Default		0.006	0.003	0.008	0.043	0.117	0.283	0.541
Atmrktp = 1	-0.047	0.731	0.006	0.003	0.008	0.044	0.122	0.288	0.529
Atmrktp = 0	Default		0.006	0.003	0.008	0.043	0.117	0.283	0.541
Himrktp = 1	-0.327	0.127	0.008	0.004	0.010	0.057	0.149	0.312	0.459
Himrktp = 0	Default		0.006	0.003	0.008	0.043	0.117	0.283	0.541
Dthlss1=1	-0.125	0.280	0.006	0.004	0.008	0.048	0.129	0.295	0.510
Dthlss1=0	Default		0.006	0.003	0.008	0.043	0.117	0.283	0.541

Table 4.4 Continued

Variable	Parameter Estimate	P-Value	1	2	3	4	5	6	7
Dthlss4=1	-0.301	0.269	0.008	0.004	0.010	0.056	0.146	0.310	0.466
Dthlss4=0	Default		0.006	0.003	0.008	0.043	0.117	0.283	0.541
Dthlss5=1	0.420	0.453	0.004	0.002	0.005	0.029	0.084	0.235	0.642
Dthlss5=0	Default		0.006	0.003	0.008	0.043	0.117	0.283	0.541
			Marginal Probabilities (at default = 0)						
Age	0.006	0.238	0.000	0.000	0.000	0.000	0.000	-0.001	0.001
Sbgrsinc	0.004	0.038	0.000	0.000	0.000	0.000	0.000	0.000	0.001
Retainow	0.000	0.878	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sbtime	0.000	0.612	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Valueadd	0.006	0.003	0.000	0.000	0.000	0.000	-0.001	-0.001	0.002
Mrktinfo	0.087	0.008	0.000	0.000	-0.001	-0.003	-0.008	-0.009	0.022
Summary Statistics									
McFadden Pseudo R-Squared				0.016					
Number of Observations				1402					
Percentage of Producers Correctly Predicted				51.8%					
P-Value Associated with Chi-Square				<.001					

The nutrition model was statistically significant and accurately predicted 51.8% of producers who responded to this question. The producers this model accurately predicted predominately chose response seven. Almost 7.5% of the producers chose response four or lower, 12.2% of producers chose response five, 27.9% of producers chose response six, and 52.4% of producers chose response seven. This model was estimated based on 1,402 observations. As expected, the R-squared for this model was low, similar to the previously discussed models.

Producers who background/stock cattle year round (87.2%) find nutrition very important (response 6 and 7). Likewise, producers who do not background/stock cattle year round (default; 82.4%) also find nutrition very important. As expected, producers who do background/stock

cattle year round are more likely to find nutrition very important (response 6 and 7) than producers who do not background/stock cattle year round.

The first continuous variable with statistical significance is the gross income derived from stocking/backgrounding cattle (Sbgrsinc). This model found that the larger the producer's gross income derived from backgrounding/stocking cattle the more important nutrition is to the producer. However, all of the marginal probabilities for the aforementioned statement are small. This result was as expected because producers who have a larger income would most likely have more money to spend on nutrition, thus, placing importance on nutrition.

In reference to the model above, the larger the percentage of cattle marketed through value-added beef programs (CAB, etc.) the more important nutrition is. However, similar to, Sbgrsinc, these marginal probabilities are small. Since producers in this sector are raising animals for a specific market and potentially receiving a higher price, it is easy to see that these producers would view nutrition as important. If these animals are not healthy, then these producers will either receive less money for their product or not be able to market them through value-added beef programs.

The last variable that was statistically significant was the number of market information sources a producer relies upon (Mrktinfo). According to the model, the more market information sources a producer relies upon, the more important said producer finds nutrition. For every additional source of market information a producer relies upon (from the mean), there is a 2.2% higher probability they will rank nutrition information as very important (response 7). Even though this is statistically significant, the marginal probabilities are small.

4.8 – Sensitivity Analysis

In order to test the sensitivity of the aforementioned models (feeder cattle prices, animal health management, marketing practices, and nutrition), the dependent variables for each of the models were re-scaled from a seven-response scale down to a three-response scale. For each of the models, the original responses of 1-5 were scaled to the sensitivity model response 1, the original response of 6 was re-scaled to the sensitivity model response 2, and the original response of 7 was re-scaled to the sensitivity model response 3. For each of the new three-response models each rank (1, 2, and 3) contains at least 10% of the producers that responded to the question. The previous models will be considered more reliable and robust if the same explanatory variables are still statistically significant (95% confidence level) and moving in the same direction. Similar to the original (7-response) model, the sensitivity model uses an ordered logit model to estimate the relationships between producer demographics and characteristics and how they rank the importance of information on various topics. The sensitivity models for each of the importance models discussed above (feeder cattle prices, animal health management, marketing practices, and nutrition) are reported below (Tables 4.5 – 4.8). A sample analysis for the feeder cattle prices sensitivity model (Table 4.5) is given as an example of how these models should be interpreted.

Table 4.5 Ordered Logit Estimates for the Sensitivity Analysis of the Importance of Feeder Cattle Prices Model

Variable	Parameter Estimate	P-Value	1	2	3
Intercept	1.927	<.0001		**Probabilities**	
Sbwithcc=1	-0.318	0.041	0.101	0.189	0.711
Sbwithcc = 0	Default		0.075	0.153	0.772
Sbwithft = 1	-0.528	0.074	0.121	0.213	0.666
Sbwithft = 0	Default		0.075	0.153	0.772
Sbwithcf = 1	-0.487	0.030	0.117	0.208	0.675
Sbwithcf = 0	Default		0.075	0.153	0.772
Offfrmjb = 1	-0.129	0.306	0.085	0.167	0.748
offfrmjb = 0	Default		0.075	0.153	0.772
Sbyrrnd = 1	-0.035	0.777	0.078	0.157	0.765
Sbyrrnd = 0	Default		0.075	0.153	0.772
Manager = 1	-0.777	0.004	0.150	0.241	0.608
Manager = 0	Default		0.075	0.153	0.772
Ownmnger = 1	-0.180	0.121	0.089	0.173	0.738
Ownmnger = 0	Default		0.075	0.153	0.772
Other = 1	-0.966	0.165	0.176	0.261	0.562
Other = 0	Default		0.075	0.153	0.772
Famorcor = 1	0.032	0.893	0.073	0.150	0.777
Famorcor = 0	Default		0.075	0.153	0.772
Belmrktp = 1	-0.086	0.626	0.081	0.162	0.756
Belmrktp = 0	Default		0.075	0.153	0.772
Atmrktp = 1	-0.089	0.527	0.082	0.163	0.755
Atmrktp = 0	Default		0.075	0.153	0.772

Table 4.5 Continued

Variable	Parameter Estimate	P-Value	1	2	3
Himrktp = 1	-0.036	0.877	0.078	0.157	0.765
Himrktp = 0	Default		0.075	0.153	0.772
			Marginal Probabilities (at default = 0)		
Age	-0.003	0.491	0.000	0.000	-0.001
Sbgrsinc	0.010	0.000	-0.001	-0.001	0.002
Retainow	0.001	0.509	0.000	0.000	0.000
Sbtime	0.001	0.243	0.000	0.000	0.000
Valueadd	-0.002	0.386	0.000	0.000	0.000
Mrktinfo	0.066	0.063	-0.005	-0.007	0.012
Summary Statistics					
McFadden Pseudo R-Squared				0.019	
Number of Observations				1458	
Percentage of Producers Correctly Predicted				66.0%	
P-Value Associated with Chi-Square				<0.001	

The sensitivity model offers increased confidence that the importance of feeder cattle prices model is reliable. In comparison, this sensitivity model also has a low R-squared and was statistically significant. It correctly predicts 66.0% of producers of which all responded with a three (response seven in the original, 7-response model).

Both the stocker/backgrounder operation with a cow/calf operation (Sbwithcc) and the stocker/backgrounder operation with a cow/calf operation and feedlot (Sbwithcf) are both statistically significant. While both still suggest that feeder cattle prices are important, producers with only a stocker/backgrounder operation (default) will be more likely to view feeder cattle prices as important when compared to the previously mentioned two variables.

Similar to the importance of the feeder cattle prices (7-response) model, the operation manager variable (Manager) is statistically significant. Even though operation managers view feeder cattle prices as very important, operation owners are more likely to view feeder cattle prices as being very important than are operation managers.

Finally, the percentage of income producers derive from backgrounding/stocking (Sbgrsinc) is also statistically significant. After examining the marginal probabilities, the same trend can be seen—the more income a producer derives from stocking/backgrounding, the more important that producer views feeder cattle prices. Therefore, as previously mentioned, there is increased confidence that this model is reliable based on this sensitivity test.

All of the following sensitivity models increased confidence in their respective 7-response model. The feeder cattle price model was explained in detail above as an example of how the other sensitivity models should be interpreted. Any discrepancies will be described in detail after their respective model.

