OKLAHOMA CATTLEMEN'S ASSOCIATION MEMBERS' PERCEPTIONS OF THE NATIONAL ANIMAL IDENTIFICATION SYSTEM

BY

BRILEY K. ELLIOTT

Bachelor of Science in Agricultural and Extension Education

New Mexico State University

Las Cruces, New Mexico

2006

Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
MASTER OF SCIENCE
December 2007

OKLAHOMA CATTLEMEN'S ASSOCIATION

MEMBERS' PERCEPTIONS OF THE NATIONAL

ANIMAL IDENTIFICATION SYSTEM

Thesis Approved:

Dr. Shelly Sitton

Thesis Adviser

Dr. Dwayne Cartmell

Dr. Chris Richards

Dr. A. Gordon Emslie

ACKNOWLEDGMENTS

When I started the graduate program at Oklahoma State University in January 2006, I never imagined the journey on which I was about to embark. I had no idea I would learn so much, not only in the academic world, but also in real life. It has been an eye-opening experience that has allowed me to grow and develop as an individual and as a professional. I have been blessed with the opportunity to work with wonderful people and have the unlimited support of close friends and family. I would like to give credit to them.

To my adviser, Dr. Shelly Sitton – we made it! Thank you so much for your time, hard work, and dedication. I know I have been a challenge since I left in May to complete my graduate work from a distance. You have become not only my adviser and mentor but also a close friend. Thank you for your motivation and in helping to keep things in perspective.

To my committee member, Dr. Dwayne Cartmell – thank you for your guidance and wisdom throughout my time at OSU. Your door has always been open to answer questions and provoke further thought into theories and processes in the academic world. Thank you for teaching me to "think outside the box."

To my committee member, Dr. Chris Richards – thank you for providing insight into the "bigger picture" in the beef industry. Your wealth of knowledge in the subject matter and dedication to helping me complete the research is greatly appreciated.

To my dear friend, Cheramie Viator – you have helped me to succeed in so many ways. You have taught me survival skills since I started my first "big kid" job, and your constant motivation has been extremely encouraging. Thank you for reminding me the light at the end of the tunnel is not necessarily a train!

To my best friend, Sara Calhoun – you have been a shoulder to lean on and an ear to listen when I needed one. You have been there to get me through the tough times and remind me things will be better in the end. Thank you for being a sounding board for thoughts and ideas and for helping see the positive in all of life's obstacles.

Finally, I would like to thank my family, Mom, Dad, and Brynn – your constant love and support mean more to me than you will ever know. You have been a source of strength when I needed it and I am truly blessed to have been given the opportunities I have because you have encouraged me to pursue my goals and dreams. Without you, I would not be who I am today.

The journey through my master's program has been a growing experience. I have learned things about myself and I have come to realize determination and motivation often walk hand-in-hand.

TABLE OF CONTENTS

Chapter Page

LIST OF TABLES

Table Page

LIST OF FIGURES

Figure Page

CHAPTER I

INTRODUCTION

The threat of zoonotic diseases in the food animal industry has brought traceability to the forefront in the agricultural sector (Slade, 2004). Specifically, bovine tuberculosis (TB), foot-and-mouth disease (FMD), and bovine spongiform encephalitis (BSE) incidents have increased awareness of contagious diseases in the beef industry (Animal and Plant Health Inspection Service, 2007). The United States Department of Agriculture (USDA) has tested 787,000 head of cattle for TB since 2004 (APHIS, 2007). More than 25,000 of those cattle have been euthanized due to outbreaks of TB found in California, New Mexico, Texas, Arizona, Michigan, and Minnesota (APHIS, 2007). Furthermore, the threat of a BSE outbreak has resulted in the loss of 80 percent of U.S. foreign trade (APHIS, 2007). The USDA has spent $5 million on BSE initial response efforts, investigation of possible outbreaks, and depopulation of cattle (APHIS, 2007). Implementation of an improved program for the analysis of BSE outbreaks has caused the USDA to spend close to $189 million in an attempt to reopen trade with foreign countries (APHIS, 2007). As a result, cattle producers raising livestock to enter the human food chain are becoming more accountable for the livestock leaving the farm or ranch (Slade, 2004).

This accountability is, in part, influenced by the development of the National Animal Identification System (NAIS). The USDA and APHIS developed this program to provide traceback for food animals from harvest to the place of origin (APHIS, 2007).

This national system is being implemented to combine different protocols into one uniform system of identification (USDA, 2006; APHIS, 2007). After careful review of the current system, the USDA found several improvements could be made to increase the efficiency and advance the technology of the system (APHIS, 2007). The NAIS is in the early stages of implementation on a voluntary basis (USDA, 2006).

Premise identification is the first step in the implementation process (USDA, 2006; Slade, 2004). The ability to trace cattle to the premise of origin becomes extremely important if an outbreak of a disease occurs (APHIS, 2007; Slade, 2004).

> An optimal traceability infrastructure uses modern technologies to collect, store and make available data that animal health officials need to conduct animal disease surveillance, eradication and control programs. A highly reliable, complete and cost-effective information system equips officials to trace the movement of diseased animals, and identify and contain other potentially exposed animals. Fundamental to this system is accurate and accessible identification of as many animals as possible within a population. (APHIS, 2007, p. 1)

The efficiency in finding the diseased animal, locating all premises it may have contaminated, and tracing all animals that have come in contact with the infected animal is important to halting the spread of a disease (APHIS, 2007). Without a quick response, a small outbreak could quickly become a major contamination issue in the United States (APHIS, 2007).

As of September 15, 2007, the NAIS Premises Registration Statistics reported 416,178 premises registered in the United States. This is 28.9 percent of the 1.4 million livestock premises identified in the United States. Each state is responsible for

registering premises identification for its residents. Wisconsin and Idaho are the two leading states in premises registration (APHIS, 2007).

Several factors, including cost and concerns of who will have access to the database of information, may have producers contemplating the true value of participating in a traceability program (Slade, 2004). The lack of knowledge of specific producer concerns is inhibiting the growth of participation in the program (Slade, 2004).

Because many unknown factors exist, it becomes a challenge to convince producers to comply with the program (Slade, 2004). Thus, reasons behind the lack of voluntary participation need to be explored to further gain support from the beef industry (Breiner, et al., 2007). Issues such as these directly affect the adoption of the program (Slade, 2004).

> Producer groups are another key stakeholder in the development of the NAIS, because producers will bear some or all of the cost of implementation. Consequently, producer organizations likely reflect producer attitudes about animal ID programs. In addition to covering costs for implementation of the NAIS, producers also have considerable political influence with the U.S. government (Slade, 2004, p. 20).

State producer organizations will represent cattle producers at the government level and will have an impact on member participation in NAIS (Slade, 2004). By understanding the issues affecting the adoption rate of the NAIS, the industry can better educate and comprehend concerns producers have (Breiner et. al., 2007).

Little research is available to explain the perceptions and awareness of Oklahoma cattlemen and cattlewomen have toward the NAIS or to explain the reason for the slow

adoption rate of the NAIS. Therefore, this study will address the lack of information available concerning producer participation in the voluntary NAIS.

Purpose

The purpose of this study was to determine Oklahoma Cattlemen's Association (OCA) members' awareness of the National Animal Identification System and livestock traceability as it pertains to marketing and to determine their perceptions and concerns toward the implementation of this program.

Objectives

This study sought to answer the following objectives regarding marketing, traceability, and the implementation of the NAIS:

1. To identify specified characteristics of OCA members;
2. To determine the OCA members' awareness and perceptions of the NAIS;
3. To identify OCA members' perceptions of marketing cattle in regard to traceability; and
4. To determine relationships between selected characteristics of OCA members and their perceptions of NAIS.

Scope

The scope of this study was the OCA members who attended the 2007 annual convention held in Midwest City, Oklahoma, therefore, providing subjects for a case study. A case study method is defined as:

> gathering and analyzing data about one or a small number of examples as a way of studying a broader phenomenon. This is done on the assumption that the example (the "case") is in some way typical of the broader phenomenon. (Vogt, 2005, p. 38)

Definition of Terminology

The following operational definitions guided this study:

Breadth: The entire information package that was recorded by the traceability system (Golan, Krissoff, Kuchler, Calvin, Nelson, & Price, 2004).

Depth: How far back or forward the traceability system is able to track an animal (Golan et al., 2004).

Precision: The accuracy of the traceability system (Golan et al., 2004).

Radio Frequency Identification (RFID) : Low- frequency radio signals are used to transfer information that is uniquely coded between a transponder and an antenna, and is then transferred to a decoder (McAllister, et. al., 1999).

Traceability: The collection, documentation, maintenance and application of information related to all processes in the supply chain in a manner that provides guarantee to the consumer and other stakeholders on the origin, location and life history of a product as well as assisting in crisis management in the event of a safety and quality breach (Opara, 2003).

Assumptions

The following assumptions were made about the population:

1. Each individual who completed the survey raises beef cattle;
2. Each individual who completed the survey is providing honest responses to the instrument questions; and
3. Respondents participated without any prior knowledge of or bias toward the contents of survey.

Limitations

The following limitations were made about population:

1. The data is based on perceptions of OCA members who attended the 2007 OCA annual convention;
2. The population includes individuals whose primary income is from the cattle industry as well as individuals whose primary income is not from the cattle industry; and
3. Respondents were self-selected to participate in the survey.

Significance

No research could be found regarding the slow rate of adoption of the NAIS as a traceability program. Although the limited scope of this study does not allow it to be generalized to the population beyond its respondents, the OCA as well as state and federal agencies can use the data to help them select methods to assist beef producers in Oklahoma.

Summary

Little research is available that identifies factors of support or nonsupport for the NAIS. State producer organizations will have an impact on the implementation of the national identification system (Slade, 2004).

The ability to trace food animals in cases of disease outbreak was a driving force in the establishment of a national traceback system (APHIS, 2007). Without this advantage, the beef industry may suffer not only from potential disease outbreaks but also from continued inability to export beef to foreign markets (Slade, 2004; APHIS, 2007).

This study determined the perceptions of OCA members about the implementation of the NAIS. It also sought to gain perceptions of advantages and disadvantages of traceability in marketing beef cattle.

CHAPTER II

REVIEW OF LITERATURE

The purpose of the review of literature was to establish the need for determining the Oklahoma Cattlemen's Association members' awareness and perceptions in regard to the NAIS. This was established by addressing research regarding the theoretical framework used, the OCA, traceability, self-administered surveys, and case study research.

Theoretical Framework: Theory of Planned Behavior/Reasoned Action

The theories of reasoned action and planned behavior were developed dependent upon each other. The theory of reasoned action was developed first. A theoretical basis was needed to explain the relationship and/or the affects of attitudes on human behavior (Brown, 2006). Many theories emerged in the early 1900s when psychologists began to study attitude as a separate mental idea (Brown, 2006). Proven effects held true until the 1960s when reexamination of these ideas began to occur.

Several milestones in the early- to mid-1900s played crucial roles in the development of these theories. The first of these specific milestones occurred in 1929 when L.L. Thurston found new methods that would accurately measure attitudes; this new method used scaled intervals (Ajzen & Fishbein, 1980).

Following Thurston's model, Rensis Likert developed a different rating scale using summated ratings. This simplified the process of measuring attitudes. The Likert scale is used extensively today in a variety of research (Ajzen & Fishbein, 1980).

In 1935, Gordon W. Allport furthered ideas about the relationship between attitudes and the effects on behavior (Brown, 2006). He proposed attitudes are comprised of several mental ideas based on feelings toward the action or object and beliefs. Allport helped to revolutionize this idea, although it did not become universally accepted until the 1950s (Brown, 2006).

Icek Ajzen and Martin Fishbein began working together in the 1960s to find methods that would predict behavior and responses based on the attitudes of an individual (Brown, K.M., 2006). Rationality was used as a basis for the attitudes, assuming each person can rationalize his or her own decision making (Brown, 2006). Ajzen (2001) generalized that "attitude represents a summary evaluation of a psychological object captured in such attribute dimensions as good-bad, harmful-beneficial, pleasant-unpleasant, and likable-dislikable" (p. 28). The result of their examination into prediction was the theoretical framework of reasoned action (Ajzen, 2001).

The theory of reasoned action provides the framework that "behavior is determined directly by one's intentions to perform the behavior, and intention, in turn, is influenced by attitudes and by subjective norms" (Bagozzi & Kimmel, 1995, p. 439). Two types of beliefs were brought forth: normative and behavioral. Normative beliefs are subjective to what the individual believes to be the norm for performing a certain behavior (Ajzen & Fishbein, 1980; Bagozzi & Kimmel, 1995). Ajzen and Fishbein (1980) defined subjective norm as "a person's belief that most of her important others

[people important in her life] think she should (or should not) perform the behavior in question" (p. 73). This literature suggested individuals include these subjective norms when making decisions on the intention to complete a behavior. A group or specific individuals have an effect on the decision (Ajzen & Fishbein, 1980). Peer pressure would be an example of this.

Behavioral beliefs affect attitudes about performing the specific behavior (Madden, Ellen, & Ajzen, 1992). These beliefs are referred to as salient beliefs and are viewed as the most important to the individual, recognizing salient beliefs are vital in understanding attitudes that affect behavior (Madden et al., 1992).

Certain outside influences can increase or decrease the effects on the attitude-behavior relationship. According to Madden et al. (1992), Ajzen and Fishbein identified three "conditions" that have the greatest effect:

> (a) the degree to which the measure of intention and the behavioral criterion correspond with respect to their levels of specificity, (b) the stability of intentions between time of measurement and performance of the behavior, and (c) the degree to which carrying out the intention is under the volitional control of the individual. (p. 4)

Volitional control describes the actual will or act of making a decision regarding a certain action or behavior. The specific reference to volitional control defined in the theory of reasoned action led to the development of the theory of planned behavior (Ajzen, 2001).

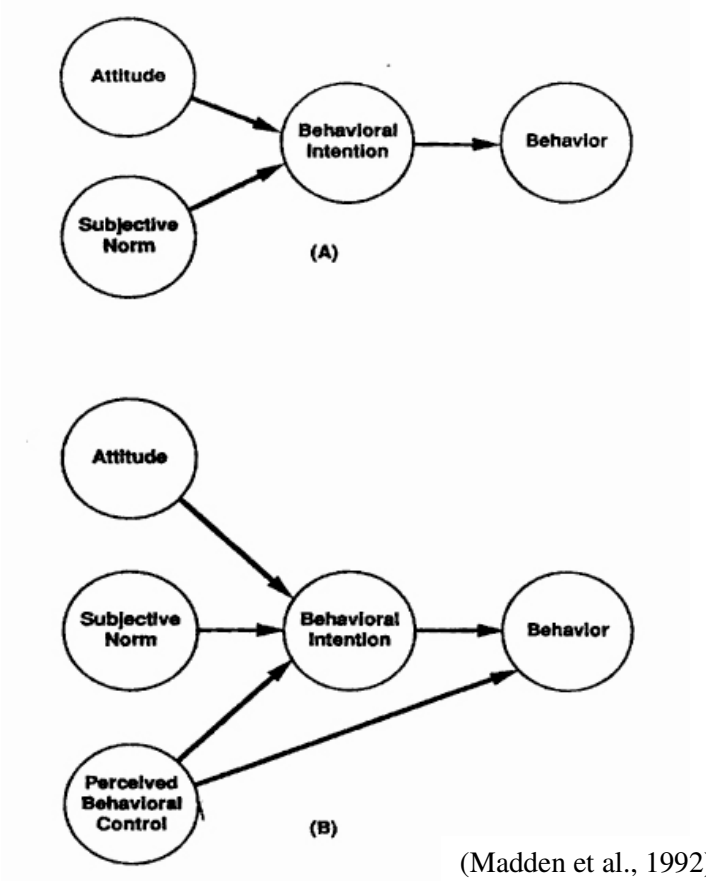
Actions not under complete, willed control needed to be addressed (Bagozzi & Kimmel, 1995). An extension of the reasoned action theory base provides the framework

for the theory of planned behavior (Ajzen, 2001). The new component to the framework was "perceived behavioral control" (Bagozzi & Kimmel, 1995).

