

IDENTIFYING SOURCES OF BIAS IN AGRICULTURAL NEWS REPORTING

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Abstract

The purpose of this study was to determine how selection of informational sources and media presentation of material contribute to the bias levels of articles in two types of periodicals-news and agricultural-in regards to the environment and food safety.

The three agricultural periodicals with the largest circulations--Farm Journal, Progressive Farmer, and Successful Farming--and the three news periodicals with the largest circulations--Newsweek, Time, and U.S. News & World Report--were evaluated for the purpose of this study. Articles were selected for the 10-year period from 1987-1996 and evaluated using the Hayakawa-Lowry method of determining bias. It was determined that the most used sources of information by journalists were educational and governmental. Articles were often printed in sections of the publication that appeared to have no relationship to the nature of the article. The depth in reporting of environmental and food safety issues was lacking. There was little difference in the presentation of articles between news and agricultural magazines. Both used articles in various locations, used pictures that generated an emotional response from readers, presented stories of various lengths, used a range of reporters to cover stories, and sought information from various sources. News magazines also used artwork, which almost always conveys a biased message.

Introduction and Theoretical Framework

Agriculture affects everyone. From the stearic acid in the tires of automobiles, insulin for diabetics, milk for newborn babies, sugar in lollipops, to today's advances in genetic engineering, agriculture is a major part of our daily lives (National Cattlewomen's Association, 1991). While these issues have been part of agricultural periodical reporting for decades, recently agricultural issues have come to the forefront of nonagricultural periodical news reporting. More specifically, environmental and food safety issues are receiving increased coverage by all news media (LaMay & Dennis, 1991).

In the early 1980s, journalists began addressing environmental and food safety issues. By the time these types of issues received their

attention, however, the issues were so complex that many journalists were overwhelmed by their complexity. Farmers were producing at an all-time level of proficiency using chemicals in almost every phase of their operations. Whereas journalists had been trained in how to write, they were ill equipped to fully understand their influence in the complex relationship between producers and consumers. Journalists found themselves giving background information that led readers to make decisions and draw conclusions based on this information. If that information was tainted, the newly empowered readers and viewers often reacted (or over-reacted) in a misinformed manner (LaMay & Dennis, 1991). Likewise, the quality of articles did not increase with the complexity of the issues. To complicate matters, journalists did little to establish new and better sources of information. LaMay and Dennis noted

that they either were not looking for objective and knowledgeable sources, or they had trouble finding them.

According to Whitaker and Dyer (1998), not only is the content of agricultural magazines different from the content of nonagricultural magazines, but so is the amount of bias in those articles. Whitaker and Dyer reported higher levels of bias in nonagricultural magazines. Is that bias purposefully injected into the articles to sell magazines, or is it because of poor sources of information? Even good journalists are likely to write inaccurate articles if their sources are poor. Bozell and Baker (1990) noted that news reporting had become more liberal. Lichter, Lichter and Rothman, (1991) noted more than two out of three reporters preferred liberal activist groups of environmental information over more conservative sources. One in four preferred individuals not involved or primarily associated with the environment or food safety issues, such as celebrities speaking either for or against the use of certain products. Compared to scientists and agriculturists, they draw equal credibility ratings with the public (LaMay & Dennis, 1991). With this demographic information in mind, the sources these journalists employ become an equally important issue. Variety, accessibility, and credibility are all factors that may determine the quality of sources and stories journalists develop (LaMay & Dennis).

The theoretical framework of this study lies in the agenda setting theory promoted by Shaw and McCombs (1977). This theory espouses the concept that the media helps set the agenda of the American public. Based on this theory, the public embraces those issues that the media reports. As a result of this information, the public's agenda is then set based upon public opinion, political choice, or a combination of the two.

Reiman (1977) supports this theory, reporting the mass media plays a major role in

shaping America's agenda. Reiman noted that several journalists might witness the same event but have very different accounts of the story. According to Reiman, the background of the journalists and the sources they used affect their journalistic decisions.

The recent interest in agricultural reporting, combined with the reported bias levels in reporting (Whitaker & Dyer, 1998) raises many questions and concerns. Does the reporting of agricultural issues require a higher technical background than does the reporting of other issues? If so, are journalists technically equipped to report about agricultural issues, or do they get technical assistance from other sources? If other sources are used, how are those sources selected? Who dictates the importance of issues? What role does the media play on influencing people's perceptions of agriculture, particularly environmental and food safety issues?