Table 4.6 Ordered Logit Estimates for the Sensitivity Analysis of the Importance of Animal Health Management Model

Variable	Parameter Estimate	P-Value	1	2	3
Intercept	1.100	<.0001		**Probabilities**	
Sbwithcc=1	-0.274	0.065	0.205	0.287	0.508
Sbwithcc = 0	Default		0.164	0.260	0.576
Sbwithft = 1	-0.186	0.514	0.191	0.279	0.531
Sbwithft = 0	Default		0.164	0.260	0.576
Sbwithcf = 1	-0.196	0.371	0.192	0.280	0.528
Sbwithcf = 0	Default		0.164	0.260	0.576
Sbyrrnd = 1	0.279	0.018	0.129	0.228	0.643
Sbyrrnd = 0	Default		0.164	0.260	0.576
Famorcor = 1	-0.335	0.109	0.215	0.292	0.493
Famorcor = 0	Default		0.164	0.260	0.576
Belmrktp = 1	-0.137	0.427	0.183	0.274	0.543
Belmrktp = 0	Default		0.164	0.260	0.576
Atmrktp = 1	0.031	0.823	0.159	0.257	0.584
Atmrktp = 0	Default		0.164	0.260	0.576
Himrktp = 1	-0.259	0.245	0.202	0.286	0.512
Himrktp = 0	Default		0.164	0.260	0.576
Vetemerg=1	-0.038	0.856	0.169	0.264	0.567
Vetemerg=0	Default		0.164	0.260	0.576
Vetyear=1	-0.132	0.752	0.182	0.274	0.544
Vetyear=0	Default		0.164	0.260	0.576
Vetfew=1	0.002	0.994	0.163	0.260	0.577
Vetfew=0	Default		0.164	0.260	0.576
Vetmnth=1	0.007	0.975	0.163	0.259	0.578
Vetmnth=0	Default		0.164	0.260	0.576
Vetgrp=1	0.832	0.001	0.078	0.164	0.758
Vetgrp=0	Default		0.164	0.260	0.576

Table 4.6 Continued

Variable	Parameter Estimate	P-Value	1	2	3
Vetyear=1	-0.132	0.752	0.182	0.274	0.544
Vetyear=0	Default		0.164	0.260	0.576
Vetfew=1	0.002	0.994	0.163	0.260	0.577
Vetfew=0	Default		0.164	0.260	0.576
Vetmnth=1	0.007	0.975	0.163	0.259	0.578
Vetmnth=0	Default		0.164	0.260	0.576
Vetgrp=1	0.832	0.001	0.078	0.164	0.758
Vetgrp=0	Default		0.164	0.260	0.576
Pllrt5=1	0.025	0.871	0.160	0.257	0.582
Pllrt5=0	Default		0.164	0.260	0.576
Pllrt11=1	0.097	0.636	0.151	0.249	0.600
Pllrt11=0	Default		0.164	0.260	0.576
Pllrt21=1	0.748	0.020	0.085	0.173	0.742
Pllrt21=0	Default		0.164	0.260	0.576
Pllrt31=1	0.886	0.052	0.075	0.158	0.767
Pllrt31=0	Default		0.164	0.260	0.576
Pllrt50=1	0.954	0.414	0.070	0.151	0.779
Pllrt50=0	Default		0.164	0.260	0.576
Dthlss1=1	-0.205	0.107	0.194	0.281	0.526
Dthlss1=0	Default		0.164	0.260	0.576
Dthlss4=1	-0.218	0.447	0.195	0.282	0.523
Dthlss4=0	Default		0.164	0.260	0.576
Dthlss5=1	0.186	0.763	0.140	0.239	0.621
Dthlss5=0	Default		0.164	0.260	0.576

Table 4.6 Continued

Variable	Parameter Estimate	P-Value	1	2	3
			Marginal Probabilities (at default = 0)		
Age	0.004	0.386	-0.001	0.000	0.001
Sbgrsinc	0.007	0.001	-0.001	-0.001	0.002
Retainow	-0.002	0.150	0.000	0.000	0.000
Sbtime	0.000	0.516	0.000	0.000	0.000
Valueadd	0.000	0.870	0.000	0.000	0.000
Summary Statistics					
McFadden Pseudo R-Squared				0.014	
Number of Observations				1751	
Percentage of Producers Correctly Predicted				56.6%	
P-Value Associated with Chi-Square				0.004	

Table 4.7 Ordered Logit Estimates for the Sensitivity Analysis of the Importance of the Marketing Practices Model

Variable	Parameter Estimate	P-Value	1	2	3
Intercept	0.546	<.0001		**Probabilities**	
Sbwithcc=1	-0.243	0.077	0.335	0.293	0.373
Sbwithcc = 0	Default		0.283	0.286	0.431
Sbwithft = 1	-0.151	0.595	0.315	0.291	0.394
Sbwithft = 0	Default		0.283	0.286	0.431
Sbwithcf = 1	-0.177	0.390	0.320	0.292	0.388
Sbwithcf = 0	Default		0.283	0.286	0.431
Offfrmjb = 1	0.009	0.941	0.281	0.286	0.433
offfrmjb = 0	Default		0.283	0.286	0.431
Sbyrrnd = 1	0.285	0.012	0.229	0.270	0.502
Sbyrrnd = 0	Default		0.283	0.286	0.431
Manager = 1	-0.199	0.437	0.325	0.292	0.383
Manager = 0	Default		0.283	0.286	0.431
Ownmnger = 1	0.016	0.884	0.280	0.286	0.435
Ownmnger = 0	Default		0.283	0.286	0.431
Other = 1	0.960	0.187	0.131	0.205	0.664
Other = 0	Default		0.283	0.286	0.431
Famorcor = 1	-0.252	0.242	0.337	0.293	0.371
Famorcor = 0	Default		0.283	0.286	0.431
Belmrktp = 1	0.006	0.973	0.282	0.286	0.432
Belmrktp = 0	Default		0.283	0.286	0.431
Atmrktp = 1	0.045	0.735	0.274	0.284	0.442
Atmrktp = 0	Default		0.283	0.286	0.431
Himrktp = 1	0.111	0.603	0.261	0.281	0.458
Himrktp = 0	Default		0.283	0.286	0.431

Table 4.7 Continued

Variable	Parameter Estimate	P-Value	1	2	3
Tech2 = 1	-0.310	0.010	0.350	0.293	0.357
Tech2 = 0	Default		0.283	0.286	0.431
Technone = 1	-0.194	0.148	0.324	0.292	0.384
Technone = 0	Default		0.283	0.286	0.431
			Marginal Probabilities (at default = 0)		
Age	0.001	0.908	0.000	0.000	0.000
Sbgrsinc	0.003	0.186	-0.001	0.000	0.001
Retainow	-0.002	0.247	0.000	0.000	0.000
Sbtime	-0.001	0.386	0.000	0.000	0.000
Valueadd	0.005	0.008	-0.001	0.000	0.001
Mrktinfo	0.112	0.001	-0.023	-0.005	0.027
Summary Statistics					
McFadden Pseudo R-Squared				0.019	
Number of Observations				1345	
Percentage of Producers Correctly Predicted				44.5%	
P-Value Associated with Chi-Square				<0.001	

Table 4.8 Ordered Logit Estimates for the Sensitivity Analysis of the Importance of Nutrition Model

Variable	Parameter Estimate	P-Value	1	2	3
Intercept	0.797	<.0001		**Probabilities**	
Sbwithcc=1	-0.185	0.191	0.204	0.300	0.496
Sbwithcc = 0	Default		0.175	0.283	0.542
Sbwithft = 1	-0.159	0.572	0.199	0.298	0.503
Sbwithft = 0	Default		0.175	0.283	0.542
Sbwithcf = 1	0.161	0.452	0.153	0.265	0.582
Sbwithcf = 0	Default		0.175	0.283	0.542
Sbyrrnd = 1	0.369	0.002	0.128	0.240	0.631
Sbyrrnd = 0	Default		0.175	0.283	0.542
Manager = 1	-0.072	0.782	0.186	0.290	0.524
Manager = 0	Default		0.175	0.283	0.542
Ownmnger = 1	-0.148	0.175	0.198	0.297	0.505
Ownmnger = 0	Default		0.175	0.283	0.542
Other = 1	1.111	0.176	0.065	0.152	0.782
Other = 0	Default		0.175	0.283	0.542
Famorcor = 1	0.012	0.957	0.174	0.281	0.545
Famorcor = 0	Default		0.175	0.283	0.542
Belmrktp = 1	-0.074	0.659	0.186	0.290	0.524
Belmrktp = 0	Default		0.175	0.283	0.542
Atmrktp = 1	-0.034	0.804	0.180	0.286	0.534
Atmrktp = 0	Default		0.175	0.283	0.542
Himrktp = 1	-0.328	0.129	0.228	0.312	0.460
Himrktp = 0	Default		0.175	0.283	0.542
Dthlss1=1	-0.121	0.295	0.193	0.295	0.512
Dthlss1=0	Default		0.175	0.283	0.542
Dthlss4=1	-0.277	0.308	0.219	0.308	0.473
Dthlss4=0	Default		0.175	0.283	0.542

Table 4.8 Continued

Variable	Parameter Estimate	P-Value	1	2	3
Dthlss5=1	0.468	0.398	0.117	0.228	0.654
Dthlss5=0	Default		0.175	0.283	0.542
			Marginal Probabilities (at default = 0)		
Age	0.006	0.211	-0.001	-0.001	0.001
Sbgrsinc	0.004	0.041	-0.001	0.000	0.001
Retainow	0.000	0.812	0.000	0.000	0.000
Sbtime	0.000	0.632	0.000	0.000	0.000
Valueadd	0.006	0.002	-0.001	-0.001	0.002
Mrktinfo	0.084	0.011	-0.012	-0.009	0.021
Summary Statistics					
McFadden Pseudo R-Squared				0.019	
Number of Observations				1391	
Percentage of Producers Correctly Predicted				52.3%	
P-Value Associated with Chi-Square				<0.001	

All of the above sensitivity models above helped increase confidence in their respective 7-response models as all of the same variables were statistically significant and moving in the same direction. There were no discrepancies to be discussed for any of the sensitivity models.

