Food Safety Scandals and Scares: Media Presentation of Local Beef

by

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Abstract

This study is part of a long-term project examining the attitudes of Southern beef consumers towards red meat food safety associated with Alternative Food Networks (AFNs). Previous work focused on locally produced beef and consumers' willingness to purchase local beef in the event of a food safety or animal handling concern. When surveyed, some Alabama consumers claimed that no one influences their beef purchasing decisions even when confronted with a food safety event. This led to consideration of potential sources of information about local beef and beef food safety.

In this sub-project, the ways in which the media frames local beef food safety is explored. It draws on the work of Bocking (2012), who examined the relationship between the media's presentation and public perception. Between 2007 and 2018, 7,656 distinct news articles were published in Alabama and Georgia that pertained to AFNs. Of these, only 1,084 articles dealt with beef food safety in some way. The most common presentation (over 60%) of beef food safety was "shock and awe." Shock and awe represents rhetoric that is alarming and frames the safety of beef negatively (e.g., listing the most gruesome symptoms of food poisoning from to *E.coli* contamination). The predominance of inflammatory language used by the media is noteworthy as it suggests that there is potential for public perception to be influenced to choose local beef by media presentation of local beef food safety.

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Abbreviations

AFN	Alternative Food Network
AWN	Access World News
BPI	Beef Products Incorporated
BSE	Bovine Spongiform Encephalopathy
FDA	U.S. Food and Drug Administration
FSIS	Food Safety Inspection Service
LFTB	Lean Finely Textured Beef
NAMI	North American Meat Institute
USDA	U.S. Department of Agriculture
SARE	Sustainable Agriculture Research and Education
SNAP	Supplemental Nutrition Assistance Program

Introduction

Previous work on Alabama consumer decision making about red meat has examined Alabama consumers' definition of "local" and "local beef" (Telligman, Worosz, and Bratcher 2017a), as well as their beliefs about safety of local beef (Telligman, Worosz, and Bratcher 2017b). Consumers' perceptions of beef food safety are subjective and function from the "perception filters" that all people have in order to process information (Telligman et al. 2017b). These perceptions of food safety are based upon the beliefs and attitudes that consumers form (Telligman et al. 2017b). The meanings that people give to local beef also contribute to their perception of its quality, and in turn, influence their willingness to purchase (Telligman et al. 2017a). The media plays a role in how it is formed and altered (Runge et al. 2018). This may contribute to a consumer's willingness to purchase, and opinions of, "conventionally" produced and "local" meat.

The Media

The media operates as an informant on most public topics and issues (Hannigan 2014). Negative news coverage of "lean finely textured beef" (LFTB) was found to have influenced consumer demand. Yadavalli and Jones (2014) claim that while there was no immediate change in demand for beef following the LFTB news stories (2008 to 2012), two weeks later pork purchases declined and turkey purchases rose, at least temporarily. As a red meat substitute, consumers purchased less pork following a ground beef food safety incident, while they purchased more turkey during that time (Yadavalli and Jones 2014). This could in part have been related to the seasonal spikes in beef and pork

purchases that occur during certain times of the year. In the case bovine spongiform encephalopathy (BSE), it was found that Belgian consumers who paid greater attention to television reports during a 1996 BSE event consumed less red meat (Verbeke, Ward, and Viaene 2000). Rieger, Kuhlgatz, and Anders (2016:89-91) examined habitual meat consumption following the 2011 German Dioxin incident. They found strong evidence that negative media exposure led to small, short-term, decline in demand, but these changes were overcome by persistent habits.

The public tends to understand scientific issues through the "filter of journalistic language and imagery" that the media uses (Bocking 2012:706). The media is capable of framing issues in ways that impact how the public understands and relates to them (Bocking 2012). For instance, the way in which the media uses differing frames to report on scientific issue can be observed in how the media frames biotechnology. Using contradicting presentation of biotechnology like presenting it as being rife with unknown dangers that lead to corporations dominating agriculture compared to an image of biotechnology functioning to alleviate food insecurity (i.e., GMO's) (Nisbet and Lewenstein 2002). The discourse used in the media can dominate "big-ticket" social issues within our culture and in turn reflect and contribute to the creation of public opinion (Gamson and Modigliani 1989).

Earlier research also found that some consumers' beliefs about local beef may, at least in part, be influenced by farmers, friends, and family (Richardson and Worosz 2017). Yet, when presented with a food safety or animal handling concern, these consumers may also indicate that no one influences their purchases, and instead, they influence others' purchasing decisions. These results led me to question the role of

various actors in socially constructing the quality of local beef and local beef food safety, particularly the mass media.

Objective

This study is part of a larger, long-term project examining the attitudes of Alabama and Georgia beef consumers toward beef associated with Alternative Food Networks (AFNs). Preliminary work found little media coverage of "local beef," especially in the context of food safety, throughout the U.S. and almost no coverage in Alabama (Hill and Worosz 2016). This is surprising given the importance of agriculture to not only Alabama's economy, but Georgia's as well. Thus, the goals of this research are to (1) conduct an in-depth, systematic, search on "local beef" within the media to construct a comprehensive dataset of Alabama and Georgia news coverage; (2) identify the claims, and the context of said claims, about the safety of beef; and (3) explore how this media coverage might contribute to a difference in safety perception associated with local beef. The purpose of this work is to gain greater understanding of the ways in which positive and negative language and rhetoric is used in the mass media to socially construct local beef food safety. Of particular interest is whether or not this media coverage was influenced by noteworthy beef incidents and scares.

Literature

This project draws on two bodies of existing literature: AFNs with a focus on the concept of "local," and media influence and framing. This research provides insight into the role that the media plays in socially constructing and framing when presenting topics as such as red meat food safety and animal handling concerns as problematic.

Concept of "Local"

Alternative food networks date back to the counterculture of the 1960s (Hinrichs and Eshleman 2014). This counterculture involved critiquing large-scale agribusiness and prompting an early interest in organic farming (Hinrichs and Eshleman 2014). These movements eventually led to the U.S. Department of Agriculture (USDA) Sustainable Agriculture Research and Education (SARE) program that created a space to develop sustainable agriculture. This USDA program combined with environmental episodes and food safety incidents augmented activist and public concern about the increasingly globalized agrifood system (Hinrichs and Eshleman 2014). Consumer concern contributed to a rise in the sale of organics and other forms of "alternative" foods (Allen and Wilson 2008). Community food security, food policies, fair trade, agribusiness accountability, genetically engineered crops, urban agriculture, animal welfare, and food justice are other forms of alternative agrifood concerns (Hinrichs and Eshleman 2014). Thus, alternative food networks now include a wide variety of food related interests, issues, and organizations. The forms of alternative agrifoods that are specific to notions of "local" would include the use of farmer's markets, engaging in community supported agriculture, interest in buying locally produced food (Allen and Wilson 2008), and farm-to-school programs (Hinrichs and Eshleman 2014).

Local food initiatives began to find success in Europe and North America in the 1990s and continuing well into the 2000s (Hinrichs and Eshleman 2014). A 2003 survey found that 79 percent of survey respondents reported that they would search for local products (Brown 2003). In a 2011 survey supported by a supermarket industry association, 68 percent of respondents cited concern for their local economy as a motivation for buying local (Food Marketing Institute 2011). Growing interest in local

foods can be seen the rise of U.S. farmer markets; the number of farmer markets in the has risen from 1,755 in 1994 (Hinrichs and Eshelman 2014) to 8,720 in 2018 (U.S. Department of Agriculture 2018). This growth is further represented by a 2012 report from the National Farm to School Network that shows a total of 12,000 schools across all fifty states involved in their programs (Hinrichs and Eshleman 2014).

The premise of the local food movement involves knowing the people producing your food, engaging in your community, and recirculating your dollars in your own local economy (Hinrichs and Eshleman 2014). The appeal for consumers includes having access to fresh, quality food, while for producers the appeal lies in consumer markets with higher-values (Hinrichs and Eshleman 2014). Food system localization creates economic opportunities for small farmers, provides fresh food for some consumers, and creates space for community interaction (Harrison 2011). People also choose to buy local because they believe local food to be healthier, to build community, to show that agro-ecosystem services have value, and to connect to an agrarian way of life (Hamm 2007).

The meanings associated with local can impact public perception of quality (Telligman et al. 2017a). How these meanings impact perception can contribute to whether or not people purchase certain types of meat or meat products. Local purchasing decisions may be rooted in the idea of "quality," for instance, notions of quality may be linked to whether or not a product has a particular social, economic, or environmental characteristic (Telligman et al. 2017a).

Media Influence and Framing

While a combination of demographic, psychological, and social factors have been found to influence how people form beliefs, Hula, Hoon, and Zainon (2017) found that

the mass media often serves as the foundation for these beliefs. The media operates as a "risk informer," alerting the public to what ought to be considered problematic, and in turn, this information is used to form a belief (Hannigan 2014). For example, following a red meat food safety incident, if the media functions as a risk informant (Hannigan 2014), their reporting might contribute to the beliefs that people form. Understanding how the media uses frames is important because these frameworks can be woven together to influence beliefs across society (Goffman 1974).

Framing is an interpretative scheme that involves specific approaches to issues, the influential relationships involved, and prospective solutions to these issues (Bocking 2012). According to Goffman (1974), we all have primary frameworks that render otherwise unimportant parts of life into something meaningful, and these meaningful bits are divided into natural and social frameworks which may come together to form beliefs among individuals within social groups. When the media uses framing to present and explain information, specifically why it is consequential, the people involved and the approaches taken to do something are all included in the process (Bocking 2012). For people who acquire information from the media, the steps involved in the process of are important in how new information is understood and related to socially accepted knowledge (Bocking 2012).

Information sharing can be viewed as meaning that has been socially constructed through each individual's view of what is real (Chou and Hiu 2009). Knowledge is not a direct perception of reality, but rather as a society, we have each constructed our own versions of reality (Blazsin and Guldenmund 2015). The meaning given to a concept comes from interactive interpretation that involves multiple people (Chou and Hiu 2009).

