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Keywords

communication, animal diseases, agricultural, challenges, framing

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Abstract

Communicating science is a complex task filled with challenges for scientists and communicators. In the field of agricultural communications, some of the most complex and controversial topics covered in today's media are related to contagious animal diseases. The purpose of this study was to explore the use of frames in two daily newspapers, The New York Times in the U.S., and The Guardian in the U.K., during both the 2001 and 2007 outbreaks of foot and mouth disease (FMD) in Britain. The analysis showed that the primary frame used in articles published during the outbreaks was fear, followed closely by a connection of FMD to bovine spongiform encephalopathy (BSE, or mad cow disease) and the potential for human infection. Secondary frames included criticism of government and politics, and a military/war frame. This research shows that the use of frames in media has the potential to create unnecessary fear among consumers who already possess low levels of knowledge regarding agricultural production practices. Future research in this area should include an evaluation of headlines corresponding to newspaper articles, as well as a study of the sources of information and quotations used in such stories. Through the use of such framing analyses, agricultural communications scholars can begin to take a concrete step in exploring the ways in which the public interprets, creates meaning and values information related to agriculture.

Introduction

Communicating science is a complex task filled with challenges for scientists and communicators. Effective science communication requires an in-depth understanding of the issue being reported, a broader understanding of the science itself, and of the context in which the subject is important to readers. Agricultural communicators may have an even more complex and difficult task – in addition to communicating the science that may be involved, they must also communicate effectively about many aspects related to the food we eat, the changing nature of agriculture, and its impacts on the American economy (Lundy, Ruth, Telg, & Irani, 2006) due in part to growing concerns across the globe regarding food safety and risk (Tucker, Whaley, & Sharp, 2006).

In the field of agriculture, some of the most complex and controversial topics covered in today's media are related to contagious animal diseases, serious outbreaks of which have occurred both in the United States (U.S.) and around the world. With the exception of bovine spongiform encephalopathy (BSE, commonly referred to as mad cow disease), few animal disease outbreaks in the past 20 years have seen the intense level of coverage that foot and mouth disease (FMD) received during the outbreaks in Britain in 2001 and 2007.

In February 2001, the British government responded to a veterinary report indicating sows at a packinghouse near London were suspected of being infected with FMD. Over the next seven months, more than 6.5 million animals were destroyed due to infection or exposure to the disease and more than 10,000 premises had been affected (Gregory, 2005). The scale of the outbreak was unlike any previously recorded (Scudamore & Harris, 2002).

The 2001 outbreak of FMD was a major news event, in addition to being a major agricultural and economic crisis for the United Kingdom (U.K.). While FMD has not been found in the U.S. since the early 1900s, experts anticipated that an outbreak similar to the one in the U.K. would devastate the American agricultural industry and have significant effects on the overall economy. A subsequent outbreak of FMD in the U.K. in August 2007 once more triggered alarm bells and again appeared in both British domestic media outlets and in the U.S.

Literature Review

This study was designed to evaluate the use of framing in daily newspaper coverage of the U.K. FMD outbreaks in 2001 and 2007. Framing is a technique that categorizes information and refers to the way in which events and issues are organized and made sense of by mass media and their audiences (Reese, 2003). Since most adults encounter science-related information only from media coverage (Weigold, 2001) an examination of frames used in newspaper coverage of these outbreaks can offer an assessment of coverage, both in the U.K. and the U.S., and provide valuable insight to the quality of information available to audiences about a major agricultural science issue.

Foot and Mouth Disease Background

FMD is a severe, highly contagious viral disease of cattle, swine, sheep, and other cloven-hoofed animals. Signs of the disease often develop within three days of infection and include blisters followed by lesions in the mouth or on the feet, resulting in excessive salivation or lameness in affected animals. Animals, people, and materials that bring the virus into physical contact with susceptible animals can spread the disease; airborne transmission of the virus has also been reported (U.S. Department of Agriculture, 2007). Previous research indicates that airborne transmission of the virus may have played a role in the 2001 outbreak; however, scientists continue to debate the conclusiveness of such evidence (Gloster, Williams, Doel, Esteves, Coe, & Valarcher, 2007; Konig, Cottam, Upadhyaya, Gloster, Mansley, Haydon & King, 2009). Some research points to variation in transmissibility among livestock species, where the disease spreads faster among hogs and sheep than other animals (Valarcher, Gloster, Doel, Bankowski & Gibson, 2008). Regardless, the American Veterinary Medical Association considers FMD the most economically devastating livestock disease in the world and projects a worst-case scenario if an outbreak were to occur in the U.S. because of the variety of species involved and the difficulty in preventing the rapid spread of the virus over a large area (American Veterinary Medical Association, 2007).