The general problem addressed by this study is the public's perception of agriculture as a threat to food safety and the environment. Specifically, the study seeks to focus on the question, "What are the sources of bias in news periodicals versus agricultural periodicals when reporting environmental and food safety issues in agriculture?"

Since the introduction of technical journalism, the coverage of agricultural issues like the environment and food safety has not been evaluated and/or compared in news and agricultural periodicals over a period of time. Research has failed to address the problem of objectivity and its consequences in both types of periodicals.

As food safety issues become more scientific and environmental issues become more controversial, the sources of bias in reporting must be evaluated. A review of literature revealed that:

1. Environmental articles in news magazines

are negatively biased against agriculture, and

2. Journalists may not be adequately instructed in proper ways to eliminate bias from their articles.

Purpose

The purpose of this study was to determine how selection of informational sources and media presentation of material contribute to the bias levels of articles in two types of periodicals-news and agricultural-in regards to the environment and food safety.

LaMay and Dennis (1991) noted that bias levels in articles like those relating to agriculture have the potential to be greater than bias levels of less technical and emotional issues. However, are news periodicals more or less biased than agricultural periodicals? Specifically, this study addressed the following research questions:

1. What were the most reported/most important environmental and food safety issues of the decade?
2. What sources did periodicals use when reporting environmental and food safety issues?
3. How did articles differ in presentation between news and agricultural magazines?

Procedures

This study used a descriptive design. The three agricultural periodicals with the largest circulations-*Farm Journal*, *Progressive Farmer*, and *Successful Farming-and* the three news periodicals with the largest circulations-*Newsweek*, *Time*, and *U.S. News & WorldReport*-were evaluated for the purpose of this study. Articles were selected for the 10-year period from 1987-1996.

From a review of literature, several topics were identified as major environmental and food safety topics in agriculture. These issues were, in alphabetical order: Alar, E.coli, Hepatitis A, Hog Operation Pollution, "Mad Cow" Disease (BSE), Ozone Depletion, Pesticide Use, and Salmonella. The expert panel was asked to rank these eight issues in order of importance, from most important to least important. A space was provided for respondents to identify "other" issues they deemed important,

It was decided a priori that the top four issues identified by the respondents would be used to determine the sample of articles. Once these important issues were identified, agricultural periodicals-*Farm Journal*, *Progressive Farmer*, *Successful Farming-and* news periodicals-*Newsweek*, *Time*, *U.S. News & World Report*--from 1987- 1996 were searched for articles relative to those top issues.

Framing techniques described by Berelson (1952) were used to categorize and interpret data. The following frames were used: origin of articles-the author of the article, space and time measures-the length of articles (one column or less, two columns, full page, more than one page); the location of articles; factual information given-given information cited to a recognizable, objective party or to someone else; the inclusion of pictures or cartoons; and topic of article-E.coli, Salmonella, pesticide use, or hog operation pollution.

Data were analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics, including measures of central tendency and variability were obtained.

Results

The first research question sought to determine the most reported/most important environmental and food safety issues of the decade. Important issues in agriculture were

identified and compared by examining recent press coverage of agricultural issues and sending those topics to an expert panel of professionals in agriculture to rank the issues in order of importance. These individuals included all members of the Coalition for Agriculture Image Promotion, CAIP ($N = 24$). Twenty-two (91.6%) of the CAIP members returned ranking sheets. The remaining two members were eliminated from the study due to company restructuring. Respondents identified the most important issues in agriculture in order of importance as: E.coli, hog operation pollution, pesticide use, and Salmonella. Both pesticide use and Salmonella were identified as equally important among the respondents.

As indicated in Table 1, news magazines accounted for 62.1% of all reported articles on these topics. Of the 74 articles identified, 46 appeared in news magazines, whereas 28 appeared in agricultural publications. When examined by magazine, this disparity appears to have resulted from the sheer number of total articles printed in news periodicals rather than an example of the theory of agenda setting. Of the six periodicals, *Progressive Farmer* had half of the agricultural magazine articles devoted to environment and food safety issues (50%). *Newsweek* published 39.1% of those attributed to news magazines.