Similarly, when applying these ideas to the media, they coincide with the theory of mediation. This theory states that institutional formats of media shape and guide content, as well as everyday life activities (Altheide 2013). The public then normalize these formats and then use them as maintenance tools that support their realities (Altheide 2013).

Observing how the media contributes to the social construction of science gives us an example of the media operating as an informant on problematic issues about a topic, and then framing that topic in ways that impact public perception. For instance, ideas surrounding the practice and credibility of science are negotiated through social relationships between scientists, interest groups, policy actors, and the general public (Bocking 2012). When the media frames the same issue differently, it can trigger alternate interpretations of the issue at hand, which may result in contrasting beliefs on the same topic (Runge et al. 2018). By framing scientific issues in certain ways and choosing to report on particular scientific "facts," the media contributes to the social construction of beliefs (Bocking 2012).

According to Del Vicario et al. (2017), 63% of survey respondents acquired their news from social media, which makes understanding the impact of both mass media and social media even more important. The theory of social networks explains how the media creates a structure through which information flows (González-Bailón and Wang 2016). For example, our societal shift toward dependence on mass media and social media for information have been shown to have a positive influence on health (Nguyen et al. 2016). According to Nguyen et al. (2016), this ranges from emotional support to the maintenance of "norms" that surround healthy behaviors through a sort of informal social

control (Nguyen et al. 2016). Analogous to viewing the mass media through the lens of societal control, some media logic theories argue that communication formats, information technology, and social activities are linked, which implies that decision-making may be influenced by communication and information technology (Altheide 2013). This argument is important because information technology has become a major way that news is consumed (Altheide 2013).

Moreover, when consumers do not have a transparent food system, it is possible that they rely more heavily on mass media for health, nutrition, and food safety information (Runge et al. 2018). Focusing on lean finely textured beef (LFTB), Runge et al. (2018) found that paying attention to LFTB stories resulted in an increase in risk associated with processed foods. When looking specifically at framing, this study found that using the words "pink slime" as opposed to "lean finely textured beef" resulted in a greater likelihood of perceiving ground beef as risky (Runge et al. 2018). This study also suggested that the media's presentation of meat processing as complex or unnatural could lead to a greater likelihood that consumers will perceive this process as risky (Runge et al. 2018). Since the media may aid the public in navigating complex issues (Ten Eyck and Deseran 2004), analyzing how the media frames said issues (e.g., local beef, beef food safety) might explain a dimension of consumers' perceptions.

To examine the relationship between the media and public perception in the context of local beef food safety, the first step is to establish what "local" means and how it is intertwined with beliefs about quality. Next, how social constructionism manifests and can be observed in the way media contributes to the formation of beliefs. Lastly,

depicting how framing functions within media presentation of local beef and beef food safety could matter in how consumers form beliefs and make purchasing decisions.

Methods and Preliminary Analysis

Concurrent with this sub-project is another that focuses on the rhetoric used by the media in the case of local and organic beef. A team comprised of a colleague, my advisor, and myself conducted the research on both projects. The two projects address different topics related to the media and local beef that were fleshed out in the steps that follow. This section includes keyword development, database searches, and coding. Data collection also involved an iterative process of preliminary analysis at each step. Figure 1 illustrates the key steps involved in building a database of articles addressing local beef and food safety in Alabama and Georgia.

Keyword Development

First, beef food safety and handling concerns, as well as several prominent food issues were identified from the literature, as well as the Center for Disease Control and Prevention (CDC) website. The cases included: Jack in the Box hamburger contamination (1992); Listeria outbreak in cold cuts (1998); organic labeling legislation (2002); use of lean finely textured beef (LFTB), more commonly known as "pink slime" (2002, 2009-2013); carbon monoxide use in meat packaging (2006); Taco Bell *E. coli* contamination (2006); Westland/Hallmark animal handling incident (2008); Peanut Corporation of American salmonella incident (2009); *Consumer Reports* profile of beef (2015); Chipotle *E. coli* outbreak (2015); and the "pink slime" lawsuit (2017).

Second, a set of keywords were identified from the alternative food networks (AFN) literature, from the team's assessment of the food safety search results in Access

World News (AWN) (see database searches), and the CDC food recall lists. Keyword List 1 included Beef Packers Incorporated (BPI), pink slime, ABC, FDA, USDA, school lunch, McDonald's, Taco Bell, *E. coli*, salmonella, Diane Sawyer, meat glue, meat, beef, Jamie Oliver, Food Revolution, carbon monoxide, community garden, locavore, Frankensteak, Michelle Obama, Chipotle, Food Inc., *Consumer Reports* plus "How Safe Is Your Beef," NAMI (North American Meat Institute), regulation, and rules (Table 1).

Table 1. Keywords Involved in Different Stages of Data Collection and Coding. This table catalogues the different keyword lists involved in this project.

Name	Keywords
Keyword List 1	Beef Packers Incorporated (BPI), pink slime, ABC, FDA, USDA, school lunch, McDonald's, Taco Bell, *E. coli*, salmonella, Diane Sawyer, meat glue, meat, beef, Jamie Oliver, Food Revolution, carbon monoxide, community garden, locavore, Frankensteak, Michelle Obama, Chipotle, Food Inc., *Consumer Reports* plus "How Safe Is Your Beef," NAMI (North American Meat Institute), regulation, and rules
Keyword List 2	beef, red meat, meat, local, food, organic, natural, grass fed, pasture-raised, humane handling, USDA, food safety, farm market, farmers market, environment, and local food
Keyword List 3	commodities, calendar, NAFTA, menu, recipe, diet, Trump, event, cooking, and SNAP
Query Search List 1	pink slime, Westland/Hallmark, Taco Bell, Jack In the Box, CO in meat packaging, contaminant, *E. coli*, food safety, pathogen, slaughter, processing, and recall

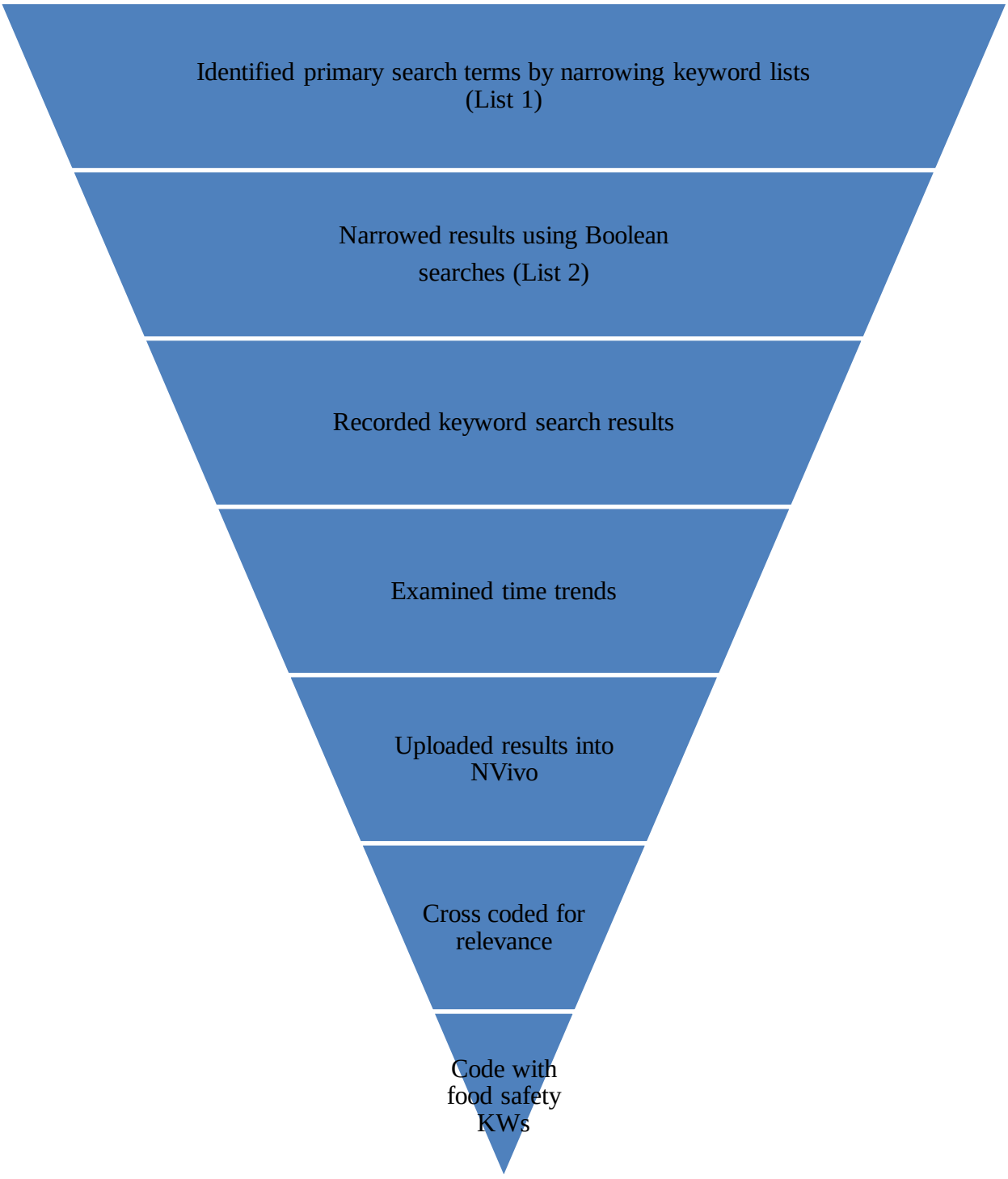


Figure 1. Multi-step Database Development Process. This inverted pyramid represents the narrowing of articles from 3.4 million based on the initial search with Keyword List 1 to the 1,084 articles that resulted from the query searches.

Database Searches

Third Access World News (AWN) is a comprehensive database from NewsBank, Inc. covering a wide array of news publications worldwide. AWN catalogues international, national, local, regional newspapers, newswires, web-only content, blogs, videos, journals, magazines, and transcripts (NewsBank, Inc. 2018). This database is searchable by state, year, and source type. Focusing on Alabama and Georgia news sources, AWN was searched using the keywords (Keyword List 2): beef, red meat, meat, local, food, organic, natural, grass fed, pasture-raised, humane handling, USDA, food safety, farm market, farmers market, environment, and local food. This second keyword list (Keyword List 2) was generated by assessing the search results from the Keyword List 1 searches from and eliminating those associated with irrelevant articles (Table 1).