4.9 – Summary

The purpose of this chapter was to discover what producer and operation characteristics affected the producers' view of the importance of feeder cattle prices, animal health management, marketing practices, and nutrition. Several variables were statistically significant in the feeder cattle prices model: producers that own a stocker/backgrounder and cow/calf operation (Sbwithcc), producers that own a stocker/backgrounder and cow/calf operation with a feedlot (Sbwithcf), operation managers (Manager), and the amount of income producers derive from stocking/backgrounding cattle (Sbgrsinc). The animal health management model had five variables that were statistically significant, and they were producers that run

stocker/backgrounder cattle year round (Sbyrrnd), producers that consult a veterinarian for every group of cattle (Vetgrp), producers that have a pull rate between 21-30% due to BRD within the first month (Pllrt21), producers that have a pull rate between 31-50% due to BRD within the first month (Pllrt31), and the amount of income producers derive from stocking/backgrounding cattle (Sbgrsinc). There were four variables that were statistically significant in the marketing practices model: producers that allow others to test and adopt new technology while they watch and learn (Tech2), producers that run stocker/backgrounder cattle year round (Sbyrrnd), the number of market information sources producers rely upon (Mrktinfo), and the percentage of cattle that producers market through value-added branded beef programs (Valueadd). Finally, the last model estimated was the importance of nutrition model with four variables that were significant: the amount of income producers derive from stocking/backgrounding cattle (Sbgrsinc), producers that run stocker/backgrounder cattle year round (Sbyrrnd), the number of market information sources producers rely upon (Mrktinfo), and the percentage of cattle that producers market through value-added branded beef programs (Valueadd). The following chapter will explore the details of the models used to examine producer demographics and characteristics and how they impact the use of futures and options market contracts.

Chapter 5 - Futures Market Contracts versus Options on Futures: Model Specifications

5.1 – Introduction

This chapter will reveal how producer and operation characteristics relate to producers' use of futures and options market contracts. Since 43.3% of producers that used futures market contracts used options, two models, one for futures contracts and one for options, were estimated. Furthermore, the correlation of these two variables is 0.42. Section 5.2 shows the binary logit model used for the models in this chapter. Section 5.3 shows the binary regression, discusses the variables in the model, and gives the results for the futures market contracts model. Similar to section 5.3, section 5.4 discusses the model and results for the options on futures model. Finally, section 5.5 summarizes the results and findings from this chapter.

5.2 – Binary Logit Model

Binary dependent variables are used when there are either or choices. For the purpose of this study, most binary dependent variables will consist of a "1" or "0" or "Yes" or "No" response from producers. Therefore, if the producer were to answer "Yes" to a question, the binary dependent variable would be $Y_i = 1$; where if a producer answered "No", then the binary dependent variable would be $Y_i = 0$ (Hill et al., 2011). An empirical model for a binary choice regression model is given as (Greene, 1997):

(15) $Prob(Y_i = 1) = F(\beta, \alpha)$,

(16) $Prob(Y_i = 0) = 1 - F(\beta, \alpha)$,

where the β parameter shows the magnitude of change in α, the explanatory decision variable, on the probability. In addition, the subscript *i* represents individual producers. Since

(17) $E\{y_i|\alpha\} = F(\beta, \alpha)$,

then the following regression model can be developed:

(18) $y_i = E\{y_i|\alpha\} + (y_i - E\{y_i|\alpha\}),$

$= \beta'\alpha + \in.$

Given that the error term, $\in$, is logistically distributed, then the probability that $Y_i = 1$ can be modeled as:

(19) $Prob(Y_i = 1) = \frac{e^{\beta\prime\alpha}}{1+e^{\beta\prime\alpha}}.$

Therefore, the marginal effects can be calculated as:

(20) $\frac{\partial E\{y_i|\alpha\}}{\partial \alpha} = \frac{e^{\beta\prime\alpha}}{(1+e^{\beta'\alpha})^2}.$

In the following sections of this chapter, there will be equations for each model that can be used to better understand the aforementioned empirical model.

5.3 – Futures Market Contracts: Model Specifications

The purpose of this section is to quantify the relationship between producer and operation characteristics and how that information impacts producers' use of futures market contracts. In the following discussion, any variable that is statistically significant at the 95% confidence level is referred to as being significant (i.e., those having a p-value less than or equal to 0.05). The following subsections further develop and explain the model to be estimated.

5.3.1 – Futures Market Contracts Empirical Model

A binary logit model was estimated to examine the relationship between producer and operation characteristics and the use of futures markets for managing price risk. Slightly under one fifth (18.2%) of producers who responded to this question use futures market contracts. Therefore, 81.8% of producers indicated that they do not use futures market contracts. The empirical binary logit model (explained in equations 15-20) is as follows:

(21) $Q60d = \beta_0 + \beta_1 SBwithCC + \beta_2 SBwithFT + \beta_3 SBwithCF + \beta_4 OffFrmJb + \beta_5 SByrrnd + \beta_6 Age + \beta_7 FamOrCor + \beta_8 SBgrsinc + \beta_9 Retainow + \beta_{10} SBtime + \beta_{11} Belmrktp + \beta_{12} Atmrktp + \beta_{13} Himrktp + \beta_{14} ValueAdd + \beta_{15} Mrktinfo + \beta_{16} Tech2 + \beta_{17} Technone + \beta_{18} Option + e$.

In the above equation (21), $Q60d$ is the dependent variable (futures market contracts) and the remaining variables are independent variables. Only one variable in the above equation has not been defined in the previous chapter:

- *Option*=Binary variable equal to 1 if a producer uses options, 0 otherwise.

The default operation for the above variable is producers that do not use options on futures. Equation 21 was used to develop a model and interpret results for the futures market contracts model.

5.3.2 – Futures Market Contract Model Estimated Equation and Results

As previously mentioned, a binary logit model was used to analyze the futures market contract model and the results of that model are reported in Table 5.1. The marginal effects of the continuous variables estimated are the measures of the change in probabilities given a one-unit change in the explanatory variables evaluated at their means. Table 5.1 lists the independent variables and their marginal effects.

Table 5.1 Futures Market Contract Model Marginal Effects

Independent Variables	Marginal Effects	P-Values	Mean of Variables	Standard Error
One	-0.315	<.001	1.000	0.594
Sbwithcc	-0.054	0.025	0.623	0.203
Sbwithft	0.035	0.427	0.051	0.353
Sbwithcf	0.043	0.220	0.111	0.281
Offfrmjb	-0.010	0.633	0.273	0.196
Sbyrrnd	0.000	1.000	0.570	0.187
Age	-0.001	0.102	54.290	0.007
Famorcor	0.058	0.123	0.071	0.288
Sbgrsinc	0.000	0.221	44.372	0.003
Retainow	0.000	0.624	33.871	0.002
Sbtime	0.000	0.758	170.695	0.001
Belmrktp	0.181	0.000	0.195	0.313
Atmrktp	0.123	0.000	0.471	0.283
Himrktp	0.166	0.003	0.089	0.362
Valueadd	0.000	0.269	12.621	0.003
Mrktinfo	0.016	0.005	2.873	0.051
Tech2	0.023	0.285	0.330	0.187
Technone	-0.046	0.055	0.251	0.228
Option	0.410	<.001	0.133	0.192
Summary Statistics				
McFadden Pseudo R-Squared				0.219
Number of Observations				1346
Percentage of Producers Correctly Predicted				39.10%
P-Value Associated with Chi-Square				<.001

This binary logit model was estimated from 1,346 observations. This model was statistically significant and predicted 39.1% of the producers correctly. The R-squared measure of goodness of fit is also relatively low at 21.9%.

Several variables in the model refer to the type of operation a producer has such as a stocking/backgrounding and cow/calf operation or a stocking/backgrounding operation with a feedlot. However, the only type of operation variable that was statistically significant was the variable where producers own both a stocker/backgrounder and cow/calf operation. When

comparing this to the default of a producer that only has a backgrounding/stocking operation, it can be concluded that a producer that owns a backgrounding/stocking and cow/calf operation is 5.4% less likely to use futures market contracts than a producer that solely has a backgrounder/stocker operation.

Three variables were used to classify how producers buy their cattle: below the average market price, at the average market price, and above the average market price. All three of these variables were statistically significant. Producers that bought cattle below the average market price were 18.1% more likely to use futures market contracts than producers that did not indicate their typical procurement/purchasing behavior (default). Next, the producers that bought cattle at the average market price were 12.3% more likely to use futures market contracts than producers that did not indicate their typical procurement/purchasing behavior (default). Finally, producers that buy cattle above the average market price were 16.6% more likely to use futures market contracts than producers that did not indicate their typical procurement/purchasing behavior (default).

This model also found that the number of market information sources a producer relies upon is a significant factor in deciding if a producer will use the futures market. A producer that relies upon four market sources of information is 1.6% more likely to use a futures market contract than producers that only uses market information from three sources. However, keep in mind that this marginal effect was calculated at the mean.

A variable that was statistically significant at the 90% confidence level was the variable related to how producers indicated they adopted technology. According to the model, if a producer is resistant to adopting new technology then they are roughly 4.6% less likely to use futures market contracts than a producer that is the first to adopt new technology.

