USING VIDEO FOR CONSUMER ATTITUDE INOCULATION ABOUT BEEF ANIMAL SLAUGHTER: A QUASI-EXPERIMENTAL STUDY

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Abstract: Consumers are demanding transparency of agricultural practices. Americans lack agricultural literacy and they need accurate information sources they can trust. Therefore, an effective communication method is needed to make the agricultural industry more transparent. With the increased consumer concern for animal welfare, the industry needs to be more transparent about humane beef cattle slaughter. Few studies exist determining consumer attitudes about beef animal slaughter and how it affects his or her attitudes, especially using the inoculation theory framework. Studies show individuals learn faster with visual media platforms. The purpose of this study was to determine the success of using video mass media communication for consumer attitude inoculation about beef animal slaughter. This study was a quasi-experimental online questionnaire of semantic differential scales, with a control and treatment group. The treatment group was exposed to a video of the beef animal slaughter process, produced by the American Meat Institute for the Glass Walls Project and guided by Temple Grandin. Overall, the findings indicated consumers have positive attitudes toward raising cattle for human consumption, humane beef animal slaughter, and consumption of beef. Consumers have positive attitudes about the importance and benefit of being educated about humane animal slaughter. In conclusion, viewing a video of beef animal slaughter is a successful communication method to educate consumers about beef animal slaughter, inoculating them to potential future threats against his or her attitudes about humane beef cattle slaughter.

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CHAPTER I

INTRODUCTION

Background and Setting

In the past 100 years, Americans have become removed from agriculture, with less than 2 percent of the population engaged in farming (AFBF, 2014; Doerfert, 2011). Despite this separation, consumers have become more concerned with the food they consume but are hesitant about where to place their trust (Croney & Reynnells, 2008; Doerfert, 2011). Globally in the agricultural and food product industries, relationships between agriculture and consumers are more distant now than ever (Brom, 2000). According to Brom (2000), the "physical and mental gap between food production and consumption has important consequences for the way consumers perceive products, and for the way they build trust" (p. 129). For consumers to receive, understand, and trust agricultural information successfully, it must be available, accessible, and easy to comprehend (Gellynck, Verbeke, & Vermeire, 2006).

Today's consumers demand more information, not less (Doerfert, 2011). Access to accurate information is critical for consumers to become literate about agriculture and to make informed decisions about agriculture, food, and natural resources (Doerfert, 2011). The lack of transparency between agriculture and consumers is because consumers' concerns differ (Gellynck et al., 2006). Consumers' differing opinions must be considered by the agricultural industry professional to communicate effectively with the consumer (Gellynck et al., 2006). Accurate

information must be available to consumers so they can make informed decisions despite their individual attitudes (Croney & Reynnells, 2008; Doerfert, 2011; Vermeir & Verbeke, 2006).

Consumers are demanding transparency in animal production, specifically the slaughter process, to ensure proper animal welfare (Troy & Kerry, 2010). Consumers of animal products want assurance that the animals used for food are treated with appropriate humane care (Croney & Reynnells, 2008). According to Croney and Reynnells (2008), the public needs to be more educated on agriculture and consumers hold the right to know how their food is produced. However, industry professionals are hesitant to be completely transparent, especially about animal slaughter (Croney & Reynnells, 2008). According to Croney and Reynnells (2008), complete transparency is risky because consumers may not want to know the gory details of animal slaughter and processing: "full disclosure of all production practices, especially those related to animal slaughter, could result in consumer aversion, greater public concern, and consequent economic losses" (Croney & Reynnells, 2008, p. 390).

Visual multimedia is an effective tool for educational messages (Krum, 2014; Mayer, 2002). Due to increased visual appeal, graphic images can be used to help consumers become educated about humane slaughter and why processes are done (Croney & Reynnells, 2008; Krum, 2014; Lester, 2006; Mayer, 2002). An accurate information source is essential to build consumer knowledge and to gain his or her trust (Croney & Reynnells, 2008; Doerfert, 2001). Providing a truthful information source is important with the risk of having others, such as activists, make untruthful statements about aspects of animal production, which could erode credibility and heighten public concern (Croney & Reynnells, 2008).

According to Compton and Pfau (2009), "inoculation treatment messages have been shown to increase perceived issue involvement, enhance attitude accessibility, increase perceived vested interest, and facilitate communication about the issue with others" (p. 11). The inoculation

theory can be used to first test, and then implement, the method of slaughter transparency. Research to find "effective education and communication strategies are indeed integral to the development, acceptance, and evaluation of creative solutions in food and agricultural systems" (Doerfert, 2011, p. 6). According to Lim and Ki (2007), a critical point in the communications segment is to foresee potential attacks that are intended to damage an industry. Information presented in a threat or attack can alter consumers' attitudes, which also plays a role in his or her decision-making (Vermeir & Verbeke, 2006). Inoculation research is used to determine the process of making people resistant to persuasion (Wood, 2006). The inoculation theory can be used to inform and inoculate consumers before the threat occurs, or to prepare information to refute the attack and educate the consumer with the accurate information (Lim & Ki, 2007; McGuire, 1964; Pfau et al., 1997; Wood, 2006).

Statement of the Problem

According to Troy and Kerry (2010), "there is a growing concern by consumers with regard to how meat is produced especially in relation to animal welfare" (p. 223). According to Brom (2000), industry professionals and marketers need to be aware of consumers' concerns, and attitudes to effectively address them. Consumers are demanding transparency and humane conditions when raising, transporting, and slaughtering animals (Troy & Kerry, 2010). As the livestock industry faces increasing pressure to be more transparent, the industry is unsure of how transparent it should be (Abrams, Zimbres, & Carr, 2013). Consumers have become more aware of food production, due to intense mass media coverage (Verbeke, 2005). Increased consumer concerns, demands for transparency, and mass media attention thus make it imperative that all methods of inoculating consumer attitudes about beef animal slaughter be examined to determine its success.

Purpose

The purpose of this study was to determine the success of using video mass media communication for consumer attitude inoculation about beef animal slaughter.

Objectives & Hypotheses

The following objectives and hypotheses guided this study:

1. Describe selected demographic characteristics of participants, including meat consumption estimates, type of residential community, age, sex, education, and ethnicity.
2. Describe consumers' attitudes toward raising beef cattle for human consumption.
    a. No significant difference ($p < .05$) exists between the group who viewed the video and the group who did not, for their attitudes toward raising beef cattle for human consumption as meat (H_0: $\mu_{1\ \text{treatment group}} = \mu_{2\ \text{control group}}$).
3. Describe consumers' attitudes toward humane slaughtering of beef cattle.
    a. No significant difference ($p < .05$) exists between the group who viewed the video and the group who did not, for their attitudes toward the humane beef cattle slaughter process (H_0: $\mu_{1\ \text{treatment group}} = \mu_{2\ \text{control group}}$).
    b. No significant difference ($p < .05$) exists between the group who viewed the video and the group who did not, for their attitudes toward transparency of humane beef cattle slaughter process (H_0: $\mu_{1\ \text{treatment group}} = \mu_{2\ \text{control group}}$).
    c. No significant difference ($p < .05$) exists between the group who viewed the video and the group who did not, for their attitudes toward consumer

knowledge of humane beef slaughter process (H_0: $\mu_{1\ \text{treatment group}} = \mu_{2\ \text{control group}}$).

4. Describe consumers' attitudes toward beef consumption.
    a. No significant difference ($p < .05$) exists between the group who viewed the video and the group who did not, for their attitudes toward his or her desire to eat beef with knowledge of humane slaughter (H_0: $\mu_{1\ \text{treatment group}} = \mu_{2\ \text{control group}}$).
    b. No significant difference ($p < .05$) exists between the group who viewed the video and the group who did not, for their attitudes toward beef as part of his or her diet (H_0: $\mu_{1\ \text{treatment group}} = \mu_{2\ \text{control group}}$).

Scope of the Study

The population for this study was a group of consumers, using current faculty and staff members of Oklahoma State University-Stillwater.

Significance of the Study

Due to the agricultural knowledge gap of consumers, an increased need exists for an effective communication method to educate and inform consumers (Brom, 2000; Doerfert, 2011; Gellynck et al., 2006). According to Vermeir and Verbeke (2006), access to comprehensive and reliable information is an important factor to consumers when making purchase decisions. Research shows the presentation of information visually, compared to text, is more effective and easier for the audience to understand (Mayer & Moreno, 2002; Roberts, 1996). Inoculation can be used by communicators in the meat industry to develop messages that educate and engage the public about the processes of beef animal slaughter.

This study contributes to priority two of the American Association for Agricultural Education research, specifically in the practices and products adoption decision area. This area requests research that addresses "the new challenges and opportunities brought about by rapidly advancing technologies; evolving consumer demands, needs, and behaviors" (Doerfert, 2011, p. 8). Although the process of animal slaughter is not a new challenge, it is an area that is constantly under public scrutiny. The agricultural, beef, meat, and food industries need an effective communication method to better educate consumers on the humane slaughter process of beef cattle.

Assumptions

The following assumptions were made regarding this study:

1. Participants responded honestly if they watched the entire American Meat Institute's beef slaughter packing plant tour video.
2. Participants responded honestly when answering all questions.
3. Participants held attitudes about humane beef animal use and humane animal slaughter prior to the study.
4. All participants could read and speak English.

Limitations

The following limitations were identified in this study:

1. Results cannot be generalized beyond the population.
2. Prior bias from media, past experiences, previously held attitudes or if respondents had already seen the video, were not accounted for in the treatment group.
3. Participants may already have a judgment of Temple Grandin.

Definition of Terms

The following terms were defined for use in this study:

Animal: "a living thing that is not a human being or plant" (animal, 2014).

Agricultural literacy: "possessing knowledge and understand of our food and fiber system" (Frick, Kahler, & Miller, 1991, p. 52).

Attitude: "inferred states of the organism that are presumably acquired in much the same manner that other such internal learned activity is acquired" (Osgood, Suci, & Tannenbaum, 1957, p. 189).

Beef: meat from a cow, bull, or steer that is bred and fattened for meat; a whole dressed carcass (beef, 2014).

Cattle: domesticated bovine animals, cows, bulls, or steers (cattle, 2014).

Counterarguing: "a motivational trigger that causes people to defend their beliefs in a process" (Fagnot, 2011, p. 23).

Inoculate: "to introduce something into the mind of" (inoculate, 2014).

Multimedia: "a communication containing words and pictures intended to foster learning" (Mayer, 2002, p. 47).

Refutational messages: the process of "attacking arguments in the course of refuting them" (Benoit, 1991, p. 219).

Risk: "the ability to sense and avoid harmful environmental conditions [which] is necessary for the survival of all living organisms" (Slovic, 1987, p. 280).

Slaughter: "the act of killing; specifically: the butchering of livestock for market" (slaughter, 2014).

Transparency: easy access to shared understanding of, and access to, product and process related information when requested, "without loss, noise, delay, and distortion" (Beulens, Broens, Folstar, & Hofstede, 2005, p. 482).

Trust: “assured reliance on the character, ability, strength, or truth of someone or something” (trust, 2014).

CHAPTER II

REVIEW OF LITERATURE

Accurate, accessible, and effective communication methods are needed to educate consumers about humane agricultural practices (Doerfert, 2011; Gellynck et al., 2006). Consumers are demanding transparency in agricultural production practices, specifically animal welfare and slaughter, but do not know where to find accurate information (Croney & Reynnells, 2008; Doerfert, 2011). In addition, industry professionals are uncertain about how transparent to be with consumers (Abrams et al., 2013; Croney & Reynnells, 2008). Visual multimedia combined with the inoculation theory can be used to educate consumers about agriculture by developing messages that would present the public with the accurate processes of beef animal slaughter (Compton & Pfau, 2009; Jurek, 2014; Vermeir & Verbeke, 2006).

Agricultural Literacy

Of the U.S. population, 98 percent of Americans are removed from the farm or ranch (AFBF, 2014). According to the National Research Council (1988), "most Americans know very little about agriculture, its social and economic significance in the United States, and particularly, its links to human health and environmental quality" (p. 9). In addition, Americans are at least two generations removed from agriculture, specifically animal agriculture (National Agriculture in the Classroom, 2011). Agricultural literacy does not require a high level of understanding

agriculture, yet a minimal knowledge level includes the basic understanding of agricultural information (Frick & Spotanski, 1990). As Frick et al. (1991) pointed out:

> Basic agricultural information includes: the production of plant and animal products, the economic impact of agriculture, its societal significance, agriculture's important relationship with natural resources and the environment, the marketing of agricultural products, the processing of agricultural products, public agricultural policies, the global significance of agriculture, and the distribution of agricultural products. (p. 52).

The public being removed from agriculture has created a relationship gap between producers and consumers, caused by both physical and mental distances (Brom, 2000). People who are removed from agriculture do not "understand even the most rudimentary of processes, challenges, and risks that farmers and the agricultural industry worked with and met head-on every day" (National Agriculture in the Classroom, 2011, p. 1). Access to accurate information is critical for consumers to become literate about agriculture and to make informed decisions about agriculture, food, and natural resources (Doerfert, 2011). Research by Meischen and Trexler (2003) studied knowledge of agriculture using fifth-grade students in a rural school. Meischen and Trexler (2003) found that students were aware that food comes from animals, but they were not familiar with other animal by-products. "The students did not understand the size and scope of modern agriculture, but most had a very basic understanding of the process that meat travels from farm to consumer" (Meischen & Trexler, 2003, p. 43).

Animal Slaughter Literacy

As defined by Frick and Spotanski (1990), the concept of literacy is to have a minimum level of skills and knowledge. However, some consumers are living "in true ignorance" and have no knowledge of animal agriculture (Loughnan et al., 2010). These consumers even may be "failing to equate beef with cow, pork with pig, or even chicken with chicken" (Loughnan et al.,

2010, p. 156). Consumers must be agriculturally literate to make wise and informed decisions (Doerfert, 2011). However, language "is more than simple vocabulary; it also embodies culturally based beliefs, values, and attitudes" (Meischen & Trexler, 2003).

According to Herzog and McGee (1983), few people experience the process of slaughtering and butchering large animals, except for hunters, butchers, and ranchers. As stated by Loughnan, Haslam, and Bastian (2010), "many people enjoy eating meat but few enjoy harming or killing other sentient creatures" (p. 156). Most consumers find the topic of slaughter distasteful (Herzog & McGee, 1983). The consumer only comes into contact with meat after the animal has been reduced to cellophane packages of product (Herzog & McGee, 1983). Meat consumers who are against killing animals are able to sociologically eat meat by using various mental alternatives (Herzog & McGee, 1983; Loughnan et al., 2010). Loughnan et al., (2010), described those consumers' mindsets to include becoming a vegetarian, failing to realize the animal had to be killed to produce meat, living in a "state of tacit denial," or ignoring their moral concerns for animals while they are eating.

An older animal slaughter behavior study conducted by Herzog and McGee (1983) examined college students who were involved in the slaughter process with their college job. This study evaluated the subjects' attitudes about slaughtering animals and the use of animals (Herzog & McGee, 1983). Participants said the presence of the head, eyes, and hide made the process of slaughter harder, but once these items were removed and the animal was skinned, they considered it meat, not an animal (Herzog & McGee, 1983). "The most common justification of the study that human welfare must override that of the animals is often cited by scientists in rationalizing the use of animals in medical and behavioral research" (Herzog & McGee, 1983).

Attitudes

Ajzen and Fishbein (2000) defined attitudes as "the evaluation of an object, concept, or behavior along a dimension of favor or disfavor, good or bad, like or dislike" (p. 3). Ajzen and Fishbein (2000) included that attitudes are based on knowledge of a topic; therefore, persuasive communication of new information can be used to alter attitudes. When an attitude change occurs, the new attitude will take precedence over the old but does not necessarily replace it (Ajzen, 2001). Strong attitudes are considered to become relatively stable over time, resistant to persuasion (Ajzen, 2001). On the contrary, Ajzen (2001) also explained the resistance of attitudes to correlate with age: "the results of several studies demonstrated that susceptibility to attitudes change declines from early to middle adulthood and then increases again in late adulthood" (p. 37). However, attitude strength also was found to correlate with education, gender, and race (Ajzen, 2001).

Previous research by Galvin and Herzog (1992) measured individuals' attitudes toward the treatment of animals using an Ethics Position Questionnaire. The questionnaire was administered to 169 college students. The results indicated "gender and the EPQ dimension of idealism were related to attitudes toward animal use" (Galvin & Herzog, 1992, p. 141). Galvin and Herzog (1992) also discussed the dominance of women in animal rights and activist groups, and women's tendencies to make judgments based on caring rather than justice. Therefore, attitudes can vary depending on gender, in terms of the treatment of animals.

Consumer Decision-Making

Vermeir and Verbeke (2006) described that specific attitudes have the ability to suggest a specific behavior; however, other attitudes are considered when making decisions. Roberts (1996) suggested that researchers must study consumer behavior because it is behavior, not concern, that will correct the problems facing the agricultural industry and create markets for products.

