

Oklahoma State University  
Honors College  
Department of Agricultural Communications, Education, and Leadership

Honors thesis of

Kaylee Lynn Cowan

Candidate for the degree of Bachelor of Agricultural Science and Natural Resources

Defended on: May 6, 2016

## **Abstract**

In the last ten years the media coverage of the topic of GMOs has steadily increased (Goyal & Gurto, 2011). People are informed about GMOs mainly through the internet and popular press (Goyal & Gurto, 2011). Popular press can influence public perception about an issue by the tone of the articles on the topic and the number of times the subject is repeated (Radford, 1996). Thus this study focuses on studying a source of popular press and how articles within the source are framed. The purpose of this study was to analyze the framing of a year's worth of New York Times articles that reference Genetically Modified Organisms. In particular, this study determines the framing of articles in the New York Times during a one-year period from Jan. 1, 2015, to Dec. 31, 2015. Additionally, this study examined the tone of articles toward the topic of GMOs as well as the number of and types of sources per article. The results of this study will help create a deeper understanding of how framing could be explored as a potential explanation of public opinion towards GMOs and popular press/media's influence.

## A Review of a Year of New York Times references to Genetically Modified Organisms

### **Introduction**

In the last ten years the media coverage of the topic of GMOs has steadily increased (Goyal & Gurto, 2011). People are informed about GMOs mainly through the internet and popular press (Goyal & Gurto, 2011). Popular press can influence public perception about an issue by the tone of the articles on the topic and the number of times the subject is repeated (Radford, 1996). The popular press has a role in the understanding of GMOs and based on the framing and tone of the article can influence a reader's perception and intake of the information in the article (Goyal & Gurto, 2011).

Framing of an article is influenced by multiple factors, but ultimately framing is how media emphasizes some aspects of reality and deemphasizes others (Miller, 2002). Severin and Tankard wrote that "framing of news stories may also have more subtle – and powerful – influences on audiences than bias in news stories" (2001, p. 278). As agriculture and other sciences continue to investigate GMOs, media framing of the topic will be important to understanding the public perception of GMOs.

### **Purpose and Objectives**

The purpose of this study was to analyze the framing of a year's worth of New York Times articles that reference Genetically Modified Organisms. In particular, this study determines the framing of articles in the New York Times during a one-year period from Jan. 1, 2015, to Dec. 31, 2015. Additionally, this study examined the tone of articles toward the topic of GMOs as well as the number of and types of sources per article.

Three research questions guided the focus of this study:

1. What is the frame of the article? toward genetically modified organisms?

2. What was the tone of the article toward genetically modified organisms?
3. What the number and types of sources which are being used?

### **Significance of the Study**

There is little literature available regarding the references of genetically modified organisms in popular press. The literature the researcher found referenced public perception of genetically modified organisms mainly in countries outside of the United States. Radford (1996) provided the only article the researcher was able to find that referenced genetically modified organisms, the popular press, and public perception.

### **Definitions**

Definitions for terms used throughout this study are as follows:

**Tone.** “A quality, feeling, or attitude expressed by the words that someone uses in speaking or writing” (The Merriam-Webster Dictionary, 2015).

**Neutral.** “Neither very good nor very bad” (The Pocket Webster School and Office Dictionary, 1990, p. 481).

**Positive.** “The positive degree of comparison” (The Pocket Webster School and Office Dictionary, 1990, p. 553).

**Negative.** “The point of view that opposes the positive” (Webster’s New World Dictionary, 1995, p. 393).

**Frame.** “A central organizing idea or story line that provides meaning to an unfolding strip of events” (Gamson & Mogdigliani, 1987, p. 143)

**Editorial.** “An article in a newspaper, etc. that clearly puts forth opinions” (The Pocket Webster School & Office Dictionary, 1990, p. 237).

## **Theories and Analysis Used**

Framing theory is the primary basis for how the data was analyzed and interpreted. For the analysis, a framing rubric was built for evaluating the articles based on previous framing studies. Two master's theses were reviewed along with four articles published in the *Journal of Applied Communications* to help guide the study's emphasis on framing (Cannon & Irani. 2011; Irlbeck, et.al. 2011; Westwood-Money. 2008; Meyers & Abrams. 2010; Irlbeck, et.al., 2014). Each of these studies were on an agricultural topic and media, and used a framing analysis.

