

KANSAS BEEF FEEDLOT MANAGERS' PERCEPTIONS
OF PREPAREDNESS AND TRUSTED SOURCES
OF INFORMATION CONCERNING
AN AGROTERRORISM EVENT:
A DESCRIPTIVE STUDY

By

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CHAPTER I

Introduction

Background and Setting

Economists estimate a nationwide outbreak of an intentionally introduced disease such as foot-and-mouth disease (FMD) would immediately bring the U.S. beef industry to a standstill. This potentially could cost between \$750,000 and \$1 million per minute of each operating business hour (Knowles et al., 2005). The result would stagger the U.S. economy.

The ease of infiltrating America's food supply allows it to be a vulnerable, under-protected target for terrorists. The livestock industry is considered a "soft target" by military terms, with its exposed fields, farms and feedlots. Of all forms of agriculture, "animal agriculture may be one of the easiest targets" (Kosal & Anderson, 2004, p. 3394) due to access to large mills. A point source mill could be sabotaged, generating a wide distribution of a poisonous chemical agent with immediate and severe losses.

Sen. Pat Roberts (R-KS) advised Americans of the potential threat to agriculture in a press release. Several of the hijackers from Sept. 11, 2001 had training in agriculture, which would make it easy for them to attack feedlots and open croplands if unprotected (Roberts, 2001).

The role of law enforcement in the event of an FMD introduction is crucial to containment. Law enforcement would be required to quarantine the area of infection and remain on-site for an average of 60 days (Knowles et al., 2005). The quarantine area, the

first priority after notification, has been defined by animal health officials as a six-mile radius from the origin. No persons, vehicles or equipment would leave this quarantine area, shown in Figure 1, without thorough decontamination.

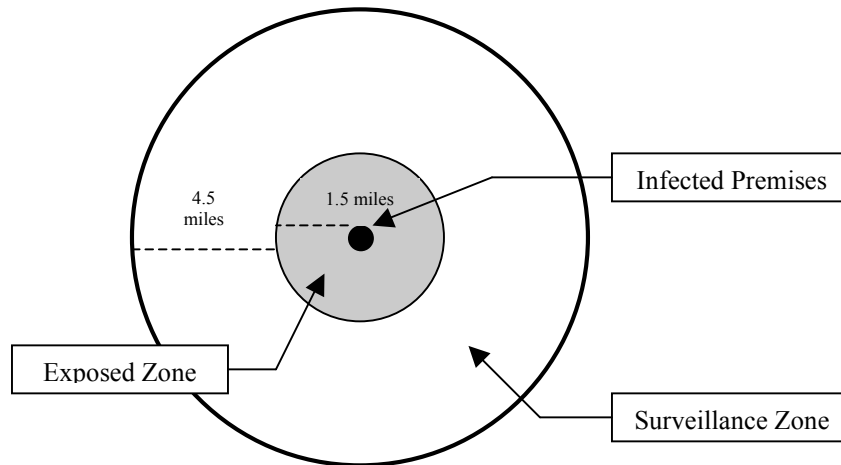


Figure 1. Quarantine area in the aftermath of an agroterrorism event. (Source: Kansas Animal Health Department)

The logistics of this quarantine are astounding, beginning at the site of infection. On average, 40 roadblocks would be necessary, and all cloven-hoofed animals in the exposed zone would be destroyed. Beyond the quarantine area, all highways into the state would be blocked, and all agricultural vehicles would be inspected (Knowles et al., 2005).

Given the vast, immediate impact of agroterrorism, the conventional reactive response is grossly inadequate.

Active prevention is the key to avoiding infection and quarantine. The National Institute of Justice has identified law enforcement's role in protecting American agriculture from agroterrorism by conducting an in-depth study including focus groups,

simulation exercises, field surveys and interviews, and trial-basis procedures. They have developed preventative strategies and initiatives for law enforcement officials to strengthen America's defense against threats (Knowles et al., 2005).

However, law enforcement does not have the financial resources or manpower to effectively implement these preventative strategies. Beef cattle feedlots have commonly been identified as probable targets of agroterrorism (Knowles et al., 2005). Community policing programs promoting local partnerships between law enforcement and feedlot managers will help prevent criminal activity and potential acts of agroterrorism. Disseminating information to feedlot managers of these programs and partnerships is a crucial step toward accomplishing this goal.

Statement of the Problem

Law enforcement officials have useful information and programs to help producers be vigilant in attempting to prevent agroterrorism events in the U.S., specifically in beef cattle feedlots. However, they lack the resources for proper application of such programs. It is necessary to determine feedlot managers' perceptions of preparedness and trusted information sources to best disseminate these useful programs. Including feedlots and feedlot managers in community policing programs would encourage local partnerships and prevent criminal activity and potential acts of agroterrorism.

Purpose of the Study

The purpose of this study was to identify preparedness levels and trusted sources of information used by feedlot managers. By identifying these components, law enforcement officials will be able to diffuse timely information to feedlot managers to help protect American animal agriculture from an agroterrorism event.

Research Questions

The following research questions will be addressed in this study:

1. What are feedlot managers' perceptions of the susceptibility of feedlots to an agroterrorism event?
2. What is the perceived level of preparedness of feedlots for an agroterrorism event?
3. What sources of information do feedlot managers use to seek information regarding security issues?
4. How do the managers' perceptions of susceptibility and sources of information differ based on location and capacity of the feedlot?

Basic Assumptions

The following assumptions were made in this study:

1. Feedlot managers are concerned about the issue of preventing agroterrorism.
2. People or organizations providing information sources regarding biosecurity or agroterrorism event-related material have an acceptable level of knowledge of the subject.

Limitations

The following limitations are applied to this study:

1. The population studied was limited to Kansas feedlot managers and owners; thus, the results can only be generalized to the population studied.
2. Law enforcement officials have limited resources for funding local or state-wide programs.

Definition of Terms

Agriculture

“The science, art, or practice of cultivating the soil, producing crops, and raising livestock and in varying degrees the preparation and marketing of the resulting products” (Merriam-Webster Online, 2006).

Agroterrorism

1. “The intentional or threatened use of viruses, bacteria, fungi or toxins from living organisms to produce death or disease in humans, animals or plants; or intentional or threatened use of chemicals against food or animals; or the intentional or threatened use of explosives to disrupt agriculture production or supplies of food. The purpose of the act or threat is to intimidate or coerce a government or civilian population” (Schaub, 2002).
2. “The deliberate introduction of an animal or plant disease with the goal of generating fear, causing economic losses, and/or undermining stability” (Monke, 2004).

Capacity

The density of animals a given environment is capable of sustaining (Herren & Donahue, 2000).

Controlled Animal Feeding Operation (CAFO)

Lot or facility (other than an aquatic animal production facility) where the following conditions are met:

Animals (other than aquatic animals) have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period.

1. Medium CAFO = 300 to 999 cattle other than mature dairy cows or veal calves. Cattle include but are not limited to heifers, steers, bulls and cow/calf pairs.
2. Large CAFO = 1,000 cattle other than mature dairy cows or veal calves. Cattle include but are not limited to heifers, steers, bulls and cow/calf pairs (USEPA, 2007).

Foot-and-Mouth Disease

A highly contagious viral disease affecting cloven-hoofed animals, including domestic cattle, sheep, goats and swine, and wild deer and elk. FMD forms painful tongue cysts and hoof lesions, which cause lameness, refusal to eat and weight loss (Spickler & Roth, 2004, p. 51).

Chapter Summary

Law enforcement officials hold information on how to be vigilant in an attempt to prevent an agroterrorism event in animal agriculture. However, it is not evident the necessary stakeholders in production animal agriculture have been given that information. There is a need to determine feedlot manager's perceptions about, and level of preparedness for, an agroterrorism event, as well as their trusted information sources.

The purpose of this study was to identify preparedness levels and trusted sources of information used by feedlot managers. By identifying these components, law enforcement officials will be able to diffuse timely information to feedlot managers to help protect American animal agriculture from an agroterrorism event.

CHAPTER II

Review of Literature

The purpose of this study was to identify preparedness levels and trusted sources of information used by feedlot managers. By identifying these components, law enforcement officials will be able to diffuse timely information to feedlot managers to help protect American animal agriculture from an agroterrorism event.

In this chapter, the diffusion of innovation theory, which served as the theoretical framework for this study, will be discussed. The chapter will begin with a review of the history of agroterrorism, including past and potential dangers to the food system. Agroterrorism is defined by Monke (2004) as “the deliberate introduction of an animal or plant disease with the goal of generating fear, causing economic losses, and/or undermining stability.” For purposes of this study, the term “agroterrorism” specifically refers to an act of terrorism or violence to the beef industry from terrorists intending to disrupt production or sale of beef cattle using a fast acting and quick spreading biological agent, such as foot and mouth disease.

The review of literature for this study focused on articles found in ProQuest Direct, peer-reviewed journal articles, white papers, published texts, conference proceedings and articles found using Google Scholar. To begin, it is important to understand the concept of agroterrorism and the history of its use.

A History of Agroterrorism

Twelve cases have been documented involving biological agents used against agriculture since 1912 (Carus, 2002). These cases were identified by Carus after conducting a series of case studies of open-source materials, including more than 270 total cases in which a perpetrator used or threatened to use a biological agent. Of these 12, only two were determined to be actual acts of terrorism.