The team developed a refined set of keywords (Keyword List 3) from an assessment of the results using Keyword List 2. The search results included a large number of irrelevant articles that did not relate to local beef or food safety. The Boolean "NOT" function was used to eliminate data associated with the following, which were determined by examining the most common topic across the irrelevant articles (Keyword List 3): commodities, calendar, NAFTA, menu, recipe, diet, Trump, event, cooking, and SNAP (Table 1).

The final search results were recorded, detrended, and then regressed using Poisson on a series of year indicators (i.e., corresponding food safety events) and state effects, which captured the persistent differences between Alabama and Georgia. This means that the AWN data were tested to determine whether or not there was a significant increase in the raw number of news articles (dependent variable) in the year in which a notable food safety event (independent variable) took place.

The time frame of analysis was narrowed to articles published between 2007 and 2018. This timeframe was chosen because one of the most notorious beef food safety scandals in U.S. history occurred in 2008 (i.e., Westland / Hallmark) and in an effort to avoid missing any data leading up to this event, we also included data from one year prior. The "local food" movement had begun to gain mainstream popularity around this time (Hinrichs and Eshleman 2014).

Transcripts from each source were copied and saved to NVivo, then examined for relevance in the following multi-stage process: (1) data were split between two coders and categorized as relevant/not relevant; (2) the research team swapped datasets to discern inconsistencies and reached consensus for coding; (3) the coders exchanged the data files again and recoded all data.

Coding

The final set of articles were analyzed in NVivo 12 to quantify the food safety events using the following food safety keywords in query searches and "stemmed word search with broad context" function (Query Search List 1): pink slime, Westland/Hallmark, Taco Bell, Jack In the Box, CO in meat packaging, contaminant, *E. coli*, food safety, pathogen, slaughter, processing, and recall (Table 1). This search was conducted using the "stemmed word search with broad context" function codes to display where the word is used and the lines above and below it for context.

The resulting articles from Alabama and Georgia were manually coded for language and rhetoric as a method of noting the articles' tone. This process involved coding all incidences of animal welfare, beef, CO, contaminant, *E. coli*, food safety, grass-fed, Jack in the Box, label, local, local beef, organic, pasture raised, pathogen, pink

slime, recall, restaurant inspection, Taco Bell, and Westland / Hallmark for positive, negative language, or questionable language towards each topic. Articles coded for "questionable" appeared to present both sides of an issue, gave only facts about both points of view, or were found to be unrelated to this research project.

Emergent from the assessment of tone were three themes. These include "shock and awe," "call to action," and "stay the course." The articles were then coded accordingly. "Shock and awe" was used for articles that included inflammatory language to describe beef or beef food safety such as listing the graphic symptoms associated with ingesting different pathogens from beef and describing animal welfare atrocities. "Call to action" includes articles that indicate a need for a lifestyle or a regulatory change in response to a food safety concern or an agriculture practice. It also includes language and details that could inspire someone to make that lifestyle change if they were already concerned about food safety or conventionally produced meat. "Stay the course" are those articles that encourage consumers to trust the dominant agrifood system and continue to eat meat products.

A last round of coding was conducted to reassess the questionable articles. "undeterminable" was chosen as the code after several discussions with the research team. Two key examples of when coding undeterminable was necessary include LFTB and the 2011 Taco Bell lawsuit. Several articles presented the issue of "pink slime" as an unsavory practice, but then specified that the USDA and industry officials support the practice. An example of a LFTB article that fits this description would be:

> Black stuck up for the meat product derisively called "pink slime" with this claim during an April 4 news conference. "Lean, finely textured beef" is made of high-fat slaughterhouse trimmings that are more susceptible to contamination. The meat is often close to the hide, which can come into contact with fecal matter. It's treated with ammonium hydroxide to kill bacteria. The federal government says it's safe. So do some state officials. Some research has concluded it is safe. Still, there are reasons for concern, such as those listed in a 2009 New York Times report. We also find it interesting that our neighbor to the north, Canada, has not permitted "lean, finely textured beef" to be sold there… (Mariano 2012).

In several of these cases, it became necessary to look at the placement of the information for each side of the issue and the title of the articles; the title and location can influence how a reader engages with the material (Hui et al. 2017). Therefore, the tone of the beginning of an article becomes most important as it may be the only part of the article seen by the reader.

The articles regarding Taco Bell used similar placements of information from the contradicting sides. These include the reasons for the lawsuit and then Taco Bell's response, as well as the outspoken support of consumers. Again, the location of the information was considered in the coding. However, context was also important. For example, during the early stages of the lawsuit, before Taco Bell had given a response, the articles tended to report that a law firm was suing Taco Bell because their beef tacos were not 100 percent beef, but instead a meat mixture. These articles were coded as negative because of the language used to describe the mixture. For example:

> WHERE'S THE BEEF? SUIT TAKES AIM AT TACO BELL 'FILLERS' An Alabama law firm has filed suit against Taco Bell Corp., claiming that the fast food giant fills its tacos, burritos and

> other fare not with the beef it advertises, but mostly with "substances other than beef."…(Birmingham News 2011).

Later in the lawsuit life cycle, articles reported that Taco Bell employed an aggressive advertisement and social media campaign. They also had their meat tested and released the results to prove it was at least 88 percent beef (Morrison 2011). For example, an article read,

> The fast-food chain is placing full-page print ads in the Wall Street Journal, USA Today, New York Times and other papers as well as online ads to "set the record straight." The print ads say, in huge letters, "Thank you for suing us. Here's the truth about our seasoned beef." They go on to outline the meat's ingredients…(Schreiner and Skidmore 2011).

Following Taco Bell's media campaign, the law firm dropped the suit, and subsequent articles presented Taco Bell's side of the story using positive tone (e.g. Associated Press 2011). These articles were coded for positive language towards Taco Bell because the lawsuit was dropped and the general public praised the restaurant.

Once the undeterminable articles had been recoded, the last step in this process was matrix coding, in which the original twelve food safety keyword query searches were crossed with the language and rhetoric codes. The matrix code quantifies where the food safety keyword query searches overlapped with the language and rhetoric coding.

Results

The results are divided into four subsections. The first section is a description of the data that covers the twelve keyword query searches and represents the construction of the comprehensive dataset. The second and third sections focus on the language and rhetoric coding of the final food safety dataset (Alabama n=255, Georgia n=829) that was found as a result of the matrix cross-coding. The fourth section narrows in on the matrix

code results to further examine how the language and rhetoric coding compares across each keyword used in the original query searches. Across these last three sections, each article was coded for multiple language and rhetoric codes. Thus, it was possible for an article to be coded for both negative and positive language and rhetoric (e.g. beef negative, food safety negative, and contaminant negative, and grass-fed positive and sustainable positive) (e.g. shock and awe and call to action). As a consequence, the percentages may exceed 100 percent for each variable.

Data Description

Consumers in the Southeast U.S. may have been exposed to nearly 3.4 million unique news articles (Georgia n=2,078,827, Alabama n=1,265,566) that have been published between 1985 and 2018. However, following Boolean searches to remove extraneous material, there were less than 17,000 articles (Georgia n=10,452, Alabama n= 6,137). In the case of Alabama most articles were from newspapers (n=6,049), web-only sources (n=57), and newswires (n=31). In Georgia, the data is composed of newspaper articles (n=10,058) predominantly, but also included newswires (n=41), web-only sources (324), blogs (n=23), and TV transcripts (n=6). The data for this project includes all source types recorded in AWN.

All coefficient estimates from the Poisson analysis were found to be statistically significant ($p<0.01$) and all, but one, are positive (Table 2). The negative coefficient on the Alabama dummy variable is consistent with the state having a smaller population and fewer news outlets than Georgia. Thus, the findings suggest that prominent beef food safety incidents or scares may have led to a statistically significant ($p<0.01$) increase in AFN articles about local beef (Table 2).

Table 2. Poisson Regression. Statistical relationship between the data and the dates of the food safety events in Alabama and Georgia (n=72, 36 years).

Event	Year	P-Value
Jack in the Box	1993	-0.2385*** (0.00005)
Listeria In Cold Cuts	1998	0.4191*** (0.00953)
Organic Labeling Pink Slime (first use)	2002	0.1274*** (0.00953)
Taco Bell *E. coli* CO in Meat Packaging	2006	0.5572*** (0.00000)
Westland / Hallmark	2008	0.9681*** (0.00000)
Peanut Corporation of America[1]	2009	0.1431*** (0.00072)
Pink Slime (ABC News Report)	2011	0.1588*** (0.00072)
Chipotle *E.coli* Consumer Report	2015	0.2610*** (0.00072)
Pink Slime Law Suit	2017	0.4629*** (0.00000)
Pink Slime (full time range)	2009-2013	0.5587*** (0.00000)
AL		-0.6234*** (0.00000)
Constant		5.5163*** (0.00000)

[1]PCA Salmonella outbreak was not meat related, but occurred in GA and garnered national attention.
*p<0.10, **p<0.05, ***P<0.01

Between 2007 and 2018 there were 2,877 news articles on AFNs and local beef in Alabama. However, 255 of these articles note a food safety issue (Table 3). Among the

9% (n=255) of articles that do mention a food safety event, the average use of associated keywords was approximately twice per article. During this same time frame, there were 4,779 unique news articles on AFNs and local beef in Georgia. Upon further analysis of the data, only 17% (n=829) of these articles note a food safety issue (Table 3). Within the 17% (n=829) of articles that do mention an event, the average use of associated keywords was approximately one time per article.

Among the food safety keyword query searches processing and recall were the most commonly encountered, 44% and 37% respectively, in Alabama (Table 3). In other words, if an Alabama consumer read an AFN article on local beef, and the article addressed a food safety issue, processing or recall were the terms most likely encountered. Another notable result of the keyword query searches is contaminant at 34% (Table 3). While *E. coli*, food safety, slaughter, and pathogen all occurred less than 30% of the time (Table 3). In contrast, the food safety scandals (i.e., pink slime, Westland / Hallmark, Taco Bell, CO in meat packaging, and Jack in the Box) were encountered in less than 10% of these articles (Table 3).This shows that while the food safety incidents were mentioned in articles, they received less attention than more general red meat food safety topics.