The final variable that was statistically significant was the option variable which is a binary variable equal to one if the producer uses options and equal to zero if the producer does not use options. According to the model, a producer that uses options is 41.0% more likely to use futures market contracts for managing price risk than a producer that does not use options (default).

Even though this model is statistically significant, it is not particularly accurate. It accurately predicts less than half of the producers that use futures market contracts. With that in mind, the above results are not very reliable at predicting what type of producers use futures market contracts.

5.4 – Options on Futures: Model Specifications

Similar to the futures market contract model, a binary logit model was used to estimate the options on futures model. While 13.3% of producers who responded to question 60h use options on futures, this also suggests that 86.7% of producers do not use options on futures. The binary logit model (explained in equations 15-20) regression is as follows:

(22) $$Q60h = \beta_0 + \beta_1 SBwithCC + \beta_2 SBwithFT + \beta_3 SBwithCF + \beta_4 OffFrmJb + \beta_5 SByrrnd + \beta_6 Age + \beta_7 FamOrCor + \beta_8 SBgrsinc + \beta_9 Retainow + \beta_{10} SBtime + \beta_{11} Belmrktp + \beta_{12} Atmrktp + \beta_{13} Himrktp + \beta_{14} ValueAdd + \beta_{15} Mrktinfo + \beta_{16} Tech2 + \beta_{17} Technone + \beta_{18} Contract + e$$.

In the above equation (21), $Q60h$ is the dependent variable (options on futures) and the remaining variables are independent variables. Only one variable in the above equation has not been defined in the previous chapter:

- *Contract*=Binary variable equal to 1 if a producer uses futures market contracts, 0 otherwise.

The default operation for the above variable is producers that do not use futures market contracts. Equation 22 was used to develop a model and interpret results for the options on futures model.

5.4.2 – Options on Futures Model Estimated Equation and Results

A binary logit model was used to analyze the options on futures model. The marginal effects of the continuous variables estimated in this model are the measures of how probabilities associated with using options change given a one-unit change in the explanatory variables evaluated at their means. The marginal effect associated with binary variables is measured against their respective default. A 95% confidence level was used to report variables that were statistically significant. Table 5.2 lists the independent variables and their marginal effects.

Table 5.2 Options on Futures Model Marginal Effects

Independent Variables	Marginal Effects	P-Values	Mean of Variables	Standard Error
One	-0.226	<.001	1.000	0.674
Sbwithcc	-0.015	0.395	0.623	0.229
Sbwithft	-0.032	0.256	0.051	0.427
Sbwithcf	-0.018	0.430	0.111	0.322
Offfrmjb	-0.026	0.118	0.273	0.229
Sbyrrnd	0.009	0.584	0.570	0.212
Age	-0.001	0.120	54.290	0.008
Famorcor	0.030	0.296	0.071	0.323
Sbgrsinc	0.001	0.009	44.372	0.004
Retainow	0.000	0.744	33.871	0.002
Sbtime	0.000	0.106	170.695	0.001
Belmrktp	0.036	0.249	0.195	0.359
Atmrktp	0.055	0.025	0.471	0.307
Himrktp	0.150	0.001	0.089	0.377
Valueadd	0.000	0.240	12.621	0.003
Mrktinfo	0.010	0.023	2.873	0.056
Tech2	-0.006	0.726	0.330	0.214
Technone	-0.012	0.539	0.251	0.250
Contract	0.312	<.001	0.181	0.192
Summary Statistics				
McFadden Pseudo R-Squared				0.229
Number of Observations				1346
Percentage of Producers Correctly Predicted				29.05%
P-Value Associated with Chi-Square				<.001

The model was estimated using 1,346 observations. Although this model was statistically significant, only 29.1% of producers that used options were correctly predicted. Moreover, this model had a low R-squared value of 22.9%.

Of the producers that responded to this question, roughly 44.4% of their gross income is derived from stocking/backgrounding cattle. For every one percentage point increase in gross income (around the mean), a producer is 0.1% more likely to invest in options. For example, a producer that receives 44.4% of their income from backgrounding/stocking cattle is 0.1% less

likely to invest in an option on futures than a producer that derives 45.4% of their income from backgrounding/stocking cattle. Since this value is small, there will be little to no affect on producers.

There were three variables describing how producers buy cattle of which two were statistically significant: at the average market price and higher than the average market price. Producers that buy their cattle at average market price are 5.5% more likely to use options than producers that did not indicate their typical procurement/purchasing behavior (default). Finally, producers that buy their cattle above the average market price are 15.0% more likely to use options than producers that did not indicate their typical procurement/purchasing behavior (default).

The next variable that was statistically significant is the number of market information sources producers rely upon. According to the model, producers that rely upon three market information sources are 1.0% less likely to invest in options than producers that rely upon four market information sources. Or more generally, increasing the number of market information sources (within close proximity to the mean) by one would increase the producer's likelihood of using options by 1.0%. Similar to the continuous variable above (Sbgrsinc), this variable must be evaluated at or near the mean.

In conclusion, the final statistically significant variable is a binary variable that is equal to one if producers use futures market contracts. An interpretation of the marginal effects for this binary variable is that producers that use futures market contracts are 31.2% more likely to invest in an option than producers that do not use futures market contracts.

While this model was statistically significant, the model does not predict producers that use options very accurately. For example, in sample this model accurately predicted roughly

29.1% of producers that use options on futures. Therefore, there is low confidence in the reliability of this model even though it was statistically significant.

5.5 – Summary

Both models (use of futures market and use of options on futures market) were statistically significant but had low accuracy of predicting the type of producer that would use these two risk management strategies. The variables that were statistically significant for the futures market contracts model were producers that owned a backgrounder/stocker operation and a cow/calf operation (Sbwithcc), producers that buy their cattle below average market price (Belmrktp), producers that buy their cattle at the average market price (Atmrktp), producers that buy their cattle above the average market price (Himrktp), the number of market information sources that producers rely upon (Mrktinfo), producers that are resistant to adopting new technology (Technone), and producers that use options on futures (Options). The variables that were statistically significant for the options on futures market model were percentage of gross income derived from stocking/backgrounding cattle (Sbgrsinc), producers that buy their cattle at the average market price (Atmrktp), producers that buy their cattle above the average market price (Himrktp), the number of market information sources that producers rely upon (Mrktinfo), and producers that use futures market contracts (Contract). The next chapter discusses the results from this study and what applications can be done to further this study.

Chapter 6 - Conclusion and Implications

6.1 – Introduction

This chapter will review the research and results from the previous five chapters. Also provided will be the limitations of this study and potential uses for future research. The following subsections will further explain each of the above topics.

The definition of stocking/backgrounding cattle provided in the 2008 National Stocker Survey was "operations where calves are grown after weaning and/or preconditioning but before the feedlot. This includes calves purchased for this purpose, as well as those retained by cow-calf producers post-weaning, but before marketing or retention through the feedlot." This survey was mailed out to over 16,200 stocker/backgrounder producers throughout the nation. The data collected in this survey were analyzed by estimating the models discussed in the previous chapters. Listed below are the three objectives of this study:

1. To review and summarize the responses from a subset of questions in the 2008 National Stocker Survey.
2. To determine how characteristics impact how producers rank the importance of various topics/issues as they relate to their operations.
3. To investigate producer and operation characteristics that help explain producers who use futures market contracts and/or options.

The first part of this study was to quantify the relationship between producer and operation characteristics and how producers rank the importance of feeder cattle prices, animal health management, marketing practices, and nutrition for their operations. The second part of this study was to examine the relationship between producer and operation characteristics and how they relate to producers use of futures or options contracts for managing price risk.

6.2 – Importance of Feeder Cattle Prices

The first model that was developed in this study delved into what producer and operation characteristics relate to how producers rank the importance of feeder cattle prices. Most producers that responded to this question found this topic to be of importance. Therefore, by analyzing producer and operation characteristics, this study was able to identify what type of producers would be most likely to find feeder cattle prices important.

There were several findings to this part of the study. The first finding was that pure backgrounder/stocker operations are more likely to view feeder cattle prices as being important than are backgrounder/stocker with a cow/calf operations. The second result from this section was that pure backgrounder/stocker cattle operations are more likely to view feeder cattle prices as important compared to backgrounder/stocker with cow/calf and feedlot operations. Next, this study found that owners of backgrounding/stocking operations are more likely to view feeder cattle prices as important compared to managers of backgrounding/stocking operations. The final result from this model found that as a producer's gross income derived from stocking/backgrounding increases the more important that producer will view feeder cattle prices. However, these marginal probabilities were small and, therefore, would not have a large affect on producers.

6.3 – Importance of Animal Health Management

The next model that was developed from the 2008 National Stocker Survey was the importance of animal health management model. A majority of producers that responded to this question believed animal health management was important. This model quantifies the relationship between producer and operation characteristics and how the producer ranks the importance of animal health management.

Five variables in this model were statistically significant at the 95% confidence level. The first result from this model was that producers that run stocker/backgrounder cattle year round are more likely to find animal health management important than producers that do not run stocker/backgrounder cattle year round. In addition, producers who consult a veterinarian for every group of cattle are more likely to view animal health management as being important than producers who never consult a veterinarian. Producers whose typical pull rate within the first month of arrival due to BRD is 21-30% or 31-50% are more likely to view animal health management as being important than producers whose pull rate due to BRD is less than 5% (default). The last variable that was statistically significant in this model was the percentage of gross income producers receive from stocking/backgrounding cattle. The larger the producer's income derived from stocking/backgrounding the more important said producer will view animal health management. Even though this variable is statistically significant, it is small in magnitude and thus will have little effect on producers.