Verbeke (2008) said behavior change could be encouraged or inhibited by factors associated with a person's physical, social, and economic environment. Access to accurate information is critical for consumers to make informed decisions about agriculture, food, and natural resources (Doerfert, 2011). Vermeir and Verbeke (2006) concluded that a positive attitude toward products is a good starting point to stimulate use of the product (see Figure 1). When considering purchase decisions, "additional attitudes come into play, moderating behavior, diluting the impact of initial attitudes, and resulting in an alternative outcome" (Vermeir & Verbeke, 2006, p. 173). Consumer decision-making behaviors are driven heavily by convenience of the product, the value, health concerns, and impact on the environment (Vermeir & Verbeke, 2006). "The less information available and/or the more complex and contradictory this information is, the more uncertain consumers may be regarding what products to choose" (Vermeir & Verbeke, 2006, p. 175). According to Krum (2014), today's consumers are pressured to research a product before making a final purchase decision. In today's information age, product information is easily available,

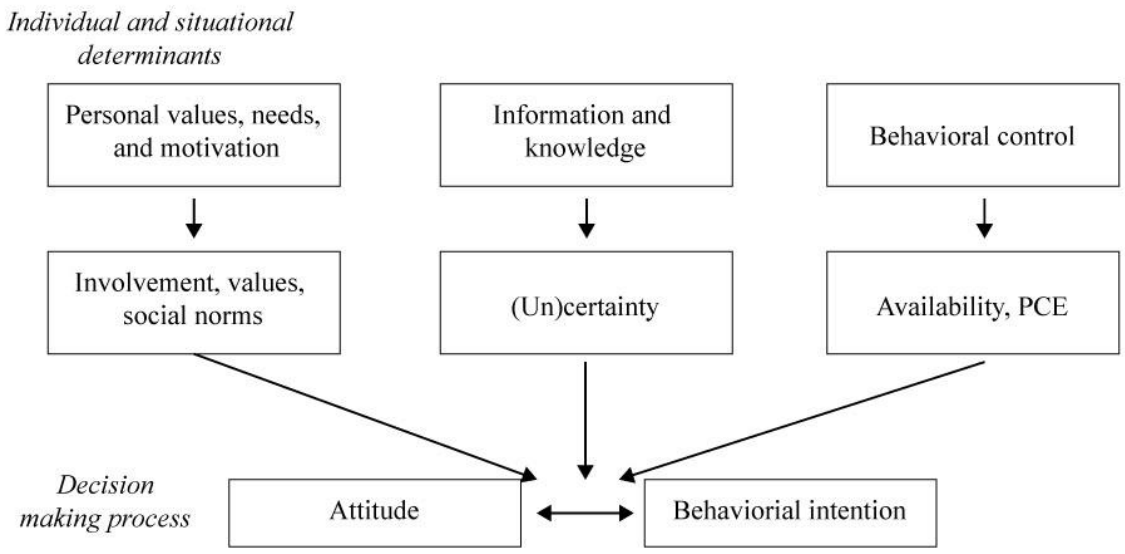

Figure 1. A diagram of the conceptual framework used to study consumer behavior in a study by Vermeir and Verbeke (2006). "Top level: adapted consumer behavior model from Jager (2000); Second level: constructs included in the empirical study; Bold face indicates manipulated constructs in the research design" (Vermeir & Verbeke, 2006, p. 172).

including “price comparisons, promotional offers, star ratings, customer reviews, expert recommendations, feature comparisons, and third-party testing results” (Krum, 2014, p. 10).

A study was conducted with 313 individuals to determine the effect on people’s sensitivity to animal welfare of increased exposure to animal origin and animal welfare (Hoogland, Boer, & Boersema, 2005). Hoogland et al. (2005) hypothesized people would express their sensitivity by not buying meat or by making the choice of purchasing free range and organic meat. Hoogland et al. (2005) answered the problem of reconnecting consumption behaviors and production practices due to recent food crises. The reasoning behind this research was to determine if making animal origin more transparent to the public would have an effect on meat product sales (Hoogland et al., 2005). The results showed that consumers were sensitive to reminders of the animal’s origin and animal welfare (Hoogland et al., 2005).

Perception of Risk

“Consumers call for food that can be fully trusted, they ask for safety guarantees and information with integrity to confirm their trust” (Beulens et al., 2005, p. 481). Consumer concerns can alter their perceptions of agriculture. The key factor is to assess the concerns to determine the effects they could have on the industry (Harrington, 1994). Knox (2000) explained that for the success of communicating food safety, a major need exists for the understanding of the public’s perception of risk. As stated by Knox (2000), consumers’ risk perception has been increased due to the already perceived food risk. Consumers’ decisions also can be affected by attack messages developed by animal activist groups. “Uncertainty can lead to the use of social information, which means that consumers will look at other people to get an indication of the best outcome” (Vermeir & Verbeke, 2006, p. 175).

Older related research by Slovic (1987) evaluated people’s perceptions of risk. Slovic (1987) used four subject categories to study a league of women voters, college students, active

club members, and experts. Slovic (1987) concluded that to broaden the public's perspectives of risk, participants must be exposed to the hazards of the risk. Slovic (1987) mentioned that the exposure to risk may not be successful, however it is likely people would use the hazards to help improve their peer's intuitions about the magnitude of risk. Slovic (1987) stated that these results could help communication with the public, "by directing educational efforts, and by predicting public responses to new technologies, events, and new risk management strategies" (p. 281).

Consumers' concerns can be translated into actions and attitudes when establishing their trust in food. Trust is the "assured reliance on the character, ability, strength, or truth of someone or something" (trust, 2014). Gellynck et al. (2006) explained that trust is associated with risk when considering consumers' opinions and relating them to the food system. Verbeke (2005) stated that consumers are hesitant to trust and question the credibility of information sources in terms of food safety. The safety of food is a concern of consumers because of the media coverage of disease outbreaks, such as BSE, avian influenza, and pathogens such as *E. coli* (Abrams et al., 2013). Due to such disease outbreaks, increasing technology use, decreased trust in government regulations, and limited transparency of agriculture, consumers' perceptions and trust in the meat industry is altering (Abrams et al., 2013; Knox, 2000).

Transparency. According to Verbeke (2008), consumers are demanding more information to help them obtain more pleasure from food consumption, achieve a better diet, and to avoid allergens. In addition, consumers want more transparency "to know the origin and environmental, ethical and technological conditions under which the food has been produced and processed" (Verbeke, 2008, p. 281). Roberts (1996) explained that consumers are more likely to make a purchase if they know it will not harm the environment. Other consumer concerns include the effect of meat consumption on health; animal welfare used in production practices, transportation and slaughtering; and the effect of livestock production on the environment

(Harrington, 1994). Transparency of these concepts and easy access to reliable agricultural information will strengthen consumers' trust in the industry (Gellynck et al., 2006).

Previous research about perceptions of animal slaughter and the transparency of the industry was conducted by Abrams et al. (2013). The objectives of this study addressed the knowledge gap of consumers and if they would be more accepting of particular production practices, how meat eaters would react to production practices such as slaughter, and the best word to use when referring to the slaughter process (Abrams et al., 2013). The major limitation of this study was the population, which was a class of 70 college students in a non-meat animal science class. It was presumed most participants had some degree of agricultural background or could have had other related courses, so they may have had an altered attitude toward the topic. Abrams et al. (2013) found no significant alterations of attitudes before and after viewing a video. Abrams et al. (2013) also stated: **"**furthermore, the present study shows that once livestock slaughter information is received, the industry should not expect to affect all people's acceptance. In fact, only those with a negative attitude toward it are likely to change" (p. 19).

A similar study by Jurek (2014) was conducted to study consumer understanding of beef processing using multimedia platforms. The study used a diverse population and collected 221 instruments using a quasi-experimental post-test design. The null hypotheses indicated differences between the control and treatment groups (Jurek, 2014). The results indicated "an informational message about the beef harvesting process–whether text, photographs and text, or video–will increase consumer understanding of beef cattle processing at the lower cognitive levels immediately following the treatment" (Jurek, 2014, p. ix).

Media Influences

According to Krum (2014), consumers' desire to obtain information is not a new concept; humans have been gathering information since the beginning of time. But, all of the information

available in today's information age can create an information overload (Doerfert, 2011; Gellynck et al., 2006; Krum, 2014). However, presenting information visually can significantly accelerate understanding (Krum, 2014). As stated by Lester (2006), "words are easily forgotten, but pictures stay in our minds" (para. 11). Lester (2006) described the benefit of computers because they allow easier production and distribution of images in real time. According to Ajzen and Fishbein (2000), the access and retrieval of information in real time can strengthen existing beliefs, resulting in positive attitudes becoming more favorable and negative attitudes become more unfavorable.

Multimedia instruction also has been shown to be a successful way to educate people (Mayer & Moreno, 2002). Mayer (2002) defines multimedia instructional messages as "a communication containing words and pictures intended to foster learning" (p. 47). Mayer and Moreno (2002) define multimedia as the "sensory modalities (e.g., visual vs. auditory) and representational modes (e.g., pictorial vs. verbal)" (p. 88). According to Abrams and Meyers (2009), the use of visuals images has proved successful for activist organizations; therefore agricultural organizations should address negative messages with visual communication. Mayer (2002) described the principle of multimedia is because "people learn more deeply from words and pictures than from words alone" (p. 47).

Abrams and Meyers (2009) conducted a study to examine and compare persuasive messages in the website campaigns of two nonprofit organizations. A content analysis of the websites indicated that the activist group website, Humane Society Factory Farm, contained more content, more content in terms of specific animal industries, and more persuasive message strategies compared to the Animal Agriculture Alliance website. The third research question specifically relates to the study, as it examined the use of images and multimedia on the organizations' websites. Using of photos and multimedia serve various purposes: 1) persuasive communication, 2) to evoke emotion, and 3) a peripheral cue for low-involvement audiences

(Abrams & Meyers, 2009; Miniard, Bhatla, Lord, Dickson, & Unnava, 1991). Abrams and Meyers (2009) concluded that using more photos and videos when the viewer is less involved in the issue may be more persuasive for people to adopt other viewpoints.

Through language and media, consumers are faced with contrasting attitudes from the agricultural industry (Kopperud, 1993; Stibbe, 2001). Increased media coverage makes consumers uncertain of the truth and potentially alters their attitudes (Verbeke, 2005). Roberts (1996) noted that past studies have indicated the most important part of changing consumers' attitudes is exposure to media. "Media coverage can change the public's thought and behavior in as little as two weeks" (Roberts, 1996, p. 217). The emergence of new media technologies such as social media has created a faster avenue to educate consumers about agriculture (Doerfert, 2011). "Research is only beginning to reveal the impact of social media and its potential to inform and persuade the user towards (sic) desired thoughts, attitudes, and behaviors" (Doerfert, 2011, p. 14).

Research to study the visual attention to pictures of meat was conducted by Stockburger, Renner, Weike, Hamm, and Schupp (2008). The study used a passive viewing task to examine "whether vegetarians' negative affect towards (sic) meat turns corresponding visual stimuli into effective attention catchers" (Stockburger et al., 2008, p. 513). The results indicated that pictures of meat stimulate a strong avoidance by vegetarian viewers and the photographs are efficient in recruiting visual attention, as indexed by the late positive potential, a process that occurs after stimulus onset (Stockburger et al., 2008).

Verbeke (2008) described how advertising and media coverage of food quality and safety issues can affect the trust and credibility in the source. Mass media is used to expose the public to messages (Wallack, 1981). Advertising and marketing campaigns serve as a reminder to reinforce or slightly modify the existing behavior the audience has (Wallack, 1981). The use of relevant and informational images when presented to the audience can educate the consumer (Krum,

2014). Although the audience may not completely give up their valued behaviors, they may adopt an alternative behavior or an equivalent of their behavior (Wallack, 1981). Audiences are targeted to increase their knowledge or to change their attitudes, and it is assumed this will trigger the behavior change to follow (Wallack, 1981). "Faith in the efficacy of mass media alone to induce behavior change is an important characteristic in present day public service programs" (Wallack, 1981, p. 219). Hoogland et al. (2005) included that values and behavior are linked by motives and criteria, which means it is not possible to predict a person's behaviors on a single act.

Theoretical Framework: Inoculation Theory

The principles of the inoculation theory were created to strengthen the pre-existing attitudes, beliefs, and behaviors that the consumer uses to resist change (Fagnot, 2011). Inoculation research determines the process people experience to become resistant to persuasion (Wood, 2006). Lim & Ki (2007) explained that the inoculation process evaluates an individual's "tendency to resist an ethically suspicious persuasive attempt when the malicious persuasive attack is revealed before reaching the audience" (p. 714). Ultimately, the inoculation theory focuses on the concept of a threat against an individual's beliefs (Fagnot, 2011).

History of the Inoculation Theory

The inoculation theory was established by William J. McGuire, a social psychologist at the University of Illinois and later at Columbia University (Wood, 2006). According to Wood (2006), McGuire began his inoculation research in the1960s because this was a time when there had been no previous "concern with protecting people's attitudes against persuasion" (p. 1). However, the theory's development was not complete until the mid-1990s. At this time, the core concepts, threat and counterarguing, of the theory were evaluated and reinforced (Fagnot, 2011).

Inoculation Theory Process

The definition of the word inoculate is "to introduce something into the mind of" (inoculate, 2014). The inoculation theory process is very similar to the inoculation practice in the medical field with disease, but uses a psychological approach. Individuals are inoculated because they are not prepared to defend their beliefs because it is not common for a person to be motivated to rehearse their defenses (Lessne & Didow, 1987). Therefore, when exposed to refuted counterarguments with inoculation, they are not only motivated to defend their beliefs, but they also demonstrate the method to refute a strong attack (Lessne & Didow, 1987). Having a prepared refutation creates resistance to persuasion from the threat (Lessne & Didow, 1987). The use of inoculation is proposed to be "a weakened attack upon the body [that] is intended to: 1) alert the system to the possibility of an attack and 2) motivate the system to prepare defenses to the attack" (Lessne & Didow, 1987, p. 158). A conventional inoculation message contains three main elements: threat, counterarguments, and refutations (Compton & Pfau, 2009; Pfau et al., 1997).

Fagnot (2011) explained that an inoculative message could be one-sided or two-sided (see Figure 2). However, in inoculation research, the two-sided message platform typically is used (Fagnot, 2011). Previous research has found two-sided messages to be more effective in resistance in opinion change than one-sided messages (McGuire, 1961). The one-sided message, also referred to as an attack message, contains a counterargument to the subject's belief (Fagnot, 2011). The two-sided message, also referred to as an inoculative message, is composed of a "counterargument and a refutation to that argument that a subject can later use if confronted by a stronger threat" (Fagnot, 2011, p. 25).

The two-sided message is a two-step process, including a forewarning and refutational pre-emption (Fagnot, 2011). Fagnot (2011) explains that forewarning the subject about the

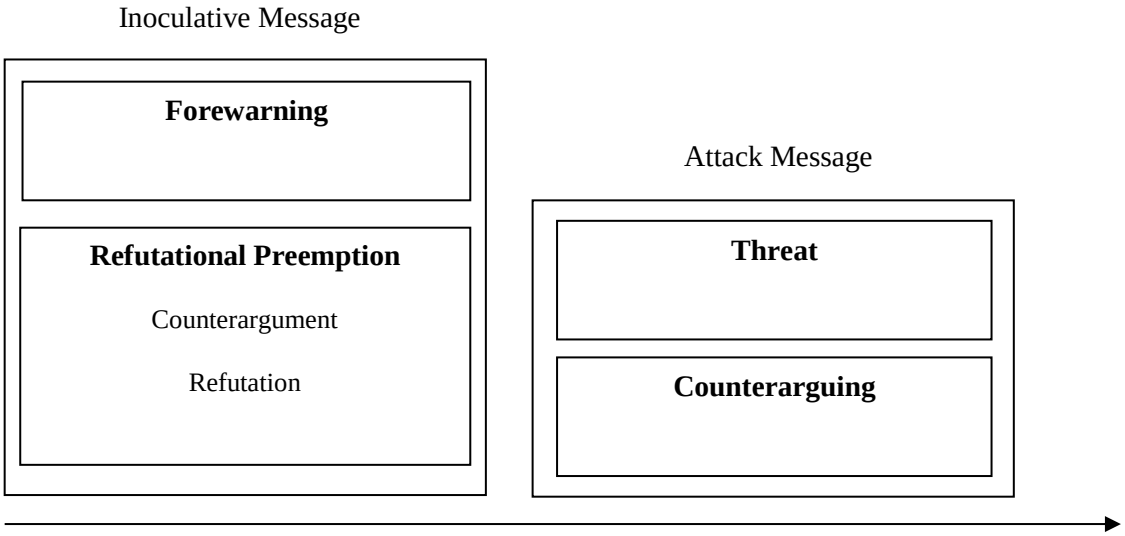

Figure 2. The inoculation process in chronological order, one-step vs. two-step. Adapted from "The Good, the Bad, and the Persuasive: Enhancing Retention of Future information Professionals Through Attitude Inoculation" (Fagnot, 2011).

upcoming threat will begin the inoculation process, which also activates the individual's defenses. The first step is for the subject to receive a forewarning, which is a warning of the future threat or attack (Fagnot, 2011). To be effective in inoculating the subject to a threat, the subject must experience the actual attack first (Compton & Pfau, 2005; Fagnot, 2011). Lessne and Didow (1987) explained this "threatening component forewarns individuals that threats to their belief do exist, and also serves to alert them to the possibility of later attacks upon their belief" (p. 159). This warning initiates the inoculation process by motivating people to read and process the inoculation message and content, ultimately helping activate his or her defenses (Compton & Pfau, 2009; Fagnot, 2011). These defenses are triggered upon hearing the warning and the subject will then begin to feel threatened (Fagnot, 2011). This is a key component of the inoculation process (Fagnot, 2011). However, it is an external factor that cannot be forced (Fagnot, 2011).