FMD is not a fatal disease, however, and poses no threat to human health. The main effects of the disease on livestock include reduced milk yields in dairy animals, abortions of pregnancies in breeding stock, death of young animals due to lack of milk and sick mothers, lameness, loss of weight in growing animals due lesions in the mouth, and permanent foot, udder or thyroid damage (James & Ruston, 2002).

Because of its potential economic harm, FMD and its eradication measures are a hot topic outside the scientific community. There is currently no cure for FMD and measures used in eradication

affect how a country is classified for trade purposes.

FMD was first reported in 1514 in Italy (American Veterinary Medical Association, 2007). According to the World Animal Health Organization (OIE), the disease is endemic throughout the globe and is present in parts of South America, Africa, the Middle East and Asia (World Animal Health Organization, 2007). Although the U.S. experienced nine outbreaks of FMD between 1905 and 1929, it has been free of FMD since 1929 (American Veterinary Medical Association, 2007).

2001 FMD Outbreak in the United Kingdom

On February 19, 2001, sows at a packinghouse in Essex, England, outside of London, were suspected of being infected with FMD. The next day, the Ministry of Agriculture, Fisheries and Food (MAFF) confirmed the diagnosis. Investigations following the 2001 outbreak never conclusively determined the exact point of entry of the disease; however, the British government's final report indicated that the disease likely arrived via illegally imported meat from the Far East (Department for Environment, Food and Rural Affairs, 2008)

The outbreak, previously unparalleled in size and scope, eventually resulted in the slaughter of more than 6.5 million animals (Department for Environment, Food and Rural Affairs, 2002). In an assessment of lessons learned by the British government after the 2001 outbreak, Anderson (2002) noted that the crisis cost close to £8 billion (approximately \$12.8 billion) in lost tourism revenue and international exports, as well as compensation payments to farmers for animals destroyed due to infection or to prevent disease spread.

Coverage of the outbreak appeared in print and on television in both the U.K. and the U.S., with American television broadcasting images of slaughtered cattle, burning pyres and distressed farmers (Baxter & Bowen, 2004). While previous studies have been conducted analyzing frames used in conjunction with the 2001 FMD outbreak, they have primarily centered on the use of frames in conjunction with policy research and analysis of metaphors used in media coverage, choosing to focus on the metaphorical war that the British government waged against the disease (Nerlich, 2004). War references were heavily employed in conjunction with powerful photographic images of death and destruction, images that appeared daily in newspapers, on television, and on the Internet (Nerlich, Hamilton, & Rowe, 2002).

U.S. food and agriculture industry publications such as *Nation's Restaurant News* reacted to the images coming out from the U.K. "The pictures out of Europe are both horrifying and heartbreaking: piles of livestock carcasses smoldering to eradicate the wildly infectious FMD disease currently plaguing the European Union" (Nation's Restaurant News, 2001, para. 1). A popular science magazine, *The Scientist*, wrote that "the United Kingdom sagged under the weight of withering tourism, huge agricultural losses, and wholesale disruptions in the movement of people. Prime Minister Tony Blair called out the army and even postponed national elections" (Palevitz, 2001, p. 6).

2007 FMD Outbreak in the United Kingdom

On August 3, 2007, an outbreak of FMD was confirmed on a farm in Surrey, England. The first new outbreak in six years following the unprecedented outbreak in 2001, it was confirmed as the same virus strain as was used at an animal research laboratory by the Institute for Animal Health and Merial Animal Health in Pirbright, England. Subsequent investigations by the British authorities revealed that the outbreak did indeed originate from the Pirbright facilities (Department for Environment, Food, and Rural Affairs, 2008):

Defra was much better prepared for an FMD outbreak in 2007 than it was in 2001. This was reflected both in its speed of initial response to the detection of the first infected farm premises in Surrey and its success in containing the spread of the disease (p. 26).

Dixon (2007) noted various headlines used by the British media during the outbreak “The 30-mile shadow of fear,” “Virus leaked from U.K. lab” and “The foot and mouth suspect,” which appeared during three successive days above articles published in *The Daily Mail* in response to the August outbreak (p. R733). Dixon also noted that while the media covered much of the recent outbreak in a responsible fashion, there were significant mistakes, only one of which involved certain media outlets’ need to find scapegoats for the outbreak and place blame within a short period of time before the three concurrent investigations being conducted were able to draw conclusions. To date there are no known studies that analyze frames appearing in media coverage of the 2007 outbreak.