In the early 1950s, the Mau Mau, a Kenyan independence movement group, initiated a series of attacks on the British government in colonial Kenya, as part of an ultimately unsuccessful revolution. In 1952, a group of these insurgents used African milk bush, a toxic plant, to poison 33 British-owned steers. The toxin was inserted in incisions cut into the skins of the animals. Eight animals died, six of them within five days, as a result of the biological attack (Carus, 2002; Kohnen, 2000).

The second attack using bioterrorism occurred in 1984 in Dalles, Ore. The Rajneeshee Cult contaminated public restaurants with salmonella, causing 751 illnesses. The attack was designed to prevent citizens from voting by making them ill. Unfortunately for the Cult, who sought to gain control of the county commission, the voters did not become ill until after the county election (Carus, 2002). This is the only confirmed biological terrorism event in the U.S., according to the Federal Bureau of Investigation (Carus, 2002).

The remaining ten confirmed cases using biological agents were all intentional food poisonings; none were considered acts of terrorism (Carus, 2002; Chalk, 2004).

There have been many other reported cases of biological or agroterrorism, but none have been official. However, other damages inflicted by interest groups have caused considerable economic losses.

According to the FBI, damage from animal rights and eco-extremists is estimated at more than \$200 million in recent years. The FBI currently has more than 150 open cases regarding violent incidents at research centers, farms, processing plants and other businesses (AAA, 2006).

The potential socioeconomic costs of an agroterrorism event are described by Chalk (2004) in three levels:

1. Direct revenue losses resulting from the eradication of disease-ridden animals.
2. Indirect revenue losses sustained by other industries, such as tourism, as a result of cancelled trips following imposed quarantines.
3. Losses in exported agricultural products after other countries impose protective embargoes (Chalk, 2004).

Dr. Bob Norton, Associate Professor in the Department of Poultry Science at Auburn University, stated

“Our nation is now a target from adversaries, both foreign and domestic, who would like to destroy the American way of life and devastate our people. Anyone responsible for securing food and agriculture facilities from internal and external threats along with protecting their workforce and the public should get training that will help them effectively execute this task” (AAA, 2006, p. 1).

Identifying the Enemy

To best understand what American animal agriculture is facing, it is important to understand from whom the threats are coming. The NIJ Research Report (2005) defined five categories of terrorists or extremists that are considered threats.

1. International terrorists, such as al-Qaeda, pose the most probable threat for an intentional introduction of a foreign animal disease.
2. Domestic terrorists, such as anarchist or anti-government groups, could be motivated to cripple the livestock industry.
3. Militant animal rights groups could view an outbreak of a foreign animal disease as a positive event to promote their cause.
4. Economic opportunists could financially benefit from a dramatic impact or change in market prices.
5. Disgruntled employees could attack some segment of the livestock industry for revenge (Knowles et al., 2005).

Also important is being aware of where a threat could occur. Kohnen (2000) identified four specific preventative levels to counter the threat of agroterrorism. These levels include:

1. The organism level – through animal/plant disease resistance;
2. The farm level – through facility management techniques and security measures intended to prevent introduction or transmission of disease;
3. The sector level – through United States Department of Agriculture disease detection and response procedures; and
4. The national level – through policies in place to minimize social and economic costs of catastrophic disease outbreak.

Biological Agents

For the purposes of protection, it is important to identify what biological agents terrorists may use in an attack. Veterinarians are aware of animal disease symptoms that

may pose a threat of transmission to humans, and they are alerted to six particular agents, identified by the Center for Disease Control and Prevention. These six agents and their associated diseases include:

1. *Bacillus anthracis* – Anthrax
2. *Clostridium botulinum* (toxin) – Botulism
3. *Yersinia pestis* – Plague
4. *Variola major* – Smallpox
5. *Francisella tularensis* – Tularemia
6. *Ebola and Lassa viruses* – Viral hemorrhagic fever (Davis, 2004)

However, FMD remains the most serious biological threat to animals, followed closely by bovine spongiform encephalopathy (Kohnen, 2000).

Law Enforcement's Role

Traditionally, law enforcement's role in agriculture occurred post-crime with follow-up investigations, arrests and prosecutions. Given the vast, immediate impact of agroterrorism, this conventional reactive response is inadequate. During research for the NIJ Research Report (2005), preventative strategies were developed and implemented for law enforcement. Included was a neighborhood watch program, Agro-Guard. The program is a partnership between law enforcement and livestock producers to identify suspicious activities and potential threats to agriculture (Knowles et al., 2005).

Other initiatives were implemented during the NIJ research project. These initiatives included:

1. Establishing specialized regional response teams.

2. Providing training to local law enforcement officers to identify and seize illegally imported food products.
3. Establishing interaction between state and federal intelligence databases to assist in managing potential threats.
4. Developing baseline data to increase law enforcement's readiness capabilities in Kansas (Knowles et al., 2005).

Organizational Trust

Trust is defined by Ellis and Shockley-Zalabak (2001) as the favorable expectations on other's behaviors based on "roles, relationships, experiences, and interdependencies" (p. 383). Torre (2006) further defines trust as "the mutual expectation that partners will not take advantage of the areas of vulnerability" (p. 68).

Recent events such as the downfall of Enron wreaked havoc on nerves of employees in organizations across the business world (Choi, Eldomiaty, & Kim, 2007). Politically, lack of trust in the Republican Party influenced voters to initiate a Democratic majority in both the national and Oklahoma Congress. This describes the need to study trust in organizations.

Leadership is more than a dyadic relationship between leader and follower. Leaders today are faced with various new challenges, including restructuring of organizational forms, changing environments, globalization, and diverse workforces (Gordon & Yukl, 2004). Additionally, subordinates are becoming more obviously involved in the productivity of organizations. Understanding the role trust plays in these situations will help organizations become more effective and productive.

An analysis of trust and its effect on inter-personnel relationships and dimensions of organizations is carried out in the study by Torre (2006). This leads to the investigation of trust and trustworthiness in relationships within local economic networks.

Torre (2006) looked closely at Designation of Controlled Origin (AOC, in French) systems, which is similar to the United States' plan to regulate the Country of Origin labeling program for agricultural products. The individual marketing systems making up the AOC are organized by product or good, much like marketing co-ops in the U.S.

The system chosen for this study was selected based on its overall reputation, which is considered high because the producers in the system are highly respected in the community. By investigating this particular system, the authors explained what type of internal trust relationship works and how that relationship is important in the local production program (Torre, 2006).

The overarching connection discovered was the factor of organizational trust, which is described by Hubbell and Chory-Assad (2005) as the perceived fairness of treatment and outcomes in the workplace. The marketing system worked well together because the members were treated well by each other and respected each other, leading to an organization that practiced fair treatment and further built trust among its members.

So far, the element of trust in an organization has been reviewed outward from the member, showing the importance of a person trusting the management or leaders in the organization to which he belongs (Kickul, Gundry, & Posig, 2005; Hubbell & Chory-Assad, 2005). It directly influences his performance and loyalty to the organization and is

dependent on how fairly he was treated in past justice outcomes. Another element of trust comes from the member's perception of trust in other members.

Trust is examined by Hansen, Morrow, & Batista (2002), both among members of a farmers' marketing co-op and between members and the co-op management. The influence of trust in such organizations is important because it impacts trade and reduces costs by limiting lengthy and expensive discussions and negotiations.

Farmers join co-ops to increase their economic advantage by selling crops as a group; however, they also join co-ops to increase social standings. This action may grow both business and personal relationships. Therefore, trust among members is important to upkeep these relationships (Hansen, Morrow, & Batista, 2002).

Trust among members is important in all levels of business, from large corporations to small family businesses. As previously shown, trust can help to increase competitive advantage by lowering operating costs, leading to the most important aspect of corporate business: profitability. It also helps an organization's social system operate smoothly (Steier, 2001).

Too much trust, however, can be a bad thing in organizations, as people tend to turn their heads away from wrongdoings of others who they believe can be trusted. This can lead to embezzlement and other problems. Too little trust, however, is just as problematic, as it is costly when an organization must operate in defense mode to avoid issues (Steier, 2001).

Another view of trust in an organization is provided by introducing the family organization and its complexities. In families, trust is usually present at the onset of the

business adventure, but may erode over time. This is an important aspect of business that is often overlooked by many families before entering into business agreements.

Family operations have a unique advantage over corporate firms, as they often do not lean so heavily on profitability. In families, trust is founded by support, which naturally provides a competitive advantage. Also, the concept of change is different in corporations vs. family businesses. While corporate change may include a new CEO or owner, family businesses may change when one member gets married, and the new partner is included (Steier, 2001).

One problem with previous research has been the absence of the opinions of the public in developing the surveying instruments. Frewer (1996) looked at the underlying constructs that build the perception of trust in information regarding food-related risks. Open-ended questions to an initial sample helped determine a set of more comprehensive questions to be addressed by a second group. This mixed-methods approach led to an in-depth look into the consumer's opinions.

Respondents in Frewer's study indicated they used the media as a primary source of food-related risk information. The second most popular source was friends. An important determinant of this trust was if the information is later proved or disproved. The most untrusted source of information was cited as the government (Frewer, 1996).

The results of Frewer's (1996) study are important to regard because they are an indicator of how people want to receive information about food-related risks. However, these surveys were conducted prior to an event of which consumers should already be informed.

A researcher can survey a population's perceived level of risk at any time, but there are few chances to actually measure those perceptions during a genuine crisis. The level of trust in an information source may drastically change after a crisis, which is described in Poortinga's 2004 study of the Foot and Mouth Disease outbreak in England. Poortinga (2004) had the opportunity to administer the survey during the week the FMD epidemic peaked, and a response rate of 78 percent indicated the population had strong attitudes about the topic.