The three primary categories of evaluation in this rubric were the frame of the article based upon key words, the tone of the article toward GMOs, and the number and types of sources included in each article.

## **Methodology**

This study examined the context of New York Times references to genetically modified organisms during a one-year period. The New York Times was selected because it is considered reliable, widely read by the general public and commonly includes science-based articles. The researcher used the Oklahoma State University Library "New York Times" database. This database is powered by ProQuest and allows for Boolean searches as well as traditional key word or phrase searches. One of the parameters set on this search engine was to only consider article text and titles for the search terms used. This parameter was set in order to keep out unrelated data from the search results.

Defining and creating search terms along the topic of genetically modified organisms for database searches was primarily determined by defining a GMO and pulling terms which commonly used in place of the term GMO. Many of the search terms were selected from variations of the term "genetically modified organism." The variations of the terms were

determined by doing three preliminary searches using the terms “GMOs” and “genetically modified organisms.” If the terms were used in place of “GMOs” or “genetically modified organisms” multiple times in the preliminary search results, they were selected as search terms.

The search terms used for this study were as follows, with the “s” in parenthesis denoting the plural form of the terms which was also searched: genetically modified organism(s), GMO(s) or G.M.O. (searched together), genetically modified or genetically altered or genetic engineering (searched together), non-GMO or non GMO (searched together), non-genetically modified organism(s) or non genetically modified organism(s) (searched together). The terms were searched individually or in groups of two to three with “or” separating multiple terms. In conducting the database searches, the researcher found that some of the terms were used interchangeably in some of the articles.

Initially, articles from the past five years were considered for this study. After reviewing the amount of data collected from this search, the researcher decided to refine the data to a one-year period. When refining the data, the articles were separated by year of publication. Articles in the most recently published full year, 2015, were chosen as the final refined data collection.

A total of 171 New York Times articles resulted from the database search using the search terms and refined within the 2015 one-year period. However, many of these articles were duplicates or triplicates of articles, which appeared under different search terms. After eliminating the duplicates and triplicates to ensure only one copy of each article was evaluated in the analysis, the number of articles was limited to 112. It should be noted that of the total number of articles found for all search terms 34.5 percent were duplicates and triplicates.

Additionally, of the 112 articles, which were not duplicates, 22 were eliminated from the framing analysis due to relevancy. These articles were culled because, while they appeared in a

database search, they had no mention of any search term or did not discuss the topic of genetic modification, engineering or alteration. Just fewer than 13 percent of the articles were eliminated as irrelevant, leaving 90 articles for final review.

The content framing and rubric used in this research were based upon a combination of coding procedures used in two studies and one master's candidate thesis on an agricultural issue in media and framing analysis (Westwood-Money, 2008; Cannon & Irani, 2011; Irlbeck, et.al., 2011).

After refining the data to 90 articles, a rubric (fig. 1), developed by the researcher but based on the Westwood-Money (2008), Cannon and Irani (2011), and Irlbeck, et al., (2011) studies regarding media framing, was applied to the data. Each of the 90 articles were evaluated to determine frame, using key words that led the researcher to determine the frame, tone (positive, negative, and neutral), sources, and number of sources. Additionally, it was noted if an article was an opinion piece, letter to the editor, correction to a previous article or some form of review article. The frames were determined using key words by a reviewer and 10 percent of the articles were spot checked by a reader for consensus on the framing, tone and sourcing. The frames were left up to the reviewer to determine, rather than establishing predetermined frames.