Message Framing

Political poll watchers have long known that a particular way of wording a question can help frame that issue in a specific manner (Tankard, 2003). Ruth, Eubanks, and Telg (2005) noted that the way an animal disease outbreak is framed in the national media has implications not only for future coverage of the issue, but also has the potential to impact public perception about the topic. Message framing provides a fruitful way of conceptualizing how media shape news and people’s perceptions (Miller & Reichart, 2001). According to Hertog and McLeod (2001), framing actually aids in structuring our understanding in a number of significant ways, helping us to determine what content is relevant to discussions of social concern, defining roles that varied groups play, and outlining ways in which our values are created. Iyengar (1996) explained that framing impacts the way in which an issue is judged based on its presentation, its frame. Schudson (2003) noted that journalists tend to select conflict frames for use in their stories, anointing individuals as opposing forces or antagonists and protagonists in a given situation. Framing research is often presented as an explanation for the influence of media coverage on issue related to risk communication (Palenchar, 2001).

Ruth, Eubanks, and Telg (2005) conducted a framing analysis of news coverage surrounding the 2003 Canadian outbreak of bovine spongiform encephalopathy (BSE) or mad cow disease, and found that Canadian and U.S. print media framed the outbreak as having devastating implications for both the cattle industry and humans who consume beef. Additionally, they determined that a health risk frame, more so than any other type of frame, included information that was conceivably out of proportion to the real health risk that the disease posed to humans.

Han (2004) conducted a longitudinal content analysis of news coverage of the 1996 BSE outbreak in Britain in both *The Guardian* and *The New York Times* newspapers. The results indicated that no significant differences existed in the dominant issue frames employed before and after the outbreak, and no significant differences existed in the kinds of sources used. However, a difference did emerge in the tone of coverage before and after the outbreak in *The Guardian*. Han determined that after the outbreak, coverage became increasingly negative in tone, due in large part to the British government’s withholding information from the press. This negative tone increased as coverage of the incident continued, criticizing the government in almost all aspects of handling the crisis.

According to Nerlich (2004), the 2001 outbreak FMD was framed in the media as an enemy in a war and the U.K.’s slaughter policy was depicted as the weapon of choice in defense of the enemy. The images of war, slaughter, and control became all too potent, as controlling the spread of FMD

led to the almost literal “killing of the countryside.” Nerlich et al. (2002) in their examination of metaphors used in media coverage of the outbreak found that while on one hand, the metaphors, narratives and images used during the outbreak heightened the sense of risk perceived by many in the U.K., on the other hand they helped the public, politicians, scientists and journalists comprehend a highly complex phenomenon.

Purpose

The purpose of this study was to explore the use of frames in mass media outlets during the 2001 and 2007 outbreaks of FMD in the U.K. The National Research Agenda (NRA) for Agricultural Education and Communication (Osborne, n.d.), a joint project of university agricultural education and communications professionals, has as one of its priorities the goal of aiding the public in effectively participating in agriculture-related decision-making. Specifically, the NRA encourages agricultural communications professionals to explore how the public interprets, creates meaning, and values information related to agriculture. A concrete step in addressing this task is examining and assessing the quality and adequacy of the information available for local, national and international public decision making concerning high priority agricultural issues.

Based on the literature presented, as well as the purpose of the study, the following research question was employed: *How was FMD framed in major daily newspapers in the U.K. and the U.S. during the 2001 and 2007 outbreaks in Britain?*

Methods

This study utilized quantitative content analysis methods to address the research question and identify relevant frames that emerged in the coverage. According to Tankard (2003), framing is a useful concept because it has the ability to pierce the surface of news coverage regarding an issue and expose hidden assumptions. However, Lockie (2006) notes that the use of framing in media does not guarantee that audiences will actually interpret the content in the manner intended. Tankard (2003) also notes that framing possesses a subtlety that makes it difficult to define and states “measurement will differ for each topic of discourse” (p. 97).

Regardless of these statements, Hertog and McLeod (2003) noted that framing analyses have risen to a place of prominence in media studies, evidenced by the diverse group of researchers using the method and the significant (and expanding) body of literature on the subject, combined with the wide array of theoretical approaches to the topic.

This particular study examined the manner in which outbreaks of FMD were framed in two major daily newspapers, *The Guardian* in the U.K. where the outbreaks occurred, and *The New York Times* in the U.S.. According to the Pew Internet & American Life Project (2006), 20% of Americans report getting their science news and information from the Internet, compared to 41% who report using television sources, and 14% who use newspapers and magazines as their main sources for such information. In the U.K., while no report was discovered with similar statistics about where Britons turn for the majority of their science information, some 60% of the British population reportedly uses the Internet on a regular basis, indicating the Internet perhaps plays an important role in obtaining information in the U.K. (Office for National Statistics, 2007). However, no evidence was discovered indicating that the Internet is a primary source of science news for British citizens.