This addition corresponds with an individual's perceived idea of the ease of actually performing the specific behavior (Bagozzi & Kimmel, 1995). The perceived ideas include resources as well as opportunities (Madden et al., 1992). The greater or more positive both are perceived, the more likely an individual is to perform the behavior (Madden et al., 1992). According to a study performed by Madden et al. (1992), behavioral control proved to be a significant predictor of the intention to perform a certain behavior.

Figure 1 illustrates the differences and similarities between the two theory bases. Diagram A illustrates the theory of reasoned action. It indicates how attitude combined with the subjective norm both affect the behavioral intention. The behavioral intention then develops into the behavior (Doll & Ajzen, 1992).

Diagram B (see Figure 1) illustrates the theory of planned behavior. The diagrams are similar in indicating the factors that influence the behavioral intention (Doll & Ajzen, 1992). As shown, perceived behavioral control was the addition to the theory of reasoned action. The perception of control the individual believes he has over the intention affects the final behavior, as well (Ajzen, 2001; Doll & Ajzen, 1992).



(Madden et al., 1992)

Figure 1. Path models for the theory of reasoned action (A) and the theory of planned behavior (B).

Determinants of intention are identified within the theory of planned behavior. Doll and Ajzen (1992) offer three distinct determinants. The first is the attitude toward the actual behavior. This determinant "refers to the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question" (Doll & Ajzen, 1992, p. 755). The second is the subjective norm; the individual's impression of social or peer pressure to either follow through with the behavioral performance or to not complete the performance. The final factor is perceived behavioral control (Ajzen, 1991; Doll & Ajzen, 1992; Madden et al., 1992). This factor also takes into account past experience. The general rule was the more positive all three of the individual factors are,

the more likely a person's intentions are to participate in the behavior (Ajzen, 1991; Doll & Ajzen, 1992; Madden et al., 1992).

Personal beliefs play an important role in the theory of planned behavior (Madden, et al., 1992). According to Doll and Ajzen (1992), a function of performing the behavior is the strong beliefs about the behavior. Three types of beliefs were designated: behavioral beliefs, normative beliefs, and control beliefs (Ajzen, 1991). The salient or prominent beliefs one holds about a specific behavior or practice were included. Behavioral beliefs directly affect the attitude toward the behavior. Attributes of a specific behavior are viewed as positive and negative. These encourage the attitude to be positive or negative toward the behavior (Ajzen, 1991).

Normative beliefs refer to the perceived subjective norms of society toward the attitude (Doll & Ajzen, 1992). The strength of the particular normative belief takes into consideration the individual's willingness to comply with the perceived norms (Ajzen, 1991). Control beliefs are the beliefs that give strength to the perception of the behavior control (Doll & Ajzen, 1992). Potentially, these beliefs could be based on prior experience (Ajzen, 1991). Furthermore, outside information about the specific behavior from family, friends, and other people who may be considered experts could affect the perceived control the individual has (Ajzen, 1991).

The basis of beliefs is that people form attitudes from these beliefs toward the action or behavior (Doll & Ajzen, 1992). These beliefs are formed through personal experience and other events that may relate to the performance of behavior (Doll & Ajzen, 1992). Prior experience can play a key role as well. The theory of planned behavior postulates that the information an individual has about the specific action or

behavior (prior experience) highly affects the intentions or beliefs of the individual (Doll & Ajzen, 1992).

Two types of information exist: direct and indirect. It is generally believed direct information has a stronger influence on beliefs and intentions than indirect information does (Doll & Ajzen, 1992). Direct information comes from personal experiences and behaviors.

Although the theory of planned behavior resolved problems with the theory of reasoned action, some issues still remain with the theory of planned behavior. According to Ajzen (1991), relationships have been identified between attitudes and beliefs, subjective norms and behavioral beliefs, and between control beliefs and the perceived ideas of behavioral control. The specific structure of each of the relationships has not been determined. Scaling limitations continue to be an issue regarding the strength of the belief, motivation, the outcome of the intention, and the perceived control (Ajzen, 1991).

Even with these specific limitations, the theories of reasoned action and planned behavior remain useful tools in understanding human behavior toward a specific subject or action (Ajzen & Fishbein, 1980). The need to understand human behavior comes from the desire to change the specific behavior (Ajzen & Fishbein, 1980). For this change to be successful, the individual's beliefs must be changed (Ajzen & Fishbein, 1980).

Research has proven the effectiveness of the theories of planned behavior and reasoned action in predicting attitudes and the affect attitudes have on behavior (Madden et al., 1992). Research can be learned from and directed moves can be made to make changes in attitudes and beliefs about behaviors (Madden et al., 1992).

Several research studies were found in the development of this review of literature that utilized the theory of planned behavior and reasoned action. Hansen, Jensen, and Solgaard (2004) used these two theories to predict consumer behavior in buying groceries online. The results of the study indicated both theories were able to predict consumer behavior adequately (Hansen et al., 2004).

Bosnjak, Obermeier, and Tuten (2006) successfully used the theory of planned behavior and reasoned action to predict online auction participation and bidding tendencies. The theory of planned behavior along with the technology acceptance model was found to predict accurately consumer behavior in participating in online auctions (Bosnjak et al., 2006). These are just two examples of many studies available indicating the theories of planned behavior and reasoned action provide a strong base for predicting consumer behavior.

Oklahoma Cattlemen's Association

According to the National Agricultural Statistics Service (NASS) as of January 2007, the United States had more than 97 million head of dairy and beef cattle combined. Oklahoma ranks fifth in the nation in total cattle and calf production with 5.25 million head.

Of the total beef production operations in the United States, Oklahoma is home to approximately 48,000 locations that house cattle (NASS, 2007). Furthermore, the average herd size in the United States is 40 head (USDA, 2007).

According to Ashlock (2006), 69.72 percent of Oklahoma beef producers are male and have an average age of 59.5 years. This was taken from a range of 24 to 90

years of age. Most of the beef producers in Oklahoma (87.45%) maintain a cow-calf operation.

The Oklahoma Cattlemen's Association (OCA) is the state organization representing cattle producers in Oklahoma and was established in 1952 (OCA, 2005). They provide producers with information, advocate cattle industry improvements, and assist in disease control and eradication (OCA, 2005). They are the state brand registrar contracted by the Oklahoma Department of Agriculture, Food, and Forestry (ODAFF) (OCA, 2005). Although Oklahoma is not a mandatory brand and brand inspection state, the OCA had registered 13,000 brands by 2005. The OCA also manages the Oklahoma Quality Beef Network (OQBN) (OCA, 2005). This program was developed to increase marketing options for Oklahoma cattle producers (OCA, 2005).

The OCA chose to comment on the NAIS strategic plan in July 2005 (OCA, 2005). As an organization, they reported they "fully support the goal of being able to identify animals and premises that have had contact with a foreign or domestic animal disease within 48 hours" (OCA, 2005, p. 1). After several OCA meetings at local, regional, and state levels, the following concerns were reported (OCA, 2005): confidentiality, cost, and a mandatory vs. voluntary system.

In regard to confidentiality, producers had "no faith in the USDA or any other federal agency for that matter being able to keep data confidential" (OCA, 2005, p. 4). In addition to this, cost was an issue. The OCA said its members felt it was "clear that producers will bear the greatest cost associated with the NAIS" (OCA, 2005, p. 4). Furthermore, producers were concerned the NAIS would become mandatory and several

smaller producers said they would leave the cattle industry should the system become mandatory (OCA, 2005).

The OCA made the following recommendations in regard to the APHIS strategic plan for the NAIS: "no one sector of the industry should bear the burden of tagging calves" (OCA, 2005, p. 6); an agreement needs to be made between the seller and the sales facility (OCA, 2005); group lots should be utilized when appropriate (OCA, 2005); the private sector should be responsible for recording movements and keeping data records (OCA, 2005); and the speed of commerce must be considered when developing traceability standards and protocol (OCA, 2005).

Traceability and Disease Control

Bovine spongiform encephalopathy (BSE) made an appearance in the United States on December 23, 2003. Often referred to as 'the cow that stole Christmas,' the first verified case of BSE was in a dairy cow located in Washington. Testing at slaughter confirmed the case (Anderson, 2004). A transmissible disease closely related to Creutzfeltd-Jacobs disease (vCJD) in humans, BSE affects the brain and nervous system and is fatal (Anderson, 2004).

An animal identification system such as the NAIS was not in place when the initial BSE outbreak occurred (Anderson, 2004). The USDA worked quickly and effectively to find not only the dairy cow's place of origin but also to stop potentially contaminated meat from reaching markets (Anderson, 2004). This proved difficult without a consistent traceback system to aid the search (Anderson, 2004).

In addition to the initial BSE case in the United States, foot- and- mouth disease (FMD) in The Netherlands in 2001 raised concerns domestically (Velthius & Mourits, 2007). FMD is a viral disease transmitted primarily to cattle and swine that is highly contagious (APHIS, 2007-b). Affected animals can contaminate facilities and transport vehicles as well as spread the virus to healthy animals (APHIS, 2007-b). Furthermore, FMD can be spread if infected meat or products from infected animals are fed to healthy animals (APHIS, 2007-b). Because FMD is so highly contagious, it could quickly eliminate entire herds of cattle or hogs (APHIS, 2007-b). This disease along with BSE brought the issue of food safety and traceability to the forefront of public policy and discussion (Anderson, 2004, APHIS, 2007-b).

According to experts, a reliable traceability system in the U.S. beef cattle industry is an evident need (Disney, Green, Forsythe, Wiemers, & Weber, 2001; Golan, Krissoff, Kuchler, Calvin, Nelson, & Price, 2004; Souza-Monteiro & Caswell, 2004). Without a reliable traceback system, the United States will not be able to compete with other leading cattle export countries currently using a traceback system (Disney et al., 2001; Golan et al., 2004; Souza-Monteiro & Caswell, 2004).

Different methods and systems of traceability were discussed in the literature. Each involved the ability to have access to information throughout the entire production process from the point of origin to the point of consumer purchase (Disney et al., 2001; Golan et al., 2004; Souza-Monteiro & Caswell, 2004).

According to Disney et al. (2001), the primary purpose of a traceability system is to aid in animal health programs for prevention and control. With the ability to trace

diseased animals, animal health officials could locate the source animal more easily and quarantine any contamination points more precisely (Disney et al., 2001).

The depth, breadth, and precision of the system are directly related to what information is being gathered and recorded. These three elements are fundamental in the development stages of a traceability system (Golan et al., 2004). Each plays an important role in information gathering and in the tracing process.

The first element is breadth. Information can be selected to tailor the system so it is unique to what is being traced. All aspects of an animal do not need to be recorded to collect just a few specific data points (Golan et al., 2004). The ability to specifically select the information gathered allows industries to customize the traceability system.

The second element is depth. This component often depends on the breadth of the system (Golan et al., 2004). After the customized breadth is determined, the distance is determined by default as it will only trace as far back or as far forward as necessary to search the information (Golan et al., 2004).

Precision is the third element. This concept would provide assurance that the system was reliable in accurately determining the key points of information (Golan et al., 2004). To determine precision, a rate of error is developed from the unit of analysis (the tracking unit) within the system (Golan et al., 2004). Systems dealing with individual units are more accurate than systems dealing with large units such as lots or pens (Golan et al., 2004).

Because a traceability system could be versatile, the benefits of traceback are further exemplified. Three main benefits came to the forefront during the analysis of the literature; response and control of contagious diseases, an increase in economic value of

the beef cattle, and consumer assurance (Augsburg, 1989; Disney et al., 2001; Souza-Monteiro & Caswell, 2004).

The first major benefit a traceability system could offer is the quick response and control of a disease outbreak (Augsburg, 1989; Disney et al., 2001; Souza-Monteiro & Caswell, 2004). The ability to trace a diseased animal quickly and effectively and narrow the quarantine sites would assist in controlling both the contagious disease and the economic loss due to disposed cattle (Augsburg, 1989; Disney et al., 2001; Souza-Monteiro & Caswell, 2004). This benefit alone has an enormous impact in controlling contagious agents that could have a devastating impact on the beef cattle industry (Augsburg, 1989; Disney et al., 2001; Souza-Monteiro & Caswell, 2004). The cost of trying to eradicate a contagious disease introduced into the herd or feedlot would be greatly reduced (Augsburg, 1989; Disney et al., 2001; Souza-Monteiro & Caswell, 2004).

The economic value of the cattle sold at market is another advantage found within the literature. Premiums for cattle that are traceable and foreign markets opening the door to United States exports would be a definite advantage (Disney et al., 2001; Souza-Monteiro & Caswell, 2004). Countries with strict traceability standards only will import beef cattle that are traceable (Disney et al., 2001; Souza-Monteiro and Caswell, 2004). If the United States. could not export beef to other countries, domestic markets would be flooded with domestic cattle; consequently, prices would drop drastically for beef in U.S. markets (Schrimper, 2001). Countries without reliable tracing systems will lose the export to the countries that require it (Schrimper, 2001).

Souza-Monteiro and Caswell (2004) reported, “Even if traceability alone does not guarantee safer foods, the information provided and the possibility of fast identification

of hazards may diminish the risk perceived by consumers" (p. 7). A reliable traceability system could regain consumer assurance (Caporale, 2001; Disney et al., 2001; Souza-Monteiro and Caswell, 2004). The consumer wants to have a safe product and to have confidence in the processing system that brings the product from the producer to the supermarket. Consumers would be more willing to purchase beef products if the products come from a trusted source (Caporale, Giovannini, Di Francesco, & Calistri, 2001; Disney et al., 2001; Souza-Monteiro & Caswell, 2004). According to the literature, few disadvantages were found to implementing a traceability system. The most discussed shortcoming of the development of a traceability dealt with the potential cost of the system (Slade, 2004).

Although these advantages seem without fault, one question has been consistently raised throughout the literature: Who will pay for a national traceability system? This question has no definite answer. Slade (2004) reported the estimated cost to implement the USDA's NAIS was more than $500 million. This estimate was not strictly for the cattle industry, but it was for all species of livestock the NAIS would include (Slade, 2004). However, according to Slade (2004), a large portion of this cost was delegated to the beef cattle industry due to its size and scope.

The initial cost of a simple electronic identification system used strictly for source verification would be a beginning at a cost of approximately $140 million (Sparks Companies, 2002). In addition to this amount, $108 million is estimated to be needed for yearly maintenance of the system (Sparks Companies, 2002).

Producers will incur some of the costs for tagging and signing with a private sector traceability system (NAIS, 2006). Electronic identification was designated as a

form of identification for use in the NAIS (NAIS, 2006). This form of tagging was often referred to as a Radio Frequency Identification (RFID).

The codes for RFID are unique to each individual animal and cannot be changed (Slade, 2004). Consequently this form of tagging is tamper-proof. The initial cost of an RFID system would not only include the tags themselves but also a reader and laptop computer to collect the information from the tags (Slade, 2004). Labor also may be increase, requiring additional costs (Slade, 2004).

If another disease issue appears, slaughter facilities will incur some of the cost for animal disposal and disinfection of the facilities (Disney et al,. 2001; Slade 2004). The surveillance of infected animals, producer vaccination costs and the possibility of U.S. exports being denied as a result of a disease outbreak were other cost issues raised (Disney et al,. 2001; Slade 2004).