Table 3. Keyword Query Searches. This table illustrates the number of references that resulted from each keyword (Query Search List 1) within the Alabama articles (n=255). This includes all the publication types searched from Access World News.

Keywords	N Articles (%)	Total KW Usage (#)	Average per Article
Pink Slime	5 (1.96)	10	2.00

Westland Hallmark	5 (1.96)	10	2.00
Taco Bell	23 (9.02)	86	3.74
Jack in the Box	3 (1.17)	3	1.00
CO in Meat Packaging	0 (0.00)	0	0.00
Contaminant	86 (33.73)	154	1.79
E. coli	61 (23.92)	158	2.59
Food Safety	71 (27.84)	105	1.48
Pathogen	10 (3.92)	13	1.30
Slaughter	67 (26.27)	93	1.39
Processing	111 (43.53)	165	1.49
Recall	93 (36.47)	255	2.74
Total Unique Articles	255	1,052	1.96

Within the Georgia data, contaminant and processing were the most commonly encountered terms as a result of the query searches, 57% and 60% respectively (Table 4). Thus, if a Georgia consumer read an AFN article on local beef, and the article addressed a food safety issue, contaminant and processing were the terms most likely to be seen. Other notable results from the keyword query searches (Query Search List 1) include food safety at 47% and recall at 36% (Table 3). In contrast, *E. coli*, pathogen, and slaughter each occurred less than 25% of the time (Table 4). The "scandal" specific keywords (i.e., pink slime, Westland / Hallmark, Taco Bell, CO in meat packaging, Jack in the Box) were each encountered in the data less than 11% of the time (Table 4). Like

Alabama, this illustrates that while the food safety events are mentioned in the Georgia media, it is still at a much lower rate than the general red meat food safety terms.

Table 4. Keyword Query Searches. This table shows the number of references that resulted for each keyword (Query Search List 1) within the Georgia articles (n=829). This includes all the publication types searched from Access World News.

Keywords	**N Articles (%)**	**Total KW Usage**	**Average Per Article**
Pink Slime	85 (10.25)	8	0.09
Westland Hallmark	13 (1.57)	19	1.46
Taco Bell	24 (2.90)	35	1.46
Jack In The Box	5 (0.60)	6	1.20
CO in Meat Packaging	0 (0.00)	0.00	0.00
Contaminant	472 (56.94)	215	0.45
E. coli	186 (22.43)	259	1.39
Food Safety	390 (47.04)	151	0.39
Pathogen	72 (8.69)	19	0.26
Slaughter	53 (6.39)	62	1.17
Processing	413 (49.82)	208	0.50
Recall	299 (36.07)	715	2.39
Total Unique Articles	829	1,697	0.98

Language Coding

For the purposes of this project, language is defined as not only whether the author of an article expresses support for a topic, but if the facts of the article could be perceived as framing the topic in a negative or positive manner. However, when coding language other factors, such as title and location of positive or negative text within the article may become important (see methods). As Hui et al. (2017) outlined, the text within news media may not always contain language that explicitly supports one side of an issue. The language coding results are broken down by state so that occurrences of negative and positive language can be compared between Alabama and Georgia.

Out of the 255 Alabama articles from the query searches, the language coding for the food safety incidents resulted in negative language towards Westland / Hallmark in 6% of the articles (Figure 2). Other food safety events that included negative language were pink slime (3%), Taco Bell (2%), restaurant inspection (3%), and Jack in the Box (0.8%) (Figure 2). Whereas in the Alabama articles positive language was only used to discuss Taco Bell positive (4%), and pink slime positive (0.8%) (Figure 2).

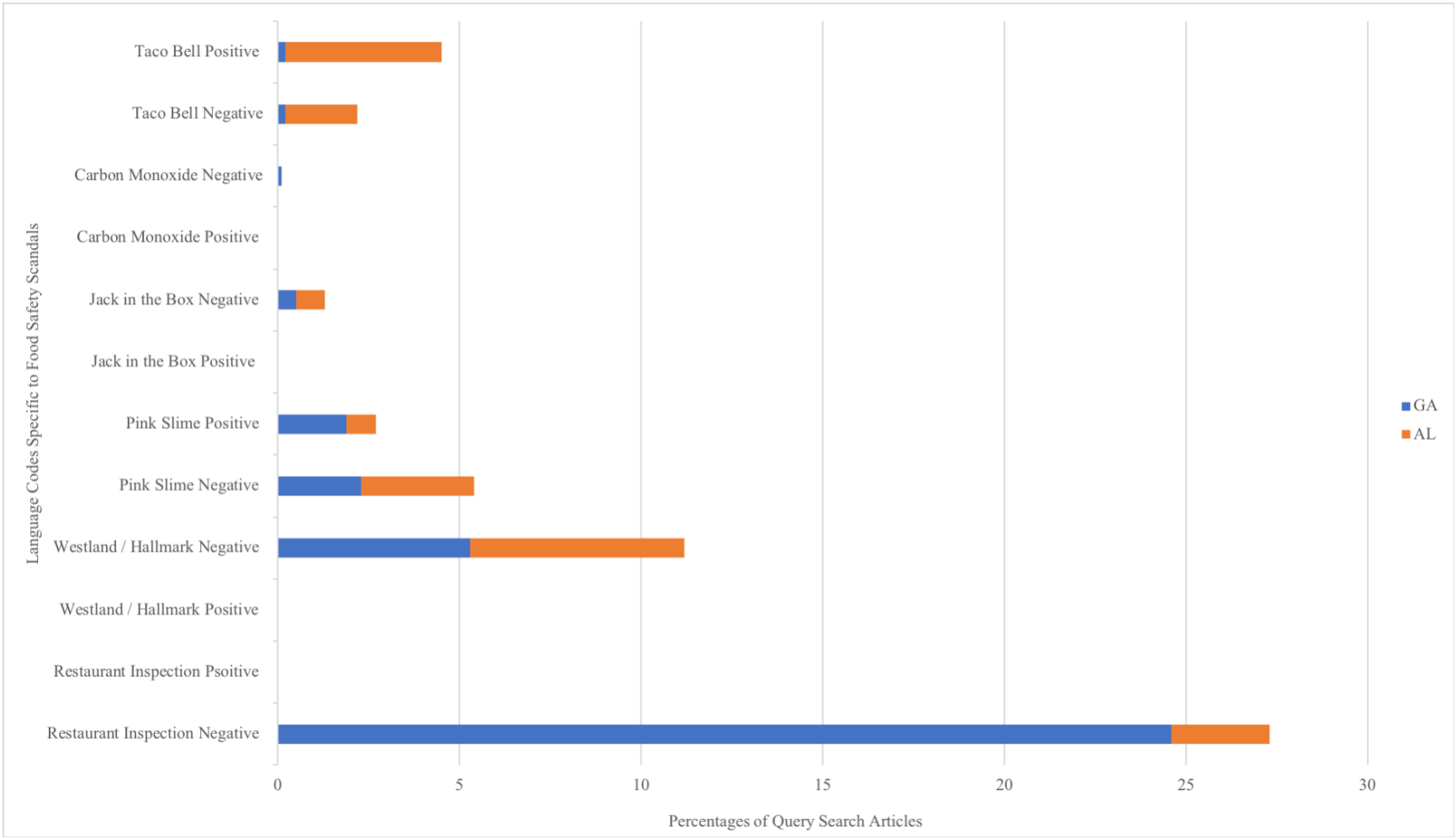
The negative language for the food safety events in Georgia (Figure 2) resulted in restaurant inspection negative being present in 25% of the 829 articles created by the query searches. Negative language among these articles occurred towards Westland / Hallmark (5%), pink slime (2%), Jack in the Box (0.5%), CO (0.12%), and Taco Bell (0.2) (Figure 2). In contrast, the positive language coding specific to the food safety events for these articles included pink slime (2%) and Taco Bell (0.2%) (Figure 2).

The matrix code did not result in any positive language in the food safety database for restaurant inspection, Westland / Hallmark, Jack in the Box, or CO in meat packaging. Furthermore, negative language for CO in meat packaging was found in the

Georgia articles, but not in the Alabama articles. These results illustrate that language associated with the specific beef food safety events occurred at a smaller rate. With negative language being more often associated with the events than positive across both states, given that positive language was only encountered for pink slime and Taco Bell.

For Alabama (n=255), the most often encountered negative language code was found in discussions of beef which occurred in 55% of the articles (Figure 3). Other notable negative language occurred in reference to contaminant (51%), food safety (51%), pathogen (43%), and recall (36%), *E. coli* (26%), animal welfare (8%), and sustainable (4%) (Figure 3). Pasture-raised (0.4%), local beef (0.4%), and organic (0.4%) were encountered the least often (Figure 3). In contrast, beef (27%), food safety (22%), local (15%), sustainable (14%), local beef (13%), and organic (12%) were the most commonly encountered positive language codes (Figure 4). Pasture-raised (11%), grass-fed (11%), and animal welfare (9%) occurred in the next highest group (Figure 4). While contaminant (1%) and pathogen (0.4%) occurred the least often (Figure 4).

Figure 2. Language Coding Specific to Food Safety Incidents in Georgia and Alabama. The percentages are of articles from the query searches (Alabama n=255, Georgia n=829) across all publication types.



For Georgia (n=829), negative language was most often focused on beef, which was present in 67% of the articles (Figure 3). Negative language was also used to reference food safety (61.2%), contaminant (51%), pathogen (26%), and recall (25%) (Figure 3). *E. coli* (15%), animal welfare (6%), sustainable (1%), organic (0.5%), grass-fed (0.4%), and pasture raised (0.2%) make up the less frequently encountered negative language (Figure 3). In contrast, beef (24%), organic (15%), sustainable (15%), pasture-raised (15%), grass-fed (15%), local (14%), and local beef (14%) were the most notable associated with positive language (Figure 4); and food safety (8%), animal welfare (4%), contaminant (0.24%), pathogen (0.4%), and *E. coli* (0.4%) occurred the least often (Figure 4).