In designing this study, the researchers determined that although online sources are most commonly used for scientific information in the U.S., the outbreaks of FMD were more than strictly a scientific issue; FMD had a huge economic impact, both in Britain and in other European countries,

and became an international concern. In addition, the first outbreak of the disease included in this analysis occurred in 2001, a time when the dominant source the public turned to for scientific information was newspapers (Blum, Henig, & Knudson, 2006).

These two newspapers were selected because they are viewed as major information gatekeepers in their respective countries and often have articles from their pages reprinted in other regional newspapers. *The Guardian* is given credit for its high ethical standards of conscience, criticism, and liberalism in covering issues, while *The New York Times* is believed to be the most influential newspaper in the U.S. due to its status as the country's major source of international news (Chomsky, 1989). Importantly, "these two papers are comparable when considering the notion of the informed citizen. Comparing the coverage of two respected daily newspapers cultivates the notion of multiple perspectives and approaches" (Han, 2004).

Articles related to the 2001 outbreak were collected from the date of the first report of a suspected outbreak (before laboratory tests confirmed the presence of the disease) on February 21, until September 30 of that year when the OIE, the international body governing the matter, declared the U.K. free of FMD.

For the 2007 outbreak, articles were again collected from the date of the first report of a suspected FMD outbreak on August 3, through September 18, 2007, the publication date of the last mention of the outbreak in the U.S. paper.

The Lexis Nexis Academic online database was used to gather articles from both *The Guardian* and *The New York Times*. Articles from the following sections of the papers were included in this purposive sample: news, opinion and feature stories. Letters to the editor were not included because, due to their brevity, they often do not provide adequate material for analysis. Articles in the sample were limited to those with more than 500 words to eliminate shorter news updates that provide minimal context for framing analysis. The search yielded a total of 279 articles; 193 articles from *The Guardian* and 44 from *The New York Times* for the 2001 outbreak period, 31 articles from *The Guardian* and six from *The New York Times* for the 2007 outbreak period. The British paper reported the story approximately four times as often as the American paper, which was not unexpected due to the location of the outbreaks in England. While the sample of articles from *The New York Times* during the 2007 period is comparatively small (only six articles), these articles were included to answer the research question.

The researchers included all articles from *The New York Times* for both the 2001 and 2007 outbreaks ($n=50$) and drew a sub-sample of articles appearing in *The Guardian* using a random number generator to identify the remaining articles. Eighty six percent ($n=43$) of the remaining articles came from the 2001 group and to equalize the number of articles ($n=100$) the remaining 14 % ($n=7$) came from the group of articles published in 2007 (see Table 1).

Table 1

Total number of articles used in analysis for each paper during each outbreak period.

	<i>The New York Times</i>	<i>The Guardian</i>
2001	44	43
2007	6	7
Total	50	50

Units of analysis used for the study were individual articles. Each of the 100 articles was assigned an identifying number and coded using a standard coding sheet that recorded descriptive information for each article, including the date of publication, article headline, article type (news, editorial, opinion, etc.), word count, and author, as well as the overall frames utilized in the article. A coding training session was conducted and the articles were analyzed and coded for emergent themes relating to the outbreaks of FMD, and dominant themes appearing through the use of key words and phrases, metaphors, use of visual imagery, and catchphrases (Tankard, 2003). A second researcher coded a random 10% sample of the 2001 articles ($n=8$), four from each publication, and all of the articles in the 2007 sample. Following this process, the researchers met and determined that they were in agreement regarding the results. Consensus agreement for the 10% sample was 98%.

Results

Using the search and sampling procedures described above, a total of 100 articles were collected and analyzed from both newspapers during the outbreak periods in 2001 and 2007.

Three primary frames and three secondary frames were found across the sample of articles. Primary frames included fear, a comparison of FMD to BSE (or mad cow disease) and the possibility of human infection from FMD, and the economic impact of the outbreaks (see Table 2). Secondary frames that did not dominate coverage and which appeared in conjunction with at least one primary frame, included politics and the British government’s handling of the outbreaks (and criticism surrounding it), and a war/military frame.

Table 2
Frequency of frames appearing in both The Guardian and The New York Times by outbreak year

Frame	<i>The New York Times</i>		<i>The Guardian</i>		Total
	2001	2007	2001	2007	
Fear	40	4	38	4	86
BSE/human infection	31	0	7	1	39
Economic impact	24	2	10	2	38
Politics/government*	6	2	16	1	25
Military/war*	8	2	7	0	17

Note. * Denotes a secondary frame.