The National Animal Identification System

According to the USDA (2006), the NAIS program is "a cooperative State-Federal-industry program administered by USDA's Animal Plant and Health Inspection Service (APHIS)" (p. 1). The program seeks to develop a database of livestock movement to better control contagious disease outbreaks should an incident occur (USDA, 2006). It is a voluntary program for livestock producers raising animals that may enter the food chain as well as for those raising horses.

Part of the goal of the program is to have a 48-hour traceback. This means the system would be able to trace an animal back to all of its previous locations and to all animals it may have came in contact within the past 48 hours (USDA, 2006). If a

contagious disease can be tracked and controlled in 48 hours, it will have less impact on other livestock (APHIS, 2004).

The NAIS has three main sections: identifying premises, tracing animal movements, and tracking animal disease (USDA, 2006). The first is premises identification. To participate, each producer must register his/her premises (USDA, 2006). This information includes the name, address, and phone number of the individual and exact location being registered (USDA, 2006). This information is entered into a database. If an outbreak occurs, this information along with other records is used to track the infected animal back to the point of origin.

According to APHIS (2006), an estimated 2 million locations house livestock in the United States. This estimate contains all places that "manage or hold livestock or poultry" (USDA, 2006). The projected date for all premises to be registered is 2009. All 50 states, two territories, and five tribes have some form of premises identification registration in place (USDA, 2006). A standardized system for this measure has been administered to make the system more universal (USDA, 2006).

The second part of the NAIS is the identification of the livestock leaving the premises (USDA, 2006). Each animal, or group of animals, must an identification tag that stays with the animal from the time it leaves the original location to the time of harvest. The point of origin is important in tracing any type of outbreak (USDA, 2006). Each location the infected animal has been to would found during traceback.

The third part of the NAIS is the actual tracking of the diseased animal (USDA, 2006). Databases will contain the premises identification information and record all movement of livestock. These databases will be maintained by businesses in the private

sector; APHIS would have to gain permission from the database management operators to gain any information (USDA, 2006).

The ultimate goal of this traceback system is to have the ability to trace an animal's movements for 48 hours (USDA, 2006). Being able to control a disease and the locations where it may spread within this time period is the most ideal for eradicating any contagious element that may be introduced (USDA, 2006).

The success of the NAIS cattle tracking sector relies on the participation of those within the cattle industry (Slade, 2004). Producers, backgrounders, feedlot owners, and packers are affected by this program. If anyone from the different segments of the industry does not participate, a link will be lost in the trace chain (Slade, 2004; USDA, 2006) and the accuracy of the trace system will be reduced dramatically (USDA, 2006).

The NAIS has met with much opposition from producers across the country. One reason cited for this opposition is the average age of the cattle producer now (Souza, 2006). Older generations have less experience with modern technology, such as computers, than the younger generations, this leads to issues regarding information dissemination on the Internet (Souza, 2006).

A valid concern also exists about the confidentiality of the database used to trace cattle (Souza, 2006; Birkdoll, 2006). Producers do not trust the government with the information the USDA is requesting (Souza, 2006; Birkdoll, 2006).

One study explored the possible reasons producers in North Dakota were not readily participating in the NAIS. Veil (2006) surveyed producers attending the North Dakota Stockmen's Association (NDSA) annual meeting.

Veil (2006) reported producers who have a negative view or experience with other government programs may compare this experience to the implementation of the NAIS. North Dakota is a brand state, meaning producers still use a form of branding cattle for identification purposes (Veil, 2006). Producers in the state have used this method of identification for more than 50 years, and they feel it is a solid, no-fail form of identification (Veil, 2006). The NDSA currently traces cattle through brand inspection services. For the NDSA to encourage members to participate in the NAIS, the USDA must prove the NAIS to out-perform the brand inspection system currently in place (Veil, 2006).

Veil (2006) identified the "lack of messages from USDA-APHIS" (p. 124) as a cause for producer disbelief in the actual, complete implementation of the system. The NDSA made a public response to the USDA-APHIS as the spokesperson for producers in the cattle industry (Veil, 2006). The response highlighted the disappointment and questions North Dakota producers had for the USDA-APHIS in regard to the implementation of the NAIS (Veil, 2006).

Veil's 2006 study of NDSA members was designed using was a self-administered questionnaire given to the members at their annual convention to be completed on their own time and returned to the researcher; likewise, that method was used in this study and necessitates a description of the method.

Self-administered Survey Questionnaire & In-person Delivery

According to Dillman (2007), there is a society as a whole is moving toward self-administration in all aspects of daily life. In general, activities and tasks that were once

completed by interacting with others are now performed by individuals without any assistance (Dillman, 2007). A simple example of this would be interacting with a bank teller versus using an Automated Teller Machine (ATM) (Dillman, 2007).

Several alternative delivery methods are available beyond mail or e-mail delivery (Dillman, 2007). Sometimes it is difficult to contact eligible respondents in a population because of the lack of information available on the population in question (Dillman, 2007). An example of this would be visitors to an art gallery. Dillman (2007) states "People eligible for some surveys appear at a location of interest, thus making it possible to sample them and ask that they answer some survey questions before leaving" (p. 246).

The Total Design Method (TDM) for in-person delivery involves the social exchange theory (Dillman, 2007). The social exchange theory is based on the idea that individuals will be motivated to complete a task based on the results the completed task will bring (Dillman, 2007). This has increased response rates when compared to the method of distributing surveys and asking for the response to be mailed at a later date (Dillman, 2007).

Jenkins and Dillman (1995) offered insight on experimental questionnaire design specifically regarding self-administered surveys. The literature supports that respondents who complete the survey often view participation differently than the researcher. When the survey is given to the participant, it is released by all accounts from the researcher (Jenkins & Dillman, 1995). The researcher has no control over how the survey will be taken, what question with which the respondent will start, etc. Hence, the structure of the self-administered survey is extremely important (Jenkins & Dillman, 1995) and were taken into consideration for this study.

A pattern of recognition is established when a respondent begins the survey (Jenkins & Dillman, 1995). This is defined as "a particular perceptual process that involves identifying a complex arrangement of sensory stimuli" (Jenkins & Dillman, 1995, p. 5). Two main patterns have emerged. The bottom-up process and the top-down process (Jenkins & Dillman, 1995).

The bottom-up process appears when a stimulus is present (Jenkins & Dillman, 1995). The top-down process places emphasis on context. The respondent sees the questions in the form of words and reads the survey based on the past experience of reading (Jenkins & Dillman, 1995). These patterns should be taken into consideration when developing self-administered survey instruments (Jenkins & Dillman, 1995).

Case Study Research

> According Vogt (2005), a case study method is defined as:
>
> gathering and analyzing data about one or a small number of examples as a way of studying a broader phenomenon. This is done on the assumption that the example (the "case") is in some way typical of the broader phenomenon. (p. 38)

Case studies are used when a specific interest is developed about a certain, specified topic (Stake, 1995). Programs or the implementation of them along with people are often the subject this type of research (Stake, 1995).

Some researchers indicate case studies are not a valid source of collecting information about a phenomenon (Yin, 2003). Often it has been said the only way to get explanatory data was to do an experiment of some sort over a large population (Yin,

2003). This leaves the research community believing case studies are only useful for preliminary research (Yin, 2003).

However, case studies have the potential to be used for organization improvement purposes as well as product information in a limited population (Stake, 1995; Yin, 2003). These individual case studies can be adapted to become multi-case studies, as well (Stake, 1995; Yin, 2003).

Summary

The theoretical framework for this study is based on Ajzen and Fishbein's (1980) theories of planned behavior and reasoned action. The theory of reasoned action was developed first and is based on the idea that a specific behavior is based on the intention to act upon that behavior (Bagozzi & Kimmel, 1995). The theory of planned behavior was developed as an addition to the theory of reasoned action. This addition addressed actions that are not under the complete, willed control of the individual (Bagozzi & Kimmel, 1995). These two theories provide a strong base for analyzing the OCA's members' perceptions of and intent to participate in the NAIS.

The Oklahoma Cattlemen's Association is the state association representing cattle producers in the fifth-largest cattle-producing state in the United States (OCA, 2005). They provide support and information for producers and work for the betterment of the beef industry in Oklahoma (OCA, 2005). The OCA provided comments and feedback to the strategic plan for the NAIS developed by USDA APHIS (OCA, 2005).

Traceability was brought to the forefront of the cattle industry with the appearance of BSE in the United States (Anderson, 2004). No consistent traceability

system was in place in the United States at the time of the outbreak. Consequently, this incident has encouraged the development of the NAIS. Several benefits of a traceback system were indentified in the literature while the main disadvantage to a traceback system was cost.

The NAIS has the potential to provide a solid traceability program in the United States (USDA, 2006). The recent threat of transmissible and highly contagious animal diseases has increased the need of a traceback system in the U.S. cattle industry (Slade, 2004). Quick and accurate control of a disease outbreak, the potential for higher cattle prices, and consumer assurance are considered the most important characteristics driving the national animal identification system (Caporale et al., 2001; Disney et al., 2001; Souza-Monteiro and Caswell, 2004).

Self-administered survey questionnaires provide an accurate method of data collection for different types of research (Dillman, 2007). In-person delivery methods tend to increase the response rates (Jenkins and Dillman, 1995). Because the researcher has no control over how the respondent will complete the survey, the structure of the self-administered survey is extremely important (Jenkins and Dillman, 1995).

Case studies often are used for identifying a specific phenomenon in a small population (Stake, 1995; Vogt, 1995, Yin, 2003). Programs and implementation of the programs are often a subject of this type of research (Stake, 1995; Yin, 2003).

CHAPTER III

METHODOLOGY

This study was completed to assess Oklahoma Cattlemen's Association members' awareness and perceptions about traceability and the National Animal Identification System. Chapter I addressed the need for a traceability system and the need to identify the beliefs of Oklahoma cattlemen and cattlewomen have on the issue. The purpose of this study was to determine Oklahoma Cattlemen's Association (OCA) members' awareness of the National Animal Identification System and livestock traceability as it pertains to marketing and to determine their perceptions and concerns toward the implementation of this program. This study sought to meet the following objectives:

1. To identify specified characteristics of OCA members;
2. To determine the OCA members' awareness and perceptions of the NAIS;
3. To identify OCA members' perceptions of marketing cattle in regard to traceability; and
4. To determine relationships between selected characteristics of OCA members

Chapter II concentrated on literature to develop a strong base for this study. The theoretical framework illustrated the fundamental principles behind this research. Ajzen and Fishbein's theory of planned behavior/reasoned action was used to define the basic standards for reviewing the data. Traceability is necessary not only for disease control but also to encourage export trade needed for the success of the beef

industry (Disney et al., 2001; Golan et al., 2004; Souza-Monteiro & Caswell, 2004). This chapter seeks to explain the methods and procedures used to design the research, collect the data, and analyze the data for the purposes of this study.

Institutional Review Board

To use human subjects in any type of research study, federal law and Oklahoma State University (OSU) require the approval of the research design before the study may begin. At OSU, a review is conducted by Research Services and the Institutional Review Board (IRB). This was done to protect an individual's rights and well-being should they chose to participate in a behavioral study. To complete this study, the IRB reviewed the research design and data collection tool. The design was approved and permission was granted to the researcher to complete the study. The IRB application number was AG0723. A copy of the approval form from the IRB can be found in Appendix A.

Research Design

This mixed-method survey included both quantitative and qualitative data. OCA members were surveyed using the Total Design Method self-administered paper survey.

Muijs (2004) stated *quantitative* research is "about explaining phenomena by collecting quantitative data which is analyzed using mathematically based methods." Descriptive data is collected and analyzed; conclusions are drawn from the data. The research objectives for this type of data are very specific and have a narrow scope (Creswell, 2007).

Quantitative data also involves collecting information from a large population of individuals using developed questions with given responses (Creswell, 2007). This type of data is used to generalize the results to the population surveyed (Creswell, 2007). The higher the response rate of the survey, the stronger the generalization of the information will be to the sample population (Creswell, 2007)

Questionnaires and survey instruments can be delivered to a specified group of people to gain information. Detailed accounts of "characteristics, attitudes or beliefs" can be reported through this method (Marshall & Rossman, 2006, p. 125). The survey questions are developed in categories, which can later be coded after data collection has occurred (Creswell, 2007; Marshall & Rossman, 2006). These questions may be open-ended or have a structural basis for finding specific answers (Marshall & Rossman, 2006).

Both quantitative and qualitative data collection lend advantages to the type of research completed by the researcher. Quantitative and qualitative data were collected to gain information about the demographics of OCA members as well as their knowledge base and awareness of the NAIS; however, only quantitative data was reported for the purpose of this study.

Population and Sample

The population chosen for this study was OCA members who attended the 2007 Oklahoma Cattlemen's Convention in Midwest City, Oklahoma. The population was 245 attendees, providing subjects for a case study. Of this limited population, 144 usable surveys were returned. This resulted in a 58.77% response rate. The OCA members pay

dues to attend meetings and are considered progressive cattle producers. It is important to know the awareness and perceptions of progressive producers in order to help the population of Oklahoma cattle producers as a whole (OCA, 2005).

Instrumentation

A self-administered survey questionnaire (see Appendix B) was developed by the researcher to address the objectives of the study. Survey questions were derived from a previous study completed by Shari Veil (2006) and used at the North Dakota Stockmen's Association annual meeting. The survey for this research contained questions to gain demographic information as well as the perceptions of the cattlemen about the NAIS.

Questions were structured as multiple-choice or open-ended questions. The multiple-choice items were developed to answer questions where specific responses were sought. Twenty-two closed-ended questions were developed by the researcher and Oklahoma State University beef extension specialists who were working with the Oklahoma Department of Agriculture, Food and Forestry to promote the NAIS in Oklahoma.

Seven open-ended questions were developed to assess producer perceptions of NAIS and traceability and to gain a better understanding of producers' perceptions of NAIS in regards to the specific questions asked. These are not reported in this study.

Validity

According to Muijs (2004), validity answers the question of "are we measuring what we want to measure?"

A panel of experts was used to establish content and face validity for this instrument. “A panel of experts evaluates individual instrument items as well as the entire instrument” (Grant & Davis, 1996, p. 269). It is important to find qualified individuals to serve on the panel of experts. “Relevant training, experience, and qualifications of content experts” (Grant & Davis, 1996, p. 270) should all be considered when choosing experts.

Oklahoma State University beef extension specialists and professors in the agricultural communications program served on the panel of experts as did an assistant professor from the University of Oklahoma who had completed her dissertation on a similar study. They reviewed the survey instrument and deemed it valid. The panel was familiar with NAIS and had been involved with the implementation of the program.

Reliability

Reliability addresses the consistency of the survey tool. If the research can be repeated and similar outcomes occur, the instrument would be considered reliable. This survey was a replication of a previous study and the protocol was modeled after the previous research. A visual comparison was made to determine consistency of the completed surveys. No inconsistencies were observed.

Data Collection

The researcher distributed and collected the instruments during the OCA’s annual convention, which was July 26-28, 2007, in Midwest City, Oklahoma. The instruments were distributed by the researcher and two assistants at a table near member registration

during the three-day meeting. More than 250 surveys were distributed. A tradeshow was located on-sight where producers could see livestock equipment exhibits as well as livestock services offered by various companies and associations. In addition to this, announcements were made throughout the convention reminding participants to fill out the survey and return in to the researcher.

Members were asked to complete the instrument on their own time during the convention. Surveys were given to spouses as well to complete. This was done because the spouses were viewed as either members or as part of the decision-making unit in regard to their cattle operations.

Each participant was asked if he/she previously had completed an instrument to avoid duplicates. Upon completion and submission of the instrument, each respondent received a baseball cap with the OCA logo. The caps were chosen as an incentive because a prior, similar study had used this incentive, and the present research was made to follow similar protocol.

The population of total registered members was 245 people. During the three-day convention, 144 surveys were returned and all were usable. The response rate for this study was 58.77%.