As indicated in Table 2, pesticide use was the issue most covered by all magazines. More than 71% of the articles pertained to pesticides ($n = 53$). However, according to agricultural professionals, of the four topics identified as important, pesticide use ranked third. E. coli was considered the most important. Only about 7% of the articles related to hog operation pollution ($n = 5$) and another 7% to E.coli ($n = 5$). Salmonella articles ($n = 11$) accounted for the final 15%. During the 10-year time frame set for this study, 1989 had the highest number of articles published ($n = 25$), whereas 1995 had the lowest turnout with only one article. (See Table 3.) Nearly one-half of the pesticide use articles ($n = 24$) appeared

in 1989. This may have been due to two events: the Alar pesticide scare and the contamination of Chilean grapes with cyanide.

While the largest yearly number of articles appeared in 1989, the type of issue covered most frequently was of equal importance. Table 4 shows an analysis of coverage between year and topic. Pesticide use received the most coverage over the ten-year period and the leading topic in five different years-1987, 1989, 1991, 1992, and 1994. In 1990, 1993, and 1996 it shared high honors with Salmonella, E.coli, and hog operation pollution, respectively. In 1993, E.coli was a major issue when a fast food chain sold contaminated meat that killed young children. It appeared again in 1995 when ground beef from a processing plant was found to be contaminated with the bacteria.

The second research question sought to determine sources that periodicals used when reporting environmental and food safety issues. To answer this question sources were divided into one of five groups: activist, agricultural, business, education, and government. The number of sources, rather than the number of times cited, was tabulated per article. Table 5 reveals that when sources were cited, the source used most often for information was from an educational institution (62.2%) or governmental agency (60.8%). By contrast, 29.7% of the articles cited one or more activist sources, 36.5% used one or more agricultural sources, and 40.5% used one or more business sources. Nearly all of the activist sources cited were used by news magazines, whereas nearly all of the agricultural sources cited were used by agricultural magazines. Both types of magazines, however, used educational institutions and/or governmental agencies as their primary source.

Realizing how an article is presented is often as influential as the content of the article, research question three sought to identify ways that articles differ in presentation between news

Table 1. Number and Percent of Environment and Food Safety Articles in News and Agricultural Magazines

Magazine	f (n=74)	% of Articles	% of Articles by Magazine
News	46	62.1	
Newsweek	18	24.3	39.1
Time	16	21.6	34.8
U.S. News & World Report	12	16.2	26.1
Agricultural	28	37.8	
Farm Journal	6	8.1	21.4
Progressive Farmer	14	18.9	50
Successful Farming	8	10.8	28.6

Table 2. Number and Percent of Environment and Food Safety Articles by Issue

Issue	f	%
Pesticide use	53	71.6
Salmonella	11	14.9
Hog operation pollution	5	6.8
E.coli	5	6.8

Table 3. Number and Percent of Environment and Food Safety Articles by Year of Publication

Year of Publication	f	%
1987	10	13.5
1988	7	9.5
1989	25	33.8
1990	4	5.4
1991	5	6.8
1992	3	4.1
1993	8	10.8
1994	7	9.5
1995	1	1.4
1996	4	5.4

and agricultural magazines. Specifically, differences in location, article length, artwork (pictures, charts, cartoons, etc.), and number of reporters assigned to a story were noted.

Magazines regularly print articles in special locations. Where an article is printed and how it is promoted may have as much to do with its perceived importance as does the content of the article. As noted in Table 6, 87.8% of all articles were published in a special section of the magazine. Almost 15% of those articles appeared

in the Business/National Affairs section. Over 13% of the articles appeared in Feature and Health sections, respectively. Science and Cover/Special Report sections both garnered 8.1% of total number of articles. Those sections with the lowest article turnout included: Livestock (2.7%), Horizons, (4.1%), Society/Lifestyle (4.1%), Food/Nutrition (5.4%), Environment (6.8%), and Opinion (6.8%). Additionally, 12.2% of the articles appeared in no marked section. The two types of publications did not contain the same types of sections, but each did contain specialized

Table 4. Number of Environment and Food Safety Articles by Article Topic and Year

Year	Hog Operation	Pollution	E.coli	Salmonella	Pesticide Use	Total
1987	-			4	6	10
1988	1			4	2	7
1989	1				24	25
1990				2	2	4
1991				1	4	5
1992					3	3
1993			4		4	8
1994	1		.		6	7
1995			1		-	1
1996	2				2	4
Total	5		5	11	53	74

Table 5. Sources of Information Used in Reporting on Environmental and Food Safety Issues