Fear Dominates

Across the sample of articles drawn during the 2001 and 2007 outbreaks, the frame used most frequently by journalists was the provocation of fear. Articles in both papers predominantly depicted dread and doom in relation to the outbreaks, incorporating fear-inspiring words such as “danger,” “horror,” “panic,” and “dread,” describing the impact of the outbreaks as “nightmarish” and “medieval” during 2001. In 2007, published stories referred both to the 2001 outbreak devastation and the impending doom that farmers faced at this second major emergence of the disease in less than a decade. An article in *The Guardian* during 2007 quoted a local councilman saying:

I was speaking to a farmer who had come to my house and he was in tears. He was telling me about his cattle and he is really terrified that he would be next. He was desperate because he said he had done everything right since 2001 and he couldn't believe that it was something out of his control that has brought this back.

Stories in both papers revealed the speed with which the disease spreads, noting that farmers and rural residents were “terrified of leaving their homes and farms” in the British countryside during 2001. Characterized as the world's worst outbreak of FMD, the 2001 devastation spread to other countries in the British Isles and Europe. During the 2007 outbreak, articles recalling images of burning piles of carcasses depicted in the media during the 2001 outbreak were invoked repeatedly and depictions total loss and devastation of farms were again the norm. Vivid language including phrases such as mass killing, funeral pyres, and burning carcasses were prevalent, describing the “destruction of the English countryside.” A mention of the crisis claiming its first human victim appeared in *The Guardian* and related the story of a farmer so devastated at discovering the infection of his herd that he committed suicide.

During both analysis periods, one of the most common fears reported among British farmers was not the loss of their herds to the disease; rather their concern was being responsible for spreading the disease to other farms, either through traveling to another property and carrying the disease on their person or through their own animals having contracted the disease. Argument still exists about the airborne transmission, but scientists do not argue that the virus is virulent and spreads rapidly regardless of the location of the outbreak. Regardless of whether their herds had been declared infected, farmers barricaded themselves on their own properties.

During the 2001 outbreak, *The Guardian* published slightly over half as many articles using the fear frame ($n=27$) as did *The New York Times* ($n=40$). Articles appearing in *The Guardian* initially used the fear frame in conjunction with the declaration that the disease would spread if not swiftly and properly stomped out. Stories detailed the inevitable ruin of British farmers should the worst happen. Not surprisingly, the disease did spread across the U.K. and to other European countries and farmers were faced with the complete destruction of their herds during the 2001 outbreak.

In 2007, articles from *The Guardian* ($n=4$) again used a frame of fear and reflected a similar threat of disease spread and almost unavoidable ruin for farmers. While significantly fewer articles used fear, stories mentioning burning carcasses and associated complications in disposing of them inspired a sense of fear that the devastation of 2001 might recur. “The bovine pyres of the 2001 outbreak were merely the most dramatic symbol of a wider devastation, which saw swaths of rural Britain closed down.” However, according to a *Guardian* article “there has been no repeat of the 2001 blunder...this time the ban [on moving animals] came immediately” and “there are other reasons to hope infections may not yet spread as far this time.”

Articles appearing in *The New York Times* during the 2001 outbreak used the fear frame ($n=40$), often relating the outbreak of FMD to BSE, and discussed the threat of human infection. An analysis by a member of *The New York Times* editorial board compared FMD to BSE and noted that while they are two distinct diseases “it's the resemblance between them that haunts us, not the dissimilarity, a resemblance that evokes other epochs, other epidemics when humans, not animals were the victims.”

In *The New York Times* articles fear also manifested itself in the threat of the disease spreading from Britain and Europe across the Atlantic Ocean to the U.S. Journalist Elizabeth Becker wrote

during the 2001 outbreak “In Washington, officials are drawing up detailed plans of what they will do if – some say when – the foot and mouth virus arrives in this country...they also have to grapple with one major problem that Europe was spared – wildlife.” A *New York Times* editorial noted:

It’s not just images of mass killing, however, that make foot-and-mouth so disturbing. It’s the fear of mass contagion, a fear that returns us, somehow, to a time of epidemics like smallpox or bubonic plague or Spanish influenza, a time when effective barriers against the spread of disease were almost nonexistent.

During the 2007 outbreak, articles in *The New York Times* again centered on the devastation and destruction caused by the 2001 outbreak noting that “British authorities burned the bodies of 60 cattle found infected with FMD on a farm...as they moved quickly to try to contain any spread of the disease, which devastated the British livestock industry in 2001” and that in 2001 “chaos gripped the farming industry.”