Data Analysis

The quantitative instrument questions were analyzed using the Statistical Package for Social Science © (SPSS), Windows © version 15. Descriptive statistics, such as frequencies, means, modes, and percentages of questions, were used to interpret the data.

Summary

The methods of research used to complete this study were explained in detail in this chapter. The research design included both quantitative and qualitative data collection to gain the most accurate information from the instrument, although only quantitative data is presented in this document. The reliability and validity of the instrument also were addressed.

This research study used a self-administered instrument to collect the data from the population. The population consisted of all members of the OCA who attended the 2007 annual convention.

The instrument was distributed at the convention by the researcher. A panel of experts from the OSU Cooperative Extension Service as well as OSU and OU faculty reviewed the instrument.

CHAPTER IV

FINDINGS

Chapter I addressed the need for a traceability system and the need to identify the beliefs OCA members have on the issue. The purpose of this study was to determine Oklahoma Cattlemen's Association (OCA) members' awareness of the National Animal Identification System and livestock traceability as it pertains to marketing and to determine their perceptions and concerns toward the implementation of this program.

Chapter II reviewed literature to develop a strong base for this study. The theoretical framework illustrated the fundamental principles behind this research. Ajzen and Fishbein's theory of planned behavior/reasoned action was used to define the basic standards for reviewing the data.

Chapter III described the methodology used to develop the instrument and collect the data. The chapter discussed the validity and reliability of the instrument. A description of the population was discussed as well as how the instrument was administered at the OCA convention.

This chapter will discuss the findings from the survey instrument. The results are taken from the questions asked about the NAIS, producer participation in the program, and sources of information.

Objectives

This study will seek to answer the following objectives regarding marketing, traceability, and the implementation of the NAIS:

1. To identify specified characteristics of OCA members;
2. To determine the OCA members' awareness and perceptions of the NAIS;
3. To identify OCA members' perceptions of marketing cattle in regard to traceability; and
4. To determine relationships between selected characteristics of OCA members

Findings Related to Objective 1: Characteristics of OCA Members

Objective 1 was to identify specified characteristics of OCA members. Of the 144 respondents, 111 (77.1%) indicated they were men, 23 (16.0%) indicated they were women, and 10 (6.9%) did not respond. Of the survey respondents, 129 (89.6%) reported owning a computer while seven (4.9%) reported they did not own a computer and eight (5.5%) did not respond. Of the respondents, 125 (86.8%) of those individuals reported having Internet access, while 11 (7.6%) did not have Internet access and eight (5.6%) did not answer.

When asked the level of education completed, 63 (43.8%) reported completing a bachelor's degree; 26 (18.1%) reported receiving a master's degree; 21 (14.6%) reported receiving a high school diploma; 12 (8.3%) did not respond; 10 (6.9%) reported receiving an associate's degree; six (4.2%) reported receiving a professional degree (MD, JD, DVM, etc); four (2.8%) reported receiving a doctoral degree; and two (1.4%) of the respondents completed less than high school (see Figure 2).

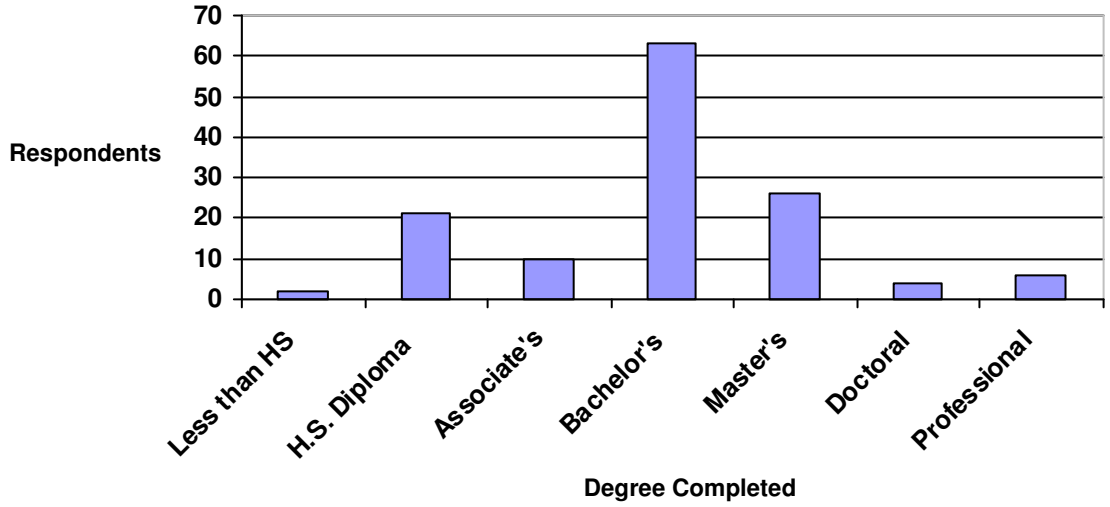


Figure 2. OCA members' level of education

Respondents were asked to identify their primary type of cattle operation. Of the respondents, 108 (75.0%) ran a cow/calf operation; 31 (27.1%) ran a stocker/backgrounder operation; six (4.2%) operated a feedlot; and 11 (7.6%) responded "other." Zero (0.0%) dairy farms were reported. More 100.0% were reported as some respondents marked more than one answer to the question (see Figure 3).

Respondents were asked to identify their secondary type of cattle operation. Of the respondents, 51 (35.4%) ran a stocker/backgrounder operation; 29 (20.1%) responded "none"; 19 (13.2%) ran a cow/calf operation; 16 (11.1%) operated a feedlot; 11 (7.6%) responded "other"; 1 (0.7%) operated a dairy farm; and 17 (11.9%) did not respond (see Figure 3).

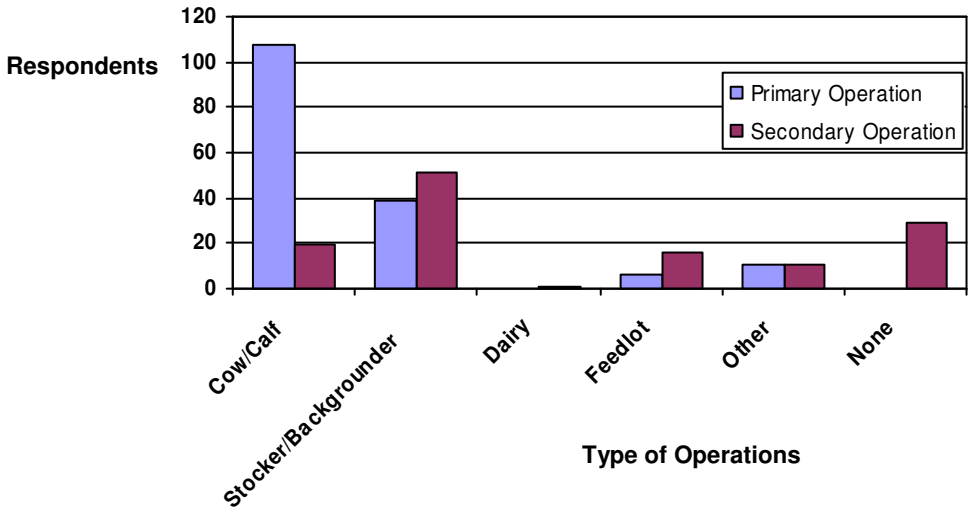


Figure 3. Primary and secondary cattle operations of respondents

Of the respondents, 74 (51.4%) reported they had jobs outside of the cattle industry; 62 (43.1%) said they did not; and eight (5.5%) did not respond. Respondents were asked to indicate the number of cattle they managed regardless of ownership. The mean number of head reported was 3,289 head. The mode was 99 head, and the median was 200 head.

Respondents were asked to identify other beef industry organizations in which they were members and to choose all that applied. Of the respondents, 78 (54.2%) were members of the Oklahoma Farm Bureau; 73 (50.7%) were members of the National Cattlemen's Beef Association (NCBA); 35 (24.3%) replied "other"; 26 (18.1%) were members of the Oklahoma Farmer's Union; and 4 (2.8%) were members of R-Calf (see Figure 4).

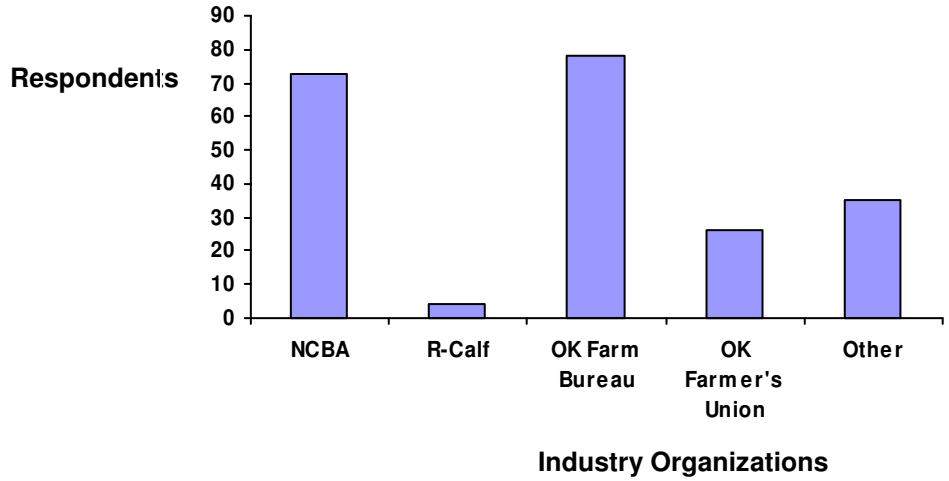


Figure 4. OCA members' affiliation with other beef industry organizations

Findings related to Objective 2: OCA members' awareness and perceptions of the NAIS

Objective 2 sought to address the OCA members' awareness and perceptions of the NAIS.

Respondents were asked to indicate all sources where they receive information about the NAIS. Of the respondents, 75 (52.1%) received information from agricultural publications; 69 (47.9%) received information from the ODAFF; 66 (45.8%) received information from the USDA; 42 (29.2%) received information from other producers; 40 (27.8%) received information from producer organizations; 39 (27.1%) received information from the cooperative extension service or university; 31 (21.5%) received information from agricultural broadcasting; 20 (13.9%) received information from a veterinarian; 16 (11.1%) received information from sales representatives; and 5 (3.5%) received information from non-agricultural media (see Figure 5).

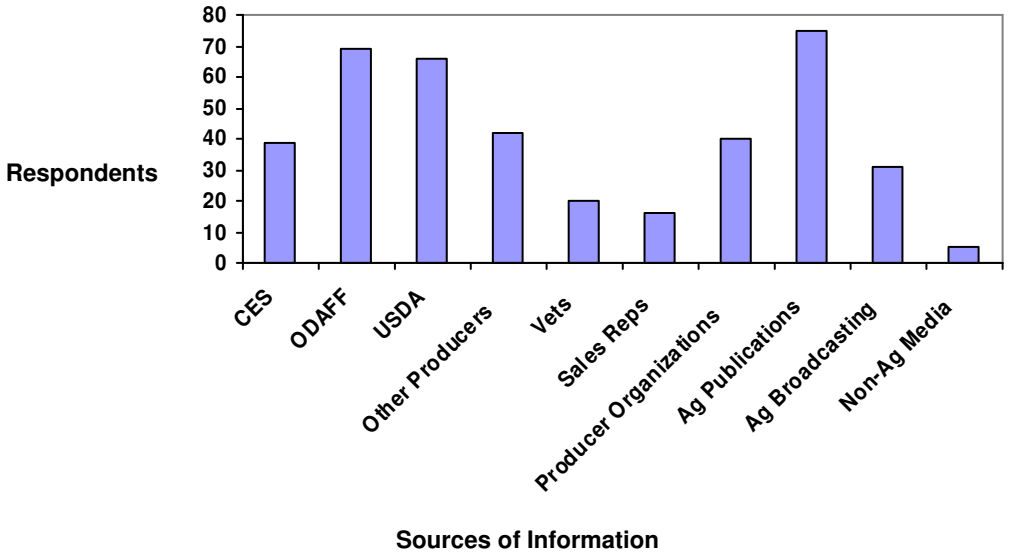


Figure 5. OCA members' sources of information about the National Animal Identification System

Respondents were asked if they believed a national system of animal identification is needed in the United States for animal health monitoring purposes. Of the respondents, 101 (70.1%) said "Yes," 29 (20.1%) said "No," and 14 (9.8%) did not respond (see Figure 6).

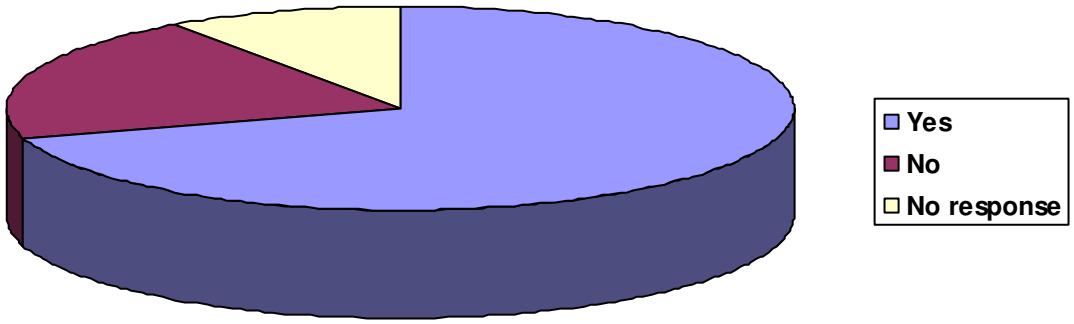


Figure 6. OCA members' perceptions of the need for a National Animal Identification System for U.S. animal health monitoring purposes

Respondents were asked if a national system for animal health monitoring should be mandatory. Of the respondents, 61 (42.4%) said "Yes," 62 (43.1%) said "No," and 21 (14.5%) did not respond (see Figure 7).

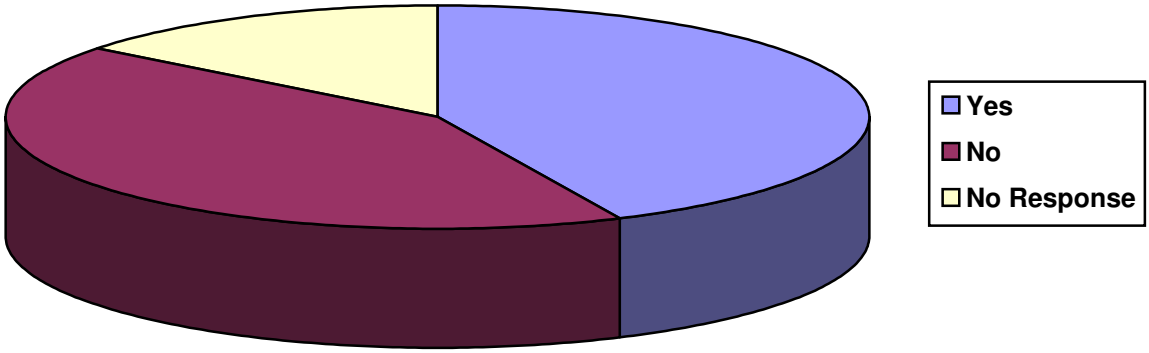


Figure 7. OCA members' beliefs about the NAIS' need to become mandatory

Of the 68 respondents who indicated the NAIS should be mandatory, 24 (35.3%) indicated the NAIS should become mandatory within two years; 21 (30.9%) indicated the NAIS should become mandatory within three years; 14 (20.6%) indicated the NAIS should become mandatory within five years; 6 (8.8%) indicated the NAIS should become mandatory immediately; and 3 (4.4%) indicated the NAIS should become mandatory within one year (see Figure 8).

