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To the Graduate Council:

I am submitting herewith a thesis written by Michelle Lauren Howard entitled "The Effect of Social Media on Consumer Perceptions of the Beef Industry." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Agricultural Leadership, Education and Communications.

Carrie A. Stephens, Major Professor

We have read this thesis and recommend its acceptance:

Christopher T. Stripling, H. Dwight Loveday

Accepted for the Council:

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Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

The Effect of Social Media on Consumer Perceptions of the Beef Industry

A Thesis Presented for the
Master of Science
Degree
The University of Tennessee, Knoxville

Michelle Lauren Howard
May 2015

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Dedication

For my father: Without his support and guidance I never would have had the courage to pursue this degree. After his death at the beginning of my program, I had the difficult decision of whether or not to continue. Dad, you lived long and prospered.

*“Someone told me long ago
There’s a calm before the storm
I know, it’s been comin’ for some time
When it’s over, so they say
It’ll reign a sunny day
I know, shinin’ down like water*

*I wanna know have you ever seen the rain
I want to know, have you ever seen the rain
Comin’ down on a sunny day?*

*Yesterday, and days before,
Sun is cold and rain is hard,
I know; been that way for all my time.
’Til forever, on it goes
Through the circle, fast and slow,
I know; it can’t stop, I wonder?”*

-Creedence Clearwater Revival

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Abstract

As the American population has transitioned from rural life to more urbanized settings, a divide has appeared between consumers and the agriculture industry. Consumers now receive the majority of information about agriculture through traditional media outlets and social media platforms. Social media is known for having the ability to rapidly disseminate information, which in the case of agriculture and its sub-industries is often inaccurate and leads to negative short- and long-term effects. In order to fully understand the impact of social media on the beef industry, a study was conducted to assess changes in consumer perceptions and behaviors. The study utilized a survey that was completed by 300 students from the University of Tennessee. This study sought to describe the effect of social media on consumer perceptions of the beef industry. Results showed consumers are reliant on social media to gather information about current affairs including beef safety incidents and that the information they gather had a predominantly negative effect on their perceptions. Following the pink slime controversy of 2012, consumers felt the information they received on social media about the beef product led to negative perceptions of the industry and changes in their buying and eating habits over short- and long-term periods.

Table of Contents

Chapter 1 Introduction and General Information.....	1
Introduction	1
Need of Study	3
Purpose of the Study	4
Objectives of the Study.....	4
Definitions of Terms.....	5
Social Media.....	5
Social Networking.....	5
Blogs.....	6
Micro-blogs	6
The Millennial Generation	6
Pink Slime - Lean Finely Textured Beef.....	7
Chapter 2 Literature Review	8
History of Communication	8
Media Dependency Theory and Consumers.....	10
History of Social Media.....	12
The Trend of Misinformation in Social Media.....	14
Social Media and the Agriculture and Beef Industries	16
Traits of the Generations	18
The Millennial Generation’s Use of Social Media	20
Chapter 3 Materials and Methods	23
Survey Design.....	23
Section 1: Normal Social Media Use.....	24
Section 2: Perceptions of the Beef Industry	24
Section 3: Social Media Use During Beef Safety Incidents	25
Section 4: Pink Slime Incident and Social Media	25
Section 5: Demographics.....	26
Reliability, Validity, and Non-Response.....	26
Chapter 4 Journal of Applied Communications Manuscript	28
Abstract.....	29
Introduction/Theoretical Framework.....	29
Purpose and Objectives	33
Methods and Procedures.....	34
Findings	37
Conclusions	44
Discussion and Implications	44
Recommendations	46
Chapter 5 Conclusions and Recommendations.....	48
List of References	52
Appendix.....	60
Appendix A: IRB Approval	61
Appendix B: Informed Consent Statement.....	63

Appendix C: Questionnaire.....	66
Section 1: Normal Social Media Use.....	67
Section 2: Perceptions of the Beef Industry	68
Section 3: Social Media Use During Food Safety Incidents	70
Section 4: Pink Slime Incident and Social Media	70
Section 5: Demographics.....	72
Thank You	73
Vita.....	74

List of Tables

Table 1	<i>Consumers experience in agriculture</i>	37
Table 2	<i>Consumers hours per week spent on social media platforms for personal, business, and/or entertainment use</i>	38
Table 3	<i>Consumers perceived trustworthiness of social media platforms in providing accurate information about any issue</i>	38
Table 4	<i>Consumers beliefs about the beef industry</i>	39
Table 5	<i>Consumers concerns in relation to the beef industry</i>	40
Table 6	<i>Consumers average weekly beef consumption</i>	41
Table 7	<i>Consumers likelihood of using social media to gather information concerning beef safety incidents</i>	41
Table 8	<i>Consumers perceived helpfulness of social media platforms in providing information about national beef safety incidents</i>	42
Table 9	<i>Effect on consumers of information received about pink slime on social media on consumer perception of the beef industry</i>	43
Table 10	<i>Information about pink slime on social media negatively effected consumer habits</i>	43

Chapter 1

Introduction and General Information

Introduction

In March 2012, lean finely textured beef (LFTB) and the beef industry was scrutinized by the media and consumers nationwide (Greene, 2012). An ABC News report coined the term *pink slime* to describe the pale pink, 100% beef product and questioned the product's safety (Greene, 2012). Once the report was shared across social media platforms, the misinformation about the 21 year old beef product led to a sensationalized demand by the public calling for the United States Department of Agriculture to end the use of LFTB in school lunches, to label meat at the grocery store that was cut with the product, and to remove it from commercial sale (Greene, 2012). Burton and Young (1996) showed media coverage during a food safety incident with beef products had short- and long-term impacts on demand. In the case of pink slime, what followed in the wake of the controversy were changes to the beef industry that has had lasting effects for the producer and the consumer (Greene, 2012).

The agriculture industry has a history of being attacked by activist and consumer groups (Vogt, 2013). Using social media platforms, agriculture activists film hours of footage of livestock and condense it into only a few minutes of bad moments on YouTube; post photos on Instagram that are taken out of context; and utilize Facebook and Twitter to draw consumers into their labyrinth (Vogt, 2013). Commodity groups, major food producers, and agricultural organizations struggle to respond to the anti-agriculture crusade (Vogt, 2013), and because farmers make up only 2% of the population (American Farm Bureau Foundation, 2014; Patsche, 2014), it is a struggle for farmers to make their voices heard. Nancy Donley, president of STOP Foodborne Illness, is concerned that campaigns against agriculture will lead companies “to cease

innovations for developing better food safety technologies and strategies” (Donley, 2012, para. 10).

The consumers most likely to be effected by the rapid spread of misinformation through social media are members of the Millennial generation (Leung, 2013). The Millennials are the most technologically connected generation to date (Leung, 2013). Technology and social media is a fixture of their lives, with 89% of Millennials using at least one social media platform daily (Smith, 2014). Members of this generation are generally considered to be “more affluent, better educated, and more ethnically diverse” (Howe & Strauss, 2003, p. 30) than any to come before them. Now outnumbering their Baby Boomer parents by way of living members (Tapscott, 2009), Millennials are vocal on issues related to social change and reform (Leung, 2013; Smith, 2014). Their use and reliance on social media, as well as their removal from agriculture, makes them a prime population to gather data about the effect of social media on their perception of the beef industry (Anderson-Wilk, 2009; Patsche, 2014). Millennials are also the next generation to make decisions about supporting agriculture and social media provides direct access for agricultural communicators to interact with these consumers and influence their opinions (Graybill, 2010).

With the social media boom society has experienced since the early 2000s, it is important for the beef industry to create and maintain an online presence (Vogt, 2013). Having a platform that allows industry communicators to interact and engage with consumers creates a semblance of trust between consumers and producers and allows the industry to respond quickly to consumer concerns (Vogt, 2013). Social media has the power to entertain, socialize, inform, educate, and indoctrinate users (Berger, 2003). The majority of consumers are receiving information about agriculture from the media (Patsche, 2014), and much of their misperceptions

come about from those with a lack of understanding about the industry passing along information that is not accurate (Frick, Birkenholz, & Machtmes, 1995). Further research is needed to develop an understanding into the way that the delivery of information related to the beef industry across social media can effect consumer perceptions, especially with the Millennial generation. With this information, the agriculture and beef industries can respond to accusations and misinformation more effectively.

Need of Study

Over the past century, Americans have seen a steady transition from rural to urbanized life (Jepsen, Pastor, & Elliot, 2007) with less than 2% of the population presently living on farms (American Farm Bureau Foundation, 2014; Patsche, 2014). Today's families are often twice removed from their farming ancestry (American Farm Bureau Foundation, 2014), and because they are so removed from farming, most have a very limited understanding of current agriculture practices. Their view is further aggravated by gathering the majority of their information from sources that are equally separated from the agriculture industry (Frick et al., 1995). It is becoming clear that "with such a small portion of the population involved in agriculture...advocacy will be vital in the long term" (Berg, 2013, p. 20).

The agriculture and beef industries are bombarded by mixed messages launched across social media platforms (Berg 2013; Vogt, 2013). Activist groups post "diatribes against biotechnology that appear in response to almost any story, blog or Facebook post that discusses the benefits of these crops" (Vogt, 2013, p. 16). In addition, they post YouTube videos showing how farmers abuse their livestock or arbitrarily deemed unsafe methods of food processing in action. Users then share and repost these messages on their own pages. The activists' biased information spreads quickly to consumers and has devastating effects for consumers and

producers, which have included the closure of agricultural businesses, hundreds of lost jobs, and financial impacts (Vogt, 2013). In addition, media coverage of food safety incidents in the beef industry is often negative (Anderson, 2000; Burton & Young, 1996), and most of the reported negative information is misleading to consumers (Swinnen, McCluskey, & Francken, 2005).

The beef industry needs to respond to the spread of misleading information being distributed to the population through social media (Berg, 2013; Graybill, 2010; Patsche, 2014; Vogt, 2013). Furthermore, there is a lack of research on the effect social media has on the consumer perception of the beef industry (Charanza, 2011). Farmers and *AgVocates* (Berg, 2013) are beginning to use social media as a tool to make agriculture accessible to consumers. With more research into the outcome of publicity and information spread over social media, the beef industry can have a stronger general presence and respond to industry challengers. This research will enable the beef industry to influence the Millennial generation's knowledge of the industry, which is quickly becoming the major consumer group in America (Tapscott, 2009).