BSE and Human Health

Overall, the frame comparing FMD to BSE appeared in 39 articles, in both *The New York Times* and *The Guardian*. The majority of articles containing this frame appeared in *The New York Times* ($n=31$) during the 2001 outbreak. Articles in both newspapers noted the differences and similarities between the two diseases and while they often pointed out that BSE has a lethal human variant and no known cure, humans are at no risk of infection from FMD:

For years, there have been news reports about deaths from mad cow disease, or bovine spongiform encephalopathy. More recently, there were warnings to avoid contact with cows, pigs, sheep, goats and deer, particularly in England, because of foot-and-mouth disease. But many travelers fail to distinguish between foot-and-mouth, which poses no risk to humans, and mad cow disease, which can be transmitted to humans by eating beef infected with it.

Other phrases used in these articles included the disease rarely affects humans, is seldom harmful to humans, poses little or no danger to humans, and has a low risk of transmission to humans. A few articles mentioned the link between CJD and BSE and alluded to the idea that FMD could develop a similar human variant.

During the 2001 outbreak, *The Guardian* published a summary from the British health department noting, that while the risk of humans acquiring foot and mouth is extremely small, “disposal of carcasses on the scale now being undertaken cannot be carried out without some risk to human health.”

Comparisons between foot and mouth and BSE also appeared in concert with references to the economic devastation caused by these diseases. “The suspension [of transportation of animals] is a terrible blow to Britain’s livestock industry, already reeling from the prolonged crisis over mad cow disease.” “What these two diseases share is an aftermath – the slaughter of entire herds of infected and potentially infected farm animals.”

Articles published in *The Guardian* represented British citizens’ concerns about whether the government and scientists were trustworthy regarding FMD’s lack of contagiousness to humans, specifically recalling:

Britain has just recorded its 100th victim of CJD, the human form of mad cow disease. We no longer trust experts who say they can fully anticipate the consequences of accelerated change to natural patterns, or that our exposure is so limited the risks are too small to bother with.

Economic Impact

The second most common frame concerned the economic impact of the outbreaks ($n=38$). Articles reported the crippling of the British farming industry due to the relentless speed of disease spread. Following the initial weeks of the outbreak in 2001, articles began to report the economic troubles of the British tourism industry as a result of the closure of the British countryside. According to the Department for Environment, Food, and Rural Affairs (2002) the direct costs to the British government for the 2001 outbreak were more than £3 billion (approximately \$4.4 billion).

In *The Guardian* during 2001, articles containing this frame ($n=10$) initially discussed food shortages and damage to the livestock trade in the U.K. However, as the disease spread, the frame expanded to include concerns about the wider impact on the economy separate from agriculture such as rural businesses and tourism. Many articles described the damage to the tourism trade due to the virtual closing of the countryside, noting that “the fall-off in tourism has cost the industry millions.” A *New York Times* article noted:

The much bigger tourism industry stands to lose \$1.5 billion to \$5 billion this year – twice as much as the farmers. The deathly quiet that has fallen on many of the more beautiful parts of Britain has been caused not only by the much-cited “silence of the lambs,” but also by the silence of American tour buses and holidaying German cyclists.

Articles published in 2007 recalled the devastating economic impact of the previous epidemic, and announced the changes in British Prime Minister Gordon Brown’s summer vacation due to his eagerness to “avoid the economic disaster of the 2001 outbreak, when millions of cattle and other livestock were slaughtered and burned. Tourism also slumped badly that year.” One of two articles appearing in *The Guardian* during 2007 declared FMD as “essentially an economic sickness” and asserted that the British media over-reacted in its extensive coverage of the outbreak, “papers scream about a ‘deadly virus’ on the loose, but it isn’t even that...the press has no interest calming us down.”

Secondary Frames - Politics and Government

While appearing less frequently than the major frames, the researchers believe that the secondary frames were important to report, as they included vivid imagery and strong words relating to the political climate and government’s handling of the outbreaks and the use of references to war and the military.

A frame emphasizing politics and government included a wide range of words and phrases designed to reflect a sense that the British government was to blame for the size of the 2001 outbreak due to its mishandling of the situation. Using terms such as scapegoat and partisan politics, articles published in *The Guardian* during 2001 ($n=16$) increased their criticism of the government handling of the crisis as the outbreak progressed. Measures adopted by the government were seen as “frighteningly authoritarian and hopelessly ineffective, and advocated instead a policy of doing nothing. There is damn all that the government can do now to stop it, until it has run its course.” “The teams of epidemiologists...produced devastating confirmation that foot and mouth cannot be controlled by the government’s existing methods.”