Poortinga's 2004 study compared two populations; one a small, agricultural town near the epicenter, while the other was a larger, non-agricultural town farther away from the initial outbreak area. Questions regarding blame, government handling of the crisis and trusted sources of information were included in the instrument. One interesting observation from the surveys was "people were more concerned about the health risks arising from government policy measures and handling of FMD than about the disease itself" (p. 79).

It is important to note the FMD outbreak in England came shortly after the BSE epidemic in the same country. The public seemed reasonably aware that BSE could affect humans, while FMD would not. However, people still blamed the government for the lack of containment of FMD, considering it a system failure (Poortinga, 2004).

The UK government's initial reaction was an attempt at containment of the disease, which soon failed, leading to the heavy culling and slaughtering of contaminated livestock. Masses of culled livestock were piled, but burning was delayed, increasing risk of public health issues. Further, many people were concerned about the future of farming

and agriculture in the area, and government conduct during the entire crisis made people question the abilities of the government to handle any situation.

It is evident by the evolving body of research on trust relationships that this is an important factor in organizations today. Relationships in organizations are continually transforming, and employees' perceptions are important to the success of the company. The influence of trust in such organizations is important as it impacts trade and reduces costs by limiting lengthy and expensive discussions and negotiations.

Members must be able to trust their organization's leaders to provide them with timely, accurate information. Further understanding the role trust plays will help organizations become more effective and productive, while building members' trust.

Theoretical Framework

Diffusion of Innovation Theory

Rogers (2003) postulated an innovation is communicated through particular channels among members of a social system by diffusion. Technological innovations have made it possible for new information to reach interested persons faster than ever. More importantly, agricultural information is accessible by livestock producers when they need it.

An innovation is adopted by individuals at a rate consistent with certain characteristics. One determining characteristic is relative advantage, defined by Rogers (2003).

Relative advantage is the degree to which an innovation is perceived as better than the idea it supersedes. The degree of relative advantage may be measured in

economic terms, but social prestige factors, convenience and satisfaction are also important factors. It does not matter so much whether an innovation has a great deal of “objective” advantage. What does matter is whether an individual perceives the innovation as advantageous. The greater the perceived relative advantage of an innovation, the more rapid its rate of adoption will be (p.15).

Diffusion occurs within a social system due to the structure of the system. An innovation’s diffusion is affected by this system in many ways. The four main elements of diffusion are the innovation, communication channels, time and the social system (Rogers, 2003). An investigation into each element will demonstrate the benefits of the diffusion theory.

Elements of Diffusion

Innovation

Rogers defines an innovation as an idea, practice, or object perceived as new by an individual or other unit of adoption. For this study, the primary innovation is the preventative protocols for use by feedlot managers and law enforcement officials. First, the managers and officials must understand the advantage of preventative protocols. Without a perception of a clear benefit, the innovation will likely not be adopted (Rogers, 2003). Feedlot managers and law enforcement officials must be convinced that preventative protocols will benefit agriculture and Americans.

To convince them of this, it may be necessary to demonstrate the innovation’s relative advantage to feedlot managers and law enforcement officials. Adopting the

preventative protocols must be perceived as being consistent with existing values or needs. Many in agriculture believe tragedy will not happen to them; a feeling of invincibility (Oskam, 1992). Due to this feeling, some may disregard preventative protocols, deeming them unnecessary. Unless convinced that the feedlot is a potential target for agroterrorism, they will not adopt the preventative protocols.

An important factor in innovation adoption is presenting the information as simply as possible (Oskam, 1992). An innovation's perceived complexity greatly influences its adoption rate. Ideas that are easier to understand are generally adopted more rapidly than complicated innovations, which may require the individual to acquire new skills (Rogers, 2003).

Communication Channels

Crucial to the success of diffusion is how and by whom the information is communicated. The two primary channels are mass media and interpersonal communication. The mass media are important in this process, because the majority of persons in agriculture has televisions and radios, and read daily or weekly newspapers (Slocum, 1962). Often, however, interpersonal channels are more persuasive for adopting an idea, especially if the interpersonal channel connects similar individuals (Rogers, 2003).

Determining the useful communications channels was one of the key objectives in this study. By identifying the channels used to convey information about agroterrorism, law enforcement officials may get information disseminated more effectively.

Time

The length of time between an individual learning about an innovation and the time he or she actually adopts (or rejects) it is important when determining how to disseminate the information. Convincing individuals that adopting an innovation will save them time and money may help them adopt it more willingly (Oskam, 1992).

“The importance of agriculture to our economy and our national security cannot be underestimated. We must take steps to protect our agriculture producers and food supply” (Roberts, 2001, p. 1).

Innovation-Decision Process

An individual passes through a process of decision-making regarding an innovation. The process includes gaining initial knowledge of the innovation to persuading an attitude about the innovation, to deciding to adopt or reject the innovation, to implementing the new idea, and finally confirming the decision. The two stages of the decision process involved in this study are the knowledge and persuasion stages.

Knowledge

This stage in the process of decision-making begins when an individual becomes aware of the innovation and starts to understand its function. This is referred to as awareness-knowledge (Rogers, 2003). It is commonly initiated by mass media bringing the innovation to the individual. Once knowledge of an innovation is established, the individual may begin to see a need for the innovation, leading to the next stage, persuasion.

Persuasion

During this stage of decision-making, the individual forms an attitude toward the innovation, either favorable or unfavorable. A psychological attachment forms as the individual actively seeks information about the innovation. When developing an attitude about the innovation, the individual may consider how the new idea applies to his current situation and future planning before deciding to implement it.

At this stage in the decision-making process, an individual may consult with peers regarding the innovation. This communication channel is defined as interpersonal communication (Rogers, 2003).

Chapter Summary

The use of biological agents as a form of agroterrorism in animal agriculture has been documented dating back to the 1950s (Carus, 2002; Kohnen, 2000). There are several potential threats to animal agriculture, including various terrorist groups. Additionally, there are several organizational levels where a threat could occur, as well as a range of potentially dangerous agents that could be used.

Law enforcement officials have been collecting information about the prevention of agroterrorism (Knowles et al., 2005), including the formation of initiatives for partnerships with local producers and state and federal authorities.

Members of organizations trust their leaders to provide timely, accurate information. Maintaining a trustworthy relationship is important for both organizations and members to remain effective and productive.

Rogers' (2003) theory of diffusion of innovation provides the theoretical basis for this study. Information is communicated to members of a social system using four elements: the innovation, communication channels, time, and the social system. Additionally, the two stages of the innovation-decision process involved include knowledge and persuasion.

CHAPTER III

Methodology

The purpose of this chapter is to describe the methods and procedures used to conduct this study. The population, instrument design, data collection, and analysis procedures are discussed in this chapter.

Institutional Review Board

Oklahoma State University (OSU) and federal policy dictate that all research studies involving human subjects must be approved before research may commence. The Oklahoma State University Office of University Research Services conducts the review under the direction of the Institutional Review Board (IRB) to ensure the rights and welfare of human subjects involved in biomedical and behavioral research are protected.

In accordance with this policy, the OSU IRB reviewed a proposal for this study. The researcher was granted permission to collect human subject data via IRB application number AG0721. Appendix A displays a copy of the IRB approval form.

Purpose of the Study

The purpose of this study was to identify preparedness levels and trusted sources of information used by feedlot managers. By identifying these components, law enforcement officials will be able to diffuse timely information to feedlot managers to help protect American animal agriculture from an agroterrorism event.

Research Questions

The following research questions will be addressed in this study:

1. What are feedlot managers' perceptions of the susceptibility of feedlots to an agroterrorism event?
2. What is the perceived level of preparedness of feedlots for an agroterrorism event?
3. What sources of information do feedlot managers use to seek information regarding security issues?
4. How do the managers' perceptions of susceptibility and sources of information differ based on location and capacity of the feedlot?

Research Design

A descriptive method was used in this study to identify Kansas feedlot managers' perceptions of preparedness and trusted information sources. For the purposes of this study, a feedlot manager was identified as one who manages or owns a beef feedlot registered with the Kansas Department of Health and Environment.

Descriptive research was chosen for its ability to indicate general data tendencies, such as means, standard deviations, and percentages (Creswell, 2005).

Additionally, descriptive research explores existing conditions or relationships. It exceeds simple gathering and tabulating of data by including an interpretation of the significance of data (Best, 1970).

Population

The target population for this study was all Kansas feedlot managers or owners. A list of beef feedlots registered with the Kansas Department of Health and Environment (KDHE) was provided. The target population consisted of 259 managers and owners of operational beef feedlots.

An accessible population of all KDHE registered Kansas beef feedlots was determined by excluding all names on the list without telephone information or with disconnected numbers. This left an accessible population of 228. Feedlots were recognized on the KDHE list by county of operation. Figure 2 shows the counties of Kansas, as well as the geographical regions used for further analysis in Chapter 4.