Purpose of the Study

The purpose of this study is to gain an understanding of the way social media usage (i.e. Facebook, Twitter, or blogging) effects consumer perceptions of the beef industry within the Millennial generation at a land grant institution.

Objectives of the Study

1. Describe how students at the University of Tennessee, Knoxville utilize social media to interact under normal circumstances, including what platforms and with what frequency;
2. Describe students' perceptions of the beef industry;

3. Describe how students at the University of Tennessee, Knoxville utilize social media to interact during a food safety incident related to the beef industry, including what platforms and with what frequency; and
4. Describe students' exposure to the pink slime incident through social media and any self-determined short- and long-term effects of this exposure.

Definitions of Terms

Social Media

Social media is defined by Murphy, Hill, and Dean (2013) for the purpose of public opinion research as: “The collection of websites and web-based systems that allow for mass interaction, conversation, and sharing among members of a network” (p. 3). The most prevalent platforms in use include the following:

- Social Networking Services (e.g. Facebook, MySpace, LinkedIn)
- Blogging (e.g. Weebly, WordPress, Tumblr)
- Micro-Blogging (e.g. Twitter)
- Content Sharing and Discussion Sites (e.g. YouTube, Reddit, 4chan)

According to the Pew Internet and American Life Project, 81% of adults in the United States had internet access, and 73% of those utilized social media (Duggan & Smith, 2013b).

Social Networking

Social networking sites allow users to:

- (1) construct a public or semi-public profile within a bounded system,
- (2) articulate a list of other users with whom they share a connection, and
- (3) view and traverse their list of connections and those made by others within the system (Boyd & Ellison, 2008).

Users are able to share a variety of content including text, pictures, and video with their connections, as well as make new connections with strangers or businesses. Early social networking platforms included SixDegrees and Friendster (Boyd & Ellison, 2008). Facebook is the dominant social networking site today with 1.23 billion users at the end of 2013 (Kiss, 2014).

Blogs

Blogs are websites operated by individuals or groups that have streams of periodic entries, typically on a topic related to the theme of the blog (Duggan & Smith, 2013b). Blog followers are able to leave comments and interact with the author. Popular hosting sites include WordPress, Weebly, and Tumblr. Blogs are a popular platform with educated females, age 18 to 34, who are also active on other platforms (The Nielsen Company, 2012).

Micro-blogs

Micro-blogs are “abbreviated versions of blogs” (Murphy et al., 2014, p. 13) which utilize very short messages. Twitter is the most popular micro-blogging service in use. It limits messages known as *tweets* to 140 characters and is often less themed than a traditional blog (Duggan & Smith, 2013b). Twitter has become the “dominant mechanism to get timely updates about events that are taking place regardless of geography, topic or even language” (Lotan & Gaffney, 2011, para. 8).

The Millennial Generation

The Millennial generation is also known as Generation Y or the Digital Natives. It represents those born between 1981 and 2002 and represents a population size of 75 million (Brinckerhoff, 2011). They are the first generation to be born into modern technology and are better educated than any generation prior (Howe & Strauss, 2003; Leung, 2013).

Pink Slime - Lean Finely Textured Beef

Lean finely textured beef (LFTB) is a beef product developed by Beef Products, Inc in 1991 (Greene, 2012). It is a product made from the trimmings of muscle cuts such as sirloin or rib eye, and is between 94%-97% lean beef (Letch, 2013). LFTB does not contain any filler materials (Letch, 2013) and is treated with ammonium hydroxide, a chemical that raises the pH level of the beef and inhibits bacterial growth (Letch, 2013). Furthermore, ammonium hydroxide has been used in food processing for baked goods, cheese, chocolate, and pudding since 1974 with approval from the Food and Drug Administration (Greene, 2012). LFTB is mixed with other beef trimmings to create the variances of lean meat to fat ratio found in ground beef (Letch, 2013) and adds to the flavor of the ground beef, while making the beef more affordable and available (Letch, 2013). LFTB became known as *pink slime* on March 7, 2012 after an ABC News report referred to it as “beef trimmings that were once used only in dog food and cooking oil, but now [are] sprayed with ammonia to make them safe to eat” (Avila, 2012, para. 2).

Chapter 2

Literature Review

History of Communication

Tracing communication to its origin would be nearly impossible, as communication has existed in some fashion since the beginning of life. For the purpose of studying communications as it relates to the present day meaning, we look at forms of communication that have advanced human lives (Doyle, 2010). The influx of technological advancements have given us the mass production of text, audio and audiovisual mediums, telecommunications, and most recently a figurative cloud to share these other mediums across (Doyle, 2010). Communication has proven to be an integral part of life and "history bears witness to the cataclysmic effect on society of inventions of new media for the transmission of information among persons" (Eisenstein, 1970, p. 727).

Mass print production began in 1440 with Johann Gutenberg's invention of the printing press (Doyle, 2010). Prior to this invention, books were handwritten manuscripts, making them rare and inaccessible to the majority of society (Piechota, 2002). The printing press changed this, as "technological advances in printing made possible for books to be more accessible to wider audience. . . . With time books found a way to every knowledge-seeking household in the modern world" (Piechota, 2002, p. 3). This new accessibility was a key factor in major societal changes including the Renaissance, Reformation, and Scientific Revolution (Atlassian, 2011).

In 1836, Morse code changed the way humans communicated by creating a code that allowed the transmission of brief messages without the wait required with written mail (Doyle, 2010). The code is made of a series of dots and dashes that represent letters of the alphabet to transmit messages (Doyle, 2010). The telegraph machine came shortly after and allowed these

short messages to be transferred quickly and over long distances (Atlassian, 2011). The creation of Morse code and the invention of the telegraph were the start of the telecommunication era (Atlassian, 2011). In 1876, Alexander Graham Bell received a patent for the telephone that allowed for near-immediate communication with those far away (Doyle, 2010).

Commercial radio and the television ushered in a new form of communication. Like books, messages broadcast over the radio or television could reach thousands, rather than the more direct and personal forms of communication (Doyle, 2010). At broadcast's advent in the early 1920s, families would crowd around to listen to the news or programs similar to today's soap operas (O'Malley, 1997). By 1931, three-quarters of Americans had radios in their homes (O'Malley, 1997), allowing the population access to information like never before. While the first television was created in 1925, it was not until 1953 that a color television resembling modern sets was introduced (Doyle, 2010). Televisions provided similar access to radios, but with the benefit of picture and video.

In the most modern forms of communication, there is the internet and the cellphone. The invention of the internet perhaps has had the greatest and most long-lasting effect on the way humans communicate (Duggan & Smith, 2013a). Not becoming accessible to the public until 1991, the internet has become an integral part of life across the generations through services like instant messenger, email, media sharing sites, and social media or networking (Borders, 2009). Cellphones, and specifically the *smartphone*, have combined prior methods of communication into one device that is always with us (Duggan & Smith, 2013a). Starting with the first Motorola cellphone in 1973, often referred to as the brick due to the phone's size and shape (Doyle, 2010), we have progressed to a device that allows us to watch the latest episode of a favorite television show, receive a CNN news alert, answer a Facebook friend request, send a text message, and

make phone calls – all through one small, handheld device (Duggan & Smith, 2013a). In a 2013 study by the Pew Internet and American Life Project, 63 percent of adults age 18 and over reported using their phone for accessing the internet, email, or instant messaging (Duggan & Smith, 2013a).

Humans have always placed great importance on developing new ways to communicate with one another (Carton, 2009). As technology continues to advance, we can expect to see communication advance with technology. As a society we have become increasingly reliant on having immediate access to one another and the world through a variety of sources (Duggan & Smith, 2013b) and communications and social media are constantly evolving to make that possible.

Media Dependency Theory and Consumers

Media Dependency Theory (MDT) explains the relationship between mass media and its audience, and how that relationship affects society (Ball-Rokeach & DeFleur, 1976). The overall concept of the theory is that media is dependent upon society and that the media impacts individuals (Ball-Rokeach & DeFleur, 1976). To further describe portions of the theory, dependency is defined as the “relationship in which the satisfaction of needs or the attainment of goals by one party is contingent upon the resources of another party” (Ball-Rokeach & DeFleur, 1976, p. 6). Therefore, individuals depend on outside sources when they need to understand their social world or create escapes from daily life (Ball-Rokeach & DeFleur, 1976). If that dependence falls onto mass media, it is more likely that the media will shape an individual’s ideas (Ball-Rokeach & DeFleur, 1976).

When faced with a change or conflict, society is increasingly influenced by the media (Ball-Rokeach & DeFleur, 1976). Individuals gather information from multiple media sources,

process it, and disseminate it (Ball-Rokeach, 1985; DeFleur & Ball-Rokeach, 1989) to help evaluate their position on a subject. This process encourages future media dependence (Gordon, 2009) and the link between society and the media has been explored at length with consumer media dependency during natural disasters, disease outbreaks, and terrorist attacks (Gordon, 2009; Lowrey, 2004; Tai & Sun, 2007).

Media dependency on newspapers, radios, and television broadcasts has the potential to cause cognitive, affective, and behavioral effects (Ball-Rokeach & DeFleur, 1976). Media dependency results in cognitive effects on individuals and society (Charanza, 2011). For example, individuals' attitudes often depend heavily on media sources, which are considered to be due to agenda-setting theory (Ball-Rokeach & DeFleur, 1976). According to this theory, the media decides which topics to report and put their focus on, and people "have neither the time nor the energy to form attitudes and beliefs about everything" (Ball-Rokeach & DeFleur, 1976, p. 11). Because of this, individuals choose topics out of the available pool that seem most relevant to their interests (Ball-Rokeach & DeFleur, 1976). If the media is casting a negative attitude toward something in the agriculture industry, the uninformed public is likely to follow the trend (Anderson, 2000; Burton & Young, 1996).