In *The New York Times* during 2001, the political and government frame ($n=6$) included only two mentions of British politics and government. In the remaining articles, references were made to the American government's plans should an FMD outbreak occur in this country. "We were coming to the realization that state and local government would be overwhelmed and the U.S.D.A. would be overwhelmed if foot and mouth broke out," said an Agriculture Department official. Additionally, "American farmers and ranchers began lobbying their state agriculture chiefs for better [FMD] planning. Those officials recently urged Agriculture Secretary Ann M. Veneman to find out what the rest of the government could do to contain an outbreak."

War and Military Frame

A frame containing references to the military and war in *The Guardian* during 2001 ($n=7$) included references to imprisoned farmers unable to leave their properties due to movement restrictions implemented to stem the spread of disease. Articles also illustrated the military's heavy involvement in efforts to control disease spread and dispose of thousands of animal carcasses as a result of government eradication procedures. No articles containing this frame appeared in *The Guardian* during the 2007 outbreak.

Similarly, the articles appearing in *The New York Times* with the military/war frame depicted the disease as an enemy against which farmers, the military, and the government fought a battle, and included references to "waging war against the disease." None of the 2001 articles contained this frame.

Discussion and Conclusions

The results of this framing analysis clearly show that fear was the overriding emotion conveyed to readers in newspaper coverage appearing in *The New York Times* and *The Guardian* during both the 2001 and 2007 outbreaks of FMD in Britain. Article after article used different aspects of the outbreak to inspire fear in readers including the threat of human health concerns, economic devastation, and the idea of a war being waged against the disease. While a dominant fear frame emerged during analysis, it appears that each of the frame categories discovered in the coverage includes the shadow of fear. Certainly economic devastation (both potential and actual), threats to human health related to the disease, a lack of trust of the government's ability to handle the crisis, as well as perceived issues of credibility with government sources, and the discussion of the militaristic and war-like eradication measures all have the potential to inspire fear in readers.

Similarly to the health frame appearing predominantly in coverage of mad cow disease in Ruth, Eubanks, and Telg (2005), the BSE/human infection frame appearing in *The New York Times* coverage was out of proportion to the actual threat of the disease to human health. FMD is a disease that is strictly limited to infection of cloven-hoofed animals (American Veterinary Medical Association, 2007) and is neither a food-borne illness, nor an illness that threatens humans. Once fears of potential human infection were allayed and comparisons between BSE and FMD trickled out of the media coverage, the framing of fear messages shifted to economic losses and criticism of the British government's handling of the outbreaks.

Tankard (2003) likens the concept of media framing to that of a magician's sleight of hand – attention is directed toward one area or point and away from another. In this way, it is possible for journalists to use framing techniques that guide a reader's attention toward a certain argument, while ignoring another. Schudson's (2003) comment that journalists tend to select conflict frames for use in their stories is important to recall when considering this sample of coverage. It is this sense of conflict

that, combined with the use of images of destruction and devastation, created indelible images in the minds of readers that these outbreaks could have spelled the end of British farming.

The frames appearing in articles during the analysis periods in both 2001 and 2007 were intricately interwoven; few, if any, articles contained only one frame. Most often fear was linked with either the mention of BSE and the potential for human infection from animal disease or the economic impacts of the disease outbreaks. This connection of the disease to human health may have increased fear among consumers on both sides of the Atlantic initially, putting in their heads the idea that again here was a contagious animal disease that threatened the safety of the food supply, much like the outbreaks of BSE that had seen a great deal of coverage only recently. After articles in both newspapers clarified that FMD was not contractible by humans and posed no threat to food on the dinner table, fears shifted to the economic losses being sustained in Britain. Initially, monetary losses were thought to be restricted to farmers who had their herds condemned, either due to infection or on the grounds that they had been exposed to the disease through proximity to other infected animals. As the 2001 outbreak spread, however, the British tourism industry took a significant blow due to the “closure of the British countryside” to prevent the rapid spread of FMD.

It is possible that the fear frame dominated coverage so substantially because, especially in the U.S., consumer knowledge of the agricultural production chain is extraordinarily low, and that which we fear most is the unknown. Doerfert (2003) noted that public knowledge about agricultural practices diminish as our increasingly urbanized society moves further and further away from life on the farm. In addition, Ten Eyck (2000) noted that most often the public’s attitudes and perceptions about agriculture are based on media accounts. This lack of understanding about how food makes its way from gate to plate may have contributed to consumers’ alarm when receiving media messages indicating a huge problem existed (potentially) in the food production sector. In combination with concerns over “industrialized” farming techniques and the beginning of a movement in the popular media against animal confinement, the media appear to have played upon this fear of the unknown.