6.4 – Importance of Marketing Practices

A majority of producers found marketing practices to be an important factor in the stocking/backgrounding industry. By comparing producer and operation characteristics to the dependent variable, this model was able to identify certain characteristics about the producers that find marketing practices important. Below are the variables that were statistically significant in this model.

First, producers that own stocker/backgrounder cattle year round are more likely to find marketing practices important than producers that do not own stocker/backgrounder cattle year round. Second, stocking/backgrounding producers that are the first to adopt new technology are more likely to view marketing practices as important relative to producers that let others

test/adopt new technology first while they watch and learn from these other producers. Third, the more cattle that producers market through value-added branded beef programs the more likely said producer will find marketing practices important. Although this variable was statistically significant, the marginal probabilities are small and will have little to no affect on producers. Fourth, the amount of market information sources a producer relies upon was statistically significant. Therefore, the more sources of market information that a producer relies upon, the more important marketing practices are to that producer.

6.5 – Importance of Nutrition

The last model referenced from question 65a is the importance of nutrition model. This model relates producer and operation characteristics to how producers ranked the importance of nutrition as it relates to their operations. Of the respondents to this question, a majority of producers found this topic important.

There were several producer and operation characteristics that were found to be statistically significant after modeling the data. Producers that run backgrounder/stocker cattle year round are more likely to find nutrition important than producers who do not run backgrounder/stocker cattle year round. Next, the larger the gross income producers derive from stocking/backgrounding cattle the more likely said producer will find nutrition important. Despite the fact that this variable is statistically significant, its marginal probability is small. Another continuous variable that was statistically significant is the percentage of cattle marketed through value-added beef programs variable. The larger percentage of cattle marketed through value-added beef programs, the more important nutrition is. This variable, too, has a small marginal probability. According to the model, the more market information sources a producer

relies upon, the more important said producer finds nutrition. In resemblance of a few aforementioned variables, this variable's marginal probabilities are small.

6.6 – Futures Market Contracts

This model quantifies the relationship between producer and operation characteristics and producers that invest in futures market contracts. Roughly 18.2% of producers who responded to this question use futures market contracts while 81.8% of producers do not. This model was statistically significant and correctly predicted 39.1% of producers that use futures market contracts.

There were several findings in this model. First, a producer that owns a backgrounding/stocking and cow/calf operation is 5.4% less likely to use futures market contracts than a producer that solely has a backgrounder/stocker operation. Second, producers that bought cattle below the average market price were 18.1% more likely to use futures market contracts than producers that did not indicate their typical procurement/purchasing behavior. Third, producers that bought cattle at the average market price were 12.3% more likely to use futures market contracts than producers that did not indicate their typical procurement/purchasing behavior. Fourth, producers that buy cattle above the average market price were 16.6% more likely to use futures market contracts than producers that did not indicate their typical procurement/purchasing behavior. Fifth, the more market sources of information a producer relies upon, the more likely said producer will use a futures market contract. Sixth, if a producer is resistant to adopting new technology, then they are less likely to invest in a futures market contact. Seventh, a producer that uses options is 41.0% more likely to use futures market contracts for managing price risk than a producer that does not use options.

6.7 – Options on Futures

The purpose of this model was to quantify the relationship between producer and operation characteristics and producers that invest in options on futures. While 13.3% of producers who responded to this question use options on futures, this also means that 86.7% of producers do not use options. This model was statistically significant and correctly predicted 29.1% of producers that used options.

The first result from this model was that the larger the percentage of gross income a producer derives from backgrounding/stocking, the more likely they are to use options. The third result says that producers that buy their cattle at average market price are 5.5% more likely to use options than producers that did not indicate their typical procurement/purchasing behavior. Similar the aforementioned result, producers that buy their cattle above the average market price are 15.0% more likely to use options than producers that did not indicate their typical procurement/purchasing behavior. In addition, increasing the number of market information sources (within close proximity to the mean) by one would increase the producer's likelihood of using options by 1.0%. The last result of this model stated that producers that use futures market contracts are 31.2% more likely to invest in an option than producers that do not use futures market contracts.

6.8 – Limitations and Future Research

There were several limitations to this research. As previously mentioned, this survey was developed to profile an industry and not necessarily for modeling specific characteristics of individual operations. Therefore, several of the shortcomings in my model could be explained by this fact.

The ordered logit models (feeder cattle prices, animal health management, marketing practices, and nutrition) were all highly skewed towards the importance side of the scale. As a result, there was not enough variability in the data to differentiate the producers at the extremes of the scale of the aforementioned models. For instance, there was never a time where the results discussed producers that did not find the dependent variable unimportant (response 1). One way to get the information from the small percentage of producers that do not find these topics important would be to individually contact each of those producers.

In this study's binary models, there was also an issue. Both models were not accurate in predicting producers that used futures market contracts or options. Moreover, the R-squared of these models were low. These models needed more variability in order to have a higher R-squared and more accurate model predictions.

In addition, there are several changes that I would have liked to make to the survey. First, many of the questions asked producers to identify the percentage of items. For example, question 24 asks producers to identify where their cattle come from. Producers, having the ability to mark multiple areas of the question, would end up choosing multiple areas and having a probability that added to over 100%. Even though some of the information would be lost, it may have been more beneficial for these types of questions to be binary. Also, it may have been beneficial for the scales to be decreased from one through seven to one through five. This may allow for some questions to have more variability in the results leading to a better interpretation.

This survey has immense potential for future research. This study only tackled a small percentage of the questions asked in the 2008 National Stocker Survey. Many areas of the survey could be touched upon such as nutrition, procurement, and receiving. While a few of these questions were used as explanatory variables, none were used as the dependent variable. Follow-

up questions could be asked to producers if more information is needed on questions similar to the models done in this study. There is a vast amount of potential use for the information provided in this survey.

References

Buccola, Steven T. 1980. An Approach to the Analysis of Feeder Cattle Price Differentials. *American Journal of Agricultural Economics,* 62(3):574-80.

Coelho, Andrei R., Darrell R. Mark, Azzeddine Azzam. 2008. Understanding Basis Risk Associated with Fed Cattle Livestock Risk Protection Insurance. *Journal of Extension* (On-line) 46(1) Article 1RIB6. http://www.joe.org/joe/2008february/rb6.shtml

Faminow, Merle D., and Russell L. Gum. 1986. Feeder Cattle Price Differentials in Arizona Auction Markets. *Western Journal of Agricultural Economics* 11(2):156-63.

Fausti, S.W., Brad Johnson, William Epperson, and Nancy Grathwohl. 2003. Risk and the Economic Incentive to Retain Ownership of Steer Calves. *Economics Staff Paper*. South Dakota State University, Brookings, SD:

Greene, W.H. 1998. Econometric Analysis Third Edition. Prentice Hall Publ. Co., New Jersey.

Hall, David C., Thomas O. Knight, Keith H. Coble, Alan E. Baquet, and George F. Patrick. 2003. Analysis of Beef Producers' Risk Management Perceptions and Desire for Further Risk Management Education. *Review of Agricultural Economics,* 25(2):430-48.

Harwood, Joy, Richard Heifner, Keith Coble, Janet Perry, and Agapi Somwaru. 1999. Managing Risk in Farming: Concepts, Research, and Analysis. Economic Research Service, U.S. Department of Agriculture, Agricultural Economic Report 774.

Hill, R.C., William Griffiths, and Guay Lim. 2011. Principles of Economics Fourth Edition. John Wiley & Sons, Inc.

Lawrence, John D. 2005. Alternative Retained Ownership Strategies for Cow Herds. *Staff General Research Papers*. Iowa State University, Ames, IA.

Lawrence, John D., and Cody Ostendorf. 2006. How Profitable is Backgrounding Cattle? *Staff General Research Papers*. Iowa State University, Ames, IA.

Lawrence, John D., Zhi Wang, and Daniel D. Loy. 1999. Elements of Cattle Feeding Profitability in Midwest Feedlots. *Journal of Agricultural and Applied Economics,* 31:349-57.

Mark, Darrell R., Ted C. Schroeder, and Rodney Jones. 2000. Identifying Economic Risk in Cattle Feeding. *Journal of Agribusiness,* 18(3):331S344.

McDonald, J.H. 2009. Handbook of Biological Statistics Second Edition. Sparky House Publishing.

National Agriculture Statistics Service (NASS), United States Department of Agriculture. 2010. "*Overview of the United States Cattle Industry*". http://usda.mannlib.cornell.edu/usda/current/USCatSup/USCatSup-12-17-2010.pdf Assessed March 2011

Popp, Michael P., Merle D. Faminow, and Lucas D. Parsch. 1998. Adoption of Backgrounding on Cow-calf Farms. Annual AAEA Meetings (August).

Radostits, Otto M. 2001. Herd Health: Food Animal Production Medicine Third Edition. W.B. Saunders Company.

Reda-Wilson, Kimberly, Wayne D. Pucell, Robert O. Burton, and Mark Walhberg. 1994. Managing Livestock Production: A practical management manual for farmers or ranchers. Deere & Company Service Publications.

Saskatchewan Agriculture, Food and Rural Revitalization. 2003. "*Backgrounding Beef Cattle in Saskatchewan"*. http://www.agriculture.gov.sk.ca/Default.aspx?DN=9159a536-5132-4815-ac15-c99d4374dd9e Assessed January 2011.