Affective effects, the impact that the media has on society members' feelings (Ball-Rokeach & DeFleur, 1976), also play a role in media-dependency. This can include any span of emotions depending on the topic being presented (Ball-Rokeach & DeFleur, 1976). In the scope of a society, affective effects can be seen in the form of changes in morale of a large segment of the population, as well as alienation (Ball-Rokeach & DeFleur, 1976).

Behavioral changes are a strong indicator of the media having had an effect on the public (Ball-Rokeach & DeFleur, 1976). Ball-Rokeach and DeFleur (1976) stated changes in actions

and behaviors are as important as changes in values and beliefs. The media has the ability to drive individuals to do things they normally would not, or to make them not participate in things they normally would “as a consequence of media messages” (Ball-Rokeach & DeFleur, 1976, p. 18). For example, individuals may be inclined to purchase organic meat and produce following a news report about the link between pesticides and illness, even though they have previously purchased conventional products for a number of years.

History of Social Media

Since the 1960s when the first email was sent, society has been looking for ways to push technology further and make it work. As part of the mainstream culture, social media has allowed us as a society to become hyper-connected to our friends, families, and communities (Duggan & Smith, 2013a). It also has become a gateway for information about current events (Duggan & Smith, 2013a). Mark Zuckerberg, founder of Facebook, stated that “when you give everyone a voice and give people power, the system usually ends up in a really good place, so what we view our role as is giving people that power” (Gillis, 2010). Having a platform to be heard and recognized has provided a vehicle to discuss what is happening around us like never before.

The first network allowing users to share data on the internet was developed in 1969 by the Advanced Research Projects Agency (ARPA), a United States government agency, and was called ARPANET (Borders, 2009). It was followed by the first Bulletin Board System (BBS), created by Ward Christensen in 1979 (Borders, 2009). BBSs allowed users to dial-in with a telephone modem and share messages and download files. BBSs were active until the mid-1990s (Borders, 2009). The first chat room came about in 1980 when CompuServe created a system known as the CB Simulator (Borders, 2009). It had an operational cost of \$6/hr, in addition to the

long-distance phone charges that bumped the price tag up to almost \$30/hr, far too expensive for most users (Rimskii, 2011; Ritholz, 2010). Prodigy was launched in 1990 and followed CompuServe with color graphics and a lower cost. America Online (AOL) joined the line up in 1985 (Borders, 2009).

The internet opened to the public on August 6, 1991 (Borders, 2009). For the first few years of the 1990s, the internet was accessible to only those with university, government, or military connections (Borders, 2009). In 1994, Internet Service Providers (ISPs) began servicing major cities in the United States, bringing the internet into the home for the first time (Borders, 2009). Online forums and Peer-to-Peer (P2P) media sharing sites, such as Napster, Limewire, and The Pirate Bay, quickly replaced the old BBSs (Borders, 2009). IRC, ICQ, and AOL Instant Messenger (AIM) replaced Prodigy as instant messaging and chat services (Borders, 2009). Then in the late 1990s, SixDegrees (a social networking site) went live, allowing users to create personal profiles and connect with other users (Junco, Heibergert, & Loken, 2011). This was the first of what we today consider *social media* (Junco, Heibergert, & Loken, 2011).

Once SixDegrees launched in 1997, other sites appeared annually (O'Dell, 2011). In 2002, another social networking site called Friendster was launched. In 2003, MySpace went live and was considered a *Friendster clone* (O'Dell, 2011). In 2004, Facebook launched to Harvard University students exclusively and saw more than half of the school's students sign up within the first month (O'Dell, 2011). Facebook later opened to the public and Twitter was launched in 2006 as an alternative networking option, but ultimately Facebook became the leading social media site in 2008 (Arrington, 2008).

Outside of the friend-based social media sites, other platforms have appeared in the past 10 years. For example, we have blogs hosted on sites like Weebly, Tumblr, and WordPress;

picture sharing on sites like Instagram, Photobucket, and Flickr; video sharing on YouTube and Vimeo; and link sharing sites like Pinterest and Digg (Saipe, 2010).

The majority of social media sites provide ways to follow, contact, and interact with other users. In addition, social media sites meet different needs, motives, and interests of individuals (Sun, Chang, & Yu, 2001). “What makes social network sites unique is not that they allow individuals to meet strangers, but rather that they enable users to articulate and make visible their social networks” (Boyd & Ellison, 2007, p. 211). Moreover, social media users build webs of networks, share ideas, and interact in ways they otherwise would not. In essence, society has become its own media outlet (Brogan, 2010).

The Trend of Misinformation in Social Media

A 2013 study by Pew Internet and American Life Project found 78% of adults in the United States read about the news on Facebook (Mitchell, Kiley, Gottfried, & Guskin, 2013). Part of the draw of social media as a news outlet is that information is constantly updated and discussed. While this ease of access seems like a positive scenario, the immediate nature of social media often leads to miscommunication and nonfactual statements (Vis, 2014a). Unfortunately, “time-consuming verification practices make it near impossible for newsrooms to compete with the speed of social media” (Vis, 2014b, para. 5). Furthermore, the passage of information online is a complex ecology with it being a challenge to follow the rapid spread of information or locate that information’s origin (Vis, 2014a).

In the last three years, there have been a few instances where social media was the first to launch news about a topic that was incorrect and this misinformation perpetuated rumors. One example of this occurred in May 2011 when Osama Bin Laden was killed by U.S. soldiers (Lotan & Gaffney, 2011). Before President Obama had a chance to address the nation, a tweet

had appeared on Twitter. Keith Urbahn, chief of staff for former U.S. Defense Secretary Donald Rumsfeld tweeted, “So I’m told by a reputable person they have killed Osama Bin Laden. Hot damn” (Lotan & Gaffney, 2011, para. 14). It was an hour before the formal announcement was made, yet it only took a minute for 80 people to repost Urbahn’s tweet and just two minutes for over 300 to repost (Lotan & Gaffney, 2011). Beyond those who posted responses or retweeted the message, there were thousands who followed Urbahn and could see the message while scrolling through their newsfeed (Lotan & Gaffney, 2011).

In 2013, two men bombed the Boston Marathon. Social media users scoured photos from the event and made the wrongful claim that they had identified a bomber (Vis, 2014a). In an effort to spread information quickly, the major news outlets picked up this incorrect information from social media and reported it as fact, essentially validating the identity of social media’s bomber to the public (Vis, 2014a). Representatives of the content sharing site Reddit were forced to make an apology on behalf of their users who made false claims that they had identified the bombers (Pepitone, 2014).

In early 2014, Malaysia Airlines Flight 370 disappeared before landing in Beijing and social media users around the world began to speculate (Pepitone, 2014). “Perhaps the most damaging rumor came shortly after the jet...was reported missing Saturday local time: A story spread mainly on Chinese social media that the craft had made a safe emergency landing in Nanning, China” (Pepitone, 2014, para. 2). The search for the aircraft was divided into four major phases, and each phase reported an additional set of rumors on social media. Rumors included unfounded theories and a story from a *pilot uncle* that went so far as to say a North Korean missile destroyed the plane, to the plane had landed safely in a number of different locations (Pepitone, 2014). To date, the aircraft has not been found (Pepitone, 2014).

Former president of the American Psychological Association, Frank Farley, compares the misinformation spread on social media to an economic principle “that bad money drives out good,” and qualified it with the worry that bad information does the same thing (Leopold, 2012, para. 11). What gives it the capabilities to help information flow also lines the way for misinformation to be spread (Lotan & Gaffney, 2011). In the words of Jonathan Swift, “falsehood flies, and the truth comes limping after it” (Swift & Lane-Poole, 1896, p. 168).

Social Media and the Agriculture and Beef Industries

The agriculture industry has largely lagged behind in terms of a social media presence (Berg, 2013; Patsche, 2014; Vogt, 2013). According to the American Farm Bureau Federation, 15% of jobs in America, equating to 21 million workers, are employed in some facet of the agriculture industry (American Farm Bureau Federation, 2014). Unfortunately, the majority of consumers lack basic knowledge about agriculture (Frick, Birkenholz, & Machtmes, 1995) and are often fearful of advancements.

It has become a responsibility of agriculturalists to embrace and engage in interaction with critics and consumers in order to make sure that the right side of the story of agriculture is being told; otherwise, those doubters are going to go above and beyond to dig for facts, whether they are true or false. (Graybill, 2010, p. 8)

This desire for information, right or wrong, has led to many misconceptions about agriculture and its sub-industries (Frick et al., 1995; Swinnen, McCluskey, & Francken, 2005).

Over the past 100 years, the United States population has shifted from rural to urban communities (Jepsen, Pastor, & Elliot, 2007). Newspaper and magazine coverage shifted along with the population “from farm production and market issues to agriculture’s impact on the environment and human health” (Boone, Meisenbach, & Tucker, 2000, p. 24). The internet

provides “a haven for activists” (Patsche, 2014, p. 46) who are looking to challenge the use of genetically modified organisms, the treatment of livestock, or food processing methods. These activists utilize social media as a negative for the industry: “YouTube videos that portray livestock producers as evil to the animals whose care they manage, or the diatribes against biotechnology that appear in response to almost any story, blog or Facebook post that discusses the benefits of these crops” (Vogt, 2013, p. 16). Once this information is made available on the internet, it is difficult for the agriculture industry to have its voice heard in defense (Berg, 2013; Vogt, 2013).

One example is the attack on the beef industry with the creation of the term *pink slime* to describe the Beef Product, Inc’s 100% beef product known as lean finely textured beef (LFTB) (Greene, 2012). The product consists of a mixing of beef trimmings and ammonium hydroxide to create the various ratios of ground beef available to consumers since 1991 (Greene, 2012). Once pink slime was shared on social media, several repercussions were noted including the closure of three of four processing plants, over 600 lost jobs, rises in beef prices, and changes to the United States Department of Agriculture school lunch program (Greene, 2012). Producers and processors of the beef industry had not been seen as reliable sources of information in other food safety incidents up to this point and the trend continued with pink slime (Verbeke, Pérez-Cueto, de Barcellos, Krystallis, & Grunert, 2009).