**Figure 1. Rubric Used to Determine Frames, Tone and Sources**

	A	B	C	D	E	F
	Words Used to Determine Frame:	Frames:	Other Notes:	Tone: Positive, Negative, Neutral	Sources:	Number of Sources:
1						
2	Monsanto, Chemicals, business transaction, chemicals, agriculture, seeds	Agricultural Companies		Neutral	Monsanto, Hugh Grant--CEO Monsanto, Syngenta, Sanford C. Berstein & Company, Roger Johnson--President National Farmer's Union, WHO, Monsanto executives, Syngenta executives	8
3	Insecticide, Chemicals, agriculture, genetically modified, moths, technology	Agriculture and food production, Pesticide/Chemical use and Genetic modification		Negative	Hansen--farmer, Shelton & Mark Benedict & Micheal Furlong--entomologists, Scientists at BMC Biology, Wallace--Director of GeneWatch U.K., Parry--CEO of Oxitec, Northeast Organic Farming Association of New York, Food and agriculture law professor--Scheider,	9
4	Book review, subplot genetically modified corn	Media	this is actually a book review which has a subplot about GMO corn	Negative	Amanda Ward, "The Jaguar's Children	1

*Figure 1.* The researcher developed the rubric, based on previous media framing research, to determine frames, tone and sources for one-year of New York Times articles that referenced genetically modified organisms.

Tone for this study was also evaluated in the same way as the frame analysis using the rubric. Three options were predetermined, based on previous studies, prior to the data analysis: positive, negative and neutral. In determining tone, each article in its entirety was evaluated for its tone toward GMOs. If the majority of the article used more negative terminology or if the majority of the sources were negative toward GMOs, the article was labeled “negative” for tone. However, if the article in its entirety used more positive terminology or if the sources were positive toward GMOs, then the article was labeled “positive” for tone. Neutral articles displayed either a strong balance of positive and negative sources or there were no positive or negative sources about GMOs, but simply facts, for example, the results of studies or polls.

### Findings



For this study, the researcher evaluated 90 articles from the New York Times published in 2015, that reference genetically modified organisms, to determine framing, tone and sources.

**Framing.** Research question 1 sought to determine the tone of the articles toward genetically modified organisms. After searching, collecting and refining the data, a total of 90 articles were reviewed based upon the rubric previously established. Eight frames emerged from the data.

Table 1 describes the frames, as labeled by the researcher, the number of articles included each frame, and the percentage of each frame in relation to the total number of articles evaluated.

Table 1  
*Eight Researcher-identified Frames Related to 2015 New York Times References to Genetically Modified Organisms*

<b>Frame</b>	<b>Number of Articles</b>	<b>Percentage</b>
Regulations & Labeling	20	22.2
Food Companies & Food Processors	17	18.9
Agriculture & Food Production	12	13.3
Science/Scientific Research	8	8.9
Medical	15	16.7
Agricultural Companies	3	3.3
Media	9	10.0
Chemical Use & GMOs	6	6.7
Total:	90	100

The researcher determined there were eight frames for the 2015 New York Times references to genetically modified organisms. Those eight frames are as follows: Regulations & Labeling, Food Companies & Food Processors, Agriculture & Food Production, Science/Scientific Research, Medical, Agricultural Companies, Media, and Chemical Use & GMOs. Regulations & Labeling and Food Companies & Food Processors accounted for the most number of articles, with 20 and 17 articles in those categories, respectively. Agricultural

Companies accounted for the least, with three articles.

The initial database search results grouped letters to the editor into one article if they were published on the same date and in response to the same article. These groups of letters were evaluated by the researcher as one article in reference to framing. However, when evaluating the tone, letters to the editor were each evaluated for positive, neutral or negative tone individually, rather than in the collective manner used in framing. For source evaluation, letters to the editor were also evaluated individually. This means that although there were 90 articles, as letters to the editor were grouped as one article via the database results if they were published on the same day and in response to the same article, the number of articles evaluated grew to 111 when considering tone and sourcing.

**Tone.** Research question 2 sought to determine the tone of the articles. Table 2 shows the distribution of articles as evaluated for tone. The total number evaluated for tone totals 111 because of how letters to the editor were evaluated individually rather than in the collective groups as they appeared via the database search. A total of 28 articles were labeled “positive” for tone, while 55 articles were labeled “negative.” Twenty-two articles were included in the “neutral” category, while six were “undetermined.” The “undetermined” category was created for when no consensus could be found on the whether the article’s tone was positive, negative or neutral.