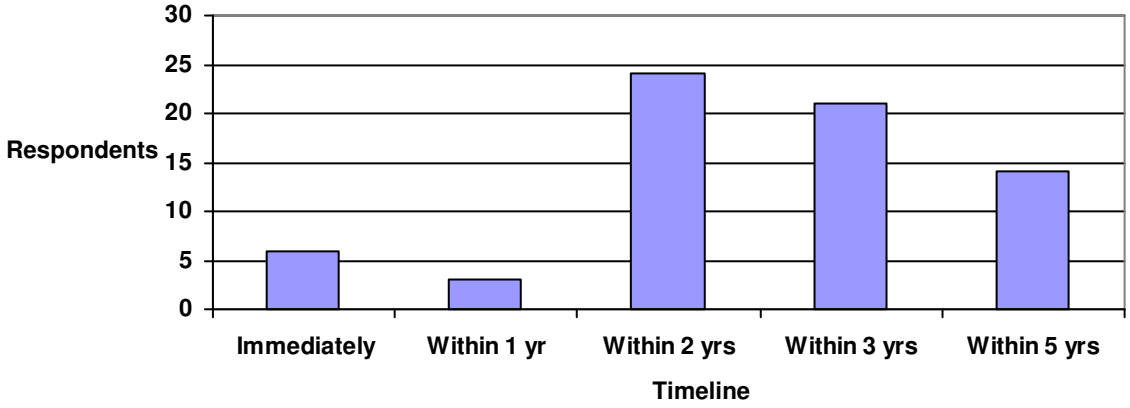


Figure 8. OCA members' beliefs on when the NAIS should become mandatory

Producers were asked if they had registered their premises with the Oklahoma Department of Agriculture, Food and Forestry (ODAFF). Of the respondents, 70 (48.7%) had registered their premises; 70 (48.8%) had not registered their premises; 4 (2.8%) did not respond; and 1 (0.7%) did not know if he/she had registered (see Figure 9).

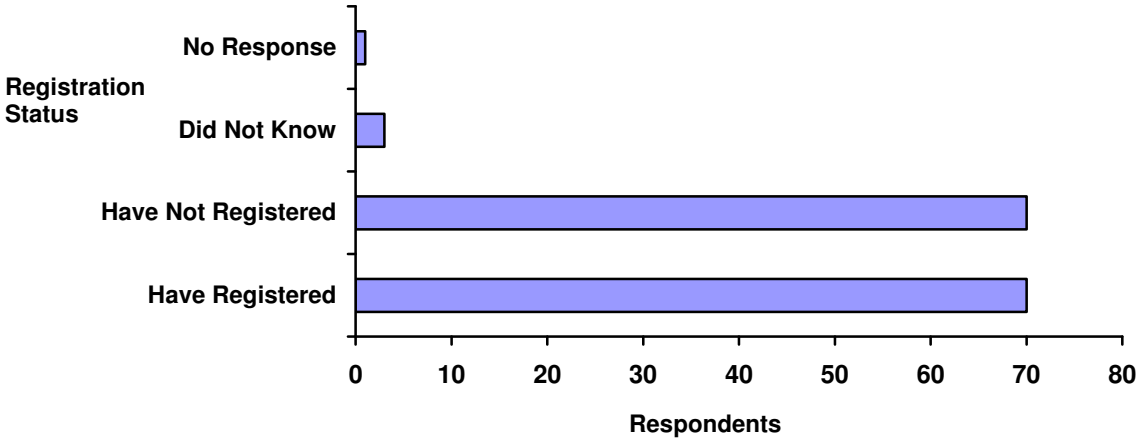


Figure 9. OCA member premises registration

If respondents indicated they had not registered their premises, they were asked why they had not registered. Of the respondents, 23 (29.1%) responded "other: please explain"; 13 (16.4%) responded "I'm too busy"; 13 (16.4%) responded "I'm waiting until

it's mandatory"; 16 (20.2%) responded "I'm unfamiliar with the program"; 10 (12.6%) responded "I'm opposed to the program"; 4 (5.3%) responded "I don't know how."

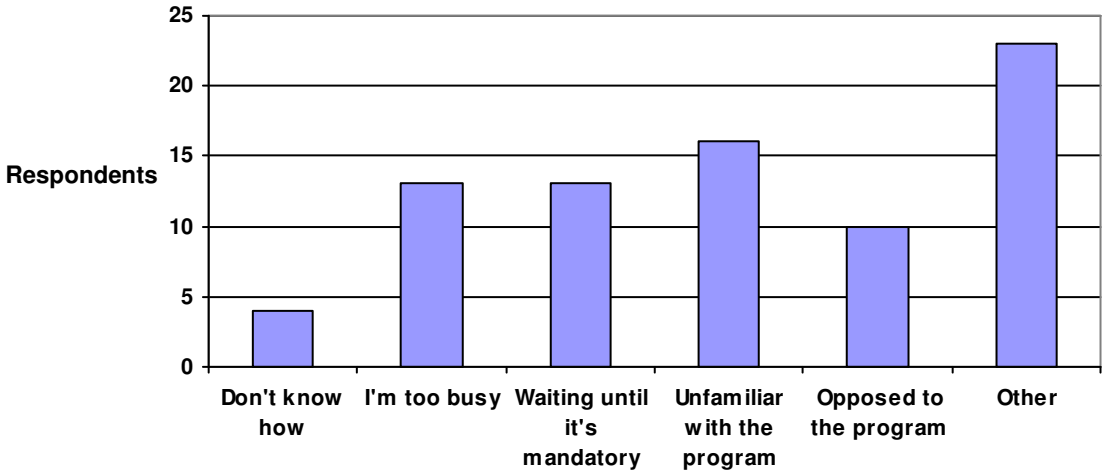


Figure 10. Reasons OCA members have not registered their premises

Responses for "Other, please explain" included: "I'm a renter of an apartment"; "no benefit yet"; "still considering pros and cons"; "I am waiting and observing what will and is going to happen with this program"; "the program is different from what the first one was stated"; "haven't decided on one premises or several for different ranches"; "just have not taken the time"; "don't live here in Oklahoma"; "don't ranch in Oklahoma"; "I just have not done it"; "I am not convinced that the information is needed on a public access registry"; "I don't feel it will actually become mandatory"; "procrastination"; "too many unknowns at the present time; no one is on the same page"; "we have a registered herd. All of our cattle have a tattoo and are freeze branded"; "registered herd. We already know everything there is to know about our animals"; "cattle are ID with AHA"; "premises out of state"; and "no need to" (see Figure 10). Percentages equal more than 100% because some respondents marked more than one.

Respondents were asked when they planned to register their premises if they had not already done so. Of the respondents, 25 (51.1%) replied they planned to register within one year; 11 (22.4%) replied they never planned to register; 10 (20.4%) said they planned to register within three months; and 3 (6.1%) replied they planned to register within six months (see Figure 11).

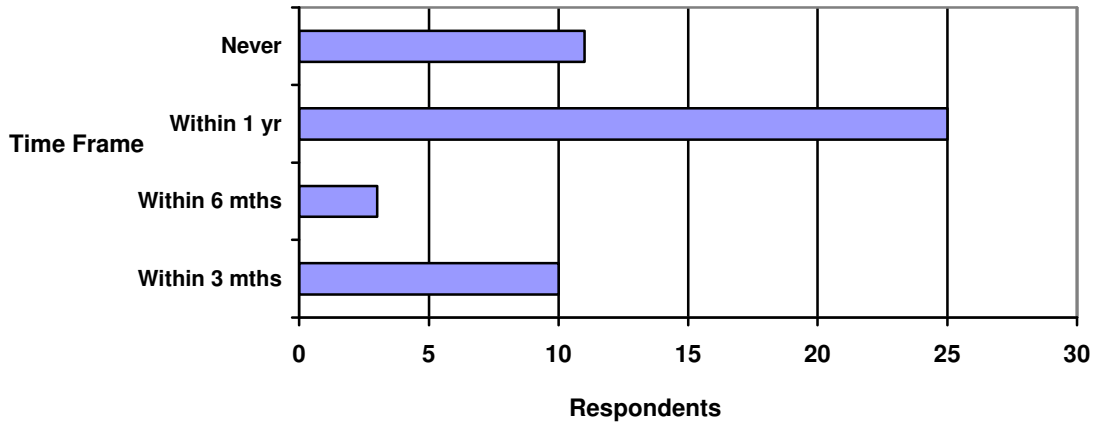


Figure 11. OCA members' plans to register their premises within certain time frames

Respondents were asked which cattle identification methods they used and could select more than one method. Of the respondents, 110 (76.4%) used other ear tags; 108 (74.3%) used brands; 50 (34.7%) used tattoo; 18 (12.5%) used electronic identification; 10 (6.9%) answered "other: please explain"; and 4 (2.8%) did not identify their cattle. Other responses included "ear notching" (see Figure 12).

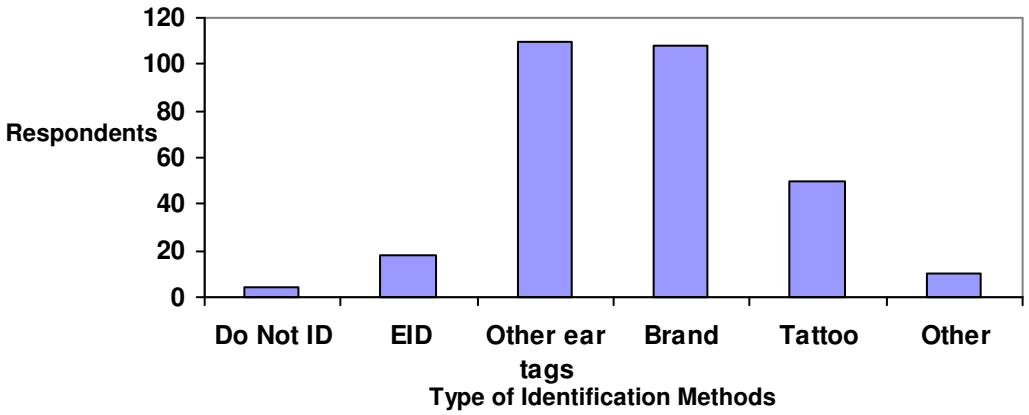


Figure 12. Identification methods used by OCA members

Respondents were asked if they collect performance data on individual cattle. Of the respondents, 74 (51.4%) collected data on individual cattle; 69 (47.9%) did not collect data on individual cattle; and 1 (0.7%) did not respond (see Figure 13).

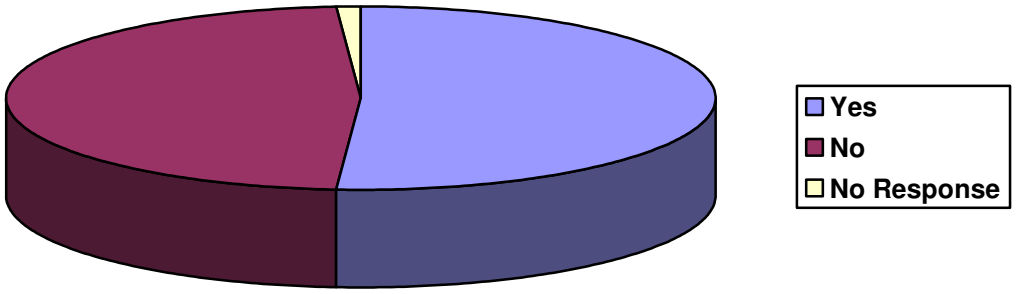


Figure 13. OCA members' performance data collection practices

Respondents were asked if the NAIS becomes mandatory, would they voluntarily capture performance data on individual animals for herd management purposes. Of the respondents, 87 (60.4%) answered "Yes," 28 (19.4%) answered "No," 26 (18.1%) answered "Don't know;" and 3 (2.1%) did not respond (see Figure 14).

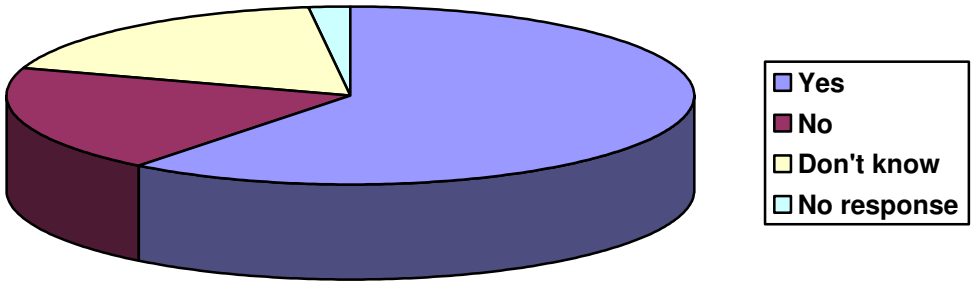


Figure 14. OCA members' willingness to collect performance data with a mandatory NAIS

Respondents were asked if electronic identification should be required for cattle in the NAIS. Of the respondents, 56 (38.9%) answered "Yes," 50 (34.7%) answered "No," 35 (24.3%) answered "Don't know;" and three (2.1%) did not respond (see Figure 15).

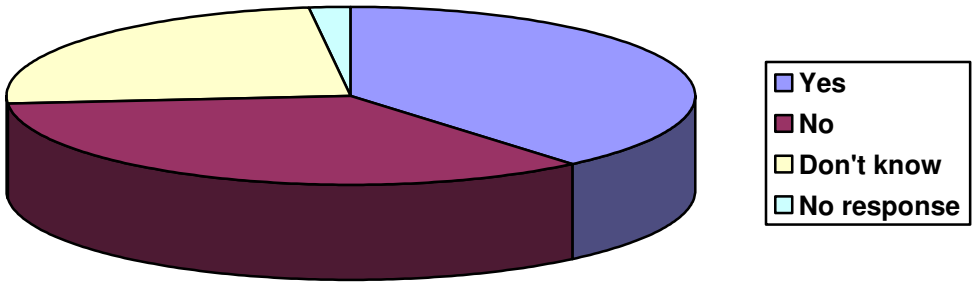


Figure 15. OCA members' perceptions of EID required

Findings Related to Objective 3: Marketing and Traceability

Objective 3 was to identify OCA members' perceptions of marketing cattle in regard to traceability.

Respondents were asked if they believed buyers are asking them for ID-based age and source verification. Of the respondents, 45 (31.3%) answered "Yes," 90 (62.5%) answered "No," 5 (3.5%) answered "Don't Know," and 4 (2.8%) did not respond (see Figure 16).

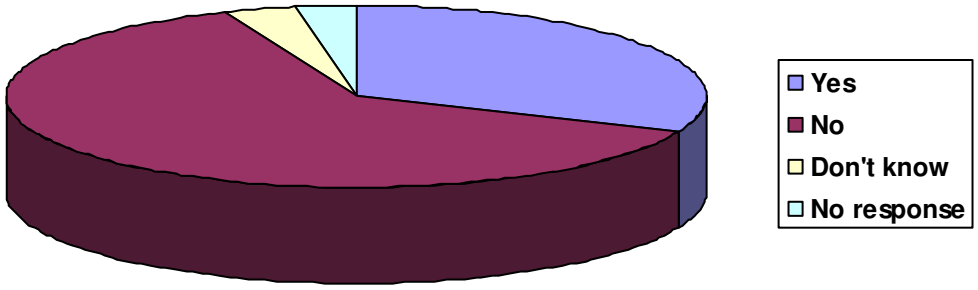


Figure 16. OCA members' perception of buyer requests for age- and source-verified cattle

Respondents were asked if they believe buyers are paying more to receive ID-based verification information. Of the respondents, 62 (43.1%) said "Yes," 51 (35.3%) said "No," 27 (18.8%) said "Don't know," and 4 (2.8%) did not respond.