Schroeder, Ted, James Mintert, Frank Brazle, and Orlen Grunewald. 1988. Factors Affecting Feeder Cattle Price Differentials. *Western Journal of Agricultural Economics*, 13(1): 71-81.

Schmitz, Troy G., Charles B. Moss, and Andrew Schmitz. 2003. Marketing channels compete for U.S. stocker cattle. *Journal of Agribusiness* 21(2):131-148.

Van Tassell, Larry W., Scott M. McNeley, Michael D. MacNeil, Robert E. Short, Elaine E. Grings. 1997. Retained Ownership of Beef Cattle When Considering Production and Price Risk. Western Agricultural Economics Association 1997 Annual Meeting (July).

Appendix A - 2008 National Stocker Survey

NATIONAL STOCKER SURVEY

MANAGEMENT/OPERATION

1. Which is the most appropriate description of your operation:

1 ☐ 100% stocker/backgrounder cattle operation
2 ☐ Stocker/backgrounder operation with cow/calf operation
3 ☐ Stocker/backgrounder operation with feedlot
4 ☐ Stocker/backgrounder operation with cow/calf and feedlot

2. Do you have an off farm job? 1 ☐ No 2 ☐ Yes

3. Do you farm row crops? 1 ☐ No 2 ☐ Yes

4. Do you run stockers or background cattle year round? 1 ☐ No 2 ☐ Yes

5. For this operation, I am the :

1 ☐ Owner 3 ☐ Owner and manager
2 ☐ Manager 4 ☐ Other *(specify)*:_____

6. My age is:

1 ☐ <25 2 ☐ 25-34 3 ☐ 35-44 4 ☐ 45-54 5 ☐ 55-64 6 ☐ >64

7. Which of the following best describes your operation?

1 ☐ Family operation 2 ☐ Corporate operation

8. What percent of annual gross income is derived from stocker/backgrounding operation?

1 ☐ 0% 2 ☐ 1-25% 3 ☐ 26-50% 4 ☐ 51-75% 5 ☐ 76-100%

9. I have actively purchased/managed beef stockers/backgrounders for the past :

1 ☐ 5 years or less 3 ☐ 11 to 20 years 5 ☐ 31 to 40 years
2 ☐ 6 to 10 years 4 ☐ 21 to 30 years 6 ☐ More than 40 years

10. Please indicate the number of stockers/backgrounders you have owned or managed (annual marketing) for each of the past five years and your expected number of head in 2007 & 2008.

	None	1 to 199	200 to 499	500 to 999	1,000 to 2,499	2,500 to 4,999	5,000 to 6,999	7,000 to 9,999	10,000 to 19,999	20,000 or more
2002	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐
2003	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐
2004	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐
2005	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐
2006	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐
2007	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐
2008	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐

11. In a typical year - a. How many days are your stocker/backgrounder cattle on each of the forage source categories in the table below?
b. Indicate the days a supplement is typically fed while on this forage source.
c. The percentage of your total cattle numbers per year that fall into this category. *(Total should equal 100%)*

	a. Days on each forage source	b. Days a supplement fed with forage	c. Average percent of total cattle
Cool season grass pasture – tame cool season grasses such as brome, fescue, perennial ryegrass, etc.	_____		_____%
Warm season grass pasture – primarily native grass such as switchgrass, big bluestem, etc.	_____	_____	_____%
Warm season annual – annuals planted specifically for cattle grazing such as Sudan	_____	_____	_____%
Fall cereal pasture – cereal grain pastures such as winter wheat, oats or ryegrass	_____	_____	_____%
Dormant winter feed – stockpiled dormant forage and crop residue	_____	_____	_____%
Dry lot (bunk fed forage) – confined management that relies on harvested feed rather than grazing	_____	_____	_____%
Other *(specify)*: _____	_____	_____	_____%

12. Please indicate the percentage of stocker/backgrounder cattle that fall into each of the ownership categories listed:

	% of cattle
Sole-owner	_____
Partnership	_____
Managed for another owner (custom)	_____

13. Typically, what percent of your stockers/backgrounders do you retain ownership in through harvest?

_____% retained

14. The average length of time you typically own/manage a group of stockers/backgrounders? *(☒ one)*

1 ☐ 30 days or less 4 ☐ 91 to 120 days 7 ☐ 181 to 240 days
2 ☐ 31to 60 days 5 ☐ 121 to 180 days 8 ☐ More than 240 days
3 ☐ 61to 90 days

15. Is length of time you own/manage a group stockers/backgrounders based on: *(☒ all that apply)*

1 ☐ Desired selling weight 3 ☐ Desired profit/head
2 ☐ Grazing period 4 ☐ Other
(specify): _____

PROCUREMENT

16. What percent of your 2007 stockers/backgrounders are:

Steers	Heifers	Cutter bulls	Cull cows/heiferettes
_____%	_____%	_____%	_____%

17. What best describes your typical procurement/stocker purchasing behavior? *(☒ one)*

1 ☐ Buy calves that are below average market price (straightening out other people's problems)
2 ☐ Buy calves that are average market price
3 ☐ Buy calves that are higher than average market price

18. What percentage of stocker cattle do you typically run with the intentions of marketing them into a value-added branded beef program (like CAB, Rancher's Renaissance, Laura's Lean, etc.)?

1 ☐ 0% 2 ☐ 1-25% 3 ☐ 26-50% 4 ☐ 51-75% 5 ☐ 76-100%

19. What percentage of the stocker cattle described in #18 fit into the following categories? (cattle can be in more than one category)

_____% Never implanted
_____% Never treated with an injectable antibiotic
_____% Never fed an antibiotic

20. For the cattle described in #18, for what specific attributes do you require certification/verification from your suppliers?
(☑ all that apply)

1☐ Source verification 2☐ Genetic verification
3☐ Age verification 4☐ Other *(specify)*:_____

21. If you require any certification/verification, do you require verification via Quality Systems Assessment (QSA) or Process Verified Program (PVP) programs?

1☐ No 2☐ Yes

22. In the last two years, what is the average pay weight of the typical stocker cattle arriving at and departing from your operation?

Arrival weight: _____ lbs Departure weight: _____ lbs

23. Please indicate in which state or states you typically run the majority of your stocker/backgrounder cattle.

State

_____
_____
_____

24. The stocker cattle in this operation typically come from…

(indicate percentages)	0%	1 to 25%	26 to 50%	51 to 75%	76 to 100%
My cowherd	1☐	2☐	3☐	4☐	5☐
Local livestock market	1☐	2☐	3☐	4☐	5☐
In-state order buyer	1☐	2☐	3☐	4☐	5☐
Out of state order buyer	1☐	2☐	3☐	4☐	5☐
Regional livestock market	1☐	2☐	3☐	4☐	5☐
Directly from a cow/calf producer	1☐	2☐	3☐	4☐	5☐
Directly from a stocker/ backgrounding operation other than this one	1☐	2☐	3☐	4☐	5☐
Video auction	1☐	2☐	3☐	4☐	5☐
Directly from a preconditioning operation	1☐	2☐	3☐	4☐	5☐
Custom grazed for a third party	1☐	2☐	3☐	4☐	5☐

25. The stocker cattle I typically purchase/manage are native to:

(indicate percentages)	0%	1 to 25%	26 to 50%	51 to 75%	76 to 100%
Southeast (FL, GA, AL, MS, AR, LA, KY & TN)	1☐	2☐	3☐	4☐	5☐
Mid-Atlantic (NC, SC, VA, PA, WV & MD)	1☐	2☐	3☐	4☐	5☐
Midwest (KS, MO, IA, MN, NE & IL)	1☐	2☐	3☐	4☐	5☐
Southwest (TX, OK, AZ & NM)	1☐	2☐	3☐	4☐	5☐
West (MT, WY, CO, SD, ND & ID)	1☐	2☐	3☐	4☐	5☐
Far West (CA, NV, UT, OR & WA)	1☐	2☐	3☐	4☐	5☐
Any state not mentioned	1☐	2☐	3☐	4☐	5☐
Mexico	1☐	2☐	3☐	4☐	5☐
Canada	1☐	2☐	3☐	4☐	5☐

26. What percentage of anticipated sickness-morbidity due to BRD do you consider low, medium and high risk in a group of incoming calves?

High Risk	_____	%
Medium Risk	_____	%
Low Risk	_____	%

27. What percentage of incoming stocker cattle you typically receive fall into each of the categories you defined in question 26?

High Risk	_____	%
Medium Risk	_____	%
Low Risk	_____	%

28. Typically, how many hours are the stocker calves you purchase hauled (in a truck or trailer) from the collection point to your operation or processing facility?

1☐ Less than 2 hours 2☐ 6 to 9 hours 3☐ More than 14 hours
4☐ 2 to 5 hours 5☐ 10 to 14 hours

29. How important is each factor in assessing the risk for BRD?

	Importance						
	Low						High
Origin	1	2	3	4	5	6	7
Level of commingling	1	2	3	4	5	6	7
Time spent assembling load	1	2	3	4	5	6	7
Distance hauled	1	2	3	4	5	6	7
Weather during transit	1	2	3	4	5	6	7
Visual evaluation	1	2	3	4	5	6	7
Rectal temperature	1	2	3	4	5	6	7
Health history	1	2	3	4	5	6	7
Buyer history	1	2	3	4	5	6	7

RECEIVING

30. What percent of your incoming stocker cattle are tested for Persistently Infected Bovine Viral Diarrhea Virus (PI-BVDV)?