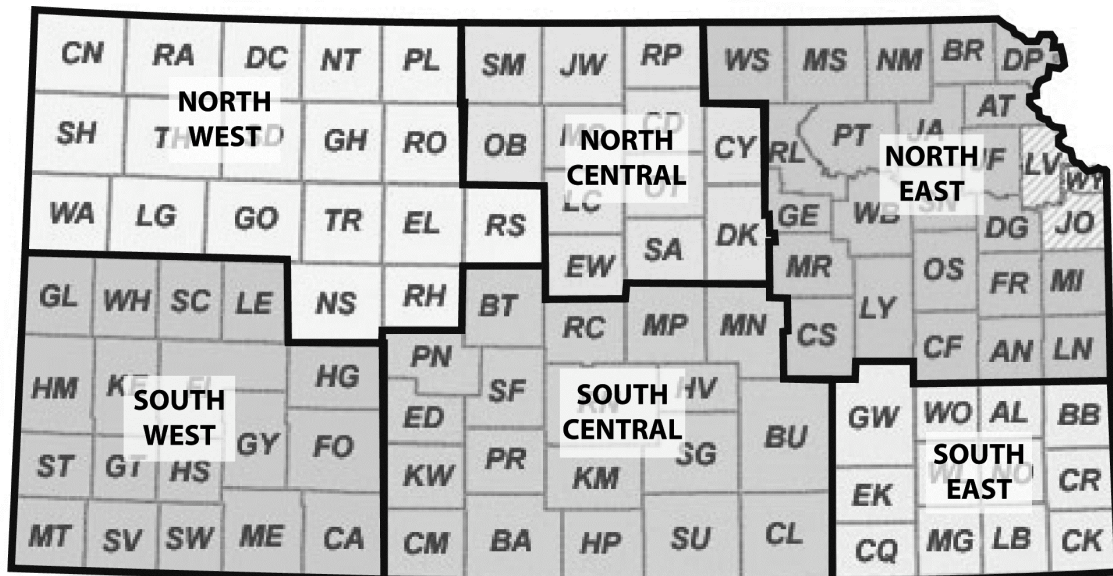


Figure 2. Map of Kansas divided into geographical regions

Coverage Error

Because a list or frame of a population may not include everyone the researcher wants to study, an error in data is considered (Dillman 2000). A total of 119 unuseable responses were received (46.9%), including 91 declining participation, and the remaining 28 feedlot managers were never reached by phone.

Instrumentation

Instrument Design

A telephone survey was developed based on questions used in Ashlock's (2006) study of Oklahoma beef producers' risk perceptions and information sources. Additional questions were generated by the researcher and a panel of experts. The questions are divided into four categories: perceptions of susceptibility, perceptions of preparedness, sources of information, and demographics. Instrument questions 1-3 determined managers' perceptions of the susceptibility of feedlots to an agroterrorism event. Questions 4-9 determined their perceived level of preparedness for an agroterrorism event. Questions 10-14 and 22-24 determined what sources of information feedlot managers prefer when seeking information about feedlot animal health and security issues, while questions 15-21 collected demographic information from respondents.

Many of the questions were answered using interval scales. An interval scale provides "continuous response options to questions that have presumably equal distance between options" (Creswell, 2005, p.168).

Validity

The survey instrument was reviewed by a panel of three experts representing experienced feedlot managers, Kansas State University beef scientists, and Kansas law enforcement officials. This panel was chosen for their knowledge of the beef feedlot industry, the target population, and desired content of the study. Their review established the face and content validity of the instrument.

Reliability

A post-data collection reliability analysis was performed on the scaled items in the instrument. A Cronbach's alpha test was performed, and a reliability alpha of .895 was received.

Data Collection Procedures

Data for the study were collected using a telephone survey. Telephone interview surveys allow a researcher access to geographically dispersed subjects (Creswell, 2005). The interviewees were informed that participation was voluntary, their answers were anonymous, responses would be reported as a summary of data collected, and no individual responses would be presented, as recommended by Creswell (2005). The researcher conducted all of the telephone surveys in a one-week period.

Data Analysis Procedures

To describe the preparedness levels and trusted sources of information used by feedlot managers, frequencies, percentages, means and standard deviations were used.

The Statistical Package for Social Science (SPSS) 11.0 program was used to analyze quantitative data collected in this study.

Chapter Summary

This chapter described the methods and procedures used in this study, including IRB approval and research design. It also discussed subject selection, the instrument design, and data collection and analysis procedures.

A telephone survey was conducted to collect data from the population of Kansas feedlot managers. The instrument was reviewed by a panel of experts in feedlot management, law enforcement, and university research. The data collection was performed by the researcher.

Data analysis was performed using frequencies, percentages, means, standard deviations, and cross tabulations.

CHAPTER IV

Findings

The purpose of this chapter is to present the findings of this study as they relate to Kansas feedlot managers' perceptions of preparedness and trusted sources of information regarding agroterrorism. The purpose and objectives of the study are outlined, along with a description of the population and response rate. Also included in this chapter is a description of the demographics of the population studied and the specific findings related to each objective.

Purpose of the Study

The purpose of this study was to identify preparedness levels and trusted sources of information used by feedlot managers. By identifying these components, law enforcement officials will be able to diffuse timely information to feedlot managers to help protect American animal agriculture from an agroterrorism event.

Research Questions

The following research questions will be addressed in this study:

1. What are feedlot managers' perceptions of the susceptibility of feedlots to an agroterrorism event?
2. What is the perceived level of preparedness of feedlots for an agroterrorism event?

3. What sources of information do feedlot managers use to seek information regarding security issues?
4. How do the managers' perceptions of susceptibility and sources of information differ based on location and capacity of the feedlot?

Population

The target population for this study consisted of 259 feedlot managers in Kansas provided in a list from the Kansas Department of Health and Environment.

Response Rate

The data were collected during the five-day period of June 18-22, 2007. Of the target population ($N = 259$), 31 did not have current telephone contact information, leaving an accessible population of 228. Fifty-three managers could not be reached due to difficulty reaching them in the office; many were harvesting wheat, while others were working outside in the feedlot. A total of 175 calls were completed, resulting in 84 usable responses. The remaining 91 chose not to respond to the survey. This resulted in a response rate of 32.4%.

Characteristics of Feedlots and Managers

The total number of cattle represented by respondents in this study was 1,554,450 head. The average capacity of the respondents' feedlots in Kansas is 18,700 head. Southwest Kansas holds 47.6% ($n = 40$) of the feedlots in the state; however, 67.8% of all cattle are fed there ($n = 1,054,100$) (see Figure 2 and Table 1). There were 14 respondents

in Northwest Kansas with 129,400 head ($M = 9,240$); seven respondents in Northcentral and seven in Northeast Kansas with 71,000 ($M = 10,140$) and 38,000 head ($M = 5,430$), respectively; 15 respondents in Southcentral Kansas with 261,950 head ($M = 17,460$); and one respondent in Southeast Kansas, who did not currently have any cattle on feed.

Table 1

Feedlots and Cattle by Geographical Region

	<i>n</i> Feedlots	% Lots	<i>n</i> Cattle	% Cattle	<i>M</i>
Northwest	14	16.7	129,400	8.3	9,240
Northcentral	7	8.3	71,000	4.6	10,140
Northeast	7	8.3	38,000	2.4	5,430
Southwest	40	47.6	1,054,100	67.8	26,350
Southcentral	15	17.9	261,950	16.9	17,460
Southeast	1	1.2	0	0.0	0
Total	84	100	1,554,450	100	18,700

The majority of feedlots were family-owned (51.2%), with 40.5% of those being incorporated. An additional 26.2% were corporately owned, while 22.6% were privately owned. The average manager was male (91.7%) and 51 years old (see Table 2). One respondent was in his 20s, 10 were in their 30s, 27 were in their 40s, 27 were in their 50s, 18 were in their 60s, and one was in his 70s. All respondents had at least a high school education, with 16 more (19.0%) achieving at least two additional years of school, 39

Table 2

Age Decade of Managers

	%	<i>M</i>	<i>SD</i>
20s	1.2	50.81	9.9
30s	11.9		
40s	32.1		
50s	32.1		
60s	21.4		
70s	1.2		

(46.4%) received a Bachelor's, 11 (13.1%) completed a Master's, and three (3.6%) were veterinarians.

The majority (89.3%, $n = 75$) of respondents were affiliated with at least one livestock association or organization related to the beef industry. Of these, 74 (98.6%) were members of either the Kansas Livestock Association or the Kansas Cattlemen's Association, and the remaining one was a veterinarian and member of the American Association of Beef Practitioners. Other associations or organizations respondents were members of included the National Cattlemen's Beef Association, Ranchers-Cattlemen's Action Legal Fund, the Red Angus Association of America, the Oklahoma Cattlemen's Association, the Oklahoma Club Calf Association, the Texas Cattle Feeders' Association, the United States Cattlemen's Association and the Cattlemen's Beef Council.

All except one respondent owned a computer, 89.3% ($n = 75$) had Internet access at home, and 97.3% ($n = 73$) of these had a high-speed connection. The additional two did not know what type of connection they had at home. Seventy-four (88.9%)

respondents had offices separate from their home, and 87.8% ($n = 65$) of these office computers had internet access, with 83.8% ($n = 62$) having high-speed connections. The additional two did not know what type of connection they had in their offices.

Findings Related to Feedlot Managers' Perceptions of Susceptibility

The first three survey questions were designed to determine feedlot managers' perceptions of the susceptibility of feedlots to an agroterrorism event.

Question one asked respondents to indicate their level of agreement with a statement using a five-point summated rating scale (1 = disagree, 2 = somewhat disagree, 3 = neither agree nor disagree, 4 = somewhat agree, 5 = agree). When asked to rate their level of agreement with the statement: "The Kansas feedlot industry is susceptible to an agroterrorism event," the majority of Kansas feedlot managers agreed: agree, 44%; somewhat agree, 23.8%; neither agree nor disagree, 19.0%; somewhat disagree, 7.1%; and disagree, 6.0% (see Table3).