Fagnot (2011) described that the subject will then receive a counterargument to his or her belief, which permits the subject to realize a threat exists. This process is also necessary for the inoculation process to be successful and is considered an internal mental process that the subject

must develop (Fagnot, 2011). As stated by Fagnot (2011), counterarguing is "a motivational trigger that causes people to defend their beliefs in a process" (p. 23). Threats and risks are very similar and are both related to inoculation. Slovic (1987) defines risk as "the ability to sense and avoid harmful environmental conditions [which] is necessary for the survival of all living organisms" (p. 280). According to Slovic (1987), the majority of the public relies on risk perceptions, which is a risk judgment based on intuition. The concept of risk perception is vital for the effectiveness of the inoculation theory and how the consumers respond to messages (Slovic, 1987). The method of counterarguing helps strengthen consumer assertiveness against attacks (Compton & Pfau, 2005; Fagnot, 2011).

Fagnot (2011) explains the final step is when the subject is offered a refutation to the experienced threat, which can be used in future situations to defend his or her position if confronted by a threat. Benoit (1991) defines refutational messages as the process of "attacking arguments in the course of refuting them" (p. 219). Refutational pre-emption is also part of the inoculative message and promotes counterarguing (Fagnot, 2011).

Effect of Inoculation Theory

The inoculation theory is used to determine an individual's abilities to resist attitude change from propaganda (Lim & Ki, 2007; McGuire, 1964). The purpose of an inoculation message is to protect them from threats or attacks, by exposing them to weakened forms of the threat prior to it actually happening (Lim & Ki, 2007). This process is comparable to the medical field practice of administering weakened doses of a virus to individuals, so they develop immunization against that virus for protection in the future (Eagly & Chaiken, 1993; Lim & Ki, 2007). The inoculation theory is successful by exposing subjects to mild, belief-threatening messages to strengthen his or her resistance to counter-attitudinal attacks (McGuire, 1964; Wood, 2006). Therefore, the inoculation theory is deemed effective when the subject is exposed to an

opponent's persuasive attack message (Lim & Ki, 2007; Pfau et al., 1997). This is because the subject's attitude tends to strengthen against change after being exposed to an inoculation message (Lim & Ki, 2007; Pfau et al., 1997).

According to Compton and Pfau (2009), "inoculation treatment messages have been shown to increase perceived issue involvement, enhance attitude accessibility, increase perceived vested interest, and facilitate communication about the issue with others" (p. 11). Wood (2007) explained, however, when the subject already has pre-existing support or an established position on a given topic, treatment messages can be used as a preventative practice. Prevention can occur by giving messages that will help protect the "subjects' preexisting attitudes against attitude slippage when subjects later encounter an attack message against their position" (Wood, 2006, p. viii).

The inoculation theory "has been used in diverse fields including marketing campaigns, public relations, crisis communication, adolescent health campaigns, education and politics" (Fagnot, 2011, p. 23). According to Wood (2007), inoculation techniques have successfully been applied to political campaigns by anticipating attack messages that could be used against the candidates, advertising, and communicating during crises. However, the "inoculation theory remains relatively limited in scope because pretests are required to confirm that only subjects who agree with the communicator's message position are exposed to the inoculation messages" (Wood, 2007, p. 358). This makes the theory challenging to apply to real-world scenarios (Wood, 2007, p. 358). In addition, according to Wood (2007), it would be very challenging to use inoculation treatments via mass media. When mass media is used, the message reaches all people, including those who may support and who may oppose the message's position (Wood, 2007). Therefore, administrators of the message would have to know the effects that the message would have on all audience members before using this method (Wood, 2007).

Related Studies

Fagnot (2011) conducted an online survey using a population of information technology majors and non-majors at universities within the United Sates. Fagnot explained the study was conducted using an online experiment, using inoculative and attack messages to evaluate the impact of the message on the subjects' resistance to attitude change in terms of the occupational features of the information technology field. Results showed that previously inoculated groups presented a greater resistance to the persuasive attitude change when confronted by threat (Fagnot, 2011). In addition, the participants in the control groups were more affected by the attack message than the participants who had received an inoculation treatment, who had less of a decline in attitude (Fagnot, 2011).

Further research used an inoculation message in the form of a press release. The first part of the message enforced a threat against participants who viewed a false video, and the second part consisted of statistics and evidence against the deceptive message found in the first group's campaign (Lim & Ki, 2007). This study by Lim and Ki (2007) was conducted at three universities across the United States with students of an introductory public relations course. The purpose of this study was to examine the effectiveness of anticipating attacks by detecting manipulative intent and preparing refutation for viewers to resist the attack influence (Lim & Ki, 2007). Lim and Ki (2007) found that "participants in the inoculation condition were better able to detect unfair manipulation, demonstrated fewer attitude changes after exposure to the video parody, and possessed a more negative view of the video sponsor than did their counter parts in the control group" (p. 722).

Research conducted by Wood (2006, 2007) used students from journalism, communication, and agriculture-related courses. This study aimed to examine the "subjects' preexisting attitudes toward the study's topic domain as a potential moderator in inoculation

research" (Wood, 2006, p. viii). Wood (2006) explained the research used the topic of agricultural biotechnology because consumers throughout the United States have pre-existing attitudes and knowledge of the issue. As explained by Wood (2006, 2007), the methodology of this study used a three-week inoculation experiment with three one-week phases. Week one consisted of the participants completing the consent form and the phase one survey online (Wood, 2006, 2007). The second week consisted of subjects reading an inoculation message supporting agricultural biotechnology; the control group did not receive the message (Wood, 2006, p. ix). Then all subjects completed the phase two online survey (Wood, 2007). In the third week, all subjects read an attack message about agricultural biotechnology (Wood, 2006). Then, all subjects completed another online survey for phase three (Wood, 2007). Wood (2006) found that the inoculation was effective among all subjects, ranging from if they initially supported agricultural biotechnology, were neutral, or were completely opposed. All "subjects exposed to the inoculation message had more positive attitudes toward agricultural biotechnology following the attack message than their respective controls" (Wood, 2006, p. ix). In addition, Wood (2006) concluded that the participants who were inoculated used the information provided in the inoculation message when counterarguing the attack message.

Finally, McGuire (1961) used an introductory psychology course as subjects for his inoculation study. The methodology consisted of a single two-hour experimental session, consisting of a variety of steps, including opinion measures, defensive treatments, supportive and refutational messages, and the attack message (McGuire, 1961). Four treatment types were used: "supportive-only (providing arguments in support of the belief), refutational-only (providing refutations of counterarguments against the belief), supportive-then-refutational, and refutational-then-supportive" (McGuire, 1961, p. 196). The use of an attack message without a defense weakened the beliefs of the respondents (McGuire, 1961). "The supportive-only defense proved the most effective of the four defensive treatments," (McGuire, 1961, p. 196).

According to Benoit (1991), the inoculation theory suggests that how the audience processes the information of the persuasive attack determines his or her resistance to persuasion. Then, refutational defenses increase the individuals' motivation and ability to rebuttal with counterarguments to a similar attack in the future (Benoit, 1991). This is why researchers must be very careful and precise when designing an inoculative message (Fagnot, 2011; Wood, 2007). Slovic (1987) concluded that to have a successful message, people who are employed to "promote and regulate health and safety need to understand the ways in which people think about and respond to risk" (p. 280).

CHAPTER III

METHODOLOGY

Due to the agricultural knowledge gap of consumers, an increased need exists for an effective communication method to educate and inform the public (Brom, 2000; Doerfert, 2011; Gellynck et al., 2006). Due to the consumers' disconnect with agricultural processes and their increased food awareness, they are demanding transparency of the agricultural industry (Brom, 2000; Troy & Kerry, 2010). Although consumers have the right to know how their food is produced and processed, the process of beef animal slaughter is a controversial topic when addressing transparency (Harrington, 1994; Roberts, 1996). This controversy is heightened with the risk of attack messages being exposed to consumers as such threats create a need to inform consumers and provide them with the accurate information (Abrams & Meyers, 2009; Wood, 2006; Wood, 2007). Research shows the presentation of information visually, compared to text, is more effective and easier for the audience to understand (Mayer & Moreno, 2002; Roberts, 1996). The inoculation theory is used to determine an individual's resistance to a threat (Lim & Ki, 2007; McGuire, 1964). Industry professionals using methods to inoculate consumers to attack messages against beef slaughter could make consumers more resistant to such messages and more knowledgeable about agriculture (Dickson & Albaum,1977; Wood, 2006; Wood, 2007).

Institutional Review Board

Prior to investigators beginning research, the Oklahoma State University policy and federal regulations require approval of all research studies involving human subjects. The Oklahoma Sate University Office of University Research Services and the Institutional Review Board (IRB) conducts this review to protect the rights and welfare of human subjects involved in biomedical and behavioral research. In compliance with the policy, this study was reviewed and was granted permission to proceed. The IRB assigned the number AG1426 (see Appendix A) to this study.

Research Design

A quasi-experimental, incentivized online survey design was used for this study. A quasi-experimental post-test only design with control and treatment groups was used because it is the most used of the "three true experimental designs" (Campbell & Stanley, 1963). According to Sax, Gilmartin, & Bryant (2003), using the Web for questionnaires is "convenient for participants, since they usually can be completed at the respondent's leisure" (p. 410).

Population and Sample

The population for this study was current faculty and staff members of Oklahoma State University-Stillwater. Subjects were a random sample selected by the information technology department from the available email addresses of the population. According to Krejcie and Morgan (1970), for a population of 5,860, a sample of 357 to 361 subjects should be sampled to ensure a representative sample of the population. However, to ensure enough responses to satisfy this requirement and run statistical analysis, previous research recommended to oversample, expecting a 10 percent response rate (Robertson, 2009). The sample for this study included 3,500 email addresses. Of these, 3,495 were deemed usable, because five email addresses were removed from this population as they were committee members or IRB staff members. The sample was

then divided using Microsoft Excel to randomly sort and assign participants to control and treatment groups. The control group included 1,747 email addresses, and the treatment group had 1,748 email addresses.

Instrumentation

The instrument of this study was an online descriptive survey using semantic differential scales. According to Fox and Ward (2008), conducting research online is becoming increasingly popular because it is more appropriate when interviewing subjects that are sensitive to in-person interviews. Semantic differential scales were used because the semantic differential format has a greater rigor and structure compared to other question formats (Babbie, 2008). A Likert-type scale was not used because, according to Stacks (2011), the issue with using the Likert-type scale is the respondents are required to respond with preset answers, which questions the accuracy of the measurement level interval. Stacks (2011) also mentioned "to overcome these problems, public relations researchers often employ a second measurement scale, the semantic differential" (p. 59).

Semantic Differentials

Semantic differentials were first developed by Osgood et al. in 1957 as a means to measure meaning by studying the change in attitude or belief (Osgood et al., 1957). Semantic differentials generate data that is suitable for indexing and scaling (Babbie, 2008). According to Fennell and Baddeley (2013), semantic differential scales are one of the most successful methods developed for studying the nature of meaning.

Semantic differential scales use a series of bipolar or unipolar adjectives as endpoints (e.g. bad-good). Respondents place a mark on the scale between the descriptors that best reflect their opinions, with the middle point being neutral (Fennell & Baddeley, 2013; Netemeyer, Bearden, & Sharma, 2003; Stacks, 2011). Seven-point scales were used in this study because past

studies show that seven alternatives result in the most equal frequencies (Osgood et al., 1957). Osgood et al.'s (1957) second form of the graphic scale was used (see Figure 3). Osgood et al. (1957) stated the advantage of this scale format is that the topic can have all adjective scales on one page. "It also has the distinct advantages of greater constancy of meaning in the thing being judged and of being much more satisfying to the subjects of the experiment" (Osgood et al., 1957, p. 82). The adjectives used in the word pairs were constructed using terms from a list (Osgood et al., 1957, pp. 53-61) and using the selection criteria of factorial composition, relevance, and semantic stability (Osgood et al., 1957). The order of sets on the scale and the positive/negative word pairs were randomly organized. Osgood et al. (1957) suggested that "the scales representing the same factor are alternated in polarity direction (e.g., fair-unfair but worthless-valuable) to prevent the formation of position preferences and the order of factors represented is rotated" (p. 82).

Semantic differentials evaluate attitude and belief through three dimensions of attitude: evaluation, potency, and activity (Stacks, 2011). The bipolar word pairs in this study were selected for the ability to measure evaluative construct. "Evaluation is the cognitive, knowledge-based component of an attitude and has been used in the vast majority of studies of attitude change and persuasion" (Stacks, 2011, p. 59). Evaluation is an essential piece of a concept's connotative meaning (Osgood et al., 1957). This meaning is formed randomly as beliefs

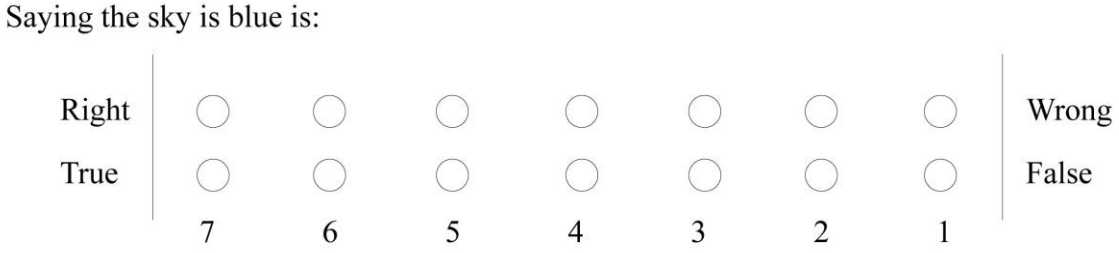

Figure 3. Example of a semantic differential scale with seven-points between bi-polar word pairs. This scale set up was used in the questionnaire. The numbers below the scale are how the responses were coded. The right side of seven was considered positive, the left side of one was considered negative, with the middle point, four, represented neutral attitudes.

are developed about an object (Ajzen & Fishbein, 2000). Evaluation reveals if the concept being measured is good or bad (Fennell & Baddeley, 2013) and reveals how the participant cognitively perceives the concept being studied (Stacks, 2011).

Dickson and Albaum (1977) explained that using the original semantic scales proposed by Osgood et al. could result in lack of relevance and loss of validity, if not altered to fit the context of the problem being studied and then pilot tested. Dickson and Albaum (1977) also suggest pilot testing the scale because of the bias that can occur when selecting the bipolar word pair adjectives or phrases. Another disadvantage to using semantic differentials is the vague measures of connotative and affective meaning because participants are not clear on what is being measured (Fennell & Baddeley, 2013). Also, Dickson and Albaum (1977) found that using phrases was more effective than adjectives because they were easier to interpret. This is why the instrument was designed using phrases with adjective word pairs below.

Design

Qualtrics, an online research and survey platform, was used to design and distribute the questionnaires. Participants were emailed an introduction/recruitment email with a link to his or her respective group's questionnaire (control group, see Appendix B; treatment group, see Appendix C). In the email, participants were told the questionnaire would take no more than 20 minutes. This time estimate was generated because Osgood et al. (1957) estimated participants to "rate at least 10 items per minute, and most come closer to 20 items per minute once they get under way" (p. 80). Therefore, with 60 items taking a maximum of 6:00 minutes, plus the video link for the treatment group lasting 10:21 minutes, plus time to complete the demographic questions and some cushion time, the maximum time estimate was set at 20 minutes.

Semantic differential scales were used for the instrument with 10 to 11 sets of bipolar adjective word pairs under the topic. The order was randomly organized and the positive-negative terms randomly swapped sides throughout the questionnaire to eliminate formation of position preference. Participants were instructed to select the point along the seven-point scale for each word pairing that best indicated their attitudes. Each of the word pairs was selected for its ability to measure evaluative construct. Scales were coded with the highest ranking of seven on the positive side, to the left of the midpoint, and the lowest ranking of one on the negative side, to the right of the midpoint (Figure 3).

The email message began the inoculation process as the forewarning message. The first part of the questionnaire was the counterargument message. A set of semantic differential scales with 10 word pairs was used for respondents to report their attitudes about raising beef cattle for human consumption.

For the treatment group, part two of the questionnaire consisted of watching a 10-minute video produced by the American Meat Institute about the beef slaughter process, http://youtu.be /VMqYYXswono. This tour was a segment in the AMI Glass Walls Project. The video was conducted and narrated by Temple Grandin, Colorado State University professor, and showed the meat animal slaughter process. This video served as the refutational message. A video was used because presenting information visually can significantly accelerate understand (Krum, 2014). Participants had the option not to watch the video and they were asked to report if they watched the entire video. The control group did not view this video and moved directly to the next part of the questionnaire.

In the next part of the questionnaire, serving as the threat or attack message, treatment and control group participants were asked about their attitudes toward the slaughtering process of beef cattle, increased industry transparency, and increased consumer knowledge. Three questions

were asked with 10 or 11 word pairs each. The next part of the questionnaire asked the treatment and control group participants two questions with 10 word pairs each about their attitudes toward desire to eat beef with knowledge of humane slaughter and attitudes toward beef as part of their diets.

The final part of the questionnaire asked for self-reported dietary behaviors of meat consumption and demographic information, including residential area location, educational level, age, sex, and race. The terms used in the demographic questions were based on the 2010 U.S. Census.

To ensure a sufficient response rate for such a long study, a chance to receive a monetary incentive was offered to participants. At the completion of the questionnaire, participants were directed to a separate questionnaire to enter a random drawing for the incentives. The researcher independently sought sponsorship for the study from state and national beef-related organizations and companies. A sponsorship proposal was emailed to the prospective sponsors and follow-up emails and phone calls were made to finalize and obtain the donation of gift cards from a sponsor. The sponsorship was $250, divided into 10 $25 Visa gift cards. The recipients were randomly selected, and the gift cards were mailed to them.