In sum, negative language was encountered more often than positive language, across both states, in the case of beef and the food safety associated keywords. Positive language tended to be used when referring to buying local and AFNs across both states. In both states negative language for beef and food safety were countered with positive language on those same topics. However, negative language surrounding contaminant was countered with little positive language.

Figure 3. Negative Language Coding in Georgia and Alabama. The percentages of articles that resulted from the query searches (Alabama n=255, Georgia n=829) across all publication types.

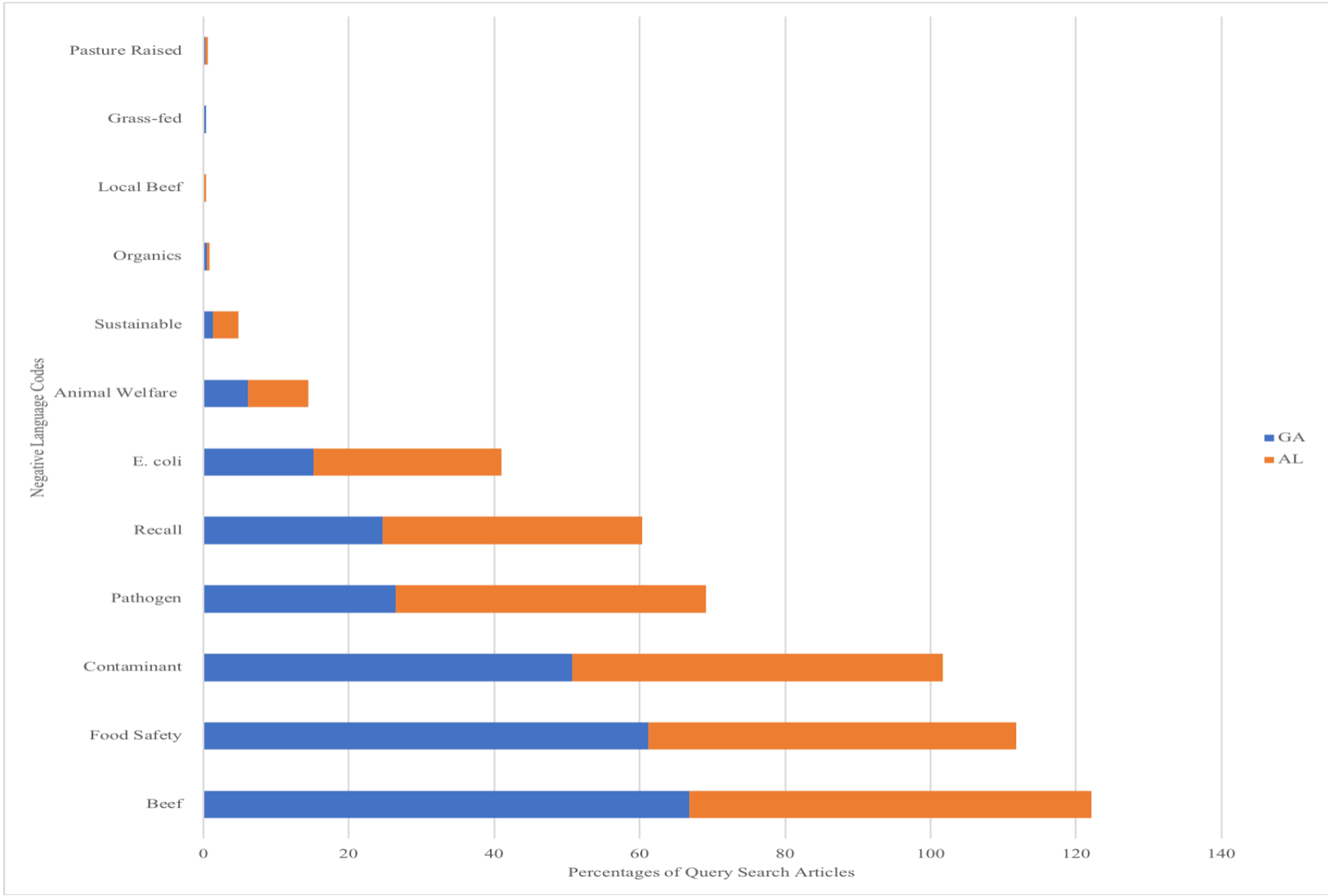
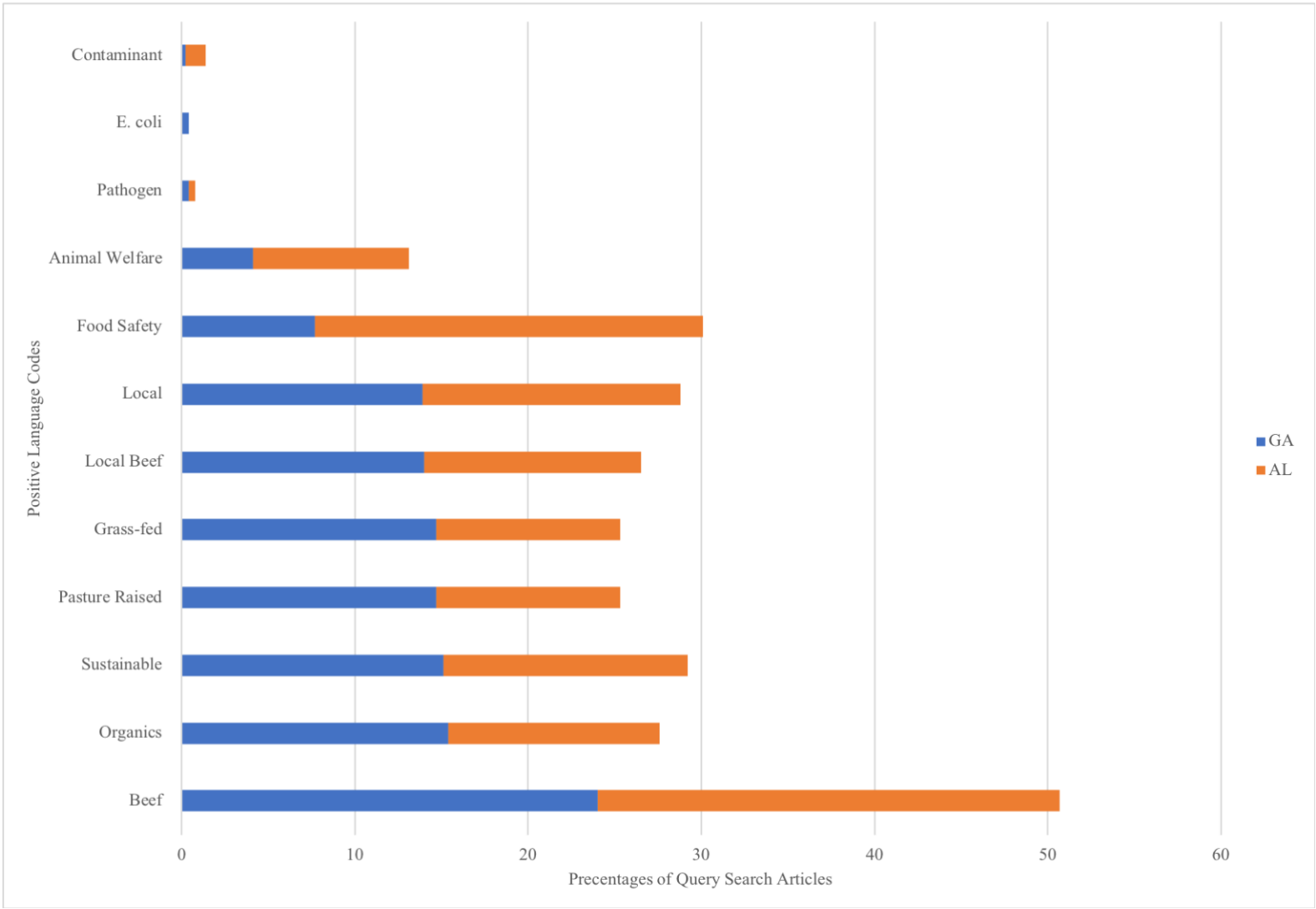


Figure 4. Positive Language Coding in Georgia and Alabama. The percentages of articles that resulted from the query searches (Alabama n=255, Georgia n=829) across all publication types.