Table 3

Feedlot Managers' Perceptions on Feedlot Industry Susceptibility to Agroterrorism

	Agreement Percentage	<i>M</i>	<i>SD</i>
Disagree	6.0	3.93	1.21
Somewhat Disagree	7.1		
Neither Agree/Disagree	19.0		
Somewhat Agree	23.8		
Agree	44.0		

The second question asked respondents to gauge the level of threat posed by various sources, including international terrorists, domestic groups, disgruntled employees and neighbors using Department of Homeland Security Threat Level codes in a five-point summated rating scale: 1 = low, 2 = guarded, 3 = elevated, 4 = high and 5 = severe. Respondents reported they believed international terrorists posed a guarded threat ($M = 2.96$), domestic groups posed an elevated threat ($M = 3.46$) disgruntled employees posed a guarded threat ($M = 2.56$) and neighbors posed a low threat to feedlot security ($M = 1.70$) (see Table 4).

Table 4

Feedlot Managers' Perceptions on Level of Threat per Source

	Threat Level %					M	SD
	Low	Guarded	Elevated	High	Severe		
International Terrorists	9.5	31.0	28.6	15.5	15.5	2.96	1.21
Domestic Groups	3.6	15.5	32.1	28.6	20.2	3.46	1.09
Disgruntled Employees	23.8	32.1	16.7	19.0	8.3	2.56	1.27
Neighbors	53.6	29.8	11.9	2.4	2.4	1.70	0.94

Question three asked respondents to gauge the susceptibility level of different sizes and types of feedlot operations in Kansas to an agroterrorism event, again using the Department of Homeland Security Threat Level codes in a five-point summated rating scale: 1 = low, 2 = guarded, 3 = elevated, 4 = high and 5 = severe. Large feedlots with 40,000 to 140,000 head of cattle were viewed as the most susceptible to an agroterrorism event ($M = 4.05$). Medium-sized lots, with 3,000 to 40,000 head capacities, were reported to have an elevated level of susceptibility ($M = 3.54$), and small feedlots with fewer than

3,000 head were viewed to have a guarded susceptibility level ($M = 2.79$). Corporately-owned lots were viewed as severely susceptible ($M = 3.85$), while privately-owned lots were given a rating of elevated susceptibility ($M = 3.32$) (see Table 5).

Table 5

Feedlot Managers' Perceptions on Level of Threat per Type of Operation

	Threat Level %					<i>M</i>	<i>SD</i>
	Low	Guarded	Elevated	High	Severe		
Small Feedlots (<3Khd)	21.4	32.1	13.1	13.1	20.2	2.79	1.5
Med. Feedlots (3K-40K hd)	0.0	10.7	45.2	23.8	20.2	3.54	0.9
Large Feedlots (>40K hd)	0.0	4.8	27.4	25.0	41.7	4.05	1
Privately owned lots	2.4	23.8	35.7	15.5	22.6	3.32	1.1
Corporately owned lots	0.0	8.3	31	28.6	32.1	3.85	1

Findings Related to Feedlot Managers' Perceived Level of Preparedness

The second objective sought to determine the perceived level of preparedness of Kansas feedlots for an agroterrorism event. Six questions on the survey instrument were designed for this objective. The first three questions gave respondents the option of answering “yes” or “no.”

The first question asked respondents, “Do you believe your feedlot is susceptible to an agroterrorism event?” Seventy-five percent responded they felt their feedlots were susceptible, while 25% did not believe they were susceptible.

The next question asked respondents, “Do you believe you have enough information about protection if a terrorist act was directed at the feedlot industry in

Kansas?” The respondents answered that they did feel they were well informed, with 71.4% answering “yes,” with the remaining 28.6% answering “no” (see Figure 3).

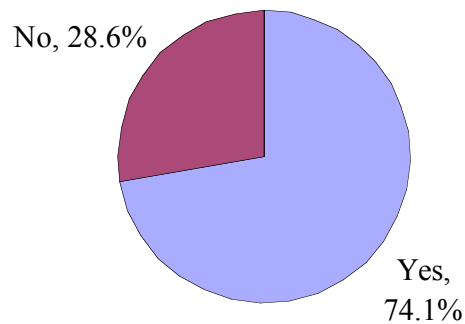


Figure 3. Managers’ perceptions of having enough information about protection against an agroterrorism event.

The final “yes” or “no” question asked respondents if they had a biosecurity plan on-site for their particular feedlot. Of the respondents, 65.5% did have some form of a biosecurity plan in place, 33.3% did not, and one respondent did not know whether or not the feedlot had a biosecurity plan (see Figure 4).

When asked how confident respondents were with their own operation’s biosecurity measures, 36.9% of respondents replied they were confident, with 13.1% of those being very confident. However, 35.7% were neutral, 15.5% were slightly confident, and the remaining 11.9% were not confident at all in their own biosecurity measures ($M = 3.11$) (see Table 6).

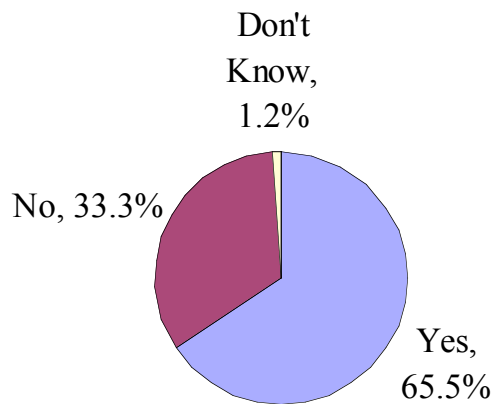


Figure 4. Feedlots with biosecurity plans in place on site.

Table 6

Level of Confidence in Biosecurity Measures

	%	<i>M</i>	<i>SD</i>
Not Confident	11.9	3.11	1.28
Slightly Confident	15.5		
Neutral	35.7		
Confident	23.8		
Very Confident	13.1		

When asked, “What level of importance do you put on security at your feedlot on a daily basis,” respondents answered “neutral” most often (32.1%). Of the remaining

respondents, 20.2% put no importance on daily security, 16.7% put a slight importance, 11.9% said it was important, and 19.0% put a high level of importance on security daily (see Table 7).

Table 7

Level of Importance on Daily Security

	%	<i>M</i>	<i>SD</i>
No Importance	20.2	2.93	1.37
Slight Importance	16.7		
Neutral	32.1		
Importance	11.9		
High Importance	19.0		

The level of importance on security was directly related to the size of the feedlot. The larger the feedlot, the more importance on safety: small feedlots (< 3,000 head) $M = 1.35$, medium feedlots (3,000-40,000 head) $M = 3.07$, large feedlots (> 40,000 head) $M = 3.18$.

Respondents were asked about security measures in place at their feedlots. Most allow public tours (60.7%). Nearly all respondents report suspicious activity (91.7%), while 81.0% educate their employees about suspicious activity, and 78.6% have perimeter fencing. However, only 8.3% have video surveillance, and only 22.6% have perimeter patrol (see Table 8). Responses to the “other” category of security practices included night watchman ($n = 11$), locked gates ($n = 15$), sign-in or check-in policies ($n = 10$) and gate security ($n = 1$), and some feedlots ($n = 13$) have someone who lives on site.

Table 8

Security Measures in Place

	% “Yes”	% “No”
No Public Tours	39.3	60.7
Report Suspicious Activity	91.7	8.3
Educate Employees about Suspicious Activity	81.0	19.0
Video Surveillance	8.3	91.7
Perimeter Fencing	78.6	21.4
Perimeter Patrol	22.6	77.4

Findings Related to Feedlot Managers’ Sources of Information

The third objective sought to determine the sources of information feedlot managers use when seeking information regarding feedlot security issues. Five questions were designed to determine where managers seek information, in what format they prefer to receive it, and which sources of information they felt were reliable and trustworthy.

The first question was open-ended, asking respondents, “Where would you seek information when reacting to a feedlot animal health issue?” Their answers indicated their consulting veterinarian or nutritionist was the primary source of information, with 58 people providing this answer (69.0%). An additional nine respondents mentioned state authorities, such as the Kansas Department of Health, the Kansas Animal Health Department or the state veterinarians’ office (10.7%). Eight respondents indicated a livestock association as their preferred source of information (9.5%). University researchers were preferred by six respondents (7.1%), and one respondent stated he

would prefer information via word-of-mouth from neighbors and peers (1.2%). Two respondents did not answer (2.4%) (see Table 9).

Table 9

Preferred Information Sources

Information Source	%	<i>n</i>
Consulting Veterinarian/Nutritionist	69.0	58
State Authorities	10.7	9
Livestock Association	9.5	8
University Researchers	7.1	6
Word-of-Mouth	1.2	1
No answer	2.4	2

With the next question, respondents were asked to choose their top three choices answering, “In what format do you prefer to receive information about preventative measures to an agroterrorism event?”

The preferred format for 47.6% of respondents was e-mail. Livestock association meetings were the second choice for 23.8% of respondents, and newsletters were the third choice for 20.2%. (see Table 10).