Validity

The instrument was reviewed for content and face validity by a panel of three experts. The panel included a beef marketing professional, an agricultural communications faculty member, and an agricultural education faculty member (see Appendix D). Each expert was selected based on his or her experience with communication practices, agriculture and meat/food industries, and experience with using semantic differentials.

The panel provided feedback on the formatting and design of the questionnaire. Suggestions were made to cut down the time of the video by skipping the introduction given by

Temple Grandin. This change could not be made due to formatting restrictions of the online survey program. A suggestion was made to split the demographic questions to help reduce the length, this change was made. The final suggestion questioned whether the terms within the question stems were relevant. Based on other panel feedback, terms were not changed.

Reliability

A pilot study was conducted to ensure reliability of the questionnaires because the instruments were created by the principal investigator and used semantic differential scales. Netemeyer et al. (2003) stated that when using semantic differentials "it is strongly recommended that the format, wording of scale points, and number of scale points be carefully judged by experts and pilot tested prior to other scale construction steps" (p. 101).

The population for the pilot study was current faculty and staff members of Oklahoma State University-Tulsa. Subjects were selected randomly by the information technology department from the available email addresses of the population. The sample consisted of 134 emails, and all were deemed usable. However, response to the pilot study was low, so 31 faculty and staff members of Oklahoma State University-Stillwater were selected to participate. The emails of these participants were not included in the email database for the main study. Nine useable responses were obtained in the pilot study. According to Hertzog (2008), when "assessing clarity of instructions or item wording, acceptability of formatting, or ease of administration, a sample of 10 or even fewer may suffice" (p. 182). However, the Cronbach's alpha coefficient effect size should be larger for a smaller sample size (Hertzog, 2008). To achieve reasonable confidence, the alpha coefficient should be .80 for samples with fewer than 25 participants (Hertzog, 2008).

A reliability analysis was conducted using responses from the pilot study. The Cronbach's alpha coefficients for each section of the instrument are in Table 1. All coefficients

were greater than .88, except one. Although the Cronbach's alpha was low ($\alpha = .388$) for one question, it remained in the questionnaire. The low reliability may have been due to the low response rate or the question being the very first of the survey.

A post-hoc reliability analysis was conducted (see Table 1). All Cronbach's alpha coefficients were above .87 for the control and treatment groups.

Data Collection

The sample was randomly divided into two test groups, a treatment and a control. Participants were emailed an introduction/recruitment email (see Appendix E) with a link to their respective group's questionnaire on May 27, 2014, and then were sent a reminder (see Appendix F) June 3, 2014. The survey was closed June 10, 2014. Qualtrics was used to distribute the emails and collect the data.

Data Analysis

Data were analyzed using Statistical Package for Social Sciences 21. To report semantic differentials in this study, frequencies, means, and standard deviations were examined. According to Osgood et al. (1957), the means for semantic differential groups should be analyzed to help measure meaning. To report the demographics of the study, means and frequencies were analyzed. ANOVAs were used to compare early and late respondents, and control and treatment groups. All tests were interpreted at the .05 level.

Homogeneity of variance was examined for all items before ANOVAs were interpreted. For items that violated the homogeneity of variance assumption, the Brown-Forsythe robust equality of means test was conducted. The non-significant Brown-Forsythe test was done to indicate difference in means, and the Kruskal-Wallis test was used to interpret items with significant Brown-Forsythe tests.

Table 1

Cronbach's Alpha Coefficients of the Pilot and Main Studies

Question Topic	Pilot (Treatment) (*n* = 9)	Main Study			
		Control		Treatment	
		α	*n*	α	*n*
Raising beef cattle for human consumption as meat	0.906	0.939	163	0.941	126
Humane slaughter process of beef cattle	0.940	0.938	164	0.943	124
Transparency of humane beef cattle slaughter process	0.886	0.918	166	0.906	125
Consumer knowledge of humane beef cattle slaughter process	0.943	0.922	165	0.911	121
Desire to eat beef with knowledge of humane cattle slaughter	0.388	0.946	165	0.955	124
Beef as part of the diet	0.948	0.888	167	0.870	124

When analyzing data, early-response and late-response data were analyzed for differences to determine nonresponse error. Miller and Smith (1983) said early and late respondent groups can be compared to determine differences between the groups. “Late respondents are statistically compared to early respondents using the evaluation data to justify generalizing from the respondents to the sample” (Miller & Smith, 1983, p. 48). Lindner and Wingenbach (2002) summarized that normally no differences were found between early and late respondents or between respondents and nonrespondents. “With late respondents assumed typical of nonrespondents, if no differences were found then respondents are generalized to the sample” (Miller & Smith, 1983, p. 48).

CHAPTER IV

FINDINGS

Consumers are demanding transparency and accurate information sources (Verbeke, 2008). Due to most consumers' lack of agricultural knowledge, they do not know where to find information they can trust (Croney & Reynnells, 2008; Doerfert, 2011). However, agricultural industry professionals are questioning the extent of transparency to take, specifically with animal slaughter (Abrams et al., 2013; Croney & Reynnells, 2008). With the increased success of visual media educated individuals, the inoculation can be used to inoculate consumers to attack messages and also educate them on the accurate practices of beef animal slaughter (Dickson & Albaum,1977; Krum, 2014; Lester, 2006; Wood, 2006; Wood, 2007).

The population for this study was current faculty and staff members of Oklahoma State University-Stillwater. The sample was divided into control and treatment groups. This study used a quasi-experimental post-test only design. The instrument of this study was an incentivized online descriptive survey using semantic differential scales.

Response Rate

For the control group, of the emails sent to the 1,747 email addresses, 26.8% (n = 469) emails were opened. Of the emails opened, 41.6% (n = 195) started the questionnaire. Of these, 87.2% (n = 170) were determined to be use able. For the treatment group, of the emails sent to the

1,748 email addresses, 27.1% (n = 474) of emails were opened. Of the emails opened, 45.1% (n = 214) started the questionnaire. Of these, 58.9% (n = 126) were determined to be use able. Responses deemed not usable included respondents who did not watch the entire treatment video, did not complete the entire questionnaire, or had a pattern in the responses with the same answer for every question or extreme opposite answers.

Non-response Error

The early-response and late-response data were analyzed for differences and to determine the non-response error. Early-response and late-response data were pooled together because there were no differences between the responses. The non-significant Brown-Forsythe tests indicated there were no differences in means; therefore, no further comparisons were needed. The Kruskal-Wallis test was used to interpret items with significant Brown-Forsythe test. No significant differences were found. According to Lindner and Wingenbach (2002), because there were no differences between early and late respondents, results can be generalized for the population.

Findings Related to Objective One: Demographic Characteristics

Objective one was designed to described selected demographic characteristics of respondents. The demographic questions included age, sex, community type, education level, race, and meat consumption estimates. The findings for both the control and treatment groups are explained below.

Of the 170 control respondents, 144 provided their ages. The age range of respondents was 19 years old to 77 years old, with a mean age of 44.5 (SD = 12.0). Of the 126 treatment respondents, 112 provided their ages. The age range of respondents was 24 years old to 72 years old, with a mean age of 45.5 (SD = 12.3).

Of the control group, 64.7% (n = 110) of the respondents were female. For the treatment group, 62.7% (n = 79) of the respondents were female.

All control group respondents (n = 170) provided the type of community where they spent most of their lives. As indicated, 17.1% (f = 29) lived in a rural area, on a farm; 32.9% (f = 56) lived in a rural area, not on a farm; 16.5% (f = 28) lived in a suburban area, outside of a major metropolitan city; 22.4% (f = 38) lived in a suburban area, and 11.2% (f = 19) lived in an urban area. All treatment respondents (n = 126) provided his or her community type where they spent most of their life. As indicated, 26.2% (f = 33) lived in a rural area, on a farm; 27.8% (f = 35) lived in a rural area, not on a farm,'16.7% (f = 21) lived in a suburban area, outside of a major metropolitan city; 20.6% (f = 26) lived in a suburban area; and 8.7% (f = 11) lived in an urban area.

All but one (99.4%, n = 169) of the control respondents indicated their highest level of education, as 0% earned none, 7.7% (f = 13) earned a high school diploma or GED, 6.5% (f = 11) earned an associate's, 32.5% (f = 55) earned a bachelor's, 31.4% (f = 53) earned a master's, and 21.9% (f = 37) earned a doctorate or higher. All treatment respondents (f = 126) indicated their highest level of education, 0% earned none, 11.1% (f = 14) earned a high school diploma or GED, 7.1% (f = 9) earned an associate's, 23.8% (f = 30) earned a bachelor's, 31.7% (f = 40) earned a master's, and 26.2% (f = 33) earned a doctorate or higher.

All (n = 170) control respondents indicated their race 88.8% (f = 151) were white, 4.1% (f = 7) were black or African American, 3.5% (f = 6) were American Indian or Alaska Native, 2.9% (f = 5) were other, 0.6 % (f = 1) were Asian, and 0% were Native Hawaiian or Pacific Islander. Those that indicated other established their races as Hispanic, Human, Okie, and Scottish/German, with each being 0.6% (f = 1). Of the treatment respondents 99.2% (f = 125) indicated his or her race 90.4% (f = 113) were white, 4.0% (f = 5) were American Indian or

Alaska Native, 2.4% (*f* = 3) were black or African American, 1.6 % (*f* = 2) were Asian, 1.6% (*f* = 2) were other, and 0% were Native Hawaiian or Pacific Islander. Those that indicated other, .8% (*f* = 1) were Hispanic.

Respondents reported their meat consumption average estimates of red meat, white meat, and fish (see Table 2). Of the control respondents (*n* = 170), 30 responses were not used, and of the treatment respondents (*n* = 126), 34 responses were not used, due to a technical error with the set-up of the question in the questionnaire. The highest consumption was reported for pork, chicken, or other white meat, with 53.5% (*f* = 91) of control and 52.4% (*f* = 66) of treatment respondents indicating consumption of 2-3 times a week. The second highest consumption was reported for beef at 2-3 times a week, with 43.5% (*f* = 74) of control group respondents and 43.7% (*f* = 55) of treatment respondents. Results indicated 1.8% (*f* = 3) of control respondents and 4.0% (*f* = 5) of the treatment respondents never eat beef. For the highest reported consumption of red meat, other than beef, 15.3% (*f* = 26) of control respondents indicated 2-3 times a month and 14.3% (*f* = 18) of treatment respondents indicated less than once a month. The highest reported consumption of fish was 2-3 times a month, as indicated by 19.4% (*f* = 33) of control group and 19.8% (*f* = 25) of treatment group dietary behavior responses.

Findings Related to Objective Two: Attitudes toward Raising Beef Cattle for Human Consumption as Meat

Objective two was designed to describe the consumers' attitudes toward raising beef cattle for human consumption as meat. Treatment group and control group responses for each semantic differential word pair are shown in Table 3 and a graphical representation of mean values are displayed in Figure 4. Treatment group and control group mean and standard deviation values for each semantic differential word pair can be found in Table G1.

Table 2

Self-Reported Meat Consumption Estimates

	Never		Less than once a month		Once a month		2-3 times a month		Once a week		2-3 times a week		Daily	
	C%	T%	C%	T%	C%	T%	C%	T%	C%	T%	C%	T%	C%	T%
Beef	1.8	4.0	0.0	1.6	2.9	0.8	8.2	9.5	12.4	11.9	43.5	43.7	8.8	10.3
Fish	7.1	5.6	10.0	14.3	17.6	9.5	19.4	19.8	15.3	21.4	8.8	7.9	0.0	0.0
Pork, chicken, or other white meat	0.6	2.4	0.6	3.2	0.6	0.0	4.1	6.3	11.8	5.6	**53.5**	**52.4**	7.1	9.5
Red meat, other than beef	10.0	13.5	13.5	14.3	7.1	5.6	15.3	9.5	10.0	12.7	10.6	13.5	1.8	1.6

Note. C = control group (*n* = 170), T = treatment group (*n* = 126).

Table 3

Semantic Differential Word Pair Responses for Raising Beef Cattle for Human Consumption as Meat

	n		7		6		5		4		3		2		1		
	C	T	C%	T%	C%	T%	C%	T%	C%	T%	C%	T%	C%	T%	C%	T%	
Affectionate	168	126	8.9	12.7	6.0	9.5	10.7	11.9	**66.7**	**61.9**	3.0	3.2	3.0	0.0	1.8	0.8	Hateful
Beneficial	169	126	**53.8**	**59.5**	20.1	16.7	11.8	14.3	6.5	5.6	1.2	1.6	4.7	0.8	1.8	1.6	Harmful
Efficient	168	126	**35.1**	**37.3**	23.8	23.8	10.7	15.9	14.9	11.9	6.5	2.4	4.8	4.8	4.2	4.0	Inefficient
Important	170	126	**62.9**	**67.5**	14.7	15.9	12.4	7.9	4.7	5.6	1.2	0.0	2.4	1.6	1.8	1.6	Unimportant
Merciful	169	126	16.0	22.2	13.0	15.1	13.0	14.3	**48.5**	**41.3**	4.7	4.8	2.4	0.8	2.4	1.6	Merciless
Optimistic	167	126	19.2	23.8	12.6	15.9	15.0	17.5	**47.3**	**40.5**	1.8	0.8	2.4	0.8	1.8	0.8	Pessimistic
Right	169	126	**52.7**	**54.8**	19.5	13.5	9.5	13.5	11.2	16.7	1.8	0.0	3.0	0.8	2.4	0.8	Wrong
Tasteful	170	126	**47.1**	**50.8**	17.6	14.3	15.3	17.5	11.8	11.9	4.1	3.2	2.4	0.0	1.8	2.4	Distasteful
Useful	169	126	**60.9**	**59.5**	21.3	26.2	7.7	7.1	4.7	3.2	1.8	0.0	1.2	1.6	2.4	2.4	Useless
Wholesome	170	126	**45.3**	**50.0**	21.8	14.3	12.4	21.4	12.9	8.7	3.5	4.0	2.4	0.8	1.8	0.8	Morbid

Note. C= control group, T= treatment group.

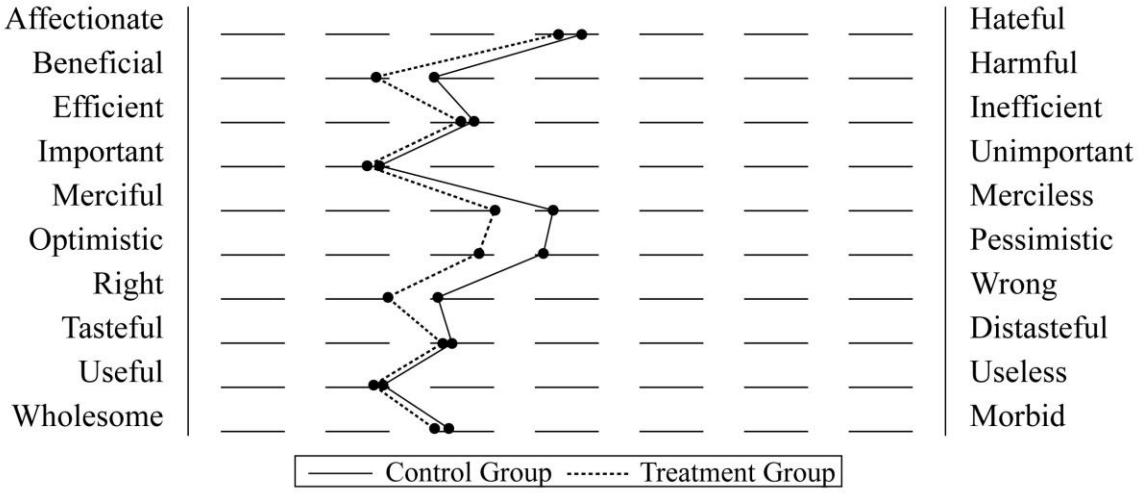

Figure 4. Graphical representation of word pair mean values for semantic differential scale topic, raising beef cattle for human consumption as meat.

The highest mean values were for the word pairs important-unimportant and useful-useless. For the word pair important-unimportant, 90% (*f* = 153) of control respondents and 91.3% (*f* = 115) of treatment respondents marked a box of five or greater, on the positive side of the scale. The mean values were 6.19 (*SD* = 1.36) for the control group and 6.34 (*SD* = 1.23) for the treatment group. For the word pair useful-useless, the control group had a mean of 6.22 (*SD* = 1.33) and the treatment group's mean value was 6.28 (*SD* = 1.26). Both groups marked a box of five or greater, on the positive side of the scale.

The lowest mean value of this question was for the word pair affectionate-hateful. The control group had a mean value of 4.35 (*SD* = 1.16) and the treatment group's mean was 4.63 (*SD* = 1.16). Both means were on the neutral box of the scale. For this word pair, 25.6% (*f* = 44) of control group respondents and 34.1% (*f* = 43) of treatment respondents selected a box of five or greater, on the positive side of the scale. About 7% (7.8%, *f* = 13) of the control group and 4.0% (*f* = 5) of the treatment group selected a box of three or less, on the negative side of the scale. The

word pairs merciful-merciless and optimistic-pessimistic also displayed lower mean values compared to the other responses.

Hypothesis One

Hypothesis one was that no significant difference ($p < .05$) exists between the group who viewed the video and the group who did not, for their attitudes toward raising beef cattle for human consumption as meat (H_0: $\mu_{1\ \text{treatment group}} = \mu_{2\ \text{control group}}$). The treatment group and control group analysis of variance (ANOVA) values, grand means, and standard deviations for each topic can be found in Table 4.