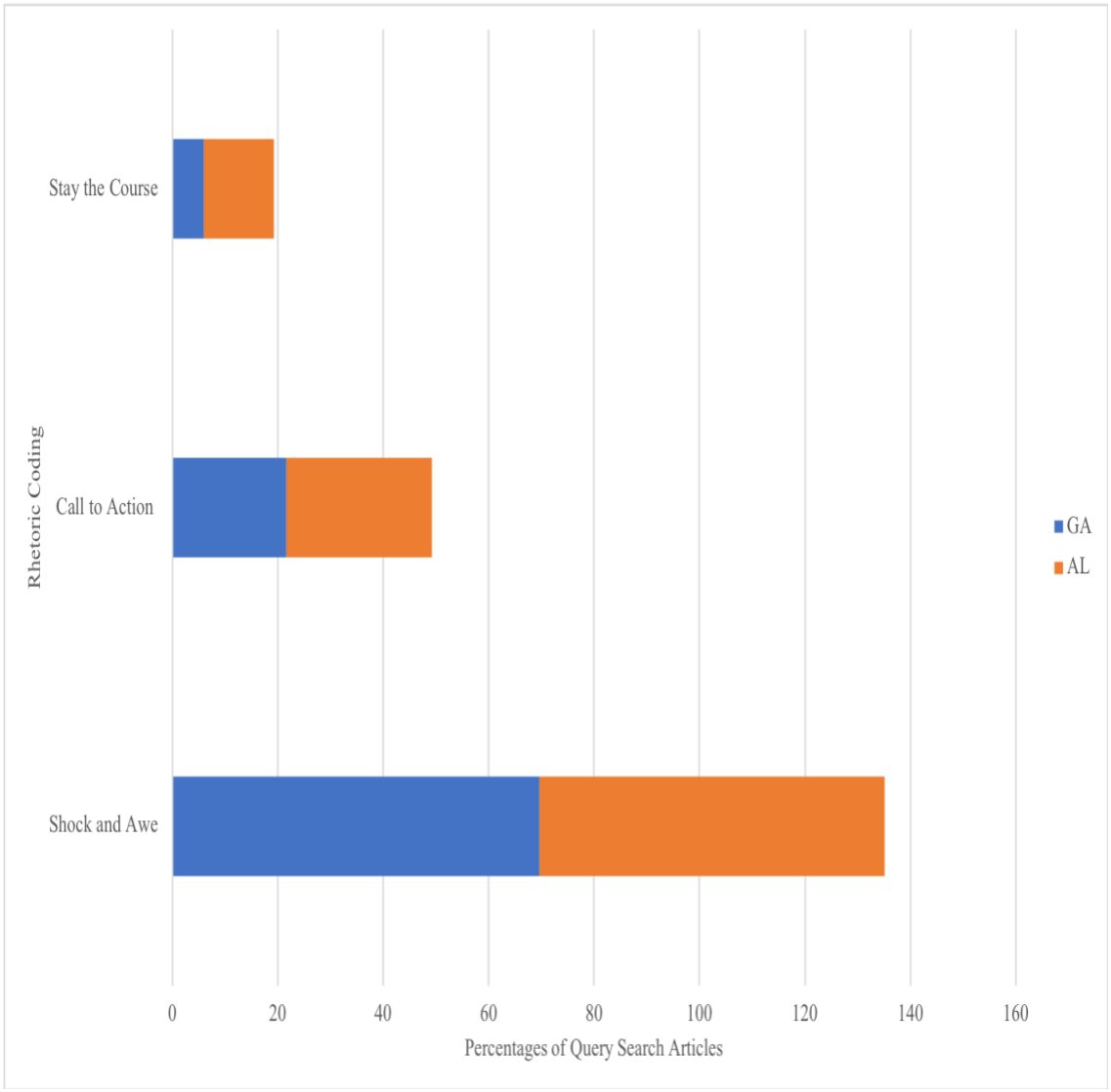


Rhetoric Coding

The rhetoric and frames used by the media are important because they can come together to aid the public in understanding issues that garner media attention, while also injecting the understanding of these issues with the meaning associated with the rhetoric and frames being used (Hannigan 2014). Much like the language coding, these results are broken down by state so the occurrences of each type of rhetoric can be compared between Alabama and Georgia and are an analysis of the articles that resulted for each state from the query searches (Alabama n= 255, Georgia n =829). The rhetoric coding for Alabama resulted in "shock and awe" (66%), "call to action" (28%), and "stay the course" (13%) (Figure 5). Whereas the rhetoric coding for Georgia was "shock and awe" (70%), "call to action" (22%), and "stay the course" (6%) (Figure 5). This shows that the rhetoric most commonly used by the media in both states involved inflammatory and alarming language, while rhetoric that encouraged consumers to trust conventional agriculture was seen least often across both states.

Overall, following the matrix cross-code, only 13 undeterminable codes occurred within the Alabama articles (n=255), and 10 were encountered in the Georgia articles (n=829). The highest undeterminable results in the food safety database for Alabama are grass-fed (1%), food safety (0.8%), and pasture raised (0.8%). The highest undeterminable results in the food safety database for Georgia are food safety (0.6%) and beef (0.2%).

Figure 5. Rhetoric Coding in Georgia and Alabama. The percentages of articles that resulted from the query searches (Alabama n=255, Georgia n=829) across all publication types.



Presentation of Local Beef Food Safety

Analysis of the language and rhetoric from the matrix code of the food safety articles (Alabama n=255, Georgia n=829) revealed a pattern within the data. This pattern can be further examined by focusing on the individual keywords from the original query searches (Query Search List 1) and how the language and rhetoric coding compares on by

individual term. This pattern involved three groupings within the data that follow the rate at which language and rhetoric were seen within the articles.

The first group includes "shock and awe" rhetoric and negative language towards beef and the food safety associated keywords (i.e., food safety, contaminant, pathogen). The most prominent in Alabama was "shock and awe" rhetoric, which occurred in 100% of the articles that mentioned Westland / Hallmark, 100% of the articles that reference pathogen, and 94% of the articles that dealt with recall (Table 7). Following this in occurrence, was negative language towards beef, which occurred in 100% of the articles that mentioned Westland / Hallmark, 90% of the articles that referenced *E. coli* and 83% of the articles that mentioned recall (Table 5). Negative language towards food safety also occurred in 100% of the articles that referenced Westland / Hallmark, 84% of the articles that mentioned *E.coli*, and 80% of the articles that referenced recall (Table 5). Among the Georgia data, most notable was "shock and awe," which was seen in 100% of the Westland / Hallmark articles, 87% of the articles that reference *E. coli*, and 85% of the articles that mention recall (Table 8). Following this in prominence for Georgia, negative language towards beef also occurred in 100% of the articles that referenced Westland / Hallmark, 83% of the articles that mentioned Taco Bell, and 81% of the articles that referenced recall (Table 6). Negative language towards food safety was also found in 100% of the articles that mentioned Westland / Hallmark, 76% of the articles that reference recall, and 75% of the articles that mention Taco Bell (Table 6). Another notable result from this analysis is that while food safety scares were mentioned in the AFN articles rarely, when they were it was negative.

The second group in this pattern includes "call to action" rhetoric and positive language towards the keywords associated with AFNs (i.e., organic, sustainable, grass-fed, local). Within the Alabama data, "call to action" rhetoric occurred in 40% of the articles that reference pathogen and 37% of the processing articles (Table 7). While positive language towards organics and sustainable occurred in 20% of the articles that mentioned processing (Table 5). In Georgia, "call to action" rhetoric was seen in 33% of articles that referenced pink slime and 32% of the slaughter articles (Table 8). Whereas, positive language for organic was found in 25% of the articles that mention pink slime and 19% of the articles that reference processing (Table 6). Moreover, positive language for sustainable occurred in 20% of the pink slime articles and 20% of the processing articles (Table 6).

The final group within the coding pattern were those encountered the least often. This group is made up of "stay the course" rhetoric, positive language towards beef and associated food safety terms, and negative language for the terms associated with AFNs. In Alabama, "stay the course" rhetoric was seen in 48% of the Taco Bell articles and 12% of the articles that reference slaughter (Table 7). Positive language towards beef occurred in 39% of the articles that mentioned Taco Bell, while positive language towards food safety was also highest in articles that mentioned Taco Bell at 48% (Table 5). Among the Georgia data, "stay the course rhetoric" occurred in 36% of the pathogen articles and 33% of the articles that mention food safety (Table 8). Positive language for beef was found in 40% of the articles that mention pink slime and 38% of the articles that reference pathogen (Table 6). Positive language for food safety occurred in 39% of the articles that mention pathogen (Table 6).

Table 5. Prominent Language Matrix Coding in Alabama (n=255). These numbers breakdown the language cross-coding by individual keywords for the query searches. The percentages are based on the article total for each keyword listed.

Keyword Query Searches	Total Cross Coded Articles	Beef Negative (%)	Food Safety Negative (%)	Beef Positive (%)	Food Safety Positive (%)	Organic Positive (%)	Sustainable Positive (%)
Recall	93	77 (83.80)	74 (79.57)	8 (8.60)	11 (11.82)	3 (3.23)	3 (3.23)
Processing	111	44 (39.64)	41 (36.94)	37 (33.33)	22 (19.82)	22 (19.82)	22 (19.82)
Pink Slime	5	1 (20.00)	1 (20.00)	0 (0.00)	0 (0.00)	1 (20.00)	1 (20.00)
Pathogen	10	7 (70.00)	4 (40.00)	0 (0.00)	6 (60.00)	1 (10.00)	1 (10.00)
Food Safety	71	48 (67.61)	45 (63.38)	10 (14.08)	24 (33.80)	1 (1.41)	1 (1.41)
E. coli	61	55 (90.16)	51 (83.60)	3 (4.92)	8 (13.11)	3 (4.92)	3 (4.92)
Contaminant	86	73 (84.88)	69 (80.23)	1 (1.16)	14 (16.28)	2 (2.33)	2 (2.33)
Westland Hallmark	5	5 (100.00)	5 (100.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
Taco Bell	23	13 (56.52)	8 (34.78)	9 (39.13)	11 (47.83)	2 (8.70)	3 (13.04)
Slaughter	67	35 (52.24)	28 (41.79)	19 (28.35)	16 (23.88)	11 (16.42)	13 (19.40)

Table 6. Prominent Language Matrix Coding in Georgia (n=829). These numbers breakdown the language cross-coding by individual keywords for the query searches. The percentages are based on the article total for each keyword.

Keyword Query Searches	Total Cross Coded Articles	Beef Negative (%)	Food Safety Negative (%)	Beef Positive (%)	Food Safety Positive (%)	Organic Positive (%)	Sustainable Positive (%)
Recall	299	243 (81.27)	232 (77.59)	38 (12.71)	19 (6.35)	34 (11.37)	33 (11.03)
Processing	413	256 (61.9)	231 (55.93)	122 (29.54)	40 (9.69)	80 (19.37)	82 (19.85)
Pink Slime	85	49 (57.65)	44 (51.76)	34 (40.00)	21 (24.71)	21 (24.71)	17 (20.00)
Pathogen	72	36 (50.00)	18 (25.00)	27 (37.50)	28 (38.88)	8 (11.11)	9 (12.50)
Food Safety	390	265 (67.94)	232 (59.49)	94 (24.10)	44 (11.28)	73 (18.72)	68 (17.44)
E.coli	186	148 (79.57)	132 (70.97)	33 (17.74)	32 (17.20)	29 (15.59)	25 (13.44)
Contaminant	472	342 (72.46)	312 (66.10)	101 (21.40)	24 (5.08)	67 (14.19)	58 (12.29)
Westland Hallmark	13	13 (100.00)	13 (100.00)	0 (0.00)	0 (0.00)	2 (15.38)	2 (15.38)
Taco Bell	24	20 (83.33)	18 (75.00)	2 (8.33)	4 (16.67)	1 (4.17)	1 (4.17)
Slaughter	53	28 (52.83)	31 (58.49)	12 (22.64)	4 (7.55)	9 (16.98)	10 (18.87)

Table 7. Prominent Rhetoric Matrix Coding in Alabama (n=255). These numbers breakdown the rhetoric cross-coding by individual keywords for the query searches. The percentages are out of the article total for each keyword.