The next question was designed to determine what information sources were deemed reliable, or provided consistent and well-balanced information. Respondents were asked to answer the question, “How reliable do you view the following sources of information regarding feedlot animal health issues,” using a five-point summated rating scale. Sources included: agricultural extension agents, local newspapers, local/consulting

Table 10

Preferred Information Format

Format	First Choice	<i>n</i>	Second Choice	<i>n</i>	Third Choice	<i>n</i>	Total %	Total <i>n</i>
E-mail	47.6	40	3.6	3	10.7	9	61.9	52
Association meetings	11.9	10	23.8	20	16.7	14	52.4	44
Newsletter	6.0	5	17.9	15	20.2	17	44.0	37
County Extension meetings	14.3	12	15.5	13	9.5	8	39.4	33
Mail	4.8	4	9.5	8	10.7	9	25.0	21
Other	1.2	1	2.4	2	21.5	18	25.0	21
Internet	4.8	4	14.3	12	4.8	4	23.8	20
Magazine articles	4.8	4	4.8	4	2.4	2	11.9	10
County Extension publications	3.6	3	4.8	4	2.4	2	10.7	9
Daily newspaper	0.0	0	3.6	3	1.2	1	4.8	4

veterinarians, USDA, radio, periodicals, Internet magazines, livestock associations and university specialists.

The local or consulting veterinarian was considered the most reliable information source, with 90.4% of respondents calling him or her reliable or very reliable ($M = 4.56$). Additionally, 72.6% of respondents considered university specialists reliable or very reliable ($M = 3.99$), and 73.8% of respondents viewed their livestock associations as reliable ($M = 3.98$). The local newspaper was viewed least reliable, as only 15.5% of respondents considered it reliable or very reliable ($M = 2.33$) (see Table 11).

Table 11

Reliability of Information Sources

Source	Not Reliable	Slightly Reliable	Neutral	Reliable	Very Reliable	Other	<i>M</i>
Local or Consulting Veterinarian	0.0	6.0	3.6	19.0	71.4		4.56
University Specialists	1.2	0.0	25.0	45.2	27.4	1.2	3.99
Livestock Association	1.2	3.6	21.4	44.0	29.8		3.98
Magazine	2.4	4.8	38.1	40.5	14.3		3.60
USDA	3.6	13.1	34.5	31.0	17.9		3.46
Periodicals	3.6	9.5	42.9	35.7	8.3		3.36
Internet	2.4	17.9	42.9	21.4	14.3	1.2	3.28
Radio	8.3	22.6	39.3	23.8	6.0		2.96
Agricultural Extension Agent	13.1	20.2	33.3	23.8	8.3	1.2	2.94
Local Daily Newspaper	25.0	35.7	23.8	11.9	3.6		2.33

To determine which information sources were trusted the most by respondents, the next question defined the terms “trust” and “trustworthy” as “your level of belief in the information you read or receive.” Respondents were asked, “What is your level of trust in the following sources of information?” They were also asked to answer using a five-point summated rating scale where 1 = not trustworthy through 5 = very trustworthy.

Again, the local or consulting veterinarian was considered the most trustworthy, with 94.0% of respondents indicating this source was either trustworthy or very

trustworthy ($M = 4.62$). Additionally, the USDA ($M = 4.46$), university specialists ($M = 4.21$) and livestock associations ($M = 4.11$) were all considered trustworthy or very trustworthy. Local newspapers ($M = 2.46$) and radio ($M = 2.81$) were considered the least trustworthy (see Table 12).

Table 12

Trustworthiness of Information Sources

Source	Not Trust-worthy	Slightly Trust-worthy	Neutral	Trust-worthy	Very Trust-worthy	M
Local or Consulting Veterinarian	0.0	1.2	4.8	25.0	69.0	4.62
USDA	0.0	8.3	28.6	42.9	20.2	4.46
University Specialists	1.2	1.2	13.1	53.6	28.6	4.21
Livestock Association	0.0	3.6	13.1	52.4	31.0	4.11
Area Law Enforcement	1.2	8.3	34.5	40.5	15.5	3.61
Magazine	1.2	11.9	54.8	23.8	8.3	3.26
Agricultural Extension Agent	10.7	14.3	28.6	32.1	13.1	3.23
Periodicals	3.6	15.5	45.2	33.3	2.4	3.15
Internet	3.6	21.4	41.7	22.6	9.5	3.13
Radio	4.8	28.6	51.2	11.9	3.6	2.81
Local Daily Newspaper	14.3	39.3	34.5	9.5	2.4	2.46

The final question related to this objective asked respondents, “Which sources of information do you trust the most?” A total of 71 respondents considered their local or consulting veterinarian as one of their top three choices for trusted information sources, with 66.7% of respondents mentioning them first. Fifty respondents (59.5%) mentioned university specialists, and 48 considered livestock associations as a top three choice (see Table 13).

Table 13

Preferred Information Source

Format	First Choice	<i>n</i>	Second Choice	<i>n</i>	Third Choice	<i>n</i>	Total %	Total <i>n</i>
Local or Consulting Veterinarian	66.7	56	13.1	11	4.8	4	84.5	71
University Specialists	4.8	4	36.9	31	17.9	15	59.5	50
Livestock Association	14.3	12	26.2	22	16.7	14	57.1	48
USDA	3.6	3	3.6	3	16.7	14	23.8	20
Area Law Enforcement	4.8	4	7.1	6	8.3	7	20.2	17
Agricultural Extension Agent	0.0	0	4.8	4	10.7	9	14.3	12
Internet	0.0	0	1.2	1	6	5	7.1	6
Magazine	0.0	0	1.2	1	6	5	7.1	6
Periodicals	3.6	3	1.2	1	1.2	1	6	5
Local Daily Newspaper	0.0	0	1.2	1	1.2	1	2.4	2
Radio	0.0	0	0	0	1.2	1	1.2	1

Findings Related to Demographics of Feedlot Size and Location

To determine if responses regarding perceptions of susceptibility changed according to feedlot size or location, scores were cross-tabulated by feedlot size and geographical location. Small feedlot managers agreed the Kansas feedlot industry is susceptible to an agroterrorism event, with 35.3% agreeing. A majority (52.7%) of the medium-sized feedlot managers agreed, but only 18.2% of large feedlot managers agreed the feedlot industry in Kansas was susceptible to an agroterrorism event ($M = 3.27$). The center of the state saw the industry as more susceptible, with Northcentral Kansas respondents agreeing 57.1% of the time ($M = 4.14$) and Southcentral Kansas respondents agreeing 53.3% ($M = 4.07$) (see Table 14).

Table 14
Perception of Susceptibility by Size and Location

	Disagree	Somewhat Disagree	Neither	Somewhat Agree	Agree	<i>M</i>	<i>SD</i>
Small (<3K)	11.8	5.9	17.6	29.4	35.3	3.71	1.36
Medium (3K-40K)	3.6	3.6	18.2	21.8	52.7	4.16	1.09
Large (>40K)	9.1	18.2	27.3	27.3	18.2	3.27	1.27
Northwest	14.3	0.0	28.6	21.4	35.7	3.64	1.39
Northcentral	0.0	14.3	14.3	14.3	57.1	4.14	1.22
Northeast	14.3	0.0	28.6	28.6	28.6	3.57	1.40
Southwest	0.0	10.0	20.0	25.0	45.0	4.05	1.04
Southcentral	13.3	0.0	6.7	26.7	53.3	4.07	1.39
Southeast	0.0	100.0	0.0	0.0	0.0	2.00	0.00

When asked, “Do you think your feedlot is susceptible to an agroterrorism event,” only 47.1% of small feedlot managers responded “yes,” while 80.0% of medium feedlot managers and 90.9% of large feedlot managers responded “yes.” Southwest and Southcentral Kansas managers most felt they were susceptible, with 82.5% and 80.0% of respondents in those areas answering “yes,” respectively.

When asked if they had enough information about protection if a terrorist act was directed at the feedlot industry in Kansas, 76.5% of small feedlot managers responded “yes,” 65.5% of medium feedlot managers said “yes,” and 90.9% of large feedlot managers responded “yes.” Northeast Kansas respondents were the only ones who did not believe they had enough information, with 57.1% of respondents answering “no.”

There was no significant difference in whether the different sized lots had a biosecurity plan in place, nor in level of confidence of their own biosecurity measures. All groups primarily sought information from their local or consulting veterinarians, and state authorities, livestock associations and university specialists followed with a slightly lower ranking.

The local or consulting veterinarian was considered the most trusted source for all demographic groups studied. University specialists were second choices for the small and medium feedlot managers, while livestock associations were the third choice, and this was reversed for the large feedlot managers: livestock associations were second and university specialists were third.

The managers’ level of education achieved increased with size of feedlot. Small feedlot managers had most often achieved at most a high school education (41.2%). Both

medium-sized feedlot managers (47.3%) and large feedlot managers (63.6%) had achieved bachelor's degrees.

Chapter Summary

A telephone survey was used to collect data from Kansas feedlot managers about their perceptions of preparedness and trusted sources of information regarding agroterrorism.

The average feedlot manager was male (91.7%) and 51 years old. Many had achieved at least two years of higher education (46.4%), and most were members of at least one livestock association (89.3%). Of those who were members, all but one were members of the Kansas Livestock Association or the Kansas Cattlemen's Association, and the remaining one was a veterinarian and member a professional beef practitioner association. Most owned personal computers (98.8%), and the majority of those (93.7%) had high speed internet connections at home.

Forty-four percent of respondents agreed the Kansas feedlot industry is susceptible to an agroterrorism event, and they felt domestic terrorist groups posed the greatest threat.

Local or consulting veterinarians were considered the primary source of information, and were the most reliable and trusted. Managers' level of education increased with the size of the feedlot managed.