For the initial question about raising beef cattle for human consumption as meat, the one-way ANOVA, $F(1, 287) = 1.47$, $MSE = 1.84$, $p = .23$, indicated no significant differences between the control group ($M = 5.53$, $SD = 1.14$) and treatment group ($M = 5.69$, $SD = 1.08$).

Findings Related to Objective Three: Attitudes toward Humane Slaughtering of Beef Cattle

Objective three was designed to describe consumers' attitudes toward humane slaughtering of beef cattle. The treatment group watched a video of beef slaughter prior to completing this set of semantic differential scales. The semantic differential scale findings for the control group and treatment group are explained below.

The first question asked about attitudes toward the humane slaughtering process for beef cattle. Treatment group and control group responses for each semantic differential word pair are shown in Table 5 and a graphical representation of mean values are displayed in Figure 5. Treatment group and control group mean and standard deviation values for each semantic differential word pair can be found in Table G1.

Table 4

Semantic Differential Scale Topic Values for ANOVA, Grand Mean, and Standard Deviation

		Control		Treatment	
Question & Bi-Polar Word Pairs	*p*	*M*	*SD*	*M*	*SD*
Raising beef cattle for human consumption as meat	.23	5.53	1.14	5.69	1.08
Humane beef cattle slaughtering process	.00	5.21	1.11	5.86	1.12
Transparency of humane beef cattle slaughter process	.00	5.64	0.99	6.18	0.82
Consumer knowledge of humane beef slaughter process	.00	5.72	0.96	6.16	0.81
Desire to eat beef with knowledge of humane slaughter	.07	5.03	1.12	5.28	1.17
Beef as part of diet	.38	5.16	1.09	5.27	1.00

Note. 7 = most positive attitude, 1 = most negative attitude

For the control group, the highest mean value of this question was for the word pair useful-useless with a mean of 6.10 (*SD* = 1.29), on the positive side of the scale. For this word pair, 86.4% (*f* = 147) of control group respondents and 95.2% (*f* = 120) of treatment group respondents selected a box of five or greater, closest to the word useful. The treatment group's highest mean value was for the word pair important-unimportant with a mean of 6.53 (*SD* = 0.92), on the positive side of the scale. For this word pair, 87.6% (*f* = 149) control group respondents and 96.0% (*f* = 120) treatment group respondents marked a box of five or greater, closest to the word important.

The lowest mean value of this question was for the word pair painless-painful. The control group had a mean of 4.34 (*SD* = 1.52), on the neutral box of the scale, and the treatment group's mean was 5.25 (*SD* = 1.62), on the positive side of the scale. For this word pair, 36.7% (*f* = 62) control group respondents marked a box of five or greater, on the positive side of the scale, and 22.5% (*f* = 38) selected a box of three or less, on the negative side of the scale. The treatment group had 69.1% (*f* = 87) of respondents select a box of five or higher, on the positive side of the scale, and 13.5% (*f* = 17) of respondents selected a box of three or less, on the negative side of the scale.

Table 5

Semantic Differential Word Pair Responses for the Humane Slaughter Process of Beef Cattle

	n		7		6		5		4		3		2		1		
	C	T	C%	T%	C%	T%	C%	T%	C%	T%	C%	T%	C%	T%	C%	T%	
Clean	170	125	15.3	41.6	**21.2**	**23.2**	13.5	12.8	30.6	12.8	10.6	2.4	6.5	2.4	2.4	4.8	Dirty
Efficient	170	126	**34.7**	**61.9**	28.2	23.8	11.2	7.9	17.6	3.2	4.1	0.0	1.8	1.6	2.4	1.6	Inefficient
Good	170	126	**30.6**	**47.6**	25.9	20.6	12.9	11.1	24.1	16.7	2.9	1.6	1.2	0.0	2.4	2.4	Bad
Humane	169	126	**33.7**	**54.8**	21.9	19.8	13.0	11.9	17.2	6.3	9.5	2.4	1.8	0.8	3.0	4.0	Inhumane
Important	170	125	**52.9**	**71.2**	20.6	16.8	14.1	8.0	10.0	3.2	0.6	0.0	0.0	0.0	1.8	0.8	Unimportant
Merciful	168	126	16.7	**34.9**	19.0	23.8	16.1	13.5	**38.1**	19.8	5.4	0.0	2.4	3.2	2.4	4.8	Merciless
Painless	169	126	8.9	24.6	18.3	**31.0**	9.5	13.5	**40.8**	17.5	10.7	7.1	7.7	1.6	4.1	4.8	Painful
Reassuring	168	126	10.7	**39.7**	23.2	17.5	11.3	14.3	**33.3**	15.9	11.3	6.3	6.0	1.6	4.2	4.8	Disturbing
Safe	169	126	**30.2**	**43.7**	29.6	32.5	17.8	12.7	15.4	7.1	4.1	1.6	2.4	0.8	0.6	1.6	Dangerous
Soothing	169	126	9.5	**26.2**	8.9	24.6	17.8	18.3	**53.8**	23.0	5.9	2.4	1.2	1.6	3.0	4.0	Aggravating
Useful	170	126	**54.1**	**75.4**	22.9	10.3	9.4	9.5	9.4	0.8	1.8	0.0	1.2	1.6	1.2	2.4	Useless

Note. C= control group, T= treatment group.

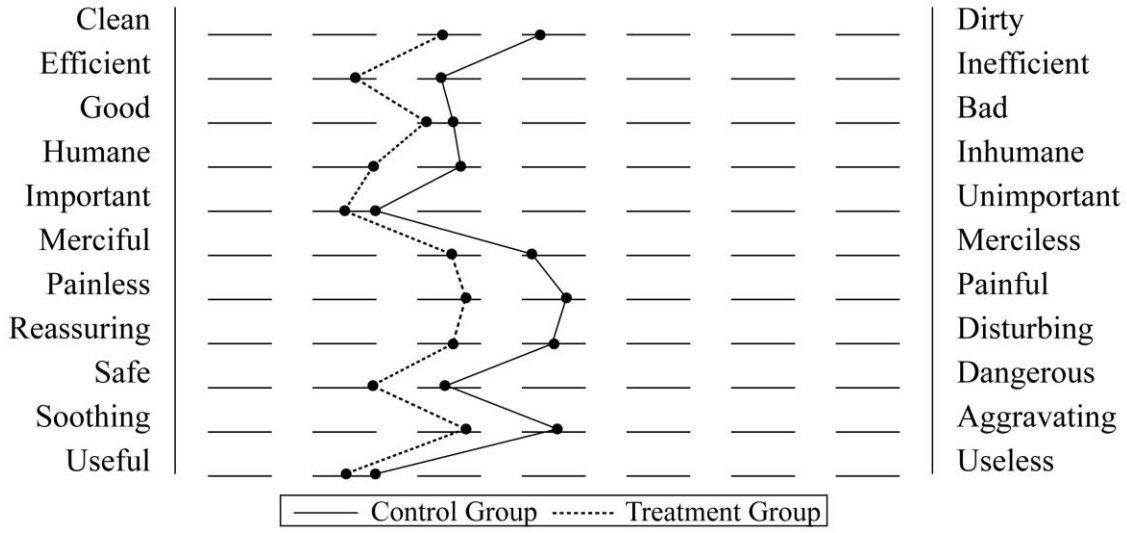

Figure 5. Graphical representation of word pair mean values for semantic differential scale topic, the humane slaughter process of beef cattle.

The second question asked about attitudes toward increased transparency of the humane beef cattle slaughter process. Treatment group and control group responses for each semantic differential word pair are shown in Table 6 and a graphical representation of mean values are displayed in Figure 6. Treatment group and control group mean and standard deviation values for each semantic differential word pair can be found in Table G1.

The highest mean value of this question was for the word pair important-unimportant, with a mean of 6.16 (*SD* = 1.04) for the control group and 6.60 (*SD* = 0.92) for the treatment group, both values falling on the positive side of the scale. For the word pair important-unimportant 90% (*f* = 153) of control respondents and 97.5% (*f* = 123) of treatment respondents selected a box of five or greater, closest to the word important.

The lowest mean value of this question was in the word pair comfortable-uncomfortable. The control group had a mean of 4.44 (*SD* = 1.65), on the neutral box of the scale, and the treatment group's mean was 5.25 (*SD* = 1.62), on the positive side of the scale. For this word pair, 45.0% (*f* = 76) of control group respondents marked a box of five or greater, on the positive side of the scale, and 23.1% (*f* = 39) selected a box of three or less, on the negative side of the scale.

Table 6

Semantic Differential Word Pair Responses for Transparency of Humane Beef Cattle Slaughter Process

	n		7		6		5		4		3		2		1		
	C	T	C%	T%	C%	T%	C%	T%	C%	T%	C%	T%	C%	T%	C%	T%	
Comfortable	169	125	14.2	**31.2**	13.0	20.8	17.8	12.0	**32.0**	20.0	10.1	12.0	7.1	1.6	5.9	2.4	Uncomfortable
Educational	170	126	**44.1**	**69.0**	30.0	21.4	12.4	7.1	10.0	1.6	2.9	0.0	0.0	0.0	0.6	0.8	Mystifying
Good	170	126	**50.0**	**70.6**	25.9	19.0	10.6	7.1	9.4	3.2	2.9	0.0	0.6	0.0	0.6	0.0	Bad
Honest	169	126	**43.8**	**63.5**	28.4	22.2	12.4	9.5	10.7	4.0	4.1	0.0	0.0	0.0	0.6	0.8	Dishonest
Important	170	126	**48.8**	**72.2**	30.0	19.0	11.2	6.3	8.8	1.6	0.6	0.8	0.6	0.0	0.0	0.0	Unimportant
Positive	168	126	**36.3**	**55.6**	25.6	19.0	17.9	12.7	16.1	12.7	1.2	0.0	1.8	0.0	1.2	0.0	Negative
Reassuring	168	126	21.4	**47.6**	25.0	16.7	16.1	16.7	**28.0**	13.5	5.4	3.2	2.4	0.0	1.8	2.4	Disturbing
Right	169	126	**45.6**	**69.0**	24.9	17.5	10.7	7.9	16.0	4.8	1.2	0.8	1.2	0.0	0.6	0.0	Wrong
Significant	169	126	**46.2**	**66.7**	27.2	23.0	13.6	6.3	10.7	3.2	1.2	0.0	0.6	0.0	0.6	0.8	Insignificant
Wholesome	168	126	22.0	**33.3**	16.1	19.0	20.2	12.7	**35.7**	29.4	4.2	4.0	0.6	0.8	1.2	0.8	Morbid

Note. C= control group, T= treatment group.

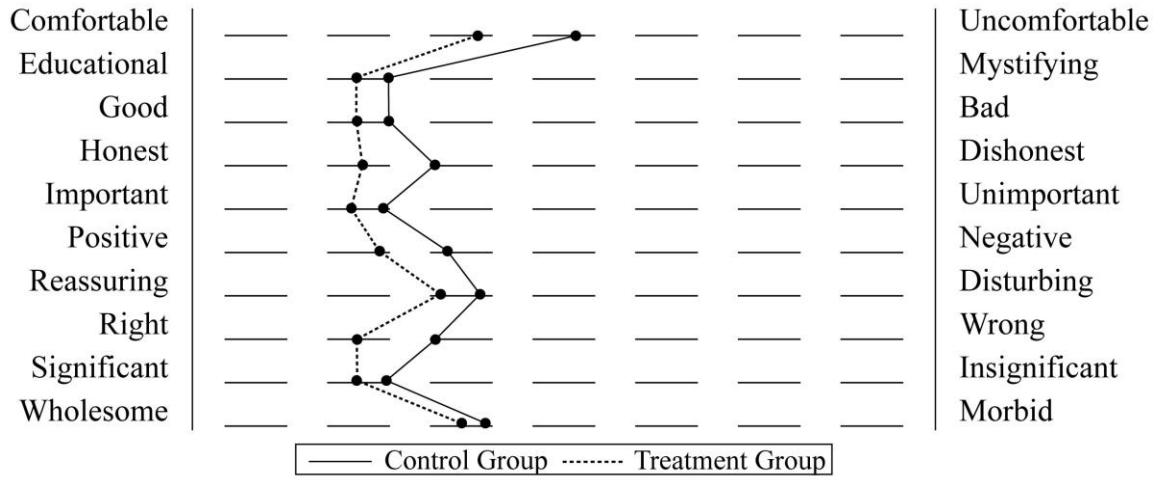

Figure 6. Graphical representation of word pair mean values for semantic differential scale topic, transparency of humane beef cattle slaughter process.

The treatment group had 64.0% (*f* = 80) of respondents mark a box of five or greater, on the positive side of the scale, and 16.0% (*f* = 20) selected a box of three or less, on the negative side of the scale.

The third question asked about attitudes toward increased consumer knowledge of humane beef cattle slaughter process. Treatment group and control group responses for each semantic differential word pair are shown in Table 7 and a graphical representation of mean values are displayed in Figure 7. Treatment group and control group mean and standard deviation values for each semantic differential word pair can be found in Table G1.

The highest mean value of this question was for the word pair educated-ignorant, with means of 6.22 (*SD* = 1.00) for the control group and 6.66 (*SD* = 0.65) for the treatment group, both values on the positive side of the scale. For this word pair, 91.7% (*f* = 154) of control group respondents and 98.4% (*f* = 124) of treatment group respondents selected a box of five or greater, closest to the word educated.

The lowest mean value of this question was for the word pair comfortable-uncomfortable. The control group had a mean of 4.57 (*SD* = 1.60), on the neutral box of the scale, and the

Table 7

Semantic Differential Word Pair Responses for Consumer Knowledge of Humane Beef Cattle Slaughter Process

	n		7		6		5		4		3		2		1		
	C	T	C%	T%	C%	T%	C%	T%	C%	T%	C%	T%	C%	T%	C%	T%	
Comfortable	167	126	15.0	**31.0**	15.0	20.6	18.0	14.3	**32.9**	19.0	7.2	10.3	7.8	3.2	4.2	1.6	Uncomfortable
Educated	168	126	**53.0**	**73.8**	25.0	19.8	13.7	4.8	7.7	1.6	0.6	0.0	0.0	0.0	0.0	0.0	Ignorant
Good	169	126	**45.0**	**65.9**	28.4	21.4	14.2	7.9	8.3	3.2	1.8	1.6	1.2	0.0	1.2	0.0	Bad
Honest	169	123	**46.7**	**64.2**	27.2	20.3	7.7	12.2	17.2	3.3	0.6	0.0	0.6	0.0	0.0	0.0	Dishonest
Important	168	125	**50.0**	**70.4**	28.0	18.4	11.9	7.2	7.7	4.0	0.0	0.0	2.4	0.0	0.0	0.0	Unimportant
Positive	168	126	**47.6**	**68.3**	27.4	19.8	12.5	7.9	8.3	3.2	1.8	0.0	1.8	0.8	0.6	0.0	Negative
Right	169	126	**43.8**	**61.9**	31.4	23.8	11.2	7.1	11.8	7.1	0.0	0.0	1.2	0.0	0.6	0.0	Wrong
Reassuring	167	126	24.0	**43.7**	**28.7**	20.6	16.2	17.5	24.6	12.7	3.0	1.6	1.8	0.8	1.8	3.2	Disturbing
Significant	167	124	**38.9**	**61.3**	28.7	21.8	15.0	7.3	14.4	8.9	0.0	0.0	3.0	0.8	0.0	0.0	Insignificant
Wholesome	168	125	14.9	**28.8**	22.0	18.4	17.3	20.0	**40.5**	24.8	3.6	6.4	1.2	0.8	0.6	0.8	Morbid

Note. C= control group, T= treatment group.

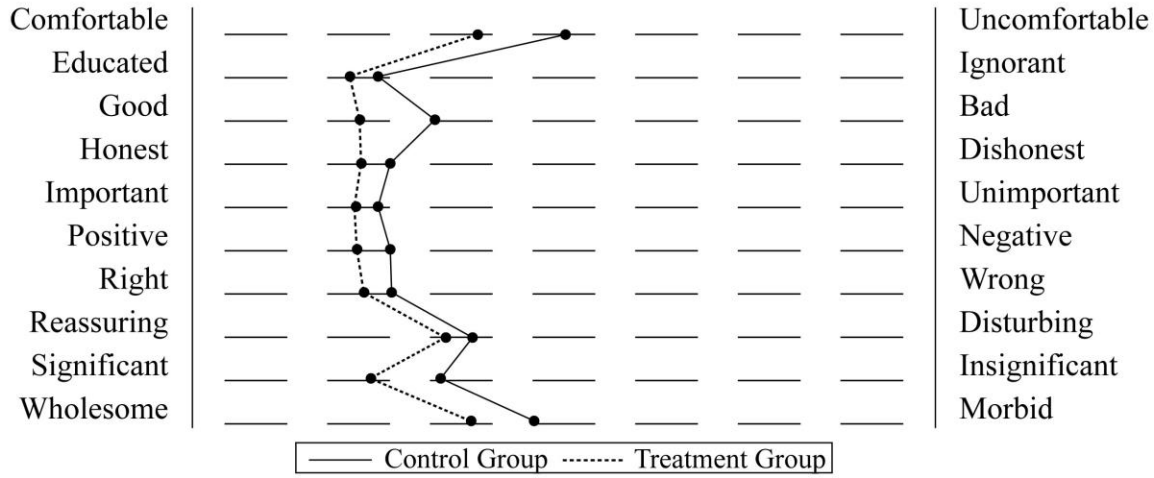

Figure 7. Graphical representation of word pair mean values for semantic differential scale topic, consumer knowledge of humane beef cattle slaughter process.

treatment group's mean was 5.27 (*SD* = 1.59), on the positive side of the scale. For this word pair, 48.0% (*f* = 80) of control group respondents marked a box of five or greater, on the positive side of the scale, and 19.2% (*f* = 32) of control respondents selected a box of three or less, on the negative side of the scale. The treatment group had 65.9% (*f* = 83) of respondents select a box of five or greater, closest to the word comfortable, and 15.1% (*f* = 19) selected a box of three or less, on the negative side of the scale.