Recently, Chris Chinn, agriculture advocate, fifth-generation farmer, and representative for the U.S. Farmers and Ranchers Alliance, stated farmers and agriculture are under attack, and she feels that it is time to start sharing her story (Berg, 2013). For Chinn, social media is the easiest way to connect with a large amount of people. Furthermore, Mark Anderson-Wilk (2009), faculty member in the College of Agriculture at Oregon State University, stated “new media

technologies such as social networks can be used to efficiently facilitate rich, targeted interpersonal communications capable of creating exposure as well as mobilization on a large scale” (p. 129). The best way to reach the population is through the use of social media (Doyle & Briggeman, 2014; Patsche, 2014). “Those same social media tools that challenge agriculture can also be used to tell agriculture's story. Farmers, commodity groups and other pro-ag advocates...are turning to the same tools used by those who denigrate ag to join the conversation” (Vogt, 2013, p. 16). The responsibility cannot fall entirely on the major agriculture brands to inform the public (Berg, 2013), because everyone who plays a role the agriculture industry should be engaged in the social media conversation (Berg, 2013; Doyle & Briggeman, 2014; Patsche, 2014; Vogt, 2013).

Traits of the Generations

Members of a generation share "a common location in the social and historical process that predisposes them to certain modes of thought and action” (Vaidhyanathan, 2008, p. 366). The term generation typically refers to a group of individuals who share common life experiences such as world events, natural disasters, politics, economic conditions, and pop culture (Smith & Clurman, 1998). These life experiences shape the viewpoint, outlook, and values of the generation (Foster, 2006; Smith & Clurman, 1998). There are four generations recognized in the United States: The Silent Generation, The Baby Boomers, Generation X, and the Millennials (Brinckerhoff, 2011). The Millennial generation views Generation X as whiners; Generation X views the Millennials as arrogant and entitled; and Generation X and the Millennials both view boomers as self-absorbed workaholics (Foster, 2006). These viewpoints play a large role in the way each generation interacts with the world and each other.

The Silent Generation, sometimes called the Greatest Generation, is made up of those

who were raised during the Great Depression and World War II and were born between 1925 and 1945 (Brinckerhoff, 2011). The generation received its name in 1951 from a Time magazine article which described the characteristics of the generation as withdrawn, cautious, and silent (Strauss & Howe, 1991). In addition, members of this generation place great value on earning and saving their money (Kupperschmidt, 2000), are loyal, and put their faith and trust in well-known institutions and traditions (Lancaster & Stillman, 2002). These traits are likely due to the hardships the generation endured as children (Strauss & Howe, 1991).

Baby Boomers were the population surge at the end of World War II, born between 1946 and 1962 (Brinckerhoff, 2011). The 80 million-person Baby Boomer generation is the largest in American history (Brinckerhoff, 2011) and, as a result, Baby Boomers were repeatedly thrust into competition for opportunities over their lifetime (Lancaster & Stillman, 2002). Even with constant competition and sometimes defeat, they are known for their optimism (Lancaster & Stillman, 2002). Baby Boomers are often called the ones who “saved the world” through their roles in civil rights action and political reform as young adults (Brinckerhoff, 2011, p. 6). As mature adults, Baby Boomers are dedicated to their work, placing a large part of the meaning of their lives and self-worth in their careers (Strauss & Howe, 1991).

Generation Xer’s were born in the midst of social reform between 1963 and 1980 (Brinckerhoff, 2011), and are generally seen as cynical and skeptics (Lancaster & Stillman, 2002). They were the first generation to be born into an era where divorce had lost its stigma, women were becoming breadwinners, crime was increasing, and America was in a cycle of war (Losyk, 1997). In many families, both parents worked outside of the home, creating a generation of latchkey kids (Kupperschmidt, 2000) who were raised by television programs and other media that allowed them unlimited access to current events and pop culture (Lancaster & Stillman,

2002). This lack of supervision and access to outside information may have contributed to the generations' independent and resilient nature (Kupperschmidt, 2000; Strauss & Howe, 1991). Members of Generation X are known for being self-starters and resourceful in the workplace (Lancaster & Stillman, 2002; Strauss & Howe, 1991). Unlike prior generations, they are willing to switch jobs to create a better work-life balance or to seek out new challenges or developmental opportunities (Cohen, 2002).

The Millennials, also known as Generation Y or the Digital Natives, are those who do not remember their lives without technology (Howe & Strauss, 2003). This generation is made up of 75 million and now outnumbers the living Baby Boomers, who are their parents (Brinckerhoff, 2011). They were born between 1981 and 2002 (Brinckerhoff, 2011) and were raised by parents who centered their lives around their children out of a determination to “avoid replicating what they perceived as their own traumatic, latchkey childhoods” (Strutton, Taylor, & Thompson, 2011, p. 565). Parents of Millennials were protective and obsessive, but also put great amounts of pressure on their children to achieve (Strutton, Taylor, & Thompson, 2011). The term *trophy kid* is applied to this generation, as they were the first to never lose and always received an award for just showing up and participating (Alsop, 2008). This generation witnessed Desert Storm, Columbine and the rise of the school shooting, and watched the Twin Towers fall. They have always had television, cell phones, text messaging, and social media (Miller, 2013).

The Millennial Generation's Use of Social Media

The Millennials are “more numerous, more affluent, better educated, and more ethnically diverse than any previous generation” (Howe & Strauss, 2003, p. 30). They are the first generation born into the internet lifestyle, and view technology as a de facto part of their lives (Leung, 2013). Research has determined that Millennials comprise 27% of the United States

population, which makes them a larger consumer group than the Baby Boomers (Tapscott, 2009) and are more influential.

Social media usage has boomed over the past 10 years (Leung, 2013), especially amongst the Millennial crowd of whom 89% relied on social media for staying connected with family and friends in 2014 (Smith, 2014). To the Millennial Generation, social media is a portal for information on current events and what is trending worldwide (Sun et al., 2001). It is where they turn to find useful, relevant, up to the second information (American Society for Training and Development, 2010). Currently, the Millennial generation is relying as much or more on sites like Facebook and Twitter for their news updates rather than traditional sites like CNN.com or the New York Times (Smith, 2014).

Sixty-seven percent of Millennials use social media on their mobile phones (Smith, 2014). They feel, more so than any other generational group, that social media is a tool in their life (American Society for Training and Development, 2010). They believe they get more work done, get better work done, learn truly useful things, and learn more in less time because of their use of social media (American Society for Training and Development, 2010). This devotion to social media seems to stem from a need to build and maintain close ties with friends, revive dying relationships, and improve their social network in real life (Smith, 2014). In a study of Millennials' future use of social media, 67% agreed with the statement that in 2020, they "will continue to be ambient broadcasters who disclose a great deal of personal information in order to stay connected and take advantage of social, economic, and political opportunities" (Anderson & Raine, 2010, p. 2).

Millennials are the Digital Natives (Anderson & Raine, 2010) and technology and social media are embedded in their lives in a way that makes it difficult to separate them (Smith, 2014).

Because of this, it is increasingly necessary to study the way Millennials interact with social media, so it can be utilized as a tool to communicate with the generation.

Chapter 3

Materials and Methods

The researcher created a questionnaire based on prior research in agriculture and the media. This questionnaire was developed with the primary focus on the beef industry. An overview of the delivery and survey questions is included, as well as information about the reliability and validity of the survey. Data describing participation in the survey is also included.

This study was conducted using descriptive survey research. The survey instrument was designed based on literature focusing on media influences on consumer perceptions of the beef industry (Charanza, 2011) and media dependency theory (Ball-Rokeach, 1985; Ball-Rokeach & DeFleur, 1976; DeFleur & Ball-Rokeach, 1989; Jakob, 2010; Robertson, 2009). Data was collected via an online questionnaire that was created utilizing *Qualtrics* and delivered to participants using iPads. The questionnaire included five sections: (a) perceptions of the beef industry, (b) normal social media use, (c) social media use during food safety incidents, (d) the pink slime incident and social media, and (e) demographics. Researchers chose to utilize an online questionnaire as the method of delivery due to lower cost, convenience, and the ability to reach a larger population (Ary, Jacobs, & Sorenson, 2010). The entire student population at the University of Tennessee, Knoxville was the target population for this study and students were approached and asked to participate at four locations on campus including two libraries, a residence hall, and a restaurant. Surveys were conducted over the course of a week and provided researchers with a convenience sample.

Survey Design

The survey contained five sections that were designed to measure (a) perceptions of the beef industry, (b) normal social media use, (c) social media use during food safety incidents, (d)

the pink slime incident and social media, and (e) demographics. Multiple choice, fill-in-the-blank, and scaled questions were utilized in the survey, with all scaled questions utilizing a 5-point Likert type scale.

Section 1: Normal Social Media Use

Section 1 contained questions about participants' normal social media usage. This section satisfies objective number one. Five questions assessed how many hours per week participants spent on social media across multiple platforms, whether they believed social media to be trustworthy or accurate in providing information, whether participants' published views or opinions on social media and how many times per week, and if media coverage of issues had changed their opinion about an issue. These questions were used to assess how often participants use social media and how important or reliable they perceive information on social media platforms. Multiple choice, fill-in-the-blank, and scaled questions were utilized in this section.

Section 2: Perceptions of the Beef Industry

Section 2 of the questionnaire contained four questions about the participants' perceptions of the beef industry. This section achieves objective number two. The first question focused on whether participants felt the industry supplied a safe product and responded to beef safety concerns. The second question assessed participants' concerns about beef safety, accuracy of information about the beef supply, beef cattle production practices and humane treatment, and the use of antibiotics and growth hormones. The third question assessed participants' concerns for who may be harmed by a beef safety incident including themselves, their family, someone they know, or the nation. The fourth question gauged participants' average weekly beef consumption. These questions measured participants' perceptions and opinions of the beef

industry under normal circumstances. Questions in this section utilized multiple choice, fill-in-the-blank, and scaled questions.