Han (2004) concluded that the British government’s mishandling of the 1996 BSE outbreak contributed substantially to the negative coverage of news during the time period surrounding that crisis. In light of this, it is possible that some residual effects exist in the mind of British citizens and that the fear and other frames employed in coverage of the FMD outbreaks described here brought back unhappy and difficult memories.

Additionally, echoes of the fear frame appeared in articles containing the secondary frames: references to the military and war and politics and government. Initially, fears surrounded potential human infection from FMD itself, and then shifted focus to disposal techniques of culled animals and the potential threat that poor planning of these methods might have an impact on human health. Images of war were invoked during 2001 when it became clear that the epidemic was beyond the control of the British government and the military was called in, which in turn sparked criticism of the government’s handling of the crisis. While criticism of the British government was confined to articles appearing in *The Guardian*, this secondary frame appeared in the *The New York Times* and centered on the sufficiency of the American government’s plans should an outbreak of FMD come to America. Ruth et al. (2005) acknowledged that the way in which frames were employed in the coverage of the Canadian BSE outbreak in 2003 may have provoked fear in readers, causing a sense of uncertainty.

The results of this study are limited due to the fact that significantly fewer articles were available for analysis during the 2007 outbreak from *The New York Times* than from *The Guardian*. This dearth

of articles during the more recent outbreak is likely due to the drastically reduced size and scope of the outbreak, in addition to the fact that it again occurred on the far side of the Atlantic Ocean. Additionally, as framing analysis is generally accepted as a qualitative research method and was used as such in this research study (with the exception of message frame frequency counts), it is important to acknowledge that the results of this study can only be used to describe coverage in these two publications and cannot be generalized to other media coverage regarding these outbreaks.

Implications and Recommendations

Framing analysis studies such as the one described here are important to illustrate the broad brush and dark strokes that were used to paint negative perceptions of agriculture during the periods of coverage analyzed in two major newspapers. Coverage of these two outbreaks can be categorized across both incident periods as fear inspiring, and provided readers a strong sense that there was cause for concern about the disease whether they resided in the U.S. or the U.K.

Today's consumers have a low level of understanding of the agricultural production process. We often fear what we do not know. Ruth, Eubanks, and Telg (2005) noted that "if journalists continue to cover only agricultural news that is problematic or associated with risk...then it can be expected that consumers will continue to lack accurate knowledge and understanding of agricultural and food related issues" (p. 20). Because frames determine what content is relevant to the discussion, "frames, as part of the deep structure of a culture, provide a significant portion of the shared meaning among society's members" (Hertog & McLeod, 2003, p. 141). Overall, frames used during the FMD outbreaks in Britain communicated to the public in both the U. S. and the U. K. that agricultural practices led to a situation that posed a threat to the human population. It is important that analyses such as this are used to inform the practice of agricultural communicators to aid in combating the negative associations the public has regarding certain aspects of agricultural production. Being aware of the use of such frames and the influence they have in creating an alarming picture of modern agricultural practices provides valuable information to practitioners about the quality of information available to the public regarding these issues. Through the use of framing analyses such as this study, a more comprehensive picture of mass media coverage regarding American agriculture can be created, paving the way for the important future work of agricultural communicators.

The results of this analysis illustrate that the use of frames in media have the potential to create unnecessary fear among consumers with already low levels of knowledge regarding agricultural production practices. Coming on the heels of the BSE controversy as it did, the implications of the 2001 outbreak heightened consumer concerns in both Britain and the U.S. regarding the safety of the food supply. Echoing the findings of Ruth, Eubanks, and Telg (2005) in their analysis of the coverage of mad cow disease, frames such as those used during the 2001 and 2007 outbreaks of FMD have the potential to further negatively influence consumer perceptions toward the livestock industry as well as the wider agricultural industry.

Beneficial future research utilizing framing analysis techniques may include an evaluation of the headlines accompanying the articles in the sample used for this study to determine if similar frames were used, and if those frames are indicative of the frames contained in the respective articles. It may also be of value to practitioners for researchers to analyze the use of sources quoted and cited in the articles included in this study to determine the roles that individuals, groups, organizations and institutions might have had regarding this phenomena (Hertog & McLeod, 2003).

As journalists bring their own experiences and paradigms to their writing, an examination of

articles published during the outbreaks, the frames contained therein and the journalists responsible for writing the articles may be helpful in illustrating any potential relationships among these three variables. Such a study may indicate to agricultural communication professionals that certain journalists are predisposed to use certain frames, pointing to targeting certain journalists with certain types of stories.

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foot and mouth, animal disease, framing, media, newspapers, Britain, agriculture

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