Keyword Query Searches	**Total Cross Coded Articles**	**Shock and Awe (%)**	**Stay the Course (%)**	**Call to Action (%)**
Recall	93	87 (93.55)	6 (6.45)	13 (13.98)
Processing	111	55 (49.55)	11 (9.91)	41 (36.94)
Pink Slime	5	1 (20.00)	0 (0.00)	1 (20.00)
Pathogen	10	10 (100.00)	0 (0.00)	4 (40.00)
Food Safety	71	56 (78.87)	5 (7.04)	18 (25.35)
E. coli	61	56 (91.80)	2 (3.28)	12 (19.67)
Contaminant	86	79 (91.86)	4 (4.65)	19 (22.09)
Westland Hallmark	5	5 (100.00)	0 (0.00)	0 (0.00)
Taco Bell	23	18 (78.26)	11 (47.83)	4 (17.39)
Slaughter	67	41 (61.19)	8 (11.94)	24 (35.82)

Table 8. Prominent Rhetoric Matrix Coding in Georgia (n=829). These numbers breakdown the rhetoric cross-coding by individual keywords for the query searches. The percentages are out of the article total for each keyword.

Keyword Query Searches	**Total Cross Coded Articles**	**Shock and Awe (%)**	**Stay the Course (%)**	**Call to Action (%)**
Recall	299	255 (85.28)	17 (5.69)	58 (19.40)
Processing	413	278 (67.31)	36 (8.72)	113 (27.36)
Pink Slime	85	65 (76.47)	23 (27.06)	28 (32.94)
Pathogen	72	46 (63.89)	19 (26.39)	14 (19.45)
Food Safety	390	282 (72.31)	33 (8.46)	101 (25.90)
E.coli	186	161 (86.56)	26 (13.9)	50 (26.88)
Contaminant	472	342 (72.46)	28 (5.93)	92 19.49)
Westland Hallmark	13	13 (100.00)	0 (0.00)	3 (23.08)
Taco Bell	24	20 (83.34)	2 (8.34)	2 (8.34)
Slaughter	53	34 (64.15)	5 (9.43)	17 (32.08)

Review of key food safety events (i.e., Westland / Hallmark, pink slime, the Taco Bell lawsuit) found that they tend to follow a general pattern in the news. The pattern involves a practice, identified as safe by a federal agency, which is called into question. It is brought to the public's attention through media exposure and typically framed as a risk. The case of Westland/Hallmark, the largest beef recall in U.S. history (Runge et al. 2018), provides one such example (Figure 6).

In short, the Humane Society released an undercover video in 2008 that included a "downed cow" (i.e., non-ambulatory) forced into a slaughter facility. This practice was in violation of animal handling regulations. The video prompted the USDA to recall 143 million pounds of beef, 37 million of which was destined for the national school lunch program (Wald 2008). The cow was suspected to have Bovine Spongiform Encephalopathy (BSE), commonly known as "mad cow disease" (Runge et al. 2018) or to have pathogens on its hide from laying on the ground. Based on the keyword query searches between both states 18 articles mentioned the Westland / Hallmark case by name. However, the matrix cross-code resulted in 59 articles that discussed the events related to the Westland / Hallmark incident with negative language across both states. This suggests that some articles discussed Westland / Hallmark using negative language without using the name of the slaughter facility specifically. In addition to federal investigation, public outcry for transparency contributed toward the CEO testifying before a Congressional committee and then facing sanctions (Wald 2008). As a result of this scandal, legislation was updated to require that cattle slaughter facilities report non-ambulatory cattle to FSIS inspectors (Beck 2009).

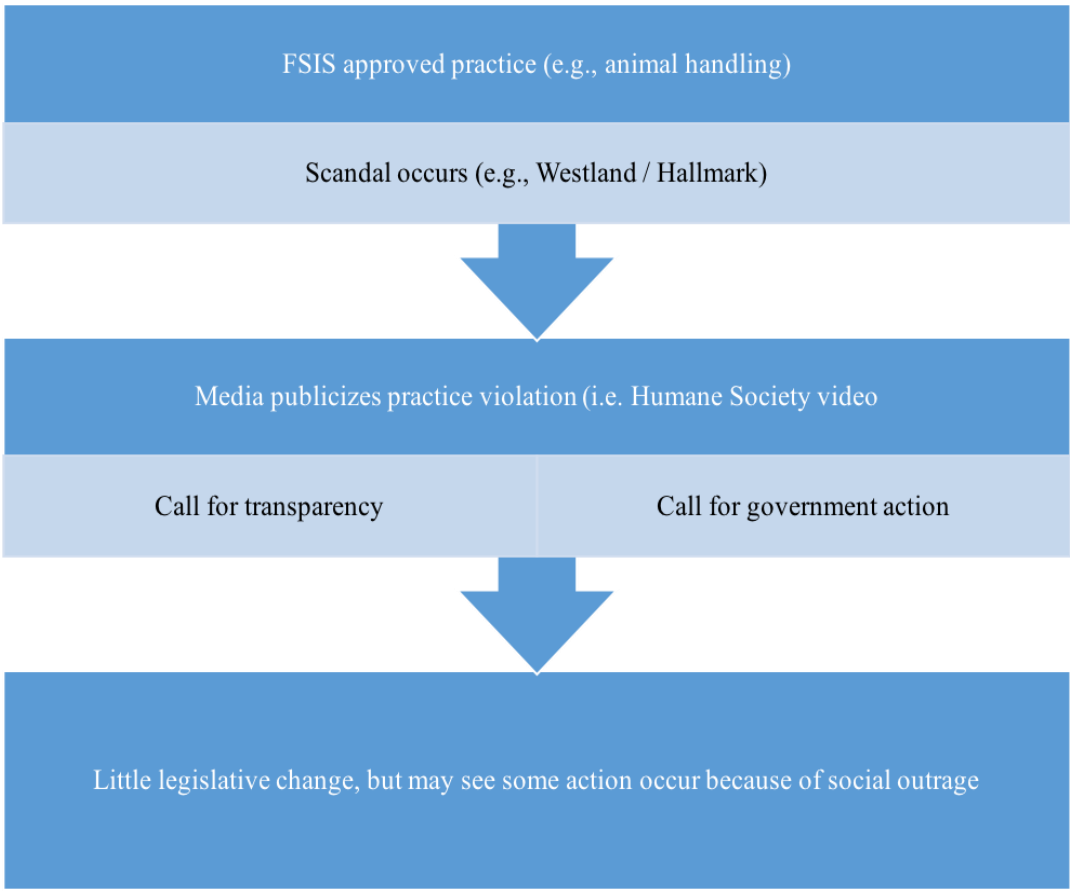


Figure 6. Progression of Events in the Westland / Hallmark Case. The media pattern is represented here through the events that took place in the Westland / Hallmark incident. Of the articles that referenced Westland / Hallmark, 100% of them used negative language towards beef and food safety.

Discussion

The discussion illustrates media coverage of food safety and local beef as well as how this coverage might influence consumers' food safety perception associated with local beef. To demonstrate the pattern observed, this discussion will examine the highest occurring and most consequential language and rhetoric codes from the overall database (Alabama n=255, Georgia n=829). The first notable occurrence involved the most commonly used language and rhetoric across both states; negative language towards beef and food safety typically coincided with "shock and awe" rhetoric. The second group is

comprised of positive language associated with buying local and sustainability, as well as "call to action" rhetoric. The final group, with the fewest number of articles, consisted of negative language toward buying local, and positive language toward food safety, and "stay the course" rhetoric. This section provides examples of these patterns and suggests why these patterns might be meaningful.

The first grouping within this pattern include the highest codes that resulted from the matrix cross-coding, with "shock and awe" being coded the most often for both states. When combining the high occurrence of "shock and awe articles," beef negative articles, and food safety negative articles in both Alabama and Georgia, it displays the potential to for negative perception to be associated with beef and food safety. The kind of rhetoric associated with "shock and awe" ranged from detailed descriptions of the symptoms associated with different foodborne illnesses, and the potential ways conventional agriculture might be contaminated, to the negative impacts the current agricultural system can have on the environment or the animals involved. An example emblematic of this approach is:

> Zemco Industries has recalled approximately 380,000 pounds of deli meat that may be contaminated with bacteria that can cause potentially fatal disease. The U.S. Department of Agriculture says the meats may be contaminated with Listeria monocytogenes…The USDA says consumption of foods contaminated with Listeria monocytogenes can cause listeriosis, an uncommon but potentially fatal disease. Healthy people rarely contract listeriosis…It can cause high fever, severe headache, neck stiffness and nausea. Listeriosis can cause miscarriages and stillbirths, as well as serious and sometimes fatal infections in those with weakened immune systems…. (George 2010).

While the article about Zemco focused on the alarming language used to show the symptoms of listeriosis and associated deli meat with death, the following article on dairy and dairy alternatives demonstrates use of this language and rhetoric focused on production practices.

> The commercial with the man dressed as a cow with a needle sticking out of his arm says it clearly, buy organic and grass-fed. It's the milk or dairy or non-dairy product we want. Even non-dairy items can be loaded with hormones, pesticides and antibiotics, not to mention herbicides. Another issue to look for is to make sure items are not raised by animals eating GMO corn or crops… (Ranieri 2013).

Based upon these results, it could be concluded that both consumers in Alabama and Georgia are exposed to news that employs shocking and inflammatory rhetoric and negative language most often from the articles associated with food safety. Food safety negative was coded a bit more broadly to include restaurant inspections and recalls or incidents related to other commodities. This was done because if there is a steady stream of that kind of information mixed with negative language and framing of beef, then it may not be difficult for a consumer to think, "How could this apply to other parts of my diet?" Simultaneously, negative language towards contaminant was also encountered frequently within the articles, but what could be most impactful about this is that positive language was not. Therefore, consumers may be more susceptible to view food safety and beef more negatively when associated to contaminations because there is not much exposure to positive language to counter the negative.