Section 3: Social Media Use During Beef Safety Incidents

Section 3 completed objective number three by assessing participants' usage of social media during a beef safety incident. Three questions assessed the likelihood of using social media to gather information about the incident, how helpful social media platforms are in providing information on the incident, and whether social media coverage of beef safety incidents have changed participants' opinions or attitudes about beef. These questions were used to assess participants' usage and perception of information received on social media, and the effect that information had on their opinion about the beef industry. This section utilized multiple choice and scaled questions.

Section 4: Pink Slime Incident and Social Media

Section 4 of the questionnaire focused specifically on the pink slime incident and the role of social media. This section achieves objective number four. In the seven questions of the section, participants were asked whether they learned about pink slime on social media and to identify which social media platforms presented the information, whether that information affected their perception of the beef industry, and whether the information presented to them on social media effected their short-term (0-6 months) and long-term (6+ months) buying and eating habits. These questions were used to assess participants' response to a specific food safety incident in relation to the beef industry. This section utilized multiple choice and scaled questions.

Section 5: Demographics

Section 5 addressed the demographics of the participants. This section contains seven questions. Questions include standard demographic inquiries such as ethnicity, age, and gender, as well as include academic status and what type of area participants live in. One question pertained specifically to the agriculture industry with an assessment of living, working, and educational experience in relation to agriculture. This section utilized multiple choice and fill-in-the-blank questions.

Reliability, Validity, and Non-Response

Face and content validity of the survey instrument were established through review by an expert panel (Ary et al., 2010) of six faculty members at the University of Tennessee, Knoxville. This panel included two faculty members from the Department of Agricultural Leadership, Education and Communications; three faculty members from the Department of Agricultural and Resource Economics; and a faculty member from the Department of Food Science and Technology. Feedback was provided individually. Panel members collectively felt the survey included several questions that did not directly relate to the subject being studied, and were subsequently removed or streamlined.

A pilot study was conducted with a sample of 12 students in the Agricultural Leadership Development course at the University of Tennessee, Knoxville. The sample for the pilot study included males ($n=6$) and females ($n=6$) ranging from ages 20 to 28 years old. The pilot study was delivered using *Qualtrics*. Reliability was determined through the use of cognitive interviews (Dillman, Smyth, & Melani, 2010). Cognitive interviewing is used to determine “whether respondents comprehend questions as intended by the survey sponsor and whether questions can be answered accurately” (Dillman et al., 2010, p. 142). Participants of the pilot

study were asked to complete the survey individually and discuss any uncertainties or suggestions related to survey questions. At participants' suggestion, the instrument was modified to add a zero, or null, option to questions regarding frequency of use following the pilot study.

In-person surveys were collected for a period of one week at four locations on campus. The total sample included 300 participants from the University of Tennessee, Knoxville. The sample was made up of 47% males ($n=142$) and 53% females ($n=158$). Ages of participants ranged from 18 to 28 years. Participants identified themselves as Hispanic or Latino, American Indian or Alaska Native, Asian, Black or African American, White or Caucasian, or Mixed Race and were primarily White or Caucasian ($n=182$, 61%) and lived in suburban locales ($n=178$, 60%) versus urban or rural. Participants represented all academic classifications including 16% freshman ($n=49$), 28% sophomores ($n=83$), 27% juniors ($n=80$), 19% seniors ($n=58$), and 10% graduate students ($n=30$).

Due to the content of the study being focused on the agriculture and beef industries, participants were asked to describe their experience in agriculture. In total, 183 study participants indicated they had some experience in agriculture with the majority being they live or had lived in a rural area ($f=108$), representing 36% of the total sample. Having taken high school agriculture courses was second most popular with 28% ($f=83$) and was followed by living or having lived on a farm or ranch with 27% ($f=81$). Having taken college agriculture courses ranked 7th with 16% ($f=48$).

Data collected represents a convenience sample and should not be considered representative of the entire target population. Due to the nature of data collection, non-response error was not addressed (Lindner & Wingenbach, 2002).

Chapter 4

Journal of Applied Communications Manuscript

This chapter includes the manuscript prepared for submission to the Journal of Applied Communications.

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Abstract: As the American population has transitioned from rural life to more urbanized settings, a divide has appeared between consumers and the agriculture industry. Consumers now receive the majority of information about agriculture through traditional media outlets and social media platforms. Social media is known for having the ability to rapidly disseminate information, which in the case of agriculture and its sub-industries is often inaccurate and leads to negative short- and long-term effects. In order to fully understand the impact of social media on the beef industry, a study was conducted to assess changes in consumer perceptions and behaviors. The study utilized a survey that was completed by 300 students from the University of Tennessee. This study sought to describe the effect of social media on consumer perceptions of the beef industry. Results showed consumers are reliant on social media to gather information about current affairs including beef safety incidents and that the information they gather had a predominantly negative effect on their perceptions. Following the pink slime controversy of 2012, consumers felt the information they received on social media about the beef product led to negative perceptions of the industry and changes in their buying and eating habits over short- and long-term periods.

Keywords: social media; consumer perceptions; beef industry; pink slime

Introduction/Theoretical Framework:

Society increasingly feels the influence of the media (Ball-Rokeach & DeFleur, 1976) and individuals rely on their ability to gather information, process it, and disseminate it (Ball-Rokeach, 1985; DeFleur & Ball-Rokeach, 1989) to help evaluate their position on a subject. This process encourages future media dependence (Gordon, 2009), and the link between society and the media has been explored at length with consumer media dependency during natural disasters, disease outbreaks, and terrorist attacks (Gordon, 2009; Lowrey, 2004; Tai & Sun, 2007).

Media dependency on newspapers, radios, and television broadcasts has the potential to cause cognitive, affective, and behavioral effects (Ball-Rokeach & DeFleur, 1976). Media dependency results in cognitive effects on individuals and society (Charanza, 2011). For example, individuals' attitudes often depend heavily on media sources, which are considered to be due to agenda-setting theory (Ball-Rokeach & DeFleur, 1976). According to this theory, the media decides which topics to report and put their focus on, with the belief that people lack the time and energy to develop attitudes about everything they are presented (Ball-Rokeach & DeFleur, 1976, p. 11). Because of this, individuals choose topics which seem most relevant to their interests (Ball-Rokeach & DeFleur, 1976). Applied to the agriculture industry, if the media is casting a negative attitude toward an agriculture topic, the uninformed public is likely to follow the trend (Anderson, 2000; Burton & Young, 1996).

Affective effects, the impact that the media has on society members' feelings (Ball-Rokeach & DeFleur, 1976), also play a role in media-dependency. This can include any span of emotions depending on the topic being presented (Ball-Rokeach & DeFleur, 1976). In the scope of a society, affective effects can be seen in the form of changes in morale of a large segment of the population, as well as alienation (Ball-Rokeach & DeFleur, 1976).

Behavioral changes are a strong indicator of the media having had an effect on the public (Ball-Rokeach & DeFleur, 1976). Ball-Rokeach and DeFleur (1976) stated changes in actions and behaviors are as important as changes in values and beliefs. The media has the ability to drive individuals to do things they normally would not, or to make them not participate in things they normally would as a response to media messages (Ball-Rokeach & DeFleur, 1976). For example, individuals may be inclined to purchase organic meat and produce following a news

report about the link between pesticides and illness, even though they have previously purchased conventional products for a number of years.

As social media usage has boomed over the past 10 years (Leung, 2013), Millennials have found social media to be a portal for information on current events and what is trending worldwide (Sun, Chang, & Yu, 2001). It is where they turn to find useful, relevant, up to the second information (American Society for Training and Development, 2010). Currently, the Millennial generation relies on sites like Facebook and Twitter for their news updates rather than traditional sites like CNN.com or the New York Times (Smith, 2014). Millennials feel, more so than any other generational group, that social media is a tool in their life (American Society for Training and Development, 2010). In addition, the Millennial generation believes they get more work done, get better work done, learn truly useful things, and learn more in less time because of their use of social media (American Society for Training and Development, 2010).

It is important for communicators to be aware of the social media platforms consumers are using regularly, and how frequent that usage is (Robertson, 2009). A 2013 study by the Pew Internet and American Life Project found 78% of adults in the United States read about news events on Facebook (Mitchell, Kiley, Gottfried, & Guskin, 2013). Part of the draw of social media as a news outlet is that information is constantly updated and discussed, whereas newsrooms struggle to verify information and produce it as quickly (Vis, 2014b). This has led to the spread of inaccurate information across social media sites when the news is breaking and recanting when the information is proved incorrect (Vis, 2014a). Agriculture, one industry in particular, has seen the effects of inaccurate information on social media.

Over the past century Americans have seen a steady transition from rural to urbanized life (Jepsen, Pastor, & Elliot, 2007) with less than 2% of the population presently living on farms

(American Farm Bureau Foundation, 2014). Today's families are often twice removed from their farming ancestry (American Farm Bureau Foundation, 2014) and have a very limited understanding of modern agriculture practices. Their view is further aggravated by gathering the majority of their information from sources that are separated from the agriculture industry (Frick, Birkenholz, & Machtmes, 1995).

The agriculture industry has largely lagged behind in terms of a social media presence (Berg, 2013; Patsche, 2014; Vogt, 2013) and is frequently attacked by activists and individuals who instill uncertainty or fear in consumers. Through their search for information, consumers are bombarded by misconceptions about agriculture and its sub-industries (Frick et al., 1995; Swinnen, McCluskey, & Francken, 2005). Once this information is made available on the internet, it is difficult for the agriculture industry to have its voice heard in defense (Berg, 2013; Vogt, 2013).

One example is the attack on the beef industry in March 2012 when Beef Product, Inc.'s 100% beef product known as lean finely textured beef (LFTB) was scrutinized by the media and consumers nationwide (Greene, 2012). The product consists of a mixing of beef trimmings and ammonium hydroxide to create the various ratios of ground beef available to consumers since 1991 (Greene, 2012). Once an ABC News report was shared on social media coining the term *pink slime* to describe the pale pink, 100% beef product and questioned the product's safety by calling it dog food (Greene, 2012), the public outcry across social media led to several repercussions. Most notably, three of four processing plants were closed and over 600 jobs were lost, the United States Department of Agriculture ended the use of LFTB in school lunches, and producers removed it from commercial sale (Greene, 2012). Producers and processors of the beef industry had not been seen as reliable sources of information in other food safety incidents up to

this point, and the trend continued with pink slime (Verbeke, Pérez-Cueto, de Barcellos, Krystallis, & Grunert, 2009). Moreover, Burton and Young (1996) showed media coverage during food safety incidents with beef products had short- and long-term impacts on demand and what followed in the wake of the pink slime controversy were changes to the beef industry that has had lasting effects for the producer and the consumer (Greene, 2012).