Hypothesis Two

Hypothesis two was that no significant difference ($p < .05$) exists between the group who viewed the video and the group who did not, for their attitudes toward the humane beef cattle slaughter process (H_0: $\mu_{1\ \text{treatment group}} = \mu_{2\ \text{control group}}$). The treatment group and control group analysis of variance (ANOVA) values, grand means, and standard deviations for each topic can be found in Table 4.

The one-way ANOVA, $F(1, 286) = 24.30$, $MSE = 30.12$, $p = .00$, indicated significant differences between the control and treatment groups for the topic of humane slaughter process of beef cattle.

Hypothesis Three

Hypothesis three was that no significant difference ($p < .05$) exists between the group who viewed the video and the group who did not, for their attitudes toward transparency of humane beef cattle slaughter process (H_0: $\mu_{1\ \text{treatment group}} = \mu_{2\ \text{control group}}$). The treatment group and control group analysis of variance (ANOVA) values, grand means, and standard deviations for each topic can be found in Table 4.

The one-way ANOVA, $F(1, 289) = 24.32$, $MSE = 20.55$, $p = .00$, indicated significant differences between the control and treatment groups for the topic of transparency of humane beef cattle slaughter process.

Hypothesis Four

Hypothesis four was that no significant difference ($p < .05$) exists between the group who viewed the video and the group who did not, for his or her attitudes toward consumer knowledge of humane beef slaughter process (H_0: $\mu_{1\ \text{treatment group}} = \mu_{2\ \text{control group}}$). The treatment group and control group analysis of variance (ANOVA) values, grand means, and standard deviations for each topic can be found in Table 4.

The one-way ANOVA, $F(1, 284) = 16.87$, $MSE = 13.57$, $p = .00$, indicated significant differences between the control and treatment groups for the topic of the effect of consumer knowledge of humane cattle slaughter.

Findings Related to Objective Four: Attitudes toward Beef Consumption

Objective four was designed to describe the consumers' attitudes toward consuming beef. The treatment group watched a video of beef slaughter prior to completing this set of semantic differential scales. The semantic differential scale findings for the control group and treatment group are explained below.

The first question asked about desire to eat beef with knowledge of humane cattle slaughter. Treatment group and control group responses for each semantic differential word pair are shown in Table 8 and a graphical representation of mean values are displayed in Figure 8. Treatment group and control group mean and standard deviation values for each semantic differential word pair can be found in Table G1.

The highest mean value of this question was for the word pair educated-ignorant, with a mean of 5.77 (*SD* = 1.33) for the control group and 5.97 (*SD* = 1.26) for the treatment group, both values on the positive side of the scale. For this word pair, 75.6% (*f* = 127) of control group respondents marked a box of five or greater, closest to the word educated, and 2.4% (*f* = 4) of control respondents selected a box of three or less, closest to the word ignorant. The treatment group had 81.6% (*f* = 102) of respondents mark a box of five or greater on the positive side of the scale, and 1.6% (*f* = 2) select a box of three or less, on the negative side of the scale.

The lowest mean value of this question was in the word pair increase-decrease. The control had a mean of 4.67 (*SD* = 1.50) and the treatment group's mean was 4.70 (*SD* =1.50), both values on the neutral box of the scale. For this word pair, 40.8% (*f* = 69) of control group respondents marked a box of five or greater, on the positive side of the scale, and 9.5% (*f* = 16) of control respondents selected a box of three or less, on the negative side of the scale. The treatment group had 38.0% (*f* = 48) of respondents mark a box of five or greater, closest to the word increase, and 8.8% (*f* = 11) selected a box of three or less, closest to the word decrease.

The second question asked about attitudes toward beef as part of their diets. Treatment group and control group responses for each semantic differential word pair are shown in Table 9 and a graphical representation of mean values are displayed in Figure 9. Treatment group and control group mean and standard deviation values for each semantic differential word pair can be found in Table G1.

Table 8

Semantic Differential Word Pair Responses for Desire to Eat Beef with Knowledge of Humane Cattle Slaughter

	n		7		6		5		4		3		2		1		
	C	T	C%	T%	C%	T%	C%	T%	C%	T%	C%	T%	C%	T%	C%	T%	
Educated	168	125	**42.3**	**47.2**	22.0	24.8	11.3	9.6	22.0	16.8	0.6	0.0	1.2	0.8	0.6	0.8	Ignorant
Good	167	126	27.5	**38.1**	13.2	16.7	18.0	10.3	**37.7**	32.5	1.2	0.8	1.2	0.0	1.2	1.6	Bad
Increase	169	126	17.8	19.8	11.8	10.3	11.2	7.9	**49.7**	**53.2**	1.8	2.4	4.1	3.2	3.6	3.2	Decrease
Intentional	168	125	21.4	24.8	17.9	22.4	11.9	13.6	**46.4**	**37.6**	0.6	0.0	0.6	0.8	1.2	0.8	Unintentional
Merciful	168	125	12.5	18.4	10.1	13.6	9.5	14.4	**63.1**	**52.0**	1.8	0.0	1.8	0.0	1.2	1.6	Merciless
Positive	168	125	26.2	**37.6**	22.0	17.6	8.9	10.4	**36.9**	30.4	3.0	1.6	1.8	0.8	1.2	1.6	Negative
Reassuring	167	125	22.2	28.8	20.4	20.0	12.6	14.4	**35.3**	**31.2**	6.0	1.6	1.8	1.6	1.8	2.4	Disturbing
Right	168	125	24.4	34.4	19.0	12.8	10.7	11.2	**42.3**	**38.4**	1.8	1.6	1.2	0.0	0.6	1.6	Wrong
Thoughtful	168	125	16.1	21.6	17.9	20.0	20.8	19.2	**42.3**	**36.8**	0.6	0.8	1.2	0.8	1.2	0.8	Vacuous
Wholesome	167	125	16.2	21.6	12.6	17.6	14.4	14.4	**49.7**	**42.4**	4.2	0.8	1.8	1.6	1.2	1.6	Morbid

Note. C= control group, T= treatment group.

Table 9

Semantic Differential Word Pair Responses for Beef as Part of the Diet

	n		7		6		5		4		3		2		1		
	C	T	C%	T%	C%	T%	C%	T%	C%	T%	C%	T%	C%	T%	C%	T%	
Beneficial	169	126	**31.4**	**37.3**	26.0	23.8	18.9	18.3	12.4	14.3	5.3	1.6	2.4	3.2	3.6	1.6	Harmful
Good	169	125	**39.3**	**41.6**	22.0	26.4	14.9	12.8	16.7	17.6	1.8	0.0	2.4	0.0	3.0	1.6	Bad
Healthy	168	126	**31.5**	**35.7**	21.4	22.2	17.9	21.4	13.7	9.5	6.0	4.8	6.0	4.8	3.6	1.6	Unhealthy
Important	170	126	**49.4**	**44.4**	18.8	23.0	13.5	14.3	7.1	4.8	1.2	3.2	4.7	4.8	5.3	5.6	Unimportant
Intentional	168	125	**42.9**	**44.8**	28.6	23.2	13.1	16.8	12.5	12.8	0.6	0.0	0.6	0.0	1.8	2.4	Unintentional
Merciful	168	124	14.3	14.5	7.7	13.7	7.7	9.7	**59.5**	**56.5**	5.4	0.8	1.8	2.4	3.6	2.4	Merciless
Right	169	126	**36.7**	**40.5**	19.5	18.3	10.7	11.9	25.4	26.2	2.4	0.0	3.0	0.8	2.4	2.4	Wrong
Thrifty	169	126	4.1	2.4	1.8	0.8	4.1	3.2	16.6	26.2	**26.0**	**27.0**	24.3	21.4	23.1	19.0	Expensive
Voluntary	168	126	**43.5**	**43.7**	24.4	17.5	11.3	13.5	9.5	13.5	4.8	6.3	4.2	0.8	2.4	4.8	Compulsory
Wholesome	168	125	**30.4**	**32.0**	20.2	20.8	18.5	20.8	25.0	21.6	1.2	0.8	1.8	1.6	3.0	2.4	Morbid

Note. C= control group, T= treatment group.

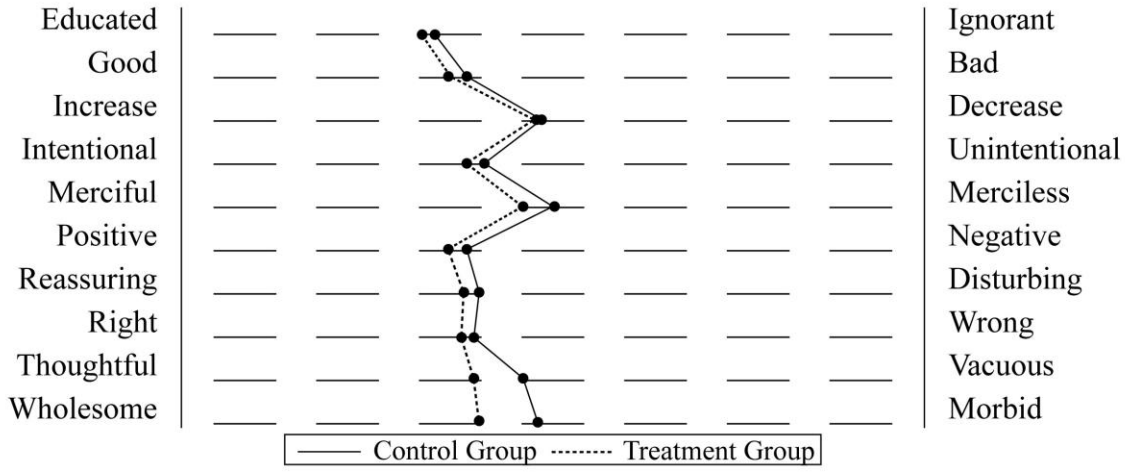

Figure 8. Graphical representation of word pair mean values for semantic differential scale topic, desire to eat beef with knowledge of humane cattle slaughter.

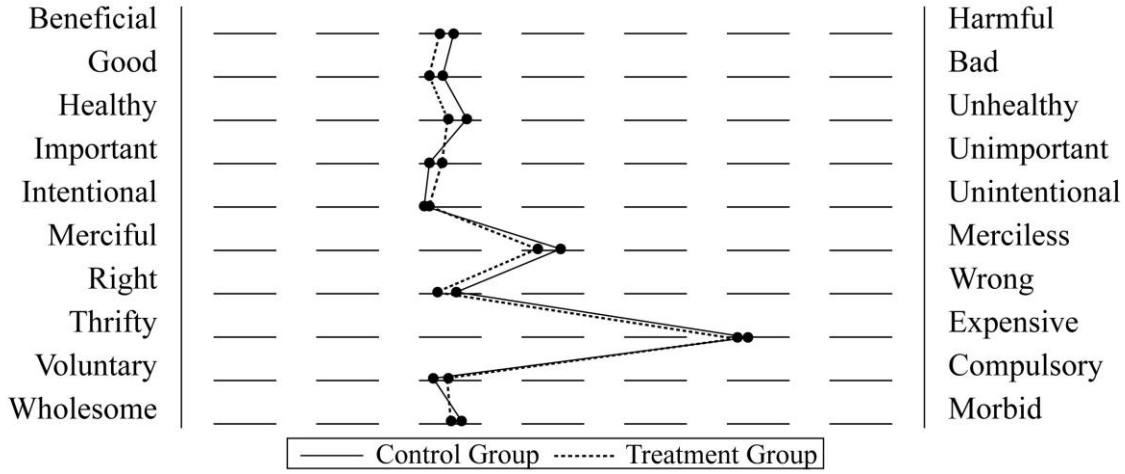

Figure 9. Graphical representation of word pair mean values for semantic differential scale topic, beef as part of the diet.

The highest mean value of this question was for the word pair intentional-unintentional, with a mean of 5.92 (*SD* = 1.29) for the control group and 5.90 (*SD* = 1.32) for the treatment group, both values on the positive side of the scale. For this word pair, 84.6% (*f* = 142) of control group respondents marked a box of five or greater, closest to the word intentional, and 3.0% (*f* = 5) selected a box of three or less, closest to the word unintentional. The treatment group had 84.8% (*f* = 106) of respondents mark a box of five or greater, on the positive side of the scale, and 2.4% (*f* = 3) selected a box of three or less, on the negative side of the scale.

The lowest mean value of this question was in the word pair thrifty-expensive. The control group had a mean of 2.76 (*SD* = 1.51) and the treatment group's mean was 2.85 (*SD* = 1.35), both values on the negative side of the scale, closer to the word expensive. For this word pair, 10.0% (*f* = 17) of control group respondents and 6.4% (*f* = 8) of treatment group respondents marked a box of five or greater, on the positive side of the scale. And 73.4% (*f* = 124) of control respondents and 67.4% (*f* = 85) of treatment respondents selected a box of three or less, on the negative side of the scale.

Hypothesis Five

Hypothesis five was that no significant difference ($p < .05$) exists between the group who viewed the video and the group who did not, for attitudes toward their desire to eat beef with knowledge of humane slaughter (H_0: $\mu_{1\ \text{treatment group}} = \mu_{2\ \text{control group}}$). The treatment group and control group analysis of variance (ANOVA) values, grand means, and standard deviations for each topic can be found in Table 4.

For the topic of desire to eat beef with knowledge of humane cattle slaughter process, the one-way ANOVA, $F(1, 287) = 3.40$, $MSE = 4.44$, $p = .07$, indicated no significant differences between the control and treatment groups.

Hypothesis Six

Hypothesis six was that no significant difference ($p < .05$) exists between the group who viewed the video and the group who did not, for attitudes toward beef as part of his or her diet (H_0: $\mu_{1\ \text{treatment group}} = \mu_{2\ \text{control group}}$). The treatment group and control group analysis of variance (ANOVA) values, grand means, and standard deviations for each topic can be found in Table 4.

The one-way ANOVA, $F(1, 289) = 0.79$, $MSE = 0.87$, $p = .38$, indicated no significant differences between the control and treatment groups for the topic of beef as part of the diet.

CHAPTER V

CONCLUSIONS, RECOMMENDATIONS, AND IMPLICATIONS

The consumer's demand for accurate information they can trust and the need to increase agricultural literacy of consumers has created a need for an effective communication method (Gellynck et al., 2006; Harrington, 1994; Verbeke, 2008). Transparency of animal welfare and the animal slaughter process is a risky concept for industry professionals (Croney & Reynnells, 2008). The use of the inoculation theory can be used to inoculate individuals to the threats and help educate consumers about agricultural practices (Doerfert, 2011; Fagnot, 2011). Studies incorporating inoculation can also assist industry professionals to determine consumer attitudes, develop marketing materials, and to anticipate threats to have crisis communication plans (Dickson & Albaum,1977; Krum, 2014; Lester, 2006; Wood, 2006; Wood, 2007).

The population for this study was current faculty and staff members of Oklahoma State University-Stillwater. The sample was divided into control and treatment groups who were administered an incentivized online descriptive survey using semantic differential scales. Results indicated no differences between the groups prior to the treatment. However, differences existed between the groups in regard to consumer attitudes of humane beef animal slaughter. There were no differences between the groups in terms of consumer attitudes of beef consumption.

Conclusions

Objective One: Demographic Characteristics

The first objective of the study was to describe selected demographic characteristics of consumers. Compared to the OSU-Stillwater faculty and staff population demographics including 50.7% males and 49.3% females, this study had a higher percentage of females. Research done by Galvin and Herzog (1992), indicated that "gender and ethical ideology (particularly idealism) independently contribute to attitudes about the treatment of animals" (p. 146). Therefore, since the study had more than 60.0% females, the results may represent more negative attitudes.

This study is representative of the population in regard to age. When compared to the demographics of the OSU-Stillwater faculty and staff population which includes 87.8% (*n* = 5,145) of individuals between the age of 25 and 64. Plus, the most individuals are (24.0%, *n* = 1,407) between the ages of 45 to 54 years old, similar age ranges were in the study. According to the literature the majority of the population was susceptible to attitude change in this age range of late adulthood (Ajzen, 2001, p. 37).

This study included more than 80.0% who indicated their race as white. This is similar when compared to the demographics of the OSU-Stillwater faculty and staff population that includes 84.4% (*n* = 4,947) of individuals who indicate their race as white. Therefore, the sample used for this study is representative of the population.

About one-third (32.5%, *f* = 55) of the control group indicated their highest level of education earned as a bachelor's degree, and 31.7% (*f* = 40) of the treatment group indicated their highest level of education earned as a master's degree. Compared to the demographics of the OSU-Stillwater faculty and staff population that includes 39.4% (*n* = 2,309) of individuals earned a bachelor's, master's, or doctoral degree, the sample used for this study is representative of the population.

For the type of residential community they spent most of their lives, approximately half of consumers did not reside in a rural area. It was concerning to have almost half of consumers indicate they lived the longest in a rural area, not on a farm because the target audience of this study was those who are removed from agriculture with little agricultural experience. Nevertheless, according to Meischen and Trexler (2003), "'rural' can no longer be directly associated with 'farm'" (p. 44). Therefore, in conclusion, this sample could be used to study attitudes toward agricultural practices, such as beef animal slaughter.