CHAPTER V

Conclusions and Recommendations

An introduction to this study was presented in Chapter I. The study identified preparedness levels and trusted sources of information used by feedlot managers. By identifying these components, law enforcement officials will be able to diffuse timely information to feedlot managers to help protect American animal agriculture from an agroterrorism event.

Chapter II provided a review of literature, including a theoretical framework on the theory of diffusion of innovation. The chapter began with a review of the history of agroterrorism, including past and potential dangers to the food system.

The methods and procedures used in this study were outlined in Chapter III. A telephone interview instrument was developed and reviewed by a panel of experts in feedlot management, beef research, and law enforcement. The target population consisted of all feedlots registered with the Kansas Department of Health and Environment, totaling 259. After eliminating those names without telephone contact information, an accessible population of 228 was determined.

Chapter IV detailed the findings discovered in the study. The results were reported according to the specific research questions of the study.

The purpose of this chapter was to draw conclusions regarding the findings of the study and to provide recommendations for future action.

Statement of the Problem

Law enforcement officials have useful information and programs for preventing agroterrorism events in the U.S., specifically in beef cattle feedlots. However, they lack the resources for proper application of such programs. It is necessary to determine feedlot managers' perceptions of preparedness and trusted information sources to best disseminate useful programs. Including feedlots and feedlot managers in community policing programs would encourage local partnerships and prevent criminal activity and potential acts of agroterrorism.

Purpose of the Study

The purpose of this study was to identify preparedness levels and trusted sources of information used by feedlot managers. By identifying these components, law enforcement officials will be able to diffuse timely information to feedlot managers to help protect American animal agriculture from an agroterrorism event.

Research Questions

The following research questions will be addressed in this study:

1. What are feedlot managers' perceptions of the susceptibility of feedlots to an agroterrorism event?
2. What is the perceived level of preparedness of feedlots for an agroterrorism event?
3. What sources of information do feedlot managers use to seek information regarding security issues?

4. How do the managers' perceptions of susceptibility and sources of information differ based on location and capacity of the feedlot?

Methods and Procedures

A telephone survey was conducted to collect data from the population of Kansas feedlot managers. The instrument was reviewed by a panel of experts in feedlot management, law enforcement, and university research. The data collection was performed by the researcher.

Data analysis was performed using frequencies, percentages, means, and standard deviations.

Summary of Findings and Conclusions

Findings Related to Feedlot Managers' Perceptions of Susceptibility

The majority of Kansas feedlot managers agreed the feedlot industry is susceptible to an agroterrorism event, and they viewed domestic terrorist groups to pose the highest threat. Respondents did not, however, see neighbors as a threat to security, contrary to the NIJ report (Knowles et al., 2005).

Large (more than 40,000 head), corporate feedlots were considered to be the most susceptible, primarily due to the single-incident impact an agroterrorism event could have, leading to wide-spread damage or infection.

Conclusions Related to Feedlot Managers' Perceptions of Susceptibility

Larger feedlots were considered more susceptible because of the potential to do wide-scale harm, which was the opinion of Knowles et al. (2005). Also, because large-scale feedlots often have feed mills housing grain dispersed to a large number of cattle, the impact of a point source contamination is quite large, as stated by Kosal & Anderson (2004). These feedlots, especially, need to be vigilant in proactive actions to prevent agroterrorism events.

Findings Related to Feedlot Managers' Perceived Level of Preparedness

Managers did believe their feedlots were susceptible to an agroterrorism event, and they also believed they had ample information regarding protection against a terrorist act directed at the feedlot industry. However, only 13.1% of respondents were very confident in their feedlot's biosecurity measures.

Conclusions Related to Feedlot Managers' Perceived Level of Preparedness

This result indicates respondents either do not read the information provided them regarding protection against agroterrorism, or they do not see this issue as a priority in day-to-day operations. The importance and severity of the issue of agroterrorism is not a priority for these respondents. This creates a problem with the stage of innovation knowledge; if potential adopters are not aware of the innovation, they will not seek information about it (Rogers, 2003).

Findings Related to Feedlot Managers' Sources of Information

When asked where managers seek animal health information, the most common response was their consulting veterinarian. The veterinarian was also considered the most reliable and trusted source of information. However, the format in which respondents prefer to receive information varied from e-mail to meetings to newsletters.

Livestock associations were also often mentioned as preferred sources of information, and most respondents were a member of at least one livestock association or organization related to the beef industry.

Conclusions Related to Feedlot Managers' Sources of Information

Ashlock's (2006) study of beef producers in Oklahoma also found the local or consulting veterinarian to be a highly trusted and reliable source of information. This is a communication channel that must be taken advantage of by law enforcement officials to disseminate their information.

This study did not conclusively demonstrate which format to best disseminate information to managers regarding agroterrorism. The target population was too varied in their answers to pinpoint a "best" format to disseminate information.

Findings Related to Feedlot Demographics of Size and Location

There were 1,554,450 cattle represented in this study, and more than one million of those were located in Southwest Kansas. As the capacity of the feedlot increased, so did the manager's belief their lots were susceptible to an agroterrorism event. Also, as the size of feedlot managed increased, so did the level of education of the managers.

Overall, respondents perceived large feedlots as having the highest level of susceptibility. However, large feedlot managers perceived themselves less susceptible than did medium or small feedlot managers.

Conclusions Related to Demographics of Feedlot Size and Location

Southwest Kansas has a higher concentration of beef cattle, thus this area could be more susceptible to an agroterrorism event. Energy should be focused on educating local managers about the threats of agroterrorism.

The large feedlots were considered highly susceptible, while those managers perceived themselves as less susceptible than smaller lots. This strongly supports Oskam's (1992) claim that many in agriculture believe tragedy will not happen to them, leading to a feeling of invincibility.

Implications

If large, corporate feedlots are considered to be the most susceptible to an agroterrorism event, energy should be focused at educating large-scale feedlot managers about protection protocols. These managers may then become emergent leaders and change agents in the community.

Veterinarians were considered the most trusted and reliable sources. They have become assigned leaders; thus they must take the initiative to be informed about issues regarding agroterrorism in animal agriculture. Additionally, many respondents were members of either the Kansas Livestock Association or the Kansas Cattlemen's

Association. These associations should implement policies or suggested practices to prevent agroterrorism, which could be disseminated to members.

Recommendations

Because local and consulting veterinarians were considered the most sought-after, reliable, and trusted sources of information, they should also be the channel through which law enforcement officials disseminate preventative agroterrorism information to feedlot managers.

Also, a majority of Kansas feedlot managers were members of at least one organization related to the beef industry, and of those respondents, most were members of either the Kansas Livestock Association or the Kansas Cattlemen's Association. These organizations should be approached by law enforcement official for collaboration on the dissemination of information and policies/procedures resulting from research by the NIJ (Knowles et al., 2004).

Recommendations for Future Research

The dissemination of preventative information related to agroterrorism is essential to maintain the safety and integrity of animal agriculture and the nation's food supply. Previous research has identified beef cattle feedlots as a potential point of infiltration. Feedlot managers rely on their veterinarians for animal health information, and trust the information they provide.

As assessment of where veterinarians receive information and in which format they prefer to receive it would help determine how to best get agroterrorism information

to those veterinarians. By using this data, veterinarians may be used as communication channels to disseminate timely information to feedlot managers.

Additionally, a larger-scale assessment of feedlot managers' perceptions of preparedness and sources of information may help specify the content and preferred format of information to be disseminated to other sectors of animal agriculture in different parts of the country.

Finally, to replicate this study, researchers should carefully consider the seasonal time period of data collection. The week of June 18-22, 2007, found many feedlot managers harvesting wheat, making them difficult to contact. Other impediments, such as busy shipping schedules, silage harvest, and weather conditions may need to be considered during different times of the year as well.

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APPENDIX A
INSTITUTIONAL REVIEW BOARD APPROVAL

Oklahoma State University Institutional Review Board

Date: Tuesday, May 29, 2007
IRB Application No AG0721
Proposal Title: A Qualitative Study to Determine Kansas Beef Feedlot Managers' Perceptions of Preparedness and Trusted Sources of an Information of an Agroterrorism Event
Reviewed and Processed as: Exempt

Status Recommended by Reviewer(s): Approved Protocol Expires: 5/28/2008

Principal Investigator(s)
Kendra Riley Dwayne Cartmell
3602 N. Washington D19 448 Ag
Stillwater, OK 74075 Stillwater, OK 74078

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
SURVEY INSTRUMENT

Feedlot Manager Attitudinal Survey

Opening

Hello, my name is _____ and I am calling on behalf of a research project conducted by the Oklahoma State University Department of Agricultural Communications.

During this survey, I will ask you questions about your opinions on bio-security, agroterrorism, and the information sources you would use and trust if there were a beef feedlot-related terrorist incident in Kansas.

Participation in this study is voluntary, and you may stop at any time or not answer any question. Your answers will be completely anonymous. Responses will be reported as a summary of all data collected, and no individual responses will be presented. Will you please take a few moments of your time to participate in this important research?

If “yes,” proceed to question 1.

If “no,” thank them for their time and proceed to the next available respondent.

Survey

In this survey the term “agroterrorism” refers to an act of terrorism or violence to the beef industry from terrorists intending to disrupt production or sale of beef cattle; specifically, the use of fast acting and quick spreading biological agents, such as foot and mouth disease.

Please tell me the level of agreement with the following statement by answering if you disagree, somewhat disagree, neither agree nor disagree, somewhat agree, or agree.