Presently, there is a lack of research on the effect social media has on the consumer perception of the beef industry, but it is expected to follow the trend of more traditional media outlets in terms of positive and negative influences on consumer habits (Charanza, 2011). With agriculture frequently coming under attack on social media, social media is the best platform for agriculture to make a defense (Anderson-Wilk, 2009; Berg, 2013; Doyle & Briggeman, 2014; Patsche, 2014). Commodity groups, farmers, and other advocates can use social networks to create strong interpersonal communications with consumers and promote advancements in agriculture to a large population (Anderson-Wilk, 2009; Vogt, 2013).

Purpose and Objectives

The purpose of this study was to gain an understanding of the way social media usage (i.e. Facebook, Twitter, or blogging) affects consumer perceptions of the beef industry within the Millennial generation at a land grant institution. The specific objectives of this study were as follows:

1. Describe how students at the University of Tennessee, Knoxville utilize social media to interact under normal circumstances, including what platforms and with what frequency;
2. Describe students' perceptions of the beef industry;

3. Describe how students at the University of Tennessee, Knoxville utilize social media to interact during a food safety incident related to the beef industry, including what platforms and with what frequency; and
4. Describe students' exposure to the pink slime incident through social media and any self-determined short- and long-term effects of this exposure.

Methods and Procedures

This study was conducted using descriptive survey research. The survey instrument was designed based on literature focusing on media influences on consumer perceptions of the beef industry (Charanza, 2011) and media dependency theory (Ball-Rokeach, 1985; Ball-Rokeach & DeFleur, 1976; DeFleur & Ball-Rokeach, 1989; Jakob, 2010; Robertson, 2009). Research into mass media and consumer perceptions showed consumers gather information from multiple mediums and agricultural communicators should therefore target multiple mediums when publicizing information (Charanza, 2011). The entire student population at the University of Tennessee, Knoxville was the target population for this study.

Data for this survey was collected via an online questionnaire that was created utilizing *Qualtrics* and delivered via in-person surveying using iPads. Researchers approached and asked students to participate in the survey at two libraries, a residence hall, and a restaurant on campus. A questionnaire was chosen as the method of delivery due to lower cost, convenience, and the ability to reach a large population (Ary, Jacobs, & Sorenson, 2010). Surveys were conducted over the course of a week and provided researchers with a convenience sample.

The survey contained five sections that were designed to measure (a) perceptions of the beef industry, (b) normal social media use, (c) social media use during food safety incidents, (d) the pink slime incident and social media, and (e) demographics. Multiple choice, fill-in-the-

blank, and scaled questions were utilized in the survey, with all scaled questions utilizing a 5-point Likert type scale. The first section was incorporated to assess how often participants use social media and how important or reliable they perceive information on social media platforms. The second section measured participants' perceptions and opinions of the beef industry under normal circumstances, when there hasn't been a recent food safety incident. The third section assessed participants' usage and perception of information received on social media, and the effect that information had on their opinion about the beef industry. The fourth section focused on a specific food safety incident, pink slime, and whether social media's portrayal of the incident influenced perceptions or buying and eating habits of the participants. The final section consisted of demographics and included a question relating to the participants' relationship to the agriculture industry.

Prior to disseminating the survey, face and content validity of the instrument were established through review by an expert panel (Ary et al., 2010), which consisted of six faculty members at the University of Tennessee, Knoxville. This panel included two faculty members from the Department of Agricultural Leadership, Education and Communications; three faculty members from the Department of Agricultural and Resource Economics; and a faculty member from the Department of Food Science and Technology. Feedback was provided individually. Panel members collectively felt the survey included several questions that did not directly relate to the subject being studied, and were subsequently removed or streamlined.

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interviews (Dillman, Smyth, & Melani, 2010). Cognitive interviewing is used to determine “whether respondents comprehend questions as intended by the survey sponsor and whether questions can be answered accurately” (Dillman et al., 2010, p. 142). Participants of the pilot study were asked to complete the survey individually and discuss any uncertainties or suggestions for clarification. At participants’ suggestion, the instrument was modified to add a zero, or null, option to questions regarding frequency of use following the pilot study.

The total sample included 300 participants from the University of Tennessee, Knoxville. The sample was made up of 47% males ($n=142$) and 53% females ($n=158$). Ages of participants ranged from 18 to 28 years. Participants identified themselves as Hispanic or Latino, American Indian or Alaska Native, Asian, Black or African American, White or Caucasian, or Mixed Race and were primarily White or Caucasian ($n=182$, 61%) and lived in suburban locales ($n=178$, 60%) versus urban or rural. Participants represented all academic classifications including 16% freshman ($n=49$), 28% sophomores ($n=83$), 27% juniors ($n=80$), 19% seniors ($n=58$), and 10% graduate students ($n=30$).

Due to the content of the study being focused on the agriculture and beef industries, participants were asked to describe their experience in agriculture (see Table 1). In total, 183 study participants indicated they had some experience in agriculture with the majority being they live or had lived in a rural area ($f=108$), representing 36% of the total sample. Having taken high school agriculture courses was second most popular with 28% ($f=83$) and was followed by living or having lived on a farm or ranch with 27% ($f=81$). Having taken college agriculture courses ranked 7th with 16% ($f=48$).

Table 1
Consumers experience in agriculture (n=300)

Experience	<i>f</i>	%	Rank
Live(d) in a rural area	108	36%	1
High school agriculture course(s)	83	28%	2
Live(d) on a farm or ranch	81	27%	3
Unpaid work experience	80	27%	4
Paid work experience	54	18%	5
Work(ed) on a farm/ranch	51	17%	6
College agriculture course(s)	48	16%	7
Work(ed) in a rural area	39	13%	8
Exhibiting livestock at fairs/shows	32	11%	9
Extension workshop(s)	15	5%	10
Own(ed) a farm or ranch	14	5%	11

Findings

The results address the objectives and purpose of the study in determining the effect of social media on consumer perceptions of the beef industry in the Millennial generation.

Objective 1: Describe how students at the University of Tennessee, Knoxville utilize social media to interact under normal circumstances, including what platforms and with what frequency.

The first objective sought to describe the way that participants use social media under normal circumstances. As shown in Table 2, participants were asked to identify which major social media platforms they utilized and how many hours per week. Facebook was used the most hours per week ($M = 5.80$). Blogs had the lowest hourly usage ($M = 1.91$).

Table 2

Consumers hours per week spent on social media platforms for personal, business, and/or entertainment use (n=300)

Medium	<i>M</i>	<i>SD</i>
Facebook	5.80	3.28
YouTube	3.90	3.48
Instagram	3.39	2.67
Twitter	2.17	1.73
Blogs	1.91	1.91

Participants were asked to rank their perception of the trustworthiness of information on social media (see Table 3). Perceived trustworthiness was consistent across all social media platforms with the majority of participants responding social media was somewhat trustworthy to relatively trustworthy. Twitter was perceived as most trustworthy with 42% rating it relatively trustworthy ($f = 126$), 17% rating it very trustworthy ($f = 50$), and 2% rating it extremely trustworthy ($f = 7$).

Table 3

Consumers perceived trustworthiness of social media platforms in providing accurate information about any issue (n = 300)

	Not At All Trustworthy		Somewhat Trustworthy		Relatively Trustworthy		Very Trustworthy		Extremely Trustworthy	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Facebook	43	14%	100	33%	119	40%	37	12%	1	.3%
Twitter	33	11%	83	28%	126	42%	50	17%	7	2%
Blogs	52	17%	106	35%	102	34%	33	11%	6	2%
Instagram	60	20%	127	42%	94	31%	16	5%	0	0%
YouTube	37	12%	128	43%	108	36%	25	8%	2	.7%

Objective 2: Describe students' perceptions of the beef industry.

The second objective sought to describe the participants' perceptions of the beef industry. As shown in Table 4, participants agreed the beef industry supplies a safe product to consumers. Responses to whether the beef industry was lacking in its response to safety concerns and in supplying information needed for consumers to make informed decisions was predominantly neutral.

Table 4
Consumers beliefs about the beef industry (n = 300)

	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Supplies safe beef products to consumers	4	1%	18	6%	77	26%	171	57%	30	10%
Responds efficiently to beef safety concerns	6	2%	40	13%	143	48%	105	35%	4	1%
Supplies me with information I need to make informed decisions about the safety of beef	8	3%	55	18%	134	45%	98	33%	5	2%

Participants' concerns about the beef industry were consistent in multiple categories (see Table 5). Participants were very concerned about food safety (51%, $f=152$) and having access to accurate information about the beef supply (43%, $f=129$). Participants were relatively concerned about beef cattle production practices, the humane treatment of beef cattle, and the use of antibiotics and hormones in beef cattle.

Table 5

Consumers concerns in relation to the beef industry (n=300)

	Not At All Concerned		Somewhat Concerned		Relatively Concerned		Very Concerned		Extremely Concerned	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Food Safety	7	2%	28	9%	85	28%	152	51%	28	9%
Access to accurate information about the beef supply	6	2%	28	9%	122	41%	129	43%	15	5%
Beef cattle production practices	9	3%	30	10%	161	54%	89	30%	11	4%
Humane treatment of beef cattle	8	3%	35	12%	162	54%	80	27%	14	5%
Use of antibiotics given to beef cattle	7	2%	30	10%	140	47%	108	36%	14	5%
Use of growth hormones given to beef cattle	9	3%	24	8%	147	49%	101	34%	17	6%

Participants' average weekly beef consumption was measured by frequency (see Table 6). It was found that 52% of participants ($f = 156$) consumed beef 3-4 times per week, followed by 29% ($f = 88$) consuming beef 1-2 times per week. Three percent of participants ($f = 9$) did not consume beef, making it reasonable to assume the majority of participants have reason to be concerned about the beef they consume.