In conclusion, the majority of consumers eat beef, pork, chicken, or other white meat 2-3 times a week. However, the meat consumption estimates may have been altered, especially the beef estimate, because this question was at the end of the questionnaire. According to Stockburger et al. (2009), not knowing the individuals' dietary behaviors prior to the study may affect the results because their understanding may be altered by their preferences. Therefore, the estimates could have been skewed after watching the video or answering the questions in the survey.

Objective Two: Attitudes toward Raising Beef Cattle for Human Consumption as Meat

The second objective guiding this study was to describe the consumers' attitudes toward raising beef cattle for human consumption. The null hypothesis was accepted because significant differences did not exist between the control group and treatment group attitudes toward raising beef cattle for human consumption as meat. Prior to watching the video, the groups had equal attitudes toward beef consumption and raising cattle for slaughter. In addition, this objective served as the counterargument and made the subject realize a threat exists (Fagnot, 2011). Therefore, to be able to test the treatment, it was essential that the groups have no differences prior to the treatment.

Contrary to the literature, the results indicate that consumers still have positive attitudes toward raising cattle for consumption. "Consumers call for food that can be fully trusted, they ask for safety guarantees and information with integrity to confirm their trust" (Beulens et al., 2005, p. 481). Consumers are demanding more information and unsure of trusting information (Croney & Reynnells, 2008; Doerfert, 2011). However, the consumers' attitudes may be based off of previous experiences, agricultural knowledge, or other media they have been exposed to.

Objective Three: Attitudes toward Humane Slaughtering of Beef Cattle

The third objective of this study was to describe the consumers' attitudes toward humane slaughtering of beef cattle. Beginning with this objective, the treatment group watched a video of the beef cattle slaughter process prior to completing the semantic differential sets, and the control group did not watch the video. All three null hypotheses were rejected because significant differences existed between the control group and treatment group attitudes toward the humane beef animal slaughter process, increased transparency of slaughter, and increased consumer knowledge of slaughter.

In conclusion, consumers had positive attitudes about humane slaughtering of beef cattle in regard to the slaughter process, increased transparency, and increased knowledge. However, the treatment group consumers had more positive attitudes compared to the control group consumers. Therefore, the treatment was successful at inoculating attitudes. According to the inoculation theory literature, individuals' attitude change can be prevented after being presented with refutational message (Wood, 2006; Wood, 2007), which was the treatment video. In terms of the slaughter process, the results contradict the concern of Croney and Reynnells (2008) that consumers may not want to know the gory details of animal slaughter and processing. The more positive attitudes of treatment group consumers compared to control group consumers may be attributed to seeing the humane animal treatment of animals in the video, as consumers desire for

assurance that animals used for food are treated with humane care (Croney & Reynnells, 2008). In terms of increased transparency of slaughter, the results support the literature. Consumers are demanding transparency of animal production, specifically the slaughter process, to ensure proper animal welfare (Troy & Kerry, 2010). In regard to increased consumer knowledge, the results support the literature because consumers are demanding more information to help them obtain more pleasure from food consumption (Verbeke, 2008).

Objective Four: Attitudes toward Beef Consumption

The fourth objective of this study was to describe consumers' attitudes of consuming beef. Again, prior to answering the semantic differentials associated with this objective, the treatment group watched a video of the beef slaughter process and the control group did not.

Both null hypotheses were accepted because the results indicated no significant differences between the control group and treatment group attitudes toward desire to eat beef with knowledge of humane slaughter. In conclusion, the treatment did not affect attitudes about consumption of beef, because both groups' responses were similar. As noted by the inoculation theory literature, the treatment message may only serve as a preventative practice if the subject already has pre-existing support or an established position on a given topic (Wood, 2007). Similar results were seen in Fagnot's (2011) study, where previously inoculated groups presented a greater resistance to the persuasive attitude change when confronted by threat. Therefore, previous experiences, agricultural knowledge, or other media, could have served as a form on inoculation and may have altered the results of these threat messages in the treatment. In addition, according to Slovic (1987), the exposure to risk may not be successful, however it is likely people may use the hazards to help improve their peer's intuitions about the magnitude of risk.

The mean values associated with this objective were the lowest means in the study. This may be attributed to the increased media coverage because it is causing consumers to be uncertain

of the truth, potentially altering his or her attitudes (Verbeke, 2005). Despite the lowest means and the treatment not being successful, all control group and treatment group consumers had positive attitudes toward consuming beef. The treatment group consumers had slightly more positive attitudes compared to the control group in regard to attitudes toward desire to eat beef with knowledge of humane cattle slaughter.

The only negative attitude in the entire study was with the word pair thrifty-expensive in terms of beef as part of the diet. Although consumers consider consuming beef to be expensive, they voluntarily and intentionally consume beef and consider it to be important, healthy, beneficial, wholesome, good, and right. As discussed in the literature, despite the negative media coverage of animal slaughter (Verbeke, 2005), the majority of participants had positive attitudes about the humane beef cattle slaughter process.

Discussion

Contrary to Wood's (2007) concern that using inoculation treatments via mass media may be not be successful, this study's results indicated mass media could be successful in inoculation. Consumers who viewed the video of beef slaughter had more positive attitudes about humane slaughter and beef consumption, compared to consumers who did not watch the video. In conclusion, viewing a video of slaughter is an effective communication method to educate consumers about humane beef animal slaughter, inoculating them to potential future threats against their attitudes of slaughter not being a humane process. This agrees with previous beef processing literature that concluded "as long as some sort of informational format is utilized, people will be able to grasp a better understanding of a particular concept than having none at all" (Jurek, 2014, p. 96).

Recommendations

Recommendations for Practice

First, agricultural professionals need to educate and engage consumers about agricultural practices with accurate, accessible information. According to Frick and Spotanski (1990), the goal of agricultural literacy is to provide an understanding of agricultural processes. As the data indicates, an informative video can be used to educate consumers and potentially inoculate them to future attacks or threats to their attitudes.

Second, the review of literature supported the use of visual multimedia messages and advertising. Visual media platforms, such as videos, should be employed in the industry to begin the education process. A campaign to incorporate a video could be employed via social media. Similar to the efforts of the American Meat Institute with developing the Glass Walls Project video used for this study, campaigns first could be used on applications such as Facebook or Twitter, but eventually could be made into commercials to be aired on TV. According to Abrams and Meyers (2009), the use of visual images on social media has proven successful for activist organizations; therefore, agricultural organizations should address negative messages with visual communication. Although this study had an older population, this educational tool should be used for younger generations to begin their learning process to get them engaged in agriculture. The literature supports the use of altering the media message to fit the audience and problem being addressed.

Recommendations for Research

First, this study should be replicated to determine if the study's findings are consistent. In the creation of the instrument, wording should be carefully constructed to address vegetarians or vegans, such as questions they would be willing to answer or specific options for them. The study may need to be created in a platform capable of translation for consumers who do not speak or

read English, depending on the population used. In addition the instrument should apply to the situation. Dickson and Albaum (1977) explained that using the original semantic scales without altering to fit the context of the problem being studied and then not pilot testing, could result in lack of relevance and loss of validity, if not alerted to fit to the context of the problem being studied.

To address objective one, alterations should include using different regional locations of the country to determine geographical differences. In addition, the slaughter of different species should be studied, such as lamb, poultry, and pork, to examine the variance in consumer attitudes related to species. The question design should be changed for the consumption estimate question, in addition to moving the term pork to the other red meat category. Future research should ask additional questions about dietary behaviors of beef in part one of the questionnaire as the counterargument, before the treatment. This would provide a more accurate representation of respondents' self-reported behaviors without bias of the survey questions or treatment video. It is important to know the respondents' dietary behaviors prior to the study because the respondents' understanding may be altered by his or her preferences (Stockburger et al., 2009). Finally, individuals should be asked to take a knowledge test about agriculture or they should be asked to rate themselves on perceived level of agricultural knowledge. This would help eliminate ambiguity about prior agricultural knowledge.

To address objective two, alterations should include a more threatening counterargument because this aspect of inoculation helps strengthen consumer assertiveness against attacks (Compton & Pfau, 2005; Fagnot, 2011). To address objective three, alterations should be made to the semantic differential scales by designing them as a slider rather radio buttons to properly measure continuous data. To address objective four, alterations should include changing the wording for the question "beef as part of my diet" to "beef as part of the diet." This would ensure

the individual would answer the question in terms of the concept of eating meat, rather than his or her diet.

Second, related future research could use a different theoretical framework. The most common framework used in related studies is the cognitive theory of multimedia learning. In addition, future research should continue to use the inoculation theory because little agriculture-related research uses this framework.

Third, further research is recommended to determine the effectiveness of the inoculation process by showing a video of inhumane slaughter. This could be used to test inoculation by showing the humane slaughter video initially, followed by the inhumane video in a post-test as an attack message. Wood (2006) used a post-test to determine the effectiveness of inoculation and concluded the participants who were inoculated used the information provided in the inoculation message when counterarguing the attack message.

Fourth, the instrument should employ more diverse sets of word pairs for the questions under each topic, instead of mostly the same terms for each question, or use all the same terms for every question. This alteration would prevent semantic differential tendencies of creating a bias and selecting all the same answers. In addition, phrases instead of word pairs could be used. Dickson and Albaum (1977) found that using phrases was more effective than adjectives because they were easier to interpret.

Fifth, studying the relationships among demographics of respondents and their attitudes may help determine the prior attitudes consumers' hold in terms of animal slaughter and consumption.

Sixth, future research should be conducted with younger generations, such as students and young professionals. According to Messenger (2001), "students are the consumers of tomorrow," so they should be educated early (p. 34). Since this research studies attitudes and

communication methods to educate the public about beef slaughter, it has the potential to alter consumers' attitudes, dietary behaviors, and meat purchases.

Implications

The findings of this study can benefit industry communication professionals with an effective method to educate and inoculate consumers to future threat or attack messages. Understanding consumer attitudes in regard to humane animal slaughter will help agricultural professionals in his or her efforts to make the industry more transparent. Visual informative messages can be developed with consumers' concerns in mind to build their trust. The result of consumers' trusting the information source also will build their agricultural literacy, allowing them to be more engaged in the agricultural industry.

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APPENDICES

APPENDIX A

INSTITUTIONAL REVIEW BOARD

Oklahoma State University Institutional Review Board

Date:	Wednesday, April 23, 2014
IRB Application No	AG1426
Proposal Title:	Perceptions of Beef Animal Slaughter and Effect on Consumer Behaviors
Reviewed and Processed as:	Exempt

Status Recommended by Reviewer(s): Approved Protocol Expires: 4/22/2017

Principal Investigator(s):

Katherine Powers
P.O. Box 1563
Stillwater, OK 74076

Traci Naile
437 Ag Hall
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. Protocol modifications requiring approval may include changes to the title, PI advisor, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms
2. Submit a request for continuation if the study extends beyond the approval period. 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 the 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 Dawnett Watkins 219 Cordell North (phone: 405-744-5700, dawnett.watkins@okstate.edu).

Sincerely,

Shelia K

Shelia Kennison, Chair
Institutional Review Board

Oklahoma State University Institutional Review Board

Date:	Tuesday, May 27, 2014	Protocol Expires:	4/22/2017
IRB Application No:	AG1426		
Proposal Title:	Perceptions of Beef Animal Slaughter and Effect on Consumer Behaviors		
Reviewed and Processed as:	Exempt **Modification**		

Status Recommended by Reviewer(s) **Approved**

Principal Investigator(s):

Katherine Powers
P.O. Box 1563
Stillwater, OK 74076

Traci Naile
437 Ag Hall
Stillwater, OK 74078

The requested modification to this IRB protocol has been approved. Please note that the original expiration date of the protocol has not changed. The IRB office MUST be notified in writing when a project is complete. All approved projects are subject to monitoring by the IRB.

☐ 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.

The reviewer(s) had these comments:

Modification to change original questionnaire and add an item in the treatment questionnaire. Changes also made to recruitment emails.

Signature :

Shelia Kennison, Chair, Institutional Review Board

Tuesday, May 27, 2014
Date

APPENDIX B

CONTROL QUESTIONNAIRE

Survey description and instructions

Thank you for taking the time to participate in this study. The following questions ask you about your views of using animals for food, the beef slaughter process, your dietary behaviors related to beef, and your demographic information. Please respond to the questions in terms of your knowledge and perceptions.

Below is an example of what the questions will look like. For each of the questions related to this study, please select the circle for each word pair that best describes your attitudes. You do not need to answer the example question below.

Saying the sky is blue is:

Right	○ ○ ○ ○ ○ ○ ○	Wrong
False	○ ○ ○ ○ ○ ○ ○	True

Part 1

This set of questions will ask you about your views toward raising beef cattle for human consumption. Please describe your attitudes by selecting the appropriate point along each scale.

Raising beef cattle for human consumption as meat is:

Important	○ ○ ○ ○ ○ ○ ○	Unimportant
Wholesome	○ ○ ○ ○ ○ ○ ○	Morbid
Useless	○ ○ ○ ○ ○ ○ ○	Useful
Tasteful	○ ○ ○ ○ ○ ○ ○	Distasteful
Right	○ ○ ○ ○ ○ ○ ○	Wrong
Merciless	○ ○ ○ ○ ○ ○ ○	Merciful
Affectionate	○ ○ ○ ○ ○ ○ ○	Hateful
Beneficial	○ ○ ○ ○ ○ ○ ○	Harmful
Optimistic	○ ○ ○ ○ ○ ○ ○	Pessimistic
Inefficient	○ ○ ○ ○ ○ ○ ○	Efficient

Part 3

This set of questions will ask you about your views toward slaughtering beef cattle for meat. Please describe your attitudes by selecting the appropriate point along each scale.

The humane slaughtering process for beef cattle is:

Useful	○ ○ ○ ○ ○ ○ ○	Useless

Soothing	○ ○ ○ ○ ○ ○ ○	Aggravating
Dirty	○ ○ ○ ○ ○ ○ ○	Clean
Humane	○ ○ ○ ○ ○ ○ ○	Inhumane
Efficient	○ ○ ○ ○ ○ ○ ○	Inefficient
Safe	○ ○ ○ ○ ○ ○ ○	Dangerous
Good	○ ○ ○ ○ ○ ○ ○	Bad
Painful	○ ○ ○ ○ ○ ○ ○	Painless
Important	○ ○ ○ ○ ○ ○ ○	Unimportant
Disturbing	○ ○ ○ ○ ○ ○ ○	Reassuring
Merciful	○ ○ ○ ○ ○ ○ ○	Merciless

The livestock industry being more transparent about the humane slaughtering process for beef cattle is:

Honest	○ ○ ○ ○ ○ ○ ○	Dishonest
Good	○ ○ ○ ○ ○ ○ ○	Bad
Significant	○ ○ ○ ○ ○ ○ ○	Insignificant
Educational	○ ○ ○ ○ ○ ○ ○	Mystifying
Uncomfortable	○ ○ ○ ○ ○ ○ ○	Comfortable
Important	○ ○ ○ ○ ○ ○ ○	Unimportant
Wrong	○ ○ ○ ○ ○ ○ ○	Right
Wholesome	○ ○ ○ ○ ○ ○ ○	Morbid
Reassuring	○ ○ ○ ○ ○ ○ ○	Disturbing
Negative	○ ○ ○ ○ ○ ○ ○	Positive

Consumers knowing more about the humane slaughtering process for beef cattle is:

Positive	○ ○ ○ ○ ○ ○ ○	Negative
Educated	○ ○ ○ ○ ○ ○ ○	Ignorant
Bad	○ ○ ○ ○ ○ ○ ○	Good
Comfortable	○ ○ ○ ○ ○ ○ ○	Uncomfortabe
Right	○ ○ ○ ○ ○ ○ ○	Wrong
Important	○ ○ ○ ○ ○ ○ ○	Unimportant
Morbid	○ ○ ○ ○ ○ ○ ○	Wholesome
Reassuring	○ ○ ○ ○ ○ ○ ○	Disturbing
Dishonest	○ ○ ○ ○ ○ ○ ○	Honest
Significant	○ ○ ○ ○ ○ ○ ○	Insignificant

Part 4

This set of questions will ask about beef as part of your diet. Please describe your attitudes by selecting the appropriate point along each scale.

Knowing about the humane slaughtering process for beef cattle makes my desire to eat beef:

Increase	○ ○ ○ ○ ○ ○ ○	Decrease
Merciful	○ ○ ○ ○ ○ ○ ○	Merciless
Thoughtful	○ ○ ○ ○ ○ ○ ○	Vacuous
Intentional	○ ○ ○ ○ ○ ○ ○	Unintentional
Morbid	○ ○ ○ ○ ○ ○ ○	Wholesome
Reassuring	○ ○ ○ ○ ○ ○ ○	Disturbing
Wrong	○ ○ ○ ○ ○ ○ ○	Right
Educated	○ ○ ○ ○ ○ ○ ○	Ignorant
Good	○ ○ ○ ○ ○ ○ ○	Bad
Negative	○ ○ ○ ○ ○ ○ ○	Positive

Beef as a part of my diet is:

Important	○ ○ ○ ○ ○ ○ ○	Unimportant
Expensive	○ ○ ○ ○ ○ ○ ○	Thrifty
Compulsory	○ ○ ○ ○ ○ ○ ○	Voluntary
Unhealthy	○ ○ ○ ○ ○ ○ ○	Healthy
Beneficial	○ ○ ○ ○ ○ ○ ○	Harmful
Merciful	○ ○ ○ ○ ○ ○ ○	Merciless
Intentional	○ ○ ○ ○ ○ ○ ○	Unintentional
Wholesome	○ ○ ○ ○ ○ ○ ○	Morbid
Good	○ ○ ○ ○ ○ ○ ○	Bad
Wrong	○ ○ ○ ○ ○ ○ ○	Right

Part 5

This set of questions will ask you for basic demographic information. Please describe yourself by selecting the appropriate

answer for each question.