The second group within the pattern focused on positive language associated with AFNs and "call to action" rhetoric. With positive language towards sustainability, organic, and local beef being encountered most often. The importance of the AFN language group of coding is that it follows the food safety rhetoric and negative language group coding frequency. This means that following consumer in Alabama and Georgia are exposure to negative language towards food safety or beef, and "shock and awe" rhetoric, they may also be exposed to a body of articles that use positive language toward buying local. The following excerpt from an article coded in this group exemplifies "call to action" rhetoric by encouraging a change in farming and shopping habits, as well as using positive language towards organics and sustainability.

> There are also moving retellings from food advocate and mom Barbara Kowalcyk, whose son, Kevin died 12 days after eating a hamburger contaminated with *E. coli* 0157:H7 in 2001…The food industry's answer, as conveyed in the film, is to treat our ground beef with ammonia, a construct devised by huge industries such as Beef Products Inc., at a large profit…God forbid we should change the way we farm. Or change the way we process beef… A fact proved by Wal-Mart's choice (in 2006) to include organic groceries and products on its shelves. Why did it go green (at least in part)? Because we told it to. We told it to with our wallets. Get involved. Start a revolution. We can create change -- one table at a time… (Ford 2009)

It is especially worth noting that "call to action" is above 20% for both states following that negative beef food safety coverage. "Call to action" ranged from articles that explicitly called the reader to shop local or eat alternatively produced beef and agriculture like the one above to farmers market announcements and health food store information. The articles that used rhetoric associated with "call to action" may not

always have explicitly included a call to action like the example above does. However, after being exposed to negative language and alarming rhetoric towards beef and food safety, there may be potential for just reading about organic produce and grass-fed beef in farmer market announcements and farm profiles to push the consumers to consider a purchasing change given the negative beef and food safety articles they've engaged with.

The final, notable, group expresses support for conventional agriculture through positive language and "stay the course" rhetoric. One of the highest codes within this support for conventional agriculture group was beef positive, while the other prominent codes in this group include food safety positive, and "stay the course" rhetoric. With respect to this group, some discrepancies can be observed between Alabama and Georgia. Georgia follows the pattern with the numbers for positive language towards food safety being lower than the occurrence of negative language towards food safety. However, in Alabama, while positive language towards beef and food safety is still encountered less frequently than negative language towards beef and food safety, it does occur more often than in Georgia. The following article is representative of "stay the course" rhetoric, as well as negative language towards organics and AFNs.

> Organic agriculture also rejects genetically improved foods, also known as GMOs. To make growing crops more productive, most corn and soy has been genetically improved through modern biotechnology, which is not allowed under organic agriculture even though conventional breeding has genetically manipulated crops throughout history. Organic's rejection of GMOs is unfortunate. Genetically improved foods have reduced the use of herbicides and, according to EPA and USDA researchers, have led to farmers using less-toxic chemicals as well. Meanwhile, animal rights activists also claim that meat is unfriendly to the environment and responsible for much of our

> global greenhouse gas emissions. In fact, Environmental Protection Agency data provides a different take. All of meat production is responsible for less than 3 percent of the U.S.'s total emissions. That's far from planet-dooming. The conclusion isn't that Americans should go vegetarian, as animal rights activists argue. It's that we should help the rest of the world catch up to America's farming efficiency… (Coggins 2014).

An explanation for positive language towards beef being higher for both states is that even references to local beef, grass-fed beef, pasture-raised beef were coded as beef positive because while these articles were advocating for alternatively produced beef, they were still positive for the industry overall. The higher percentage of food safety positive codes within Alabama may be explained by the 2017 detection of BSE in a cow in Alabama. This incident received coverage in local news. Because the BSE was detected before the tainted beef entered the food supply, it was often interpreted as a food safety victory and used to encourage consumers to trust conventionally produced beef and food safety. This excerpt from an article displays this occurrence within the Alabama data:

> "The Alabama beef industry is vital to our state's agriculture economy," Alabama Agriculture Commissioner John McMillan said in a news release. "The response to this case by USDA officials and our department's professionals led by State Veterinarian Dr. Tony Frazier has been exemplary. This instance proves to us that our on-going surveillance program is working effectively" … (The Huntsville Times 2017).

"Call to action" occurred more often than "stay the course" in both states. This occurrence is potentially important because it means that consumers were reading articles with "call to action" rhetoric that might encourage AFNs more often than articles with

"stay the course" rhetoric that presented the current system is safe and trustworthy. With the influx of negative beef food safety coverage, it could be difficult for an article to indirectly imply that the system is safe whereas farmer's markets articles listing grass-fed and pasture-raised could have this potential to indirectly imply that alternatively produced meat is safer or healthier.

Focusing more specifically the beef food safety events for language, the highest of which was negative language toward Westland / Hallmark. While articles that mention Westland / Hallmark by name did not occur frequently, 100% of the articles that did were found to use "shock and awe" rhetoric plus negative language towards beef and food safety. This means that consumers may not have encountered many articles on Westland/ Hallmark within the given time frame, but when they did encounter them there was potential to create a negative perception towards beef and food safety. An example indicative of this approach would be:

> …The threat of meat contamination from these sick animals is putting consumers at high risk. Why didn't inspectors notice this long ago? It is long overdue to strengthen laws against abuse of animals. Meat-packing employees should put the animals down in an ethical and humane manner, and they ought to be under strict and regular observation. It is beyond my understanding that these people can let their sadistic ways out on those poor helpless creatures that are doomed for the dinner table and have to endure barbaric torture before slaughter. To them, the cows obviously are just meat without feelings… (The Anniston Star 2008)

Negative language for pink slime is also noteworthy given the national media attention the incident received. An example of this language would be:

> Our commissioner, Gary W. (pink slime) Black, has decided the voting public of Georgia don't need to be protected from pink slime in your meat products….For years, meat producers have been recovering scraps from cow carcasses, centrifuging out the fat, treating the remains with ammonia gas to kill bacteria, and using it as filler in products such as ground beef. Ammonia is highly toxic…. How do you really know how much ammonia you are ingesting with the addition of pink slime to your meat...Since it is a waste product in the beginning, why not sell it to dog and cat food manufacturers? It may not be safe for the dogs and cats... (The Macon Telegraph 2012).

While the previous quote shows an example of negative language towards pink slime, the following illustrates the alternative of this with positive language towards pink slime.

> "Pink slime" is a recently coined, inaccurate and pejorative term for the product. LFTB is safe. The process used to produce LFTB was developed more than 30 years ago…There are no human health hazards associated with the product, and the process to produce it aids in keeping ground beef lower in fat and at lower risk for pathogens… (Georgia Department of Agriculture 2012).

In comparison to the language and rhetoric towards general beef, food safety, and AFNs, the numbers for these food safety incidents could at first seem inconsequential. However, they are important because while a smaller number of articles did occur for these codes, there were still articles published, and for the most part these articles almost all occurred in the year of these incidents or in the year following. This means that for a smaller amount of time consumers' exposure to information regarding these incidents spiked. If this occurrence is situated in what seems to be a steady output of negative beef food safety language and rhetoric, followed by positive language and rhetoric for AFNs,

then there may be a possibility for it stay in the consumer's mind and have some sort of impact on how they view beef and what beef they choose to buy.

Conclusion

Future studies should include a means for comprehensive evaluation of AFN stories during TV broadcasts, as well as the information available on the Internet, broadly, and shared via social media. One limitation of the data is that AWN catalogues primarily print news media from traditional newspapers. According to Del Vicario et al. (2017), 63% of survey respondents acquired their news from social media, thus the database is missing an emerging and potentially important source of information that also might influence consumers' beef purchases by not including social media. Adding the impact that social media influencers may have could also increase insight on consumer perception. We can discover how the media might influence consumers, but cannot actually know how it influences consumers without additional study (i.e., consumer surveys). Another methodology that could be used to analyze this data in future studies is the attributes function. It would be intriguing to cross code this data on rhetoric and language with location to see the impact that metro Atlanta might have on how the media is framing local beef food safety.

Given that a high percentage of people get their news from social media (Del Vicario et al. 2017), it's becoming increasingly important to understand the effects that the mass media and social media could have on public perception. Understanding the framing and rhetoric used by the media when presenting local beef and food safety, may lead to greater knowledge about how the public is likely to perceive AFNs more broadly (Hannigan 2014). A greater understanding of media influence could also contribute to

how the meanings assigned to, and perceptions about, local beef might influence purchasing decisions (Telligman et al. 2017a). The Poisson regression revealed that prominent beef food safety incidents may have led to a statistically significant ($p<0.01$) increase in AFN articles about local beef in the given timeframe (Table 2). While the results from this project may at first show lower percentages for alternative food network articles that do mention food safety incidents out of the original group of articles (Alabama=9% of n=2,877, Georgia=17% of n=4,779), further examination of these results prove that negative language towards beef and food safety is most prevalent among the articles that do mention a food safety incident. Shocking rhetoric was also the most commonly encountered code for tone (Alabama=66% of n=255, Georgia=70% of n=829) out of the articles that do mention a food safety incident.

These numbers become consequential when viewed through the knowledge that the public form beliefs about scientific issues through the way in which the media frames these issues (Bocking 2012). So, if the media is using inflammatory rhetoric and framing beef food safety in a negative way, then this creates the potential for consumers to view beef food safety in a more negative way. This becomes even more important given that the results show us that readers are exposed to a steady stream of negative language towards beef and food safety within these articles and the given time frame. The flow of negative food safety news is punctuated with bursts surrounding the noted beef food safety incidents. Since media exposure has been found to sway consumers (Rieger et al. 2016; Verbeke et al. 2000; Yadavalli and Jones 2014), then these results do note the possibility of the media impacting consumer perception occurring when a consumer is interacting with these kinds of beef food safety articles and trying to make a choice

between conventional agriculture and conventionally produced beef, and AFNs and locally produced beef.

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