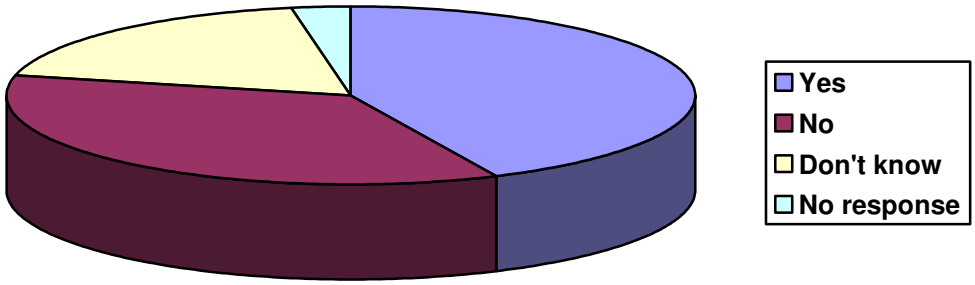


Figure 17. OCA members' perception of buyers paying more for age- and source-verified cattle

Findings related to Objective 4: Relationships between selected characteristics of OCA members and their perceptions of NAIS.

Comparisons were made with selected characteristics of OCA members and their beliefs and actions in regard to the NAIS, marketing, and traceability.

A relationship (Davis, 1971) was found with the number of cattle managed and their belief in the need for the NAIS. A negative and low relationship was indicated to exist ($r = -0.229$; $p < 0.05$). The fewer head the respondents managed, the more likely they would believe in the need for a national system of animal identification.

A negative and low relationship (Davis, 1971) was found between the years the producer was in the industry and the belief in the need for the NAIS ($r = -0.234$; $p < 0.05$). The fewer years the respondents had been in the cattle industry, the more likely they were to believe in a need for a national system of animal identification.

Furthermore, a negative and low relationship (Davis, 1971) was found between the individuals who collect data and the individual's age ($r = -0.187$; $p < 0.05$). The younger the respondents were, the more likely they were to collect performance data.

In addition to correlations, the researcher calculated "cross tabs." Cross tabulation is "a way of presenting the data about two variables in a table so that their relations are more obvious" (Vogt, 2005).

Of the male respondents, 77 (77.0%) believed a national system of animal identification was needed. Of the female respondents, 18 (90.0%) believed a national system of animal identification was needed (see Table 1).

Table 1

Response to the belief in the need of a NAIS based on gender

Sex	Believe NAIS is needed	Believe NAIS is not needed
Male	77 (77.0%)	23 (23.0%)
Female	18 (90.0%)	2 (10.0%)

The level of education was cross-tabulated with the OCA members' belief in the need for a NAIS. Of the respondents with a less than high school education, two (100.0%) believed a national system of animal identification was needed; of the respondents with a high school education, 12 (66.7%) respondents believed a national system of animal identification was needed; of the respondents with an associate's degree, 8 (88.9%) believed a national system of animal identification was needed; of the respondents with a bachelor's degree, 42 (73.6%) believed a national system of animal identification was needed; of the respondents with a master's degree, 19 (86.3%) believed a national system of animal identification was needed; of the respondents with a doctoral degree, 4 (100.0%) believed a national system of animal identification was needed; and of the respondents with a professional degree, 6 (100.0%) believed a national system of animal identification was needed (see Table 2).

Table 2

Response to the belief in the need of a NAIS based on education level

Level of Education	Believe NAIS is needed	Believe NAIS is not needed
Less than High School	2 (100.0%)	0 (0.0%)
High School Diploma	12 (66.7%)	6 (33.3%)
Associate's Degree	8 (88.9%)	1 (11.1%)
Bachelor's Degree	42 (73.6%)	15 (26.4%)
Master's Degree	19 (86.3%)	3 (13.7%)
Doctoral Degree	4 (100.0%)	0 (0.0%)
Professional Degree	6 (100.0%)	0 (0.0%)

Of the respondents that owned computers, 92 (80.0%) believed a national system of animal identification was needed. Of the respondents who do not own a computer, 4 (57.1%) believed a national system of animal identification was needed (see Table 3).

Table 3

Need for NAIS based on computer ownership

Computer Ownership	Believe NAIS is needed	Believe NAIS is not needed
Own a computer	92 (80.0%)	23 (20.0%)
Do not own a computer	4 (57.1%)	3 (42.9%)

Of the male respondents, 47 (57.3%) believed the NAIS should require Electronic Identification for cattle. Of the female respondents, 5 (31.2%) believed the NAIS should require EID for cattle (see Table 4).

Table 4

NAIS use of EID for cattle based on gender

Sex	Require EID	Do not require EID
Male	47 (57.3%)	35 (42.7%)
Female	5 (31.2%)	11 (68.8%)

Of the respondents with less than a high school education, 0 (0.0%) believed the NAIS should require ID for cattle while 2 (100.0%) believed it should not be required; of the respondents with a high school degree, 4 (40.0%) believed the NAIS should require EID for cattle, while 6 (60.0%) believed it should not be required; of the respondents with an associate's degree, 5 (62.5%) believed the NAIS should require EID for cattle while 3 (37.5%) believed it should not be required; of the respondents with a bachelor's degree, 30 (61.2%) believed the NAIS should require EID for cattle, while 19 (38.8%) believed it should not be required; of the respondents with master's degree, 7 (36.9%) believed the NAIS should require EID for cattle while 12 (63.1%) believed it should not be required; of the respondents with a doctoral degree, 3 (75.0%) believed the NAIS should require EID for cattle while 1 (25.0%) believed it should not be required; of the respondents with a professional degree, 2 (40.0%) believed the NAIS should require EID for cattle while three (60.0%) believed it should not be required (see Table 5).

Table 5

Education level in regard to the requirement of EID for cattle in the NAIS

Level of Education	Require EID	Do not require EID
Less than High School	0 (0.0%)	2 (100.0%)
High School Diploma	4 (40.0%)	6 (60.0%)
Associate's Degree	5 (62.5%)	3 (37.5%)
Bachelor's Degree	30 (61.2%)	19 (38.8%)
Master's Degree	7 (36.9%)	12 (63.1%)
Doctoral Degree	3 (75.5%)	1 (25.0%)
Professional Degree	2 (40.0%)	3 (60.0%)

Of the respondents who owned a computer, 50 (53.1%) believed the NAIS should require EID for cattle while 44 (46.9%) did not. Of the respondents who did not own a computer, three (50.0%) believed the NAIS should require EID for cattle while three (50.0%) did not (see Table 6).

Table 6

Computer ownership and the required use of EID for cattle in the NAIS

Computer Ownership	Require EID	Do not require EID
Own a computer	50 (53.1%)	44 (46.9%)
Do not own a computer	3 (50.0%)	3 (50.0%)

Of these respondents who have a job outside of the cattle industry, 26 (45.6%) believed the NAIS should require EID for cattle while 31 (54.4%) did not. Of the

respondents who do not have a job outside of the cattle industry, 27 (62.7%) believed the NAIS should require EID for cattle while 16 (37.3%) did not (see Table 7).

Table 7

Respondents' job orientation and belief about the requirement of EID for cattle in the NAIS

Job Outside the Cattle Industry	Require EID	Do not require EID
Have a job outside of the industry	26 (45.6%)	31 (54.4%)
Do not have a job outside of the cattle industry	27 (62.7%)	16 (37.3%)

Of the male respondents, 54 (49.0%) collected performance data while 56 (51.0%) did not. Of the female respondents, 15 (65.2%) collected performance data, while eight (34.8%) did not (see Table 8).

Table 8

Male and female respondents who collect performance data

Sex	Collect performance data	Do not collect performance data
Male	54 (49.0%)	56 (51.0%)
Female	15 (65.2%)	8 (34.8%)

Of the respondents with less than a high school education, one (50.0%) collected performance data while 1 (50.0%) did not; of the respondents with a high school diploma, 8 (38.0%) collected performance data while 13 (62.0%) did not; of the respondents with an associate's degree, 7 (70.0%) collected performance data while three (30.0%) did not; of the respondents with a bachelor's degree, 38 (61.2%) collected performance data while

24 (38.8%) did not; of the respondents with a master's degree, 9 (34.6%) collected data while 17 (65.4%) did not; of the respondents with a doctoral degree, 4 (100.0%) collected data while 0 (0.0%) did not; of the respondents with a professional degree, 1 (16.6%) collected data while 5 (83.4%) did not (see Table 9).

Table 9

Education level and performance data collection

Level of Education	Collect performance data	Do not collect performance data
Less than High School	1 (50.0%)	1 (50.0%)
High School Diploma	8 (38.0%)	13 (62.0%)
Associate's Degree	7 (70.0%)	3 (30.0%)
Bachelor's Degree	38 (61.2%)	24 (38.8%)
Master's Degree	9 (34.6%)	17 (65.4%)
Doctoral Degree	4 (100.0%)	0 (0.0%)
Professional Degree	1 (16.6%)	5 (83.4%)

Of the respondents who owned a computer, 67 (52.3%) collected performance data while 61 (47.7%) did not. Of the respondents who do not own a computer, 3 (42.9%) collected performance data while 4 (57.1%) did not (see Table 10).

Table 10

Computer ownership in regard to performance data collection

Computer Ownership	Collect performance data	Do not collect performance data
Own a computer	67 (52.3%)	61 (47.7%)
Do not own a computer	3 (42.9%)	4 (57.1%)

Of the respondents who had jobs outside of the cattle industry, 37 (50.6%) collected performance data, while 36 (49.4%) did not. Of the respondents who did not have a job outside of the cattle industry, 33 (53.2%) collected performance data while 29 (46.8%) did not (see Table 11).

Table 11

Respondents' job orientation and performance data collection

Job Outside the Cattle Industry	Collect performance data	Do not collect performance data
Have a job outside of the industry	37 (50.6%)	36 (49.4%)
Do not have a job outside of the cattle industry	33 (53.2%)	29 (46.8%)

Of the male respondents, 58 (52.7%) believed the NAIS should become mandatory while 52 (47.3%) did not. Of the female respondents, 6 (28.5%) believed the NAIS should become mandatory while 15 (71.5%) did not (see Table 12).

Table 12

Male and female respondents' opinion on a mandatory NAIS

Sex	NAIS should be mandatory	NAIS should not be mandatory
Male	58 (52.7%)	52 (47.3%)
Female	6 (28.5%)	15 (71.5%)

Of the respondents who have less than a high school education, 2 (100.0%) believed the NAIS should become mandatory while 0 (0.0%) did not; of the respondents with a high school education, 9 (45.0%) believed the NAIS should become mandatory

while 11 (55.0%) did not; of the respondents with an associate's degree, 5 (50.0%) believed the NAIS should be mandatory while 5 (50.0%) did not; of the respondents who have a bachelor's degree, 28 (45.9%) believe the NAIS should become mandatory while 33 (44.1%) did not; of the respondents with a master's degree, 13 (50.0%) believed the NAIS should become mandatory, while 13 (50.0%) did not; of the respondents with a doctoral degree, 3 (75.0%) believed the NAIS should become mandatory, while 1 (25.0%) did not; of the respondents with a professional degree, 2 (40.0%) believed the NAIS should become mandatory while 3 (60.0%) did not (see Table 13).

Table 13

Education level in regard to the mandatory implementation of the NAIS

Level of Education	NAIS should be mandatory	NAIS should not be mandatory
Less than High School	2 (100.0%)	0 (0.0%)
High School Diploma	9 (45.5%)	11 (50.0%)
Associate's Degree	5 (50.0%)	5 (50.0%)
Bachelor's Degree	28 (45.9%)	33 (44.1%)
Master's Degree	13 (50.0%)	13 (50.0%)
Doctoral Degree	3 (75.0%)	1 (25.0%)
Professional Degree	2 (40.0%)	3 (60.0%)

Of the respondents who own computers, 61 (48.8%) believed the NAIS should become mandatory, while 64 (51.2%) did not. Of the respondents who do not own a computer, 4 (57.1%) believed the NAIS should become mandatory, while 3 (42.9%) indicated they did not (see Table 14).

Table 14

Computer ownership and the implementation of a mandatory NAIS

Computer Ownership	NAIS should be mandatory	NAIS should not be mandatory
Own a computer	61 (48.8%)	64 (51.2%)
Do not own a computer	4 (57.1%)	3 (42.9%)

Of the respondents who have a job outside of the cattle industry, 32 (43.8%) believed the NAIS should be mandatory while 41 (56.2%) did not. Of the respondents who do not have jobs outside of the industry, 33 (55.9%) believed the NAIS should be mandatory while 26 (44.1%) did not (see Table 15.)

Table 15

Respondents job orientation and the implementation of a mandatory NAIS

Job Outside the Cattle Industry	NAIS should be mandatory	NAIS should not be mandatory
Have a job outside of the industry	32 (43.8%)	41 (56.2%)
Do not have a job outside of the cattle industry	33 (55.9%)	26 (44.1%)

CHAPTER V

CONCLUSIONS, RECOMMENDATIONS, AND IMPLICATIONS

This study was completed to assess Oklahoma Cattlemen's Association members' awareness and perceptions about traceability and the National Animal Identification System. Chapter I addressed the need for a traceability system and to identify the beliefs cattlemen and cattlewomen have on the issue.

Chapter II concentrated on present and past literature to develop a strong base for this study. The theoretical framework illustrated the fundamental principles behind this research. Ajzen and Fishbein's theory of planned behavior/reasoned action was implemented to define the basic standards for reviewing the data. Traceability is necessary not only for disease control but also to encourage export trade needed for the success of the beef industry (Disney et al., 2001; Golan et al., 2004; Souza-Monteiro & Caswell, 2004).

Chapter III described the methodology used to develop the survey and collect the data. The chapter discussed the validity and reliability of the instrument. A description of the population was discussed as well as how the survey was administered at the OCA convention.

Chapter IV described the findings of the survey instrument. The results of the study addressed the objectives defined by the researcher about the OCA members' awareness and perceptions of the NAIS.

The purpose for this chapter was to summarize the findings of the research and offer conclusions, recommendations, and implications. All of the information collected to support and answer the problem, purpose and objectives has been reported in this study.

Purpose

The purpose of this descriptive study was to determine Oklahoma Cattlemen's Association (OCA) members' awareness of the National Animal Identification System and livestock traceability as it pertains to marketing and to measure their perceptions and concerns toward the implementation of this program.

Objectives

This study sought to answer the following objectives regarding marketing, traceability, and the implementation of the NAIS:

1. To identify specified characteristics of OCA members;
2. To determine the OCA members' awareness and perceptions of the NAIS;
3. To identify OCA members' perceptions of marketing cattle in regard to traceability; and
4. To determine relationships between selected characteristics of OCA members and their perceptions of NAIS.

Summary of the Findings

Findings related to Objective 1: Develop a profile of OCA members

Members of the OCA are primarily men (77.1%) with an average age of 49 who are employed in other occupations outside the cattle industry (51.4%). They have a

college level of education or higher (74.6%). OCA members own computers (89.6%) and have Internet access (86.8%). Furthermore, they were also members of the NCBA (50.7%) and the Oklahoma Farm Bureau (54.2%).

Producers primarily run cow/calf operations (75.0%). The mean number of head managed, regardless of ownership, was 3,289 head. The mode was 99 head and the median was 200 head.

Findings related to Objective 2: Determine the OCA members' awareness and perceptions of the NAIS

OCA members' reported receiving information about the NAIS from agricultural publications (52.1%), ODAFF (47.9%), and the USDA (45.8%).

OCA members surveyed indicated their belief (70.1%) the NAIS is necessary for animal health monitoring in the United States. Some of the OCA members (42.4%) believed the NAIS should become mandatory, while others (43.1%) believed it should not. For members who believed the NAIS should become mandatory, the largest number of respondents (23.0%) believed it should occur within two years.

Almost half of the OCA members surveyed have registered their premises (48.6%) with the ODAFF. When asked when they planned to register their premises, the majority of respondents said they planned to register within one year (77.8%).