Table 6
Consumers average weekly beef consumption (n=300)

Frequency	<i>f</i>	%
1-2 times per week	88	29%
3-4 times per week	156	52%
5-6 times per week	32	11%
7 or more times per week	15	5%
0 times per week	9	3%

Objective 3: Describe how students at the University of Tennessee, Knoxville utilize social media to interact during a food safety incident related to the beef industry, including what platforms and with what frequency.

Participants were asked whether they were likely to use social media to gather information concerning beef safety incidents (see Table 7). The majority of participants at 62% ($f = 186$) stated they were somewhat likely to use social media. Twenty-seven percent ($f = 82$) were unlikely to use social media to collect information and 10% ($f = 32$) were very likely.

Table 7
Consumers likelihood of using social media to gather information concerning beef safety incidents (n = 300)

Likelihood	<i>f</i>	%
Unlikely	82	27%
Somewhat Likely	186	62%
Very Likely	32	10%

In order to determine the helpfulness of social media platforms in providing information about national beef safety incidents, participants were asked to score each major platform (see Table 8). Facebook and Twitter were considered the most helpful of the five platforms.

Table 8
Consumers perceived helpfulness of social media platforms in providing information about national beef safety incidents (n=300)

	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Facebook	37	12.3%	36	12.0%	101	33.7%	104	34.7%	20	6.7%
Twitter	32	10.7%	25	8.3%	106	35.3%	116	38.7%	21	7.0%
Blogs	25	8.3%	58	19.3%	107	35.7%	92	30.7%	16	5.3%
Instagram	50	16.7%	95	31.7%	96	32.0%	52	17.3%	7	2.3%
YouTube	28	9.3%	74	24.7%	118	39.3%	63	21.0%	16	5.3%

Objective 4: Describe students' exposure to the pink slime incident through social media and any self-determined short- and long-term effects of this exposure.

The fourth objective was to determine how exposure to information about pink slime affected participants, and whether there were short- and long-term effects. As shown in Table 9, participants were predominantly negatively effected (79%, $f = 141$) by the information they received about pink slime on social media.

Expanding on the initial negative effect of information about pink slime, participants identified both short-term and long-term negative effects (see Table 10). Short-term (0-6 months) buying habits were negatively effected in 72% ($f = 129$) of participants, and eating habits were negatively effected in 69% ($f = 123$) of participants. Long-term (6+ months) buying habits were

Table 9

Effect on consumers of information received about pink slime on social media on consumer perception of the beef industry (n = 300)

Effect	<i>f</i>	%
Negative Way	141	79%
Positive Way	12	7%
Unchanged	27	15%

Table 10

Information about pink slime on social media negatively effected consumer habits (n=300)

Negative Changes	<i>f</i>	%
<i>Short-term (0-6 months) buying habits</i>		
Yes	129	72%
No	37	21%
Unsure	14	7%
<i>Short-term (0-6 months) eating habits</i>		
Yes	124	69%
No	40	23%
Unsure	16	8%
<i>Long-term (6+ months) buying habits</i>		
Yes	100	56%
No	56	31%
Unsure	24	13%
<i>Long-term (6+ months) eating habits</i>		
Yes	99	55%
No	56	31%
Unsure	25	14%

negatively effected in 56% ($f = 100$) of participants, and eating habits were negatively effected in 55% ($f = 98$) of participants.

Conclusions

The sample used a convenience sample and should not be considered representative of the entire target population. It was found participants regularly used social media for personal, business, and/or entertainment purposes and found the information posted on the multiple platforms to be somewhat trustworthy. Participants believed the beef industry supplied safe products to consumers, but the beef industry lacked in response to concerns and providing information to consumers. The majority of participants were somewhat to very likely to use social media to gather information about a food safety incident in the beef industry, and information often resulted in negative perceptions of the industry. This was demonstrated in relation to the negative effects caused by the information participants received about pink slime on social media and the effect on their buying and eating habits for short- and long-term periods.

Discussion and Implications

This study has significant implications for the beef industry. The effects of a food safety incident in the beef industry can have long-term ramifications for consumers and industry producers. The agriculture industry and its sub-industries need to take a proactive approach with food safety messages to improve the consumer perceptions about the industry and prevent negative or nonfactual information from emerging.

This study indicates information about the beef industry received through social media has a negative effect on consumer perceptions of the industry. This is consistent with previous findings noted by Charanza (2011) in a study of consumer media dependency and the beef

industry. This study also confirmed the expectation of regular social media usage by Millennials to gather information about issues and their belief in the trustworthiness of that information. Robertson (2009) noted communicators should be aware of the amount of time consumers spend on media and the variety of platforms they use while gathering information. Responses showed the participants spent several hours per week on various social media platforms, whether for personal, business, or entertainment purposes, and that social media usage had increased significantly in the past five years (Charanza, 2011). They have come to believe the information on social media to be relatively trustworthy and use it to form opinions. Research by The Pew Internet and American Life Project found Millennials are using social media as a primary means of connection to news and current affairs (Smith, 2014), supporting this study's findings.

In regards to the beef industry, this dependence on social media carries over. The section of questions pertaining to the beef industry began with consumer concerns that ranged from health concerns for the participants and those they know to questions that could be defined as moral concerns. The purpose for this was to gauge the effect that the videos, pictures, and blog posts from activist groups and industry-challenging individuals has on the Millennial consumer. Millennials are the largest consumer group, comprising 27% of the United States population (Tapscott, 2009) and will play an important role in the future success of the agriculture industry through purchasing and consuming choices. The majority of participants indicated they consume beef with regularity, giving concern to the effect that negative information may have on their perceptions and habits. It was found that the participants believed the beef industry supplied a safe product, but that it fails to effectively address concerns and make information available to consumers. More than half of the participants were somewhat to very likely to collect information about beef safety incidents from social media, and agriculture activists have proven

they are readily waiting to shine a negative light on the beef industry with misconstrued photos, videos, and information (Vogt, 2013). In addition, participants felt the beef industry did not effectively provide proactive or reactive information about safety, which leaves consumers to collect this information from other, potentially untruthful, sources. Most media coverage about the beef industry is often negative and misleading to consumers (Anderson, 2000; Burton & Young, 1996; Swinnen et al., 2005).

In the case of pink slime the majority of participants indicated their perception of the industry was negatively effected by the information they received on social media. This effect was seen in the participants' short- and long-term buying and eating habits and confirms other research into media coverage of food safety incidents in the beef industry (Burton & Young, 2006). The beef industry did not respond effectively to the accusations spread on social media of providing an unsafe product to consumers and has suffered reduced production and declines in cattle and beef market prices (Greene, 2012). The pink slime controversy and the ensuing fall out is a relevant example of the dependency of consumers on social media to shape their perceptions and the effect that social media can have on the beef industry.

Recommendations

After considering the results of this study and its implications, some recommendations can be made for the agriculture industry and the agricultural sub-industries, as well as for further research.

Two recommendations for the agricultural industry and its sub-industries

1. Industry communicators should consider current industry representation on social media and identify ways to proactively supply information to consumers.

2. Industry communicators should identify social media platforms and other media outlets that can be used to reach consumers and provide information proactively and reactively.

Three recommendations for future research

1. This study should be repeated immediately following a food safety incident as a longitudinal study, measuring changes to consumer habits every three months for the duration of a year.
2. What effect has food safety incidents in other agriculture sub-industries, such as poultry, swine, and biotechnology, had on consumers and industry producers?
3. Describe successful and unsuccessful agricultural media campaigns that have collected messages which educate consumers about agricultural practices and products.

Chapter 5

Conclusions and Recommendations

This study adds to the body of knowledge about the effect of social media on consumer perception of the beef industry. It provides insight into where industry communicators fail to reach consumers and the effects of those failures on the Millennial generation.

This study has significant implications for the beef industry. The effects of a food safety incident in the beef industry can have long-term ramifications for consumers and industry producers. The agriculture industry and its sub-industries need to take a proactive approach with food safety messages to improve the consumer perceptions about the industry and prevent negative or nonfactual information from emerging.

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was seen in the participant's short- and long-term buying and eating habits and confirms other research into media coverage of food safety incidents in the beef industry (Burton & Young, 2006). The beef industry did not respond effectively to the accusations spread on social media of providing an unsafe product to consumers and has suffered reduced production and declines in cattle and beef market prices (Greene, 2012). The pink slime controversy and the ensuing fall out is a relevant example of the dependency of consumers on social media to shape their perceptions and the effect that social media can have on the beef industry.

After considering the results of this study and its implications, some recommendations can be made for the agriculture industry and the agricultural sub-industries. First, industry communicators should consider how the industry is being represented on social media and identify ways to proactively supply information to consumers. This information can come from commodity groups, major producers, or farmers (Berg, 2013; Vogt, 2013). Second, industry communicators should identify social media and other media outlets that can be used to reach consumers and provide information proactively and reactively. Social media has been proven to be effective in shaping consumer perceptions (Berg, 2013), but consumers feel there is a lack of accurate information about agricultural products and access to this information can aid in preventing sensationalism related to food safety incidents (Berg, 2013; Patsche, 2014; Robertson, 2009).

This study provides interesting insight into the effect that information found on social media about a specific beef safety incident had on consumer perceptions of that industry. To expand this, further research should be conducted into the social media presence of other sub-industries that have experienced a food safety incident such as poultry, swine, and biotechnology for a comparison of the effects on consumers and producers. Attention should be paid to the sub-

industries that thrive during a food safety incident with little change to consumer habits in order to determine what makes them steadfast. Alternatively, this study should be repeated immediately following a food safety incident in the beef industry (Charanza, 2011) to more accurately measure the role of social media on participants' perceptions. This study was conducted nearly three years after the pink slime controversy, so participants may not have had as clear memories of their response to the incident. A study run soon after a food safety incident could also be run as a longitudinal study measuring changes to consumer habits every three months for the duration of a year to more precisely measure the effects (Ary, Jacobs, & Sorenson, 2010). Finally, research into successful and unsuccessful agricultural media campaigns should be collected to determine the types of messages that effectively educate consumers and gain their trust (Robertson, 2009) about agricultural practices and products.