On average, how often do you eat the following, including all meals and snacks?

	Beef	Red meat, other than beef	Pork, chicken, or other white meat	Fish
Never	☐	☐	☐	☐
Less than once a month	☐	☐	☐	☐
Once a month	☐	☐	☐	☐
2-3 times a month	☐	☐	☐	☐
Once a week	☐	☐	☐	☐
2-3 times a week	☐	☐	☐	☐
Daily	☐	☐	☐	☐

How would you describe the community in which you have spent most of your life?

- ○ Rural, on a farm
- ○ Rural, not on a farm
- ○ Suburban, outside of a major metropolitan city
- ○ Suburban
- ○ Urban

What is the highest level of education you have completed?

- ○ None
- ○ High school diploma or GED
- ○ Associate's
- ○ Bachelor's
- ○ Master's
- ○ Doctorate or higher

What was your age as of May 1, 2014?

What is your sex?

- ○ Male
- ○ Female

What is your race?

- ○ Black or African American
- ○ American Indian or Alaska Native
- ○ Asian
- ○ Native Hawaiian or Pacific Islander
- ○ White
- ○ Other

APPENDIX C

TREATMENT QUESTIONAIRE

Survey description and instructions

Thank you for taking the time to participate in this study. The following questions ask you about your views of using animals for food, the beef slaughter process, your dietary behaviors related to beef, and your demographic information. Please respond to the questions in terms of your knowledge and perceptions.

Below is an example of what the questions will look like. For each of the questions related to this study, please select the circle for each word pair that best describes your attitudes. You do not need to answer the example question below.

Saying the sky is blue is:

Right	○ ○ ○ ○ ○ ○ ○	Wrong
False	○ ○ ○ ○ ○ ○ ○	True

Part 1

This set of questions will ask you about your views toward raising beef cattle for human consumption. Please describe your attitudes by selecting the appropriate point along each scale.

Raising beef cattle for human consumption as meat is:

Important	○ ○ ○ ○ ○ ○ ○	Unimportant
Wholesome	○ ○ ○ ○ ○ ○ ○	Morbid
Useless	○ ○ ○ ○ ○ ○ ○	Useful
Tasteful	○ ○ ○ ○ ○ ○ ○	Distasteful
Right	○ ○ ○ ○ ○ ○ ○	Wrong
Merciless	○ ○ ○ ○ ○ ○ ○	Merciful
Affectionate	○ ○ ○ ○ ○ ○ ○	Hateful
Beneficial	○ ○ ○ ○ ○ ○ ○	Harmful
Optimistic	○ ○ ○ ○ ○ ○ ○	Pessimistic
Inefficient	○ ○ ○ ○ ○ ○ ○	Efficient

Part 2

Please watch the video in its entirety. The video is approximately 10 minutes long.

This video includes some graphic content. If you feel you cannot watch it or are unable to complete watching it, please use the "next" button to continue to the next section of the questionnaire.

Did you watch the complete video?

- Yes
- No

Part 3

This set of questions will ask you about your views toward slaughtering beef cattle for meat. Please describe your attitudes by selecting the appropriate point along each scale.

The humane slaughtering process for beef cattle is:

Useful	○ ○ ○ ○ ○ ○ ○	Useless
Soothing	○ ○ ○ ○ ○ ○ ○	Aggravating
Dirty	○ ○ ○ ○ ○ ○ ○	Clean
Humane	○ ○ ○ ○ ○ ○ ○	Inhumane
Efficient	○ ○ ○ ○ ○ ○ ○	Inefficient
Safe	○ ○ ○ ○ ○ ○ ○	Dangerous
Good	○ ○ ○ ○ ○ ○ ○	Bad
Painful	○ ○ ○ ○ ○ ○ ○	Painless
Important	○ ○ ○ ○ ○ ○ ○	Unimportant
Disturbing	○ ○ ○ ○ ○ ○ ○	Reassuring
Merciful	○ ○ ○ ○ ○ ○ ○	Merciless

The livestock industry being more transparent about the humane slaughtering process for beef cattle is:

Honest	○ ○ ○ ○ ○ ○ ○	Dishonest
Good	○ ○ ○ ○ ○ ○ ○	Bad
Significant	○ ○ ○ ○ ○ ○ ○	Insignificant
Educational	○ ○ ○ ○ ○ ○ ○	Mystifying
Uncomfortable	○ ○ ○ ○ ○ ○ ○	Comfortable
Important	○ ○ ○ ○ ○ ○ ○	Unimportant
Wrong	○ ○ ○ ○ ○ ○ ○	Right
Wholesome	○ ○ ○ ○ ○ ○ ○	Morbid
Reassuring	○ ○ ○ ○ ○ ○ ○	Disturbing
Negative	○ ○ ○ ○ ○ ○ ○	Positive

Consumers knowing more about the humane slaughtering process for beef cattle is:

Positive	○ ○ ○ ○ ○ ○ ○	Negative
Educated	○ ○ ○ ○ ○ ○ ○	Ignorant
Bad	○ ○ ○ ○ ○ ○ ○	Good
Comfortable	○ ○ ○ ○ ○ ○ ○	Uncomfortabe
Right	○ ○ ○ ○ ○ ○ ○	Wrong
Important	○ ○ ○ ○ ○ ○ ○	Unimportant
Morbid	○ ○ ○ ○ ○ ○ ○	Wholesome
Reassuring	○ ○ ○ ○ ○ ○ ○	Disturbing
Dishonest	○ ○ ○ ○ ○ ○ ○	Honest
Significant	○ ○ ○ ○ ○ ○ ○	Insignificant

Part 4

This set of questions will ask about beef as part of your diet. Please describe your attitudes by selecting the appropriate point along each scale.

Knowing about the humane slaughtering process for beef cattle makes my desire to eat beef:

Increase	○ ○ ○ ○ ○ ○ ○	Decrease
Merciful	○ ○ ○ ○ ○ ○ ○	Merciless
Thoughtful	○ ○ ○ ○ ○ ○ ○	Vacuous
Intentional	○ ○ ○ ○ ○ ○ ○	Unintentional
Morbid	○ ○ ○ ○ ○ ○ ○	Wholesome

Reassuring	○ ○ ○ ○ ○ ○ ○	Disturbing
Wrong	○ ○ ○ ○ ○ ○ ○	Right
Educated	○ ○ ○ ○ ○ ○ ○	Ignorant
Good	○ ○ ○ ○ ○ ○ ○	Bad
Negative	○ ○ ○ ○ ○ ○ ○	Positive

Beef as a part of my diet is:

Important	○ ○ ○ ○ ○ ○ ○	Unimportant
Expensive	○ ○ ○ ○ ○ ○ ○	Thrifty
Compulsory	○ ○ ○ ○ ○ ○ ○	Voluntary
Unhealthy	○ ○ ○ ○ ○ ○ ○	Healthy
Beneficial	○ ○ ○ ○ ○ ○ ○	Harmful
Merciful	○ ○ ○ ○ ○ ○ ○	Merciless
Intentional	○ ○ ○ ○ ○ ○ ○	Unintentional
Wholesome	○ ○ ○ ○ ○ ○ ○	Morbid
Good	○ ○ ○ ○ ○ ○ ○	Bad
Wrong	○ ○ ○ ○ ○ ○ ○	Right

Part 5

This set of questions will ask you for basic demographic information. Please describe yourself by selecting the appropriate answer for each question.

On average, how often do you eat the following, including all meals and snacks?

	Beef	Red meat, other than beef	Pork, chicken, or other white meat	Fish
Never	☐	☐	☐	☐
Less than once a month	☐	☐	☐	☐
Once a month	☐	☐	☐	☐
2-3 times a month	☐	☐	☐	☐
Once a week	☐	☐	☐	☐
2-3 times a week	☐	☐	☐	☐
Daily	☐	☐	☐	☐

How would you describe the community in which you have spent most of your life?

- Rural, on a farm
- Rural, not on a farm
- Suburban, outside of a major metropolitan city
- Suburban
- Urban

What is the highest level of education you have completed?

- None
- High school diploma or GED
- Associate's
- Bachelor's
- Master's
- Doctorate or higher

What was your age as of May 1, 2014?

What is your sex?

- Male
- Female

What is your race?

- Black or African American
- American Indian or Alaska Native
- Asian
- Native Hawaiian or Pacific Islander
- White
- Other

APPENDIX D

PANEL OF EXPERTS

Dr. J. Tanner Robertson
Assistant Professor of Agricultural Sciences
West Texas A&M University

Heather Buckmaster
Executive Director
Oklahoma Beef Council

Dr. Marshall Baker
Professor, Department of Agricultural Education, Communications and Leadership
Oklahoma State University

APPENDIX E

RECRUITMENT/INTRODUCTION EMAIL

Introduction email

To: OSU Faculty & Staff
Subject: Consumer Perceptions Study - register to win a gift card!

As a faculty or staff member at Oklahoma State University, you can give feedback that will provide insights into how media can affect consumers' perceptions of beef slaughter and its affect on dietary behaviors. Your views about beef slaughter transparency can help agriculture industry professionals understand how to utilize media to increase understanding of agricultural practices.

The primary purpose of this research study, "Perceptions of beef animal slaughter and effect on consumer dietary behaviors," is to evaluate if consumers viewing a beef slaughter packing plant tour video would affect consumers' dietary behaviors.

This survey will take no longer than 20 minutes to complete. Please respond to the questions in terms of your current knowledge and perceptions. You will be able to access the survey one time from your computer. If you are not able to access the online survey, please email me at powersk@okstate.edu. When you complete the survey, you will have the opportunity to register to win a $25 Visa gift card.

By clicking on the link below, you are giving your consent to participate in this study. To access the online survey, please use your Internet browser of choice and go to:

[SurveyLink]

Your immediate response is greatly appreciated.

Your responses are voluntary and will be treated confidentially. Responses to this survey will be stored online in a password-protected account until the survey is closed and then will be stored for approximately three years in a password-protected spreadsheet on the researcher's computer.

You may choose at any time to withdraw from the study without penalty. The risks associated with this project are not greater than those ordinarily encountered in daily life.

Thank you for taking time to complete the survey. If you have any questions about this project, please call me at 302-632-3079. If you have questions about your rights as a research volunteer, you may contact Dr. Shelia Kennison, IRB Chair at 219 Cordell North, Stillwater, OK 74078; 405-744-3377; or irb@okstate.edu.

Sincerely,

Katie Powers
Master's student
Department of Agricultural Education, Communications and Leadership
Oklahoma State University

APPENDIX F

REMINDER EMAIL

Recruitment reminder 1

To: OSU Faculty & Staff
Subject: Consumer Perceptions Study - register to win a gift card!

Just a reminder that I need your help! A week ago, I emailed you a link for a study that will provide insights into how media can affect consumers' perceptions of beef slaughter and its affect on dietary behaviors. The primary purpose of this research study, "Perceptions of beef animal slaughter and effect on consumer dietary behaviors," is to evaluate if consumers viewing a beef slaughter packing plant tour video would affect consumers' dietary behaviors.

This survey will take no longer than 20 minutes to complete. Please respond to the questions in terms of your current knowledge and perceptions. You will be able to access the survey one time from your computer. If you are not able to access the online survey, please email me at powersk@okstate.edu. When you complete the survey, you will have the opportunity to register to win a $25 Visa gift card.

By clicking on the link below, you are giving your consent to participate in this study. To access the online survey, please use your Internet browser of choice and go to:

[SurveyLink]

Sincerely,

Katie Powers
Master's student
Department of Agricultural Education, Communications and Leadership
Oklahoma State University

Please note: If you do not wish to receive further emails from us, please click the link below, and you will be automatically removed from our mailing list.
[RemoveLink]

APPENDIX G

TABLE

Table G1

Semantic Differential Word Pair Values for Mean and Standard Deviation

	Control		Treatment	
Topic & Word Pairs	*M*	*SD*	*M*	*SD*
Raising beef cattle for human consumption as meat				
Affectionate-Hateful	4.35	1.16	4.63	1.16
Beneficial-Harmful	5.98	1.50	6.18	1.27
Efficient-Inefficient	5.35	1.75	5.52	1.66
Important-Unimportant	6.19	1.36	6.34	1.23
Merciful-Merciless	4.70	1.40	5.00	1.41
Optimistic-Pessimistic	4.86	1.39	5.16	1.32
Right-Wrong	5.92	1.52	6.01	1.30
Tasteful-Distasteful	5.78	1.50	5.88	1.43
Useful-Useless	6.22	1.33	6.28	1.26
Wholesome-Morbid	5.78	1.48	5.92	1.32
Humane beef cattle slaughtering process				
Clean-Dirty	4.71	1.56	5.62	1.65
Efficient-Inefficient	5.57	1.50	6.33	1.17
Good-Bad	5.44	1.46	5.87	1.41
Humane-Inhumane	5.36	1.62	6.00	1.51
Important-Unimportant	6.08	1.25	6.53	0.92
Merciful-Merciless	4.87	1.43	5.45	1.64
Painless-Painful	4.34	1.52	5.25	1.62
Reassuring-Disturbing	4.54	1.57	5.44	1.70
Safe-Dangerous	5.57	1.35	6.01	1.24
Soothing-Aggravating	4.47	1.24	5.29	1.53
Useful-Useless	6.10	1.29	6.46	1.24
Transparency of humane beef cattle slaughter process				
Comfortable-Uncomfortable	4.44	1.65	5.25	1.62
Educational-Mystifying	6.00	1.18	6.55	0.85
Good-Bad	6.06	1.22	6.57	0.76
Honest-Dishonest	5.95	1.23	6.42	0.96
Important-Unimportant	6.16	1.04	6.60	0.75
Positive-Negative	5.70	1.34	6.17	1.08
Reassuring-Disturbing	5.15	1.45	5.83	1.43
Right-Wrong	5.92	1.28	6.49	0.89
Significant-Insignificant	6.02	1.18	6.50	0.90
Wholesome-Morbid	5.10	1.35	5.43	1.42
Consumer knowledge of humane beef slaughter process				
Comfortable-Uncomfortable	4.57	1.60	5.27	1.59
Educated-Ignorant	6.22	1.00	6.66	0.65
Good-Bad	5.98	1.26	6.47	0.89
Honest-Dishonest	6.01	1.18	6.46	0.83
Important-Unimportant	6.13	1.14	6.55	0.80
Positive-Negative	6.03	1.24	6.51	0.87

Right-Wrong	6.01	1.17	6.40	0.91
Reassuring-Disturbing	5.34	1.40	5.77	1.47
Significant-Insignificant	5.83	1.26	6.33	1.03
Wholesome-Morbid	4.98	1.26	5.33	1.40
Desire to eat beef with knowledge of humane slaughter				
Educated-Ignorant	5.77	1.33	5.97	1.26
Good-Bad	5.20	1.39	5.52	1.43
Increase-Decrease	4.67	1.50	4.70	1.50
Intentional-Unintentional	5.07	1.33	5.29	1.31
Merciful-Merciless	4.58	1.22	4.92	1.29
Positive-Negative	5.21	1.44	5.50	1.46
Reassuring-Disturbing	5.05	1.46	5.29	1.48
Right-Wrong	5.16	1.36	5.34	1.45
Thoughtful-Vacuous	4.98	1.26	5.19	1.28
Wholesome-Morbid	4.77	1.32	5.06	1.38
Beef as part of diet				
Beneficial-Harmful	5.44	1.57	5.65	1.44
Good-Bad	5.61	1.54	5.86	1.28
Healthy-Unhealthy	5.27	1.70	5.54	1.53
Important-Unimportant	5.73	1.74	5.64	1.76
Intentional-Unintentional	5.92	1.29	5.90	1.32
Merciful-Merciless	4.46	1.38	4.68	1.35
Right-Wrong	5.44	1.57	5.61	1.47
Thrifty-Expensive	2.76	1.51	2.85	1.35
Voluntary-Compulsory	5.70	1.60	5.57	1.69
Wholesome-Morbid	5.36	1.49	5.47	1.43

Note. 7 = most positive attitude, 1 = most negative attitude

VITA

Katherine Elizabeth Powers

Candidate for the Degree of

Master of Science

Thesis: USING VIDEO FOR CONSUMER ATTITUDE INOCULATION ABOUT BEEF ANIMAL SLAUGHTER: A QUASI-EXPERIMENTAL STUDY

Major Field: Agricultural Communications

Biographical:

Education:

Graduated from Smyrna High School, Smyrna, Delaware, May, 2008.

Received Bachelor of Science degree in Animal Sciences from Oklahoma State University, Stillwater, Oklahoma, July, 2012.

Completed the requirements for the Master of Science in Agricultural Communications at Oklahoma State University, Stillwater, Oklahoma, July, 2014.

Experience:

Served as Real Estate Marketing Specialist at Pickens Auctions, March 2010 – June 2013.

Served as Website Developer & Designer, Rural Route Creations, August 2011 – May 2014.

Served as Communications Graduate Research Assistant, Oklahoma State University Department of Biosystems and Agricultural Engineering, August 2012 – June 2013.

Served as Student Success Graduate Teaching Assistant, Oklahoma State University College of Agricultural Sciences and Natural Resources, June 2013 – May 2014.

Serve as Communications Specialist, Oklahoma State University Department of Agricultural Economics, June 2014 – Present.

Professional Memberships:

Oklahoma Cattlemen's Association

Oklahoma and Delaware Young Farmers & Ranchers