The OCA members surveyed used non-electronic ear tags (76.4%) and brands (74.3%) for animal identification purposes. Most members collect data on individual cattle (51.4%) and would voluntarily collect data on individual animals for herd management purposes if the NAIS should become mandatory (60.4%).

Findings related to Objective 3: Identify OCA members' perceptions of marketing cattle in regard to traceability

OCA members indicated they perceived they were not being asked for age- and source- verification information (62.5%). Some members (43.1%) perceived buyers were paying more for age- and source- verified cattle.

Findings related to Objective 4: Determine relationships between selected characteristics and perceptions of NAIS.

In comparing selected characteristics with the number of cattle managed and the perception in the need for the NAIS, a positive and low relationship (Davis, 1971) was found to exist ($r = -0.229$; $p < 0.05$). A positive and low relationship (Davis, 1971) was found between the years the producer was in the industry and the perceived in the need for the NAIS ($r = -0.234$; $p < 0.05$). A negative and low relationship (Davis, 1971) was found between the individuals who collect data and the individual's age ($r = -0.187$; $p < 0.05$).

According to the data, male (77.0%) and female (90.0%) respondents perceived a national system of animal identification was needed in the United States. Each level of education indicated respondents perceived a national system of animal identification was needed. Respondents who owned a computer (80.0%) perceived a national system of animal identification is needed. Respondents who had a high school diploma or less, a master's degree or a professional degree indicated they believe EID should not be required for cattle in the NAIS. Those with an associate's, bachelor's, or doctoral degree indicated they believe EID should be required.

Of the respondents who owned a computer, 67 (52.3%) indicated they collected performance data. Of the male respondents, 58 (52.7%) indicated the NAIS should become mandatory.

Conclusions

Conclusions related to Objective 1: Develop a profile of OCA members

Based upon the findings, OCA members are large, progressive cow/calf producers who have a college education or higher. This predominately male group has computers and personal access to the Internet, and the majority have jobs outside the cattle industry.

The primary sources of information are agricultural publications, the ODAFF, and the USDA. This contradicts previous research by Ashlock (2006), which indicated the cooperative extension service was the Oklahoma beef producers' preferred source for information.

Conclusions related to Objective 2: Determine the OCA members' awareness and perceptions of the NAIS

Members of the OCA have an awareness of the NAIS. This is indicated by almost half of the members registering their premises with the ODAFF. This data contradicts previous research by Breiner et al (2007) that reported only 32.8% of cow-calf producers nationwide (n = 522) had registered their premises.

OCA members are similar to other beef producers based upon previous research by Veil (2006) and Breiner et al (2007). OCA members support the idea of a national system of identification, although they have mixed beliefs in regard to the system

becoming mandatory. This is consistent with similar data reported by Breiner et al (2007) indicating 41.0% of cow-calf producers (n = 522) believed to some degree that the NAIS was necessary.

OCA members surveyed indicated they primarily use other ear tags and branding for identification purposes, although a few used EID tags. This is similar to research completed by Veil (2006) who found members of the North Dakota Stockmen's Association used branding as the main source of identification. Further, Breiner et al (2007) reported 84.5% of cow-calf producers (n = 522) used visual ear tags while 56.1% also branded.

Conclusions related to Objective 3: Identify OCA members' perceptions of marketing cattle in regard to traceability

Based on the findings related to marketing and traceability, OCA members do not perceive traceability will provide higher prices for cattle. As the respondents indicated, they see a value for age- and source-verified cattle because they believe buyers are paying more for cattle with this information. They do not perceive buyers currently are asking for age- and source-verification, so consequently, they are not encouraged to supply age- and source-verification information.

As indicated by the results of the survey, producers do not see age- and source-verification or traceability as a significant incentive to increase the return on their cattle. These results are similar to those reported by Breiner et al (2007) that indicated a majority of cow-calf producers surveyed did not believe a national identification system would increase the return on their cattle. Premiums are being paid for cattle that have this

information and have the potential to be exported to countries requiring age and source verification information (Disney et al., 2001, Souza-Monteiro & Caswell, 2004).

Conclusions related to Objective 4: To determine relationships between selected characteristics and perceptions of NAIS

The fewer cattle managed (regardless of ownership) the more the OCA members were likely to perceive in a need for national system of animal identification. The fewer years the OCA members were in the cattle business, the more likely they were to perceive a need for a national animal identification system. Finally, the younger the OCA member, the more likely they were to collect performance data.

Respondents who owned a computer were more likely to collect performance data than those who did not own a computer. This was similar to the results reported by Breiner et al (2007) that indicated 65.4% of cow-calf producers who use computers (n = 286) utilized them for livestock records. Higher education also played a role in producer beliefs about the need for an NAIS in the United States. Producers with a bachelor's degree or a master's degree were more likely to perceive a need for a national system of animal identification for health monitoring purposes.

Male and female OCA members had different opinions on the required use of electronic identification for cattle in the NAIS; male favored EID while females did not. Education levels of producers indicated mixed results in relation to higher education versus the requirement of electronic identification tags. In general, higher education levels increase the support for EID. Respondents with an outside job were more likely to

perceive electronic identification should not be required than respondents whose primary source of income came directly from the cattle operation.

Respondents with a bachelor's degree were more likely to collect performance data than any other education level. Respondents who had completed a master's degree were more likely to not collect performance data.

Respondents with jobs outside of the cattle industry do not perceive the NAIS should be mandatory while respondents without a job outside of the cattle industry perceive it should be mandatory. Respondents owning a computer do not believe the NAIS should become mandatory while those who do not own a computer believe the NAIS should become mandatory.

If an OCA member owns a computer, he or she is more likely to perceive the NAIS should not be mandatory, as compared to support for a mandatory NAIS from those who do not.

Recommendations

The following recommendations were made based on the findings and conclusions of this research.

Recommendations for Practice

Agricultural publications along with ODAFF and the USDA were listed as primary sources of education for OCA members. Those agencies, including the USDA, the ODAFF, and the Oklahoma Cooperative Extension Service (OCES), should use the agricultural publications to release news articles and informational reports to further

inform OCA members about the NAIS and how producers can become involved in the program.

Ashlock (2006) indicated that print sources from the cooperative extension service were a preferred source of information for Oklahoma beef producers. Although the results contradicted this information, the cooperative extension service still may play a strong role in disseminating information about the NAIS.

Members identified the sources used to gain information about the NAIS. They indicated the OCES was not a popular source of information. Further investigation into why OCES is not considered a strong source for information could be completed.

OCA members indicated they perceive a need for an NAIS in the United States. Those respondents who have not registered their premises indicated they had not done so for a variety of reasons. Most of which could be changed with education. Material regarding the registration process, EID information, and general information regarding the purposes of the NAIS should be developed and disseminated to the members through mailings and OCA meetings.

Because the majority of producers use ear tags for identification purposes, the USDA APHIS should work to make the conversion to an EID or approved visual ear tag as easy as possible to encourage participation in the NAIS. Producers were uncertain if EID tags should be required for the NAIS, thus the effectiveness of the EID ear tag should be proven to producers. OCA members have their own identification practices, including branding and tattooing. These methods have provided a consistent form of identification for producers; unless EID tags are proven to be a consistent and solid

technique for identification purposes, it will be difficult to convince OCA members to change.

Producers with age- and source-verification information on their cattle should enroll in an age- and source-verified program. The USDA offers the process verified program (PVP) and quality system assessment (QSA) programs designed to aid in marketing cattle and other agricultural commodities (USDA, 2004). Private industry organizations are approved by the USDA and audited on an annual basis to ensure validity in the marketing program.

PVPs have the potential to help producers increase the return on their cattle with age and source information as well as other claim certification. The enrollment in this program can encourage producers to collect this type of information to gain higher prices for their cattle. Producers with age- and source-verification should offer this information to buyers when marketing them.

OCA members are progressive in the use of computers. These producers are more likely to collect data, but they still do not necessarily believe in the need for a national animal identification system. Since computers are being used consistently by producers, electronic dissemination of information should be used to can increase producer awareness about the NAIS.

According to Breiner et al (2007) cow-calf producers most often use their computers for e-mail access, followed by financial management and livestock records. If e-mail addresses are available, e-mail would be a way disseminate information about the NAIS. The OCA, ODAFF, and OCES should create an e-mail address list of OCA members and should use the list to send news releases and other important information to

producers. This has the potential to reach progressive members and effectively disseminate further information that could aid producers. These producers are considered innovators and early adopters and will have a positive impact on the adoption of the NAIS within the Oklahoma cattle industry (Rogers, 2003).

Recommendations for future research

As little research has been completed on beef producers' perceptions and awareness about the NAIS and traceability, this study should be replicated in other state cattlemen's organizations to discover the awareness and perception other state's producers have in regard to the NAIS.

In addition, further research should be completed regarding cattle buyers' tendency to ask for age and source verification when purchasing cattle. This may provide an explanation as to why OCA members did not believe they were being asked for age and source verification.

Implications

The research indicates OCA members believe a national system of identification and traceability is needed in the United States for animal health purposes. Most producers already use an ear tag to identify their cattle. If the USDA APHIS can find an EID tag and reader that is easy to use and cost-efficient or better promote the approved visual tags, the transition from using their old tags to using EID tags or approved visual tags would be much less challenging. The producers will have to believe these tags will work

and continue to be efficient in identifying their cattle. If they never perceive these tags to work, it will be difficult to implement them in the industry.

OCA members did not identify the OCES as a strong source of information about the NAIS. This contradiction could be due to the way the survey was written. Cooperative extension programs often work closely with the ODAFF and the USDA to deliver material to the OCA members. Consequently, the respondents may have given full credit for information to the ODAFF and the USDA without considering the method of delivery was the cooperative extension service. Also, with the high availability of Internet access, OCA members may be receiving information from the ODAFF and the USDA Web sites.

As more foreign markets continue to demand age- and source-verification information on cattle imports, producers in the United States will be forced by the market to have this information on their cattle to sell them. The OCA has the opportunity now to increase the number of producers who collect this type of data by promoting the premiums available for cattle with this information.

Although this case study is limited in scope, it provides useful information to the OCA, OCES, ODAFF, and other agencies about the Oklahoma cattle producers and could help implementation of NAIS educational programs and forums.

REFERENCES

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179-211.

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior.* Englewood Cliffs, NJ: Prentice-Hall, Inc.

Anderson, J. (2004). Potentital impact of BSE on the U.S. beef industry. Mississippi State University. Retrieved November 13, 2006, from http://msucares.com/livestock/beef/bseimpact.pdf

Animal & Plant Health Inspection Service. (2007 a). Advancing Animal Disease Traceability: An overview. Retrieved November 1, 2007 from http://animalid.aphis.usda.gov/nais/naislibrary/documents/plans_reports/traceability_overview.pdf

Animal & Plant Health Inspection Service. (2007 b). Foot-and-Mouth Disease. Retrieved November 1, 2007, from http://www.aphis.usda.gov/animal_health/emergency_management/downloads/fs_ahfmd.pdf

Animal & Plant Inspection Service. (2004) Questions and answers on the National Animal Identification System. Retrieved November 1, 2006, from http://animalid.aphis.usda.gov/nais/newsroom/factsheets/nais_qa_factsheet.shtml

Ashlock, M. A. (2006). *The uncertainty of agro terrorism: A study of Oklahoma beef producers' risk perception, information sources and source trust in the pre-crisis stage.* Unpublished doctoral dissertaion, Oklahoma State University, Stillwater.

Augsburg, J. K. (1989). *The benefits of animal identification for food safety*. American Society of Animal Science, New Brunswick, NJ.

Bagozzi, R. P., & Kimmel, S. K. (1995). A comparison of leading theories for the prediction of goal-directed behaviours. *The British Psychological Society, 34*, 437-461.

Birkdoll, S. (2006). USDA needs to listen to NAIS opposition [Electronic edition]. *The Prairie Star*. Retrieved December 1, 2007, from http://www.theprairiestar.com/articles/2006/05/10/ag_news/opinion/opinion10.prt

Bosnjak, M., Obermeier, D., & Tuten, T. L. (2006). Predicting and explaining the propensity to bid in online auctions: A comparison of two action-theoretical models. *Journal of Consumer Behavior*, *5,* 102-116.

Breiner, S. J., Boone, K. M., Blasi, D. A., Grau, S.A., Schroeder, T. C., Barnhardt, B. B., Breiner, R. M., & Bryant, A. M. (2007a). Attitudes of cow-calf producers toward NAIS are guarded [Electronic version]. Retrieved September 15, 2007, from http://www.oznet.ksu.edu/library/lvstk2/srp978.pdf

Breiner, S. J., Boone, K. M., Blasi, D. A., Grau, S. A., Schroeder, T. C., Barnhardt, B. B., Breiner, R. M., & Bryant, A. M. (2007b). Despite NAIS concerns electronic identification use by cow-calf producers is increasing [Electronic version]. Retrieved September 15, 2007, from http://www.oznet.ksu.edu/library/lvstk2/srp978.pdf

Breiner, S. J., Boone, K. M., Blasi, D. A., Grau, S. A., Schroeder, T. C., Barnhardt, B. B., Breiner, R. M., & Bryant, A. M. (2007c). Computer and Internet usage of cow-calf producers is growing [Electronic version]. Retrieved September 15, 2007, from http://www.oznet.ksu.edu/library/lvstk2/srp978.pdf

Breiner, S. J., Boone, K. M., Blasi, D. A., Grau, S. A., Schroeder, T. C., Barnhardt, B. B., Breiner, R. M., & Bryant, A. M. (2007 d). Veterinarians are most popular source of information utilized by cow-calf producers [Electronic version]. Retrieved September 15, 2007, fromttp://www.oznet.ksu.edu/library/lvstk2/srp978.pdf

Caporale, V., Giovannini, A., Di Francesco, C., and Calistri, P. (2001). Importance of the tracebility of animals and animal products in epidemiology. *Revue scientificque et technique de l Office international des Epizooties, 20*(2), 372-378. Retrieved April 21, 2007, from https://www.oie.int/eng/publicat/rt/2002/CAPORALE.PDF

Creswell, J. C. (2007). *Educational research: planning, conducting and evaluating quantitative and qualitative research.* Columbus, Ohio: Prentice Hall.

Davis, J.A. (1971). *Elementary survey analysis.* Englewood, NJ: Prentice Hall.

Dillman, D. A. (2007) *Mail and Internet Surveys: The Tailor Design Method* (2nd ed.). Hoboken, NJ: John Wiley and Sons, Inc.

Disney, W. T., Green, J. W., Forsythe, K. W., Wiemers, J. F., Weber, S. (2001). Benefit-cost analysis of animal identification for disease prevention and control. *Revue scientificque et technique de l Office international des Epizooties, 20*(2), 385-405. Retrieved April 30, 2007, from https://www.oie.int/eng/publicat/rt/2002/DISNEY.PDF

Doll, J., & Azjen, I. (1992). Accessibility and stability of predictors in the theory of planned behavior. *Journal of Personality and Social Psychology, 63*(5), 754-765.

Grant, J. S., & Davis, L. L. (1997). Focus on quantitative methods: Selection and use of content experts for instrument development. *Research in Nursing & Health*, *20,* 269–274.

Golan, E., Krissoff, B., Kuchler, F., Calvin, L., Nelson, K., & Price, G. (2004). Traceability in the U.S. food supply: Economic theory and industry studies. Washington, D.C., United States Department of Agriculture**:** 1-48.

Hansen, T., Moller-Jensen, J. & Solgaard, H. S. (2004). Predicting online grocery buying intention: a comparison of the theory of reasoned action and the theory of planned behavior. *International Journal of Information Management, 24*, 539–550.