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Appendix

Appendix A: IRB Approval

February 10, 2015

Michelle Lauren Howard
UTIA - RES-College of Agriculture & Natural Resources

Re: UTK IRB-14 02011-XP

Study Title: The Effect of Social Media on Consumer Perceptions of the Beef Industry

Dear Ms. Howard:

The Administrative Section of the UTK Institutional Review Board (IRB) reviewed your **application** for the above referenced project. It determined that your application is eligible for **expedited** review under 45 CFR 46.110(b)(1), category (7). The IRB has reviewed these materials and determined that they do comply with proper consideration for the rights and welfare of human subjects and the regulatory requirements for the protection of human subjects. Therefore, this letter constitutes full approval by the IRB of your application version 1.3 as submitted. Approval of this study will be valid from February 10, 2015 to February 9, 2016.

In the event that subjects are to be recruited using solicitation materials, such as brochures, posters, web -based advertisements, etc., these materials must receive prior approval of the IRB. Any revisions in the approved application must also be submitted to and approved by the IRB prior to implementation. In addition, you are responsible for reporting any unanticipated serious adverse events or other problems involving risks to subjects or others in the manner required by the local IRB policy.

Finally, **re-approval** of your project is required by the IRB in accord with the conditions specified above. You may not continue the research study beyond the time or other limits specified unless you obtain prior written approval of the IRB.

Sincerely,



Colleen P. Gilrane, PhD Chair
UTK Institutional Review Board

Appendix B: Informed Consent Statement

INFORMED CONSENT STATEMENT

The Effect of Social Media on Consumer Perceptions of the Beef Industry

INTRODUCTION

Dear Participant,

You have been invited to participate in a research study assessing the effect of social media on consumer perceptions of the beef industry. The purpose of this study is to understand the impact that messages on social media have on consumers buying and eating habits.

For the purpose of this study, social media is defined as “the collection of websites and web-based systems that allow for mass interaction, conversation, and sharing among members of a network” (Murphy, Hill & Dean, 2013, p. 3). This study will focus on the most prevalent social media platforms including Facebook, Twitter, YouTube, Instagram, and blogs.

To be eligible for this survey, you must be a current student at the University of Tennessee, Knoxville. There are no other requirements.

The survey includes five sections, including a section on demographics. Questions include multiple choice, fill-in-the-blank, and scaled formats. Please complete each section as fully as possible. The survey is expected to take around 5 minutes to complete.

Thank you for your participation,
Michelle Howard

RISKS & BENEFITS

There are no foreseeable risks to you if you chose to participate in this study. There is no direct benefit to you, however the knowledge that may be gained from your participation will help others.

CONFIDENTIALITY

The information in the study records will be kept confidential to the full extent allowed by law. Data will be stored securely in a password protected computer for 3 years and destroyed per professional guidelines. You will NOT be asked to write your name on any study materials so that no one can match your identity to the answers that you provide.

COMPENSATION

Upon completion of the survey, participants will receive a candy bar.

CONTACT INFORMATION

If you have questions at any time about the study or the procedures, (or you experience adverse effects as a result of participating in this study,) you may contact the researcher, Michelle Howard, at mhowar22@utk.edu, and (865) 974-4830. If you have questions about your rights as a participant, contact the Office of Research Compliance Officer, Sonya Sullivan, at (865) 974-3466.

PARTICIPATION

Your participation in this study is voluntary; you may decline to participate without penalty. If you decide to participate, you may withdraw from the study at anytime without penalty. If you withdraw from the study before data collection is completed your data will be destroyed.

CONSENT

“I have read and understand the above information. I may request a copy of this form or print this page. I agree to participate in this study with the understanding that I may choose not to participate or to stop participating at any time without penalty.”

Please select your choice:

- Participate
- Not Participate

Appendix C: Questionnaire

Section 1: Normal Social Media Use

The following questions ask about your typical social media usage. For each question, please provide or choose an answer that best represents your media use.

1. During normal usage, about how many hours per week do you spend using the following social media platforms to gather information for personal, business, and/or entertainment use

- _____ Facebook
- _____ Twitter
- _____ Blogs
- _____ Instagram
- _____ YouTube
- _____ Other

2. How trustworthy do you consider the following social media platforms to be in providing accurate and helpful information about any issue:

	Not At All Trustworthy	Somewhat Trustworthy	Relatively Trustworthy	Very Trustworthy	Extremely Trustworthy
Facebook	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Twitter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Blogs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Instagram	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
YouTube	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. Do you publish your views or opinions on the Internet using social media such as blogs, Facebook, or Twitter?

- Yes
- No
- Unsure

4. About how many times per week do you publish your view or opinions on social media such as blogs, Facebook, or Twitter?

- 0 times per week
- 1-3 times per week
- 4-6 times per week
- 7-9 times per week
- 10 or more times per week

5. In general, social media coverage of issues has changed my opinion or attitude about an issue in a:

- Negative way
- Positive way
- Unchanged

Section 2: Perceptions of the Beef Industry

The following questions relate to your perceptions of the U.S. beef industry and beef products. Safe beef is defined as a beef product that is free of disease and harmful bacteria. The beef industry is defined as producers, organizations, food processors, and any entity involved in the production, processing, and handling of beef products. For each question, please choose the answer choice that best represents your views.

1. The beef industry:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Supplies safe beef products to consumers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Responds efficiently to beef safety concerns	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Supplies me with information I need to make informed decisions about the safety of beef	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. In relation to the beef industry, how concerned are you about:

	Not At All Concerned	Somewhat Concerned	Relatively Concerned	Very Concerned	Extremely Concerned
Food safety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to accurate information about the beef supply	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Beef cattle production practices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Humane treatment of beef cattle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use of antibiotics given to beef cattle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use of growth hormones given to beef cattle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. If there was a beef safety scare in the United States, who are you concerned the following could be harmed?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My family	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Someone I know	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The nation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. How many times per week do you consume beef?

- 0 times per week
- 1-2 times per week
- 3-4 times per week
- 5-6 times per week
- 7 or more times per week

Section 3: Social Media Use During Food Safety Incidents

The following questions ask about your social media use and the helpfulness of social media when a beef safety incident has occurred or is expected to occur. For each question, please provide or choose an answer that best represents your social media use.

1. How likely are you to use social media to gather information concerning beef safety incidents?

- Unlikely
- Somewhat Likely
- Very Likely

2. The following social media are helpful in providing information about national beef safety incidents.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Facebook	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Twitter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Blogs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Instagram	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
YouTube	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. Social media coverage of beef safety incidents (e.g., E. coli, Pink Slime, etc.) has changed my opinion and/or attitude about beef in a:

- Negative way _____
- Positive way _____
- Unchanged

Section 4: Pink Slime Incident and Social Media

The following questions ask about your experience with Beef Producers, Inc.’s product, Lean Finely Textured Beef, also known as pink slime, through social media.

1. Have you learned about pink slime on social media?

- Yes
- No (If no, please skip to the next section titled "Demographics")

2. I was presented with information about pink slime on social media platforms:

	Check all that apply
Facebook	<input type="checkbox"/>
Twitter	<input type="checkbox"/>
Blogs	<input type="checkbox"/>
Instagram	<input type="checkbox"/>
YouTube	<input type="checkbox"/>
Other	<input type="checkbox"/>

3. The information received about pink slime on social media effected my perception of the beef industry in a:

- Negative way _____
- Positive way _____
- Unchanged

4. Information about pink slime on social media effected my short-term (0-6 months) buying habits.

- Yes
- No
- Unsure

5. Information about pink slime on social media effected my short-term (0-6 months) eating habits.

- Yes
- No
- Unsure

6. Information about pink slime on social media effected my long-term (6+ months) buying habits.

- Yes
- No
- Unsure

7. Information about pink slime on social media effected my long-term (6+ months) eating habits.

- Yes
- No
- Unsure

Section 5: Demographics

The following questions ask for basic information about you. The information will be used to classify the answers you have provided throughout the survey but cannot be used to identify you. For each question, please provide or choose the answer that best represents you.

1. Do you have experience in any of the following activities related to agriculture (check all that apply):

	Check all that apply
Paid work experience	<input type="checkbox"/>
Unpaid work experience	<input type="checkbox"/>
Live(d) in a rural area	<input type="checkbox"/>
Live(d) on a farm or ranch	<input type="checkbox"/>
Own(ed) a farm or ranch	<input type="checkbox"/>
Work(ed) in a rural area	<input type="checkbox"/>
Work(ed) on a farm/ranch	<input type="checkbox"/>
High school agriculture course(s)	<input type="checkbox"/>
College agriculture course(s)	<input type="checkbox"/>
Extension workshop(s)	<input type="checkbox"/>
Exhibiting livestock at fairs/shows	<input type="checkbox"/>
None	<input type="checkbox"/>

2. How would you describe the area in which you live?

- Urban
- Suburban
- Rural

3. What is your academic status?

- Freshman
- Sophomore
- Junior
- Senior
- Graduate Student

4. What is your gender?

- Male
- Female

5. What is your age?

6. What is your ethnicity?

- Hispanic or Latino
- American Indian or Alaska Native
- Asian
- Black or African American
- White or Caucasian
- Mixed Race

THANK YOU

We greatly appreciate your participation in this research study! Your input is very valuable to us. Your responses will help us to add to the body of knowledge about how social media effects the beef industry.

Thank you again for your help!

Sincerely,
Michelle Howard

Vita

Michelle Lauren Howard was born in 1989 in a small town in Missouri. She grew up in St. Louis and Williamsburg, MO and graduated from the University of Missouri High School in 2006.

Following high school, Michelle earned an Associate of Applied Sciences degree in Culinary Arts at Forest Park, followed by a Bachelor of Science degree in Hospitality Management at the University of Missouri, Columbia. She was accepted into the Agricultural Leadership, Education, and Communication graduate program at the University of Tennessee, Knoxville in 2013 and joined Gamma Sigma Delta, the International Honor Society of Agriculture, in November 2014.