(Scale Code: 1=disagree, 2=somewhat disagree, 3=neither agree nor disagree, 4=somewhat agree, 5=agree)

1. The Kansas feedlot industry is susceptible to an agroterrorism event _____

For the next question, I will ask you to gauge the level of threat posed by various sources. Using the Department of Homeland Security Threat Level codes, please answer from 1 to 5, with 1 as a low threat, 2 is a guarded threat, 3 is an elevated threat, 4 is a heightened, and 5 is a severe threat. You may use any number between 1 and 5. (Scale Code: 1=low, 2=guarded, 3=elevated, 4=high, 5=severe)

2. What level of threat do you see each of the following posing on beef feedlots?
 - 2a. International terrorists (al-Qaeda, etc.) _____
 - 2b. Domestic groups (PETA, ALF, etc.) _____
 - 2c. Disgruntled employees _____
 - 2d. Neighbors _____

For the next question, I will ask you to gauge the susceptibility level of different types of feedlot operations in Kansas. Using the Department of Homeland Security Threat Level codes, please answer from 1 to 5, with 1 as a low threat, 2 is a guarded threat, 3 is an elevated threat, 4 is a heightened, and 5 is a severe threat. You may use any number between 1 and 5. (Scale Code: 1=low, 2=guarded, 3=elevated, 4=high, 5=severe)

3. In your opinion, what is the level of susceptibility for the following feedlot operations?

- 3a. Small feedlots (1-2000hd.) _____
- 3b. Medium feedlots (2000-40K) _____
- 3c. Large feedlots (40K-150K) _____
- 3d. Privately owned lots _____
- 3e. Corporately owned lots _____

For questions the next three questions, please answer with either a “yes” or a “no.”

4. Do you believe your feedlot is susceptible to an agroterrorism event? _____

5. Do you believe you have enough information about protection if a terrorist act was directed at the feedlot industry in Kansas? _____

6. Do you have a biosecurity plan on site for your feedlot? _____

Please tell me your level of confidence with the following question by answering if you are not confident, slightly confident, neutral, confident, or very confident? (Scale Code: 1=not confident, 2=slightly confident, 3= neutral, 4=confident, 5=very confident)

7. How confident are you in your feedlot’s bio-security measures? _____

Please tell me the level of importance you place on the following issue by answering if you place no importance, slight importance, neutral, importance, or high importance? (Scale Code: 1=no importance, 2=slight importance, 3= neutral, 4=importance, 5=high importance)

8. What level of importance do you put on security at your feedlot on a daily basis? _____

9. What security measures are in place in your feedlot? (check all that apply)

- 9a. No public tours _____
- 9b. Suspicious activity reporting _____
- 9c. Employee education about suspicious activity _____
- 9d. Video surveillance _____
- 9e. Perimeter fencing _____
- 9f. Perimeter patrol _____
- 9g. Other _____

Open-ended:

10. Where would you seek information when reacting to a feedlot animal health issue? _____

Examples:

- Livestock associations (KLA, KCA, NCBA, R-CALF, USCA)
- Internet
- Magazine
- Daily newspaper
- Periodical (High Plains Journal)
- Radio
- Television
- Veterinarian
- USDA
- Word of mouth

11. In what format do you prefer to receive information about preventative measures to an agroterrorism event?

- Daily newspaper first _____
- County extension publications second _____
- E-mail third _____
- Mail
- Internet/ E-newsletter
- Magazine articles
- Newsletter
- County extension meetings
- Association meetings
- Other _____

For the next question, the term “reliable” means to provide information consistent and well-balanced. Please answer from 1 to 5, where 1 is not reliable, 2 is slightly reliable, 3 is neutral, 4 is reliable and 5 is very reliable. You may use any number between 1 and 5. (Scale code: 1=not reliable, 2= slightly reliable, 3= neutral, 4= reliable and 5= very reliable)

12. How reliable do you view the following sources of information regarding feedlot animal health issues?

- 12a. Agriculture Extension Agent _____
- 12b. Local daily newspaper _____
- 12c. Local or consulting veterinarian _____
- 12d. USDA _____
- 12e. Radio _____
- 12f. Periodicals _____
- 12g. Internet _____
- 12h. Magazine _____
- 12i. Livestock association _____
- 12j. University specialist _____

For the next question, the terms “trust” and “trustworthy” mean your level of belief in the information you read or receive. Please answer from 1 to 5 where 1 is not trustworthy, 2 is slightly trustworthy, 3 is neutral, 4 is trustworthy and 5 is very trustworthy. You may use any number between 1 and 5. (Scale code: 1=not trustworthy, 2= slightly trustworthy, 3= neutral, 4= trustworthy and 5= very trustworthy.)

13. What is your level of trust in the following sources of information?
- 13a. Agriculture Extension Agent _____
 - 13b. Local daily newspaper _____
 - 13c. Local or consulting veterinarian _____
 - 13d. USDA _____
 - 13e. Radio _____
 - 13f. Periodicals _____
 - 13g. Internet _____
 - 13h. Magazine _____
 - 13i. Livestock association _____
 - 13j. Area law enforcement _____
 - 13k. University specialist _____

14. Which sources of information do you trust the most? (List the top 3 in order)
- Agriculture Extension Agent
 - Local daily newspaper
 - Local or consulting veterinarian
 - USDA
 - Radio
 - Periodicals
 - Internet
 - Magazine
 - Livestock association
 - Area law enforcement
 - University specialist
- first: _____
 second: _____
 third: _____

The following questions are for demographic purposes:

15. At any one time, what is the largest number of cattle you have in your feedlot, regardless of ownership? _____

16. How is your feedlot organized? (check one)

- Corporately owned
- Family owned/ operated, incorporated
- Family owned/ operated, not incorporated
- Private

17. In what county is your operation located? _____

18. What is your age? _____

19. What is your gender? _____

20. What is the highest level of education you have achieved? (check one)

- Below high school
- High school
- Associate degree
- Bachelor's degree
- Masters degree
- Professional
- Doctorate

21. Are you a member of any local, regional, state, or national organizations related to the beef industry? (examples: KLA, KCA, NCBA, R-CALF, USCA)

- No
- If yes, which ones? _____

22. Do you own a computer?

- No
- Yes

23. Does your home have internet access?

- No
- If yes, what type of connection? _____

24. Does your office have internet access?

- No
- If yes, what type of connection? _____

APPENDIX C
PANEL OF EXPERTS

Panel of Experts

Dale Blasi

Professor
Animal Sciences and Industry
Kansas State University
Manhattan, Kansas

James Lane

Under sheriff
Ford County Sheriff's Office
Dodge City, Kansas

David Latta

Former general manager
ConAgra Cattle Feeding Company
Yuma, Colorado

VITA

Kendra Anne Riley

Candidate for the Degree of

Master of Science

THESIS: A DESCRIPTIVE STUDY TO DETERMINE KANSAS BEEF FEEDLOT MANAGERS' PERCEPTIONS OF PREPAREDNESS AND TRUSTED SOURCES OF INFORMATION OF AN AGROTERRORISM EVENT

Major Field: Agricultural Communications

Biographical:

Personal Data: Born in Dexter, Kansas, August 22, 1980, the daughter of Jim and Rose Ann (Jordan) Riley.

Education: Graduated from Dexter High School, Dexter, Kansas, May of 1998; received Bachelor of Science in Animal Science and Industry from Kansas State University, May 2002; completed requirements for the Master of Science degree in Agricultural Communications at Oklahoma State University, July, 2007.

Personal Experience: Communications/Public Relations Graduate Assistant, New Product Development Center at Oklahoma State University, 2006-2007; Communications Intern, Reproduction Enterprises, Inc. in Stillwater, Okla., Spring 2006; Graduate Research Assistant for the Department of Agricultural Communications at OSU, 2005-2006; Embryo Transfer Lab Technician for Cross Country Genetics North, Inc. in Manhattan, Kan. 2003-2005; Intern for the Animal Agriculture Alliance in Arlington, Va., Summer 2002; Herd Health Intern at ConAgra Cattle Feeding Company in Yuma, Colo., Summer 2001.

Name: Kendra Riley

Date of Degree: July, 2007

Institution: Oklahoma State University

Location: Stillwater, Oklahoma

Title of Study: KANSAS BEEF FEEDLOT MANAGERS' PERCEPTIONS OF PREPAREDNESS AND TRUSTED SOURCES OF INFORMATION CONCERNING AN AGROTERRORISM EVENT: A DESCRIPTIVE STUDY

Pages in Study: 70

Candidate for the Degree of Master of Science

Major Field: Agricultural Communications

Scope and Method of Study: The purpose of this study is to identify preparedness levels and trusted sources of information used by feedlot managers. The target population for this study was all 259 managers of beef feedlot registered with the Kansas Department of Health and Environment. The 84 respondents were surveyed using a telephone survey instrument consisting of summated rating scales and open-ended questions.

Findings and Conclusions: Kansas feedlot managers believe they are susceptible to an agroterrorism attack directed at the beef industry. They also believed large-scale, corporate feedlots were the most susceptible, and they felt they had sufficient information about agroterrorism. Local and consulting veterinarians were determined to be the most sought, reliable, and trusted sources of information regarding animal health issues, and should be considered as a primary communication channel for disseminating information about agroterrorism. Most managers were members of at least one association or organization related to the beef industry. Most of the cattle represented in the study were located in southwest Kansas, and as feedlot size increased, the managers' level of education also increased.

Advisor's approval: _____