_____% tested for PI-BVDV (enter 0 if no testing is done)

31. If cattle are tested, for PI-BVDV, when is the test conducted?

1☐ Prior to arriving at your operation
2☐ Within 2 days of arrival at your operation
3☐ 3 to 14 days at your operation
4☐ More than 14 days of at your operation

32. What method do you typically use to deal with stocker cattle that test positive for PI-BVD?

1☐ Separate and market at sale barn without identifying them as PI animals
2☐ Separate and market as PI animals at sale barn
3☐ Separate and market to feedlots managing groups of PI animals
4☐ Euthanize
5☐ Separate and feed out on your own

33. When are the cattle you manage typically processed?

1☐ Before shipment to me 4☐ 4-7 days after arrival
2☐ Never 5☐ 8-14 days after arrival
3☐ On Arrival (same day) 6☐ More than 14 days after arrival
4☐ The day after arrival 7☐ Other
5☐ 2-3 days after arrival *(specify)*: _____

34. When do you typically use the following management practices?
(☑ all that apply)

	Pre-shipment to your operation	On arrival	2 to 14 days after arrival	15 days or more after arrival	Do not use
Surgical castration	1☐	2☐	3☐	4☐	5☐
Non-surgical castration	1☐	2☐	3☐	4☐	5☐
Tip Horns	1☐	2☐	3☐	4☐	5☐
Mechanical dehorning	1☐	2☐	3☐	4☐	5☐
Chemical dehorning	1☐	2☐	3☐	4☐	5☐
Implant	1☐	2☐	3☐	4☐	5☐
Re-implant	1☐	2☐	3☐	4☐	5☐
Vaccination	1☐	2☐	3☐	4☐	5☐
Deworming	1☐	2☐	3☐	4☐	5☐

Receiving Nutrition/Management

35. Within the first 48 hours, my cattle typically are placed…:

1 ☐ Directly on pasture
2 ☐ Directly into a dry lot
3 ☐ Directly into a dry lot prior to moving to pasture
4 ☐ In a grass trap/small pasture for observation prior to being moved to a pasture
5 ☐ In a grass trap/small pasture for observation prior to being moved to a dry lot

36. Do you typically feed a complete receiving ration to newly arrived cattle? *A complete receiving ration is fed to newly received cattle that contains roughage, protein and energy.*

1 ☐ No
2 ☐ Yes - **If yes, is it typically:**

1 ☐ A complete commercial feed delivered to your operation
2 ☐ Mixed on farm with a combination of purchased and on-farm ingredients

37. I typically feed my receiving diet to newly arrived cattle for…

1 ☐ 1-7 days
2 ☐ 8-14 days
3 ☐ 15-21 days
4 ☐ 22-28 days
5 ☐ More than 28 days

38. Which feed additives are typically included in your receiving ration? *(☑ all that apply)*

1 ☐ Aureomycin (CTC)
2 ☐ Terramycin (OTC)
3 ☐ Vitamin/Mineral
4 ☐ Bovatec
5 ☐ V-Max
6 ☐ Gainpro
7 ☐ Probiotic
8 ☐ Other *(specify)*:_____
9 ☐ Rumensin
10 ☐ Deccox
11 ☐ Salt
12 ☐ MGA
13 ☐ Yeast

39. After your receiving ration, do you feed an ionophore (Bovatec, Rumensin, etc.) to your stocker cattle?

1 ☐ No
2 ☐ Yes - **If yes, which one?**

1 ☐ Bovatec
2 ☐ Rumensin
3 ☐ Other

40. How is the ionophore delivered to the stocker cattle? *(☑ all that apply)*

1 ☐ Free-choice loose mineral
2 ☐ Complete commercial feed delivered daily
3 ☐ Supplement/pre-mix included in a total mixed ration
4 ☐ Supplement hand-fed (i.e., two pounds/head/day)
5 ☐ Self-feeder (commercial or site-prepared bulk feed with pre-mix—feeder re-filled less than daily)
6 ☐ Free choice block
7 ☐ Free choice mineral tub (200-250#)
8 ☐ Free choice protein tub (200-250#)

42. What percentage of stocker cattle in your operation do you typically treat for BRD as a group, either metaphylactically, on-arrival, or mass medicated within the first two weeks of arrival with each of the following methods (enter 0 if you do not use a specific method)

_____ % Injectable antibiotic
_____ % Antibiotic bolus
_____ % Feed grade antibiotic mixed in the ration
_____ % Top-dress (crumbles, pellets on top of a ration)
_____ % Water-medication

43. How important are each of the following factors in choosing an injectable antibiotic for treating BRD

	Importance						
	Low						High
Reduces retreats and repulls	1	2	3	4	5	6	7
Fast acting	1	2	3	4	5	6	7
Long lasting	1	2	3	4	5	6	7
Low cost per treatment	1	2	3	4	5	6	7
Decreased labor when handling	1	2	3	4	5	6	7
Performance of cattle	1	2	3	4	5	6	7
Fits Beef Quality Assurance guidelines	1	2	3	4	5	6	7
Product track record	1	2	3	4	5	6	7
Easy to use in cold weather	1	2	3	4	5	6	7
Human safety concerns	1	2	3	4	5	6	7

Health

44. How often do you typically consult with your veterinarian? *(☑ one)*

1 ☐ Never. I don't use a veterinarian
2 ☐ Only in an emergency
3 ☐ Once a year
4 ☐ A couple times a year
5 ☐ Once a month
6 ☐ On every group of cattle

45. What performance measures do you routinely collect, monitor and calculate for each group of stockers/backgrounders that you own/manage *(☑ all that apply)*

1 ☐ Group Average Daily Gain
2 ☐ Feed efficiency (conversion)
3 ☐ Group morbidity percentage
4 ☐ Group mortality percentage
5 ☐ Group chronic percentage
6 ☐ Cost of gain
7 ☐ Value of gain
8 ☐ Individual weight on arrival/processing
9 ☐ Group weight on arrival/processing
10 ☐ Profit/Loss
11 ☐ Individual weight between arrival and shipping
12 ☐ Individual weight at shipping
13 ☐ Group weight between arrival and shipping
14 ☐ Group weight at shipping
15 ☐ Individual Average Daily Gain
16 ☐ Other *(specify)*:
_____

46. Within the first month after arrival, my typical pull rate due to BRD is:

1 ☐ Less than 5%
2 ☐ 5 – 10%
3 ☐ 11 – 20%
4 ☐ 21 – 30%
5 ☐ 31 – 50%
6 ☐ More than 50%

47. After pulling and treating cattle for BRD, do you: *(☑ one)*

1 ☐ Send cattle to hospital pen
2 ☐ Return to home group

48. Within the first 90 days after arrival, my typical death loss due to all causes is:

1 ☐ Less than 1%
2 ☐ 1 – 3%
3 ☐ 4 – 5%
4 ☐ More than 5%

49. Indicate the percentage of stocker cattle in your operation you typically treat for the following conditions.
(enter 0 if you do not treat for a condition)

	% of stocker cattle		% of stocker cattle
Pneumonia or other respiratory diseases	_____	Footrot, lameness or other joint problems	_____
Confirmed mycoplasma pneumonia	_____	Lice and/or grubs	_____
Castration infection	_____	Eye problems (pinkeye)	_____
Dehorning complications	_____	Abscesses or wounds	_____
Coccidiosis	_____	Internal parasites (other than processing)	_____
Arthritis	_____	Scours or diarrhea	_____
Bloat	_____	Adverse reaction to health products	_____
Flies	_____		

50. When do you usually administer the following to your cattle? *(☑ all that apply)*

	Pre-shipment to your operation	On arrival	2 to 14 days after arrival	15 days or more after arrival	Do not use
Antibiotics- mass medicated (group treated)	1☐	2☐	3☐	4☐	5☐
Antibiotics (only sick cattle as needed)	1☐	2☐	3☐	4☐	5☐
Clostridial vaccines (Blackleg, 7-way)	1☐	2☐	3☐	4☐	5☐
Fly control products	1☐	2☐	3☐	4☐	5☐
Implants	1☐	2☐	3☐	4☐	5☐
Ionophores such as Rumensin, Bovatec	1☐	2☐	3☐	4☐	5☐
Coccidiostats (other than ionophores)	1☐	2☐	3☐	4☐	5☐
Lice/grub control products	1☐	2☐	3☐	4☐	5☐
Pasteurella vaccines	1☐	2☐	3☐	4☐	5☐
Other vaccines (haemophilus, pinkeye)	1☐	2☐	3☐	4☐	5☐
Probiotics (yeast, bacteria, etc.)	1☐	2☐	3☐	4☐	5☐
Viral respiratory vaccines (IBR, BVD, BRSV PI3)	1☐	2☐	3☐	4☐	5☐
Others *(specify):* _____	1☐	2☐	3☐	4☐	5☐

51. Do you vaccinate your cattle?
1☐ Yes
2☐ No - **If no, what best describes the primary reason you do not vaccinate them?** *(☑ one)*
1☐ I have minimal health problems on arrival
2☐ I don't believe vaccines work
3☐ I handle older, heavier cattle
4☐ Lack of facilities to process cattle
5☐ Vaccine costs outweigh the benefits
6☐ Calves are vaccinated before purchase
7☐ Other
(specify): _____