Jenkins, C. R.,& Dillman, D. A. (1995). Toward a theory of self-administered questionnaire design. *Survey Measurement and Process Quality*. New York: Wiley-Interscience.

Madden, T. J., Ellen, P. S., & Ajzen, I. (1992). A comparision of the theory of planned behavior and the theory of reasoned action. *Personality and Social Psychology Bulletin, 18*(1), 3-9.

Marshall, C., & Rossman, G. B. (2006). *Designing qualitative research* (4th ed.). Thousand Oaks, CA: Sage Publications.

McAllister, T. A., Gibb, D. J., Kemp, R. A., Huisma, C., Olson, M. E., Milligan, D, & Schwartzkopf-Genswein, K. . (1999). Electronic identification: Applications in beef production and research. *Canadian Journal of Animal Science*, *80*, 381-392.

McKean, J. D. (2001). The importance of traceability for public health and consumer protection. *Revue scientificque et technique de l Office international des Epizooties*, *20*(2), 63-371. Retrived April 21, 2007, from http://oie.int/eng/publicat/rt/2002/MCKEAN.PDF

Muijs, D. (2004). *Doing Quantitative Research in Education with SPSS*. Thousand Oaks, CA: SAGE Publications.

National Agricultural Statistics Service. (2007) Oklahoma-All cattle beef statistics. Retrieved October 27, 2007,rom: http://www.nass.usda.gov/QuickStats/PullData_US.jsp

Oklahoma Cattlemen's Association. (2005, July) *Comments submitted on the National Animal Identification System Strategic Plan.* (Docket No. APHIS-2005-0044) Oklahoma City.

Opara, L. U. (2003). Traceability in agriculture and food supply chain: A review of basic concepts, technological implications and future prospects. *Food, Agriculture & Environment, 1*(1): 101-106.

Rogers, E.M. (2003). *Diffusion of Innovations* (5th ed.). New York: Free Press.

Schrimper, R. . (2001) *Economics of agricultural markets.* Upper Saddle River, NJ: Prentice Hall.

Slade, J. R. (2004). *Factors influencing support for a national animal identification system for cattle in the United States*. Unpublished doctoral dissertation. Utah State University, Logan.

Souza, K. (2006). Cattle ID technology meets opposition [Electronic version]. *The Morning News*. Retrieved December 1, 2007, from http://www.theprairiestar.com/articles/2006/05/10/ag_news/opinion/opinion10.prt

Souza-Monteiro, D. M., & Caswell, J. A. (2004). The economics of implementing traceability in beef supply chains: Trends in major producing and trading countries. Amherst, MA, University of Massachusetts Amherst**:** 1-30.

Sparks Companies, Inc. (2002). Linking the food chain: Sharing information and verifying source, materials and processes across traditional boundaries. A multi-client study. Memphis, TN.

Stake, R.E. (1995). *The art of case study research.* Thousand Oaks, CA. Sage Publications.

Brown, K. M. *Theory of reasoned action/theory of planned behavior*. (2006). Retrieved Nov. 11, 2006, from http://hsc.usf.edu/~kmbrown/TRA_TPB.htm

United States Department of Agriculture. (2006) *National animal identification system (NAIS): Strategies for the implementation of NAIS*. Retrieved November 1, 2006, from www,aphis.usda.gov/nais_implement.htm

Veil, S. R. (2006). *Crisis communication and agrosecurity: Organizational learning in a high-risk environment*. Unpublished doctoral dissertation. North Dakota State University, Fargo.

Velthius, A. G. J. & Mourits, M. C. M. (2007). Effectiveness of movement-prevention regulations to reduce the spread of foot-and-mouth in the Netherlands. *Preventative Veterinary Medicine, 82*, 262-281. Retrieved from Science Direct.

Vogt, W.P. (2005). *Dictionary of statistics & methodology*. Thousand Oaks, CA: Sage Publications.

Yin, R.K. (2003). *Applications of case study research* (2nd ed.). Thousand Oaks, CA: Sage Publications.

APPENDICES

APPENDIX A

IRB APPROVAL

Oklahoma State University Institutional Review Board

Date:	Thursday, July 12, 2007
IRB Application No	AG0723
Proposal Title:	Oklahoma Cattlemen's Attitudes and Perceptions about the National Animal Identification System
Reviewed and Processed as:	Exempt

Status Recommended by Reviewer(s): Approved Protocol Expires: 7/11/2008

Principal Investigator(s

Briley Elliott
448 Ag Hall
Stillwater, OK 74078

Shelly Sitton
435 Ag Hall
Stillwater, OK 74078

Shari Veil
395 West Lindsey, Rm 3509
Norman, OK 731094201

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

☑ The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Beth McTernan in 219 Cordell North (phone: 405-744-5700, beth.mcternan@okstate.edu).

Sincerely,

Sue C. Jacobs, Chair
Institutional Review Board

APPENDIX B

IRB CONSENT

701-A-5

INFORMATION SHEET FOR CONSENT TO PARTICIPATE IN A RESEARCH STUDY

Briley Elliott, graduate student in the Department of Agricultural Education, Communications and Leadership at Oklahoma State University and Shari Veil, assistant professor in the Gaylord College of Journalism and Mass Communication at the University of the Oklahoma, request that you volunteer to participate in a research study titled Oklahoma Cattlemen's Attitudes and Perceptions about the National Animal Identification System. You were selected as a possible participant because you are attending the Oklahoma Cattlemen's Association Annual Meeting. Please read this information sheet and contact us to ask any questions that you may have before agreeing to take part in this study.

Purpose of the Research Study: The purpose of this study is to determine the attitudes and perceptions of Oklahoma Cattlemen's Association members toward the National Animal Identification System as it applies to beef marketing and traceability.

Procedures: If you agree to be in this study, you will be asked to complete the survey and return it to the researchers located at the registration table throughout the meeting.

Risks and Benefits of Being in the Study: There are no risks associated with completing this study. Your name will not be associated with your completed survey. Results of this survey will assist the Oklahoma Cattlemen's Association in better understanding membership and will assist state and federal agencies in understanding if or how to implement NAIS.

Compensation: When you return your completed survey to the researchers stationed at the registration table, you will receive an Oklahoma Cattlemen's Association cap.

Voluntary Nature of the Study: Participation in this study is voluntary. Your decision whether or not to participate will not result in penalty or loss of benefits to which you are otherwise entitled. If you decide to participate, you are free not to answer any question or discontinue participation at any time without penalty or loss of benefits to which you are otherwise entitled.

Length of Participation: Completion of the survey should take about 15-20 minutes. You may complete the survey at any time during the 2-day meeting.

Confidentiality: The records of this study will be kept private and supervisors will not have access to your responses. In published reports, no information will be included to make it possible to identify you as a research participant. Only approved researchers will have access to the research records stored in a locked filing cabinet and data stored on a password-protected computer.

Contacts and Questions: If you have questions about the research, please contact Briley Elliott at 405-744-8036 or briley.k.elliott@okstate.edu, contact Shelly Sitton at 405-744-3690 or shelly.sitton@okstate.edu or contact Shari Veil at 405-325-5371 or shari.veil@ou.edu. In the event of a research-related injury, contact the researcher(s). The OSU Institution Review Board (IRB) and OU IRB have the authority to inspect consent records and data files to assure compliance with approved procedures. If you have questions about your rights as a research volunteer, you may contact Dr. Sue C. Jacobs, OSU IRB chair, 219 Cordell North, Stillwater, OK 74078, 405-744-9895 or irb@okstate.edu or you may contact the OU – Norman Campus IRB at 405-325-8110 or irb@ou.edu.

Please keep this information sheet for your records. By completing and returning this questionnaire, I am agreeing to participate in this study.

Revised 3/5/2007

APPENDIX C

IRB SCRIPT

Recruitment Script

Hi, my name is Briley Elliott. I'm a graduate student in the Agricultural Communications Department at Oklahoma State University. We are conducting a survey to determine Oklahoma Cattlemen's Attitudes and Perceptions about the National Animal Identification System. Please read this information sheet and let me know if you have any questions before completing the attached survey. You can fill out the survey now or at any time during the remainder of the meetings. When you are finished, please return the survey to me here at the registration table, and you will receive an Oklahoma Cattlemen's Association cap. Thank you.

Reminder Script

This is just a reminder that we are conducting a survey to determine Oklahoma Cattlemen's Attitudes and Perceptions about the National Animal Identification System. If you haven't already completed a survey, please see me at the registration table. If you choose to participate, you will receive an Oklahoma Cattlemen's Association cap. Thank you.

APPENDIX D

INSTRUMENT

1. **What is your OCA Convention affiliation _____**

   (producer, veterinarian, vendor, etc.)

2. **Why do you think the National Animal Identification System is being proposed?**

_____

_____

_____

3. **Do you believe a national system of animal identification is needed in the United States for animal health monitoring purposes?**

   ☐ YES
   ☐ NO
   ☐ DON'T KNOW

4. **Should such a national system for an animal health monitoring system be mandatory?**

   ☐ YES
   ☐ NO
   ☐ DON'T KNOW

   a. **If yes, When should a mandatory National Animal Identification System be fully implemented?**

   ☐ Immediately
   ☐ Within 1 year
   ☐ Within 2 years
   ☐ Within 3 years
   ☐ Within 5 years

5. **Have you registered your livestock premises with the Oklahoma Department of Agriculture, Food, & Forestry?**

   ☐ YES
   ☐ NO
   ☐ DON'T KNOW

   a. **If not, why haven't you registered your premises?**

   ☐ I don't know how
   ☐ I'm too busy
   ☐ I'm waiting till it's mandatory
   ☐ I'm unfamiliar with the program
   ☐ I'm opposed to the program
   ☐ Other: please explain:_____

6. When do you plan to register your premises?

☐ Within 3 months
☐ Within 6 months
☐ Within 1 year
☐ Never

7. Which of the following cattle identification methods do you use for your livestock? (Mark all that apply)

☐ Do not identify
☐ Electronic ear tags
☐ Other ear tags
☐ Brand
☐ Tattoo
☐ Other: Please explain:_____

8. Do you collect performance data on individual cattle?

☐ YES
☐ NO

9. If NAIS is becomes mandatory, would you voluntarily capture other performance data on individual animals for herd management purposes?

☐ YES
☐ NO
☐ DON'T KNOW

10. Should electronic identification be required for cattle in the National Animal Identification System?

☐ YES
☐ NO
☐ DON'T KNOW

11. What concerns do you have about the NAIS?

_____

_____

_____

_____

_____

12. How do you feel your concerns are being addressed by USDA/APHIS?

_____

_____

_____

_____

13. Are buyers asking you for ID-based age and source verification?

☐ YES
☐ NO
☐ DON'T KNOW

14. Do you believe buyers are paying more to receive ID-based verification information?

☐ YES
☐ NO
☐ DON'T KNOW

15. What would be the advantages to a mandatory identification program?

_____

_____

_____

_____

16. What would be the disadvantages to a mandatory identification program?

_____

_____

_____

_____

17. What role do you feel the OCA plays in the implementation of NAIS?

_____

_____

_____

_____

18. Are you a member of any other industry organizations? Mark all that apply.

- ☐ National Cattlemen's Beef Association
- ☐ R-Calf
- ☐ Oklahoma Farm Bureau
- ☐ Oklahoma Farmer's Union
- ☐ Other: Please list _____

19. Where do you get information about the National Animal Identification System? (Mark all that apply)

a. Cooperative Extension Service/University
☐ Oklahoma Department of Agriculture, Food, & Forestry
☐ United States Department of Agriculture
☐ Other beef producers
☐ Veterinarian
☐ Sales persons
☐ Producer Organizations
☐ Ag Publications
☐ Ag Broadcasting
☐ Non-Ag media

20. How many cattle do you manage, regardless of ownership? _____

21. How many years have you been in the cattle industry? _____

22. What is your primary type of cattle operation?

- ☐ Cow/Calf operation
- ☐ Stocker/Backgrounder
- ☐ Dairy
- ☐ Feedlot
- ☐ Other: _____

23. What is your secondary type of cattle operation?

- ☐ Cow/Calf operation
- ☐ Stocker/Backgrounder
- ☐ Dairy
- ☐ Feedlot
- ☐ Other: _____
- ☐ None

24. What is your age? _____

25. What is your gender?

- ☐ Male
- ☐ Female

26. What is the highest level of education you have achieved?

- ☐ Less than high school
- ☐ High School diploma
- ☐ Associates degree
- ☐ Bachelor's degree
- ☐ Masters degree
- ☐ Doctorate
- ☐ Professional degree (MD, JD, DVM, etc.)

27. Are you employed in other work besides cattle production?

- ☐ YES
- ☐ NO

28. Do you own a computer?

- ☐ YES
- ☐ NO

29. Does your home/office have Internet access?

- ☐ YES
- ☐ NO

30. What other information do you feel would be helpful to the researchers in understanding Oklahoma Cattlemen's attitudes and perceptions about the National Animal Identification System?

_____

_____

_____

_____

Thank you for your participation. Please return this survey to the researchers stationed at the registration table to receive your Oklahoma Cattlemen's Association cap.

VITA

Briley K. Elliott

Candidate for the Degree of

Master of Science

Thesis: OKLAHOMA CATTLEMEN'S ASSOCIATION MEMBERS' PERCEPTIONS OF THE NATIONAL ANIMAL IDENTIFICATION SYTEM

Major Field: Agricultural Communications

Biographical:

Personal Data: Briley K. Elliott was born December 9, 1982, in Newcastle, Wyoming. Her parents are Lee and Linda Elliott.

Education: Bachelor of Science in Agricultural & Extension Education, New Mexico State University, 2005
Completed the requirements for the Master of Science in Agricultural Communications at Oklahoma State University, Stillwater, Oklahoma, in December, 2007.

Experience: Advertising & Ranch Promotion for Camp Cooley Ranch, May 2007-Present. Direct customer contacts for sales and customer service; develop and work within an advertising and marketing budget; coordinate and produce sale catalogs; coordinate and produce The Link, a newsletter produced three times a year; coordinate ad placement and design; design ranch promotional materials including brochures, sale fliers, etc.; and photograph ranch events.

Name: Briley Elliott Date of Degree: December, 2007

Institution: Oklahoma State University Location: Stillwater, Oklahoma

Title of Study: OKLAHOMA CATTLEMEN'S ASSOCIATION MEMBERS' PERCEPTIONS OF THE NATIONAL ANIMAL IDENTIFICATION SYSTEM

Pages in Study: 91 Candidate for the Degree of Master of Science

Major Field: Agricultural Communications

Scope and Method of Study: The purpose of this study was to determine awareness and perceptions of Oklahoma Cattlemen's Association members in regard to the National Animal Identification System. A self-administered survey tool was developed and distributed at the 2007 Oklahoma Cattlemen's Association convention in Midwest City, OK. Validity was determined by a panel of experts. Quantitative data was collected and analyzed using descriptive statistics.

Findings and Conclusions: OCA members are large, progressive cow/calf producers who have a high school level education or higher. They have access to the Internet and the majority has jobs outside the cattle industry. Their primary sources of information are the ODAFF, the USDA, and agricultural publications. OCA members perceive the NAIS is necessary for animal health monitoring in the United States. Almost half of the OCA members surveyed have registered their premises. Others indicated they planned to register within one year. Predominantly, the OCA members used ear tags and brands for animal identification purposes. OCA members believe electronic ID should be used for cattle in the NAIS. OCA members indicated they were not being asked for age- and source-verification information but perceived buyers were paying more for age- and source-verified cattle. A negative and low relationship exists between the number of cattle managed and belief in the need for the NAIS. A negative and low relationship was found between the years the producer was in the industry and their belief in the need for the NAIS. A negative and low relationship was found between respondents who collect cattle performance data and the respondents' age.

ADVISER'S APPROVAL: Dr. Shelly Sitton