Table 2.  
*Researcher-identified Tone of the 2015 New York Times Articles Referencing Genetically Modified Organisms.*

<b>Tone</b>	<b>Number Evaluated</b>	<b>Percentage</b>
Positive	28	25.2
Negative	55	49.6
Neutral	22	19.8
Undetermined	6	5.4

**Source.** Research question 3 sought to determine the sourcing for the articles. The articles were evaluated for number of type sources included in each. The term “sources” in evaluation included both people and document sources such as papers, published studies as well as common group sources (scientists say, critics stated, analysts recommend, etc.). For the 90 articles, the mean number of sources per article was 5.48. The most sources included in a single article was 16, while the least number of sources included in an article was one. Many articles with one source were found to be opinion pieces, including editorials, letters to the editor, or reviews. For these types of articles, authors were evaluated as the single source.

### **Discussion**

Considering the framing of the 2015 New York Times coverage on genetically modified organisms could give insight into how people form their opinions on genetically modified organisms. The researcher was surprised that only three of the 90 articles were included in the frame labeled Agricultural Companies. The initial expectation was that a majority of articles would fall within a frames related to Agricultural Companies or Chemical Use & GMOs. However, the majority of articles were classified as Regulations & Labeling, Food Companies & Food Processors, and Medical. The aspect of the wider range of framing around the topic of genetically modified organisms although surprising should be taken note of as coverage of the topic grows. The researcher expected to find a majority of the articles framed in the context of production agriculture, but the study’s results showed that most of the articles and coverage on genetically modified organisms extend more into the food, medical and governmental regulations industries. The extent to which negative tone dominated the results was unexpected. However,

this may be due to the large number of editorial and opinion articles evaluated in the study.

Future studies should consider how genetically modified organisms are portrayed in other types of popular press, beyond the New York Times or simply newspapers in general.

## References

Cannon, K.J. & Irani, T.A. (2011). Fear and Loathing in Britain: A Framing Analysis of News Coverage during the Foot and Mouth Disease Outbreaks in the United Kingdom. *Journal of Applied Communications*, 95(1). 6-21.

Freyenberger, D.D. (2013). *Amanda Knox: A Content Analysis of Media Framing in Newspapers Around the World*. (master's thesis).  
<http://dc.etsu.edu/cgi/viewcontent.cgi?article=2281&context=etd>

Gamson, W.A., & Modigliani, A. (1987). The changing culture of affirmative action. In R.G. Braungart & M.M. Braungart (Eds.), *Research in political sociology* (Vol. 3, p. 137-177). Greenwich, CT: JAI Press.

Goyal, P., & Gurtoo, S. (2011). Factors influencing public perception: Genetically modified organisms. *GMO Biosafety Research*, 2(1).

Irlbeck, E.G., Akers, C. & Palmer, A. (2011). A Nutty Study: A Framing Analysis of the 2009 *Salmonella* Outbreak in Peanut Products. *Journal of Applied Communications*, 95(2). 48-59.

Irlbeck, E., Akers, C., Baker, M., Burris, S. & Brashears, M. (2014). A Case Study and Framing Analysis of the 2008 *Salmonella* Outbreak. *Journal of Applied Communications*, 98(2). 65-77.

Meyers, C. & Abrams, K. (2010). Feeding the Debate: A Qualitative Framing Analysis of Organic Food News Media Coverage. *Journal of Applied Communications*, 94(3&4). 22-36.

Miller, K. (2002). *Communication theories: Perspectives, processes, and contexts*. Boston: McGraw Hill.

Radford, T. (1996). Influence and power of the media. *The Lancet*, 347(9014), 1533-5.

Scheufele, D.A. (1999). Framing as a theory of media effects. *Journal of Communication*, 49(1). 103-122.

Severin, W.J. & Tankard, J. W. (2001). *Communication Theories Origins, Methods, and Uses in the Mass Media*. Boston: Longman.

*Pocket Webster School & Office Dictionary* (1990). Simon & Schuster, Inc.

Westwood-Money, K. (2008). *News Wire Coverage of the E-coli Outbreak in Spinach: A Media Framing Analysis*. (master's thesis).

*Webster's New World Dictionary* (1995). Simon & Schuster, Inc.