52. Which implant do you most frequently use?

First Implant	Re-implant
1☐ I do not implant	13☐ I do not re-implant
2☐ Ralgro	14☐ Ralgro
3☐ Ralgro Magnum	15☐ Ralgro Magnum
4☐ Synovex S or H	16☐ Synovex S or H
5☐ Synovex-C	17☐ Synovex-C
6☐ Component E-S or H	18☐ Component E-S or H
7☐ Component E-C	19☐ Component E-C
8☐ Revalor-G	20☐ Revalor-G
9☐ Component TE-G	21☐ Component TE-G
10☐ Compudose	22☐ Compudose
11☐ Encore	23☐ Encore
12☐ Other	24☐ Other
(specify): _____	*(specify):* _____

53. If you do not implant your cattle at all, indicate which best describes the primary reason? *(☑ one)*
1☐ Lack of facilities
2☐ Availability of labor
3☐ No perceived benefit
4☐ Price of implant
5☐ Other *(specify):*
6☐ Want to keep them eligible for the "natural" beef market
7☐ Subsequent cattle owner requests/ requires non-implanted cattle

_____

54. If you routinely implant, how important are the following factors affecting your implant purchase decisions?

	Importance						
	Low						High
Type of implant gun	1	2	3	4	5	6	7
Brand	1	2	3	4	5	6	7
Availability (access from local supplier)	1	2	3	4	5	6	7
Price per dose	1	2	3	4	5	6	7
Size (weight of cattle)	1	2	3	4	5	6	7
Age of cattle (calves vs. yearlings)	1	2	3	4	5	6	7
Buying the same product I always have	1	2	3	4	5	6	7
Subsequent ownership of cattle (sell vs. retaining ownership)	1	2	3	4	5	6	7
Cattle performance history	1	2	3	4	5	6	7
Active ingredients	1	2	3	4	5	6	7
Other *(specify):*	1	2	3	4	5	6	7

_____

NUTRITION

56. For what percent of your stocker cattle do you typically limit feed (fixed level of feed based on their body weight) *(enter 0 if you do not limit feed)*

_____% of stocker cattle limit-fed

MARKETING

57. How do you typically market your cattle? (indicate percentage of stocker cattle sold)

	1 to 25%	26 to 50%	51 to 75%	76 to 100%	0% - Don't use
Video auction	1☐	2☐	3☐	4☐	5☐
Forward contract	1☐	2☐	3☐	4☐	5☐
In-state order buyer	1☐	2☐	3☐	4☐	5☐
Out of state order buyer	1☐	2☐	3☐	4☐	5☐
Local livestock market – sale barn	1☐	2☐	3☐	4☐	5☐
Regional livestock market – sale barn	1☐	2☐	3☐	4☐	5☐
Feed them out in my own feedyard	1☐	2☐	3☐	4☐	5☐
Retain ownership in another feedyard (custom fed)	1☐	2☐	3☐	4☐	5☐
Retain ownership to another stocker	1☐	2☐	3☐	4☐	5☐
Directly to a feedlot – no retained ownership	1☐	2☐	3☐	4☐	5☐
Directly to another stocker – no retained ownership	1☐	2☐	3☐	4☐	5☐
Custom operation (paid for a service/performance)	1☐	2☐	3☐	4☐	5☐

58. Regardless of whether you retain ownership…for what percentage of the stocker cattle you produce do you receive feedlot performance data?

1☐ 0% 2☐ 1-25% 3☐ 26-50% 4☐ 51-75% 5☐ 76-100%

b. For what percentage of the stocker cattle you produce do you receive carcass data?

1☐ 0% 2☐ 1-25% 3☐ 26-50% 4☐ 51-75% 5☐ 76-100%

59. What sources do you rely on most for your market information (sale and purchase price of cattle)? *(☑ all that apply)*

1☐ Cattle-Fax
2☐ USDA report
3☐ DTN
4☐ Local sale barn
5☐ Order buyer
6☐ State Association
7☐ Chicago Mercantile Exchange
8☐ Other stocker producers
9☐ Stocker publications and electronic newsletters (i.e. BEEF Stocker Trends)
10☐ Local newspaper
11☐ Other *(specify)*:_____

RISK MANAGEMENT

60. Which practices do you use to manage market risk? *(☑ all that apply)*

1☐ Buying high quality cattle
2☐ Focus on low cost production
3☐ Forward contracting inputs/outputs
4☐ Futures market contracts
5☐ Livestock Risk Protection Insurance
6☐ Livestock Gross Margin Insurance
7☐ Buying cheap cattle
8☐ Options on futures
9☐ Retained ownership
10☐ Custom operation
11☐ Other *(specify)*:_____

61. Which best describes how you typically test and adopt new products and technologies for your stocker operation? *(☑ one)*

1☐ I am often the first one in my area to try new products and technology
2☐ I usually let some one else in my area be the first, and then I watch and learn from their experiences.
3☐ I wait until new products and technology are completely proven before I will try them.
4☐ I avoid new products and technology all together

COMMUNICATION/EDUCATION

62. How much do you trust the following SOURCES of stocker management information? *(please circle a number for each source)*

	Low			Trust			High
Animal health manufacturer sales representatives	1	2	3	4	5	6	7
Animal health manufacturer technical service representatives	1	2	3	4	5	6	7
Animal health distributor representatives	1	2	3	4	5	6	7
Beef industry trade journal	1	2	3	4	5	6	7
Extension agents	1	2	3	4	5	6	7
Feed company sales representatives	1	2	3	4	5	6	7
Feed company technical service representatives	1	2	3	4	5	6	7
My local veterinarian	1	2	3	4	5	6	7
Non-local (consulting) veterinarian	1	2	3	4	5	6	7
Other stocker producers	1	2	3	4	5	6	7
Order buyer	1	2	3	4	5	6	7
State livestock association	1	2	3	4	5	6	7
Stocker specific trade journal	1	2	3	4	5	6	7
University professors/Area or state extension specialists	1	2	3	4	5	6	7

63. How much do you trust each of the following METHODS for receiving stocker management information? *(circle a number for each method)*

	Low			Trust			High
Email – Electronic newsletters	1	2	3	4	5	6	7
Face-to-face discussions	1	2	3	4	5	6	7
Medium meeting/seminar (between 10 and 30 participants)	1	2	3	4	5	6	7
Large meeting/seminar (more than 30 participants)	1	2	3	4	5	6	7
Podcasts (from Internet)	1	2	3	4	5	6	7
Printed brochure	1	2	3	4	5	6	7
Printed magazine	1	2	3	4	5	6	7
Printed newsletter	1	2	3	4	5	6	7
Printed technical bulletin	1	2	3	4	5	6	7
Small meeting/seminar (less than 10 participants)	1	2	3	4	5	6	7
Website – the Internet	1	2	3	4	5	6	7

65. a. How important are the following topics to you?
b. What quantity of information is available to you on the following topics?
c. What is the quality of information that is available to you on the following topics?

	Importance							Information quantity							Information quality						
	Low						High	Low						High	Low						High
Feeder cattle prices	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Animal health management	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Basis (difference between cash & futures prices)	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Borrowing money (access to capital)	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Cattle procurement	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Environmental regulations	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Establishing contractual relationships with buyers	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Establishing contractual relationships with suppliers	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Finding labor	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Impact of stocker practices on beef quality	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Keeping labor	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Marketing practices	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Nutrition	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Trends in land values	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7

Potential Limiting Factors

66. What is the level of risk the following factors have on limiting your ability to compete in the stocker business during the next five years?

	Risk						
	Low						High
Ability to borrow money (working capital)	1	2	3	4	5	6	7
Availability of cattle that fit my operation	1	2	3	4	5	6	7
Environmental regulations	1	2	3	4	5	6	7
Health management costs	1	2	3	4	5	6	7
Labor availability	1	2	3	4	5	6	7
Labor cost	1	2	3	4	5	6	7
Land available for lease	1	2	3	4	5	6	7
Land purchase price	1	2	3	4	5	6	7
Land lease price	1	2	3	4	5	6	7
Marketing cost	1	2	3	4	5	6	7
Procurement cost (not cattle price)	1	2	3	4	5	6	7
Urban encroachment	1	2	3	4	5	6	7
Managing price risk	1	2	3	4	5	6	7
Weather	1	2	3	4	5	6	7
Input costs (feed costs)	1	2	3	4	5	6	7
Other Input costs (fertilizer costs)	1	2	3	4	5	6	7
Risk management tools for managing price risk	1	2	3	4	5	6	7
My age or physical limitations	1	2	3	4	5	6	7
Cattle health problems	1	2	3	4	5	6	7
Potential Return on Investment	1	2	3	4	5	6	7
Other *(specify:)*	1	2	3	4	5	6	7

_____

Thank-you for participating in the National Stocker Study.
Please return your survey in the postage-paid return envelope.

Appendix B - Wilcoxon P-Value Table

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
A	1.00													
B	0.00	1.00												
C	0.00	0.00	1.00											
D	0.00	0.00	0.01	1.00										
E	0.00	0.00	0.00	0.40	1.00									
F	0.00	0.00	0.00	0.78	0.42	1.00								
G	0.00	0.00	0.00	0.31	0.74	0.24	1.00							
H	0.00	0.00	0.39	0.00	0.00	0.00	0.00	1.00						
I	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.12	1.00					
J	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00				
K	0.00	0.00	0.96	0.00	0.00	0.00	0.00	0.28	0.00	0.00	1.00			
L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00		
M	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	
N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.00	0.00	0.00	1.00

The letters A-N are the topics used in question 65a. The p-values were used to determine which topics should be modeled in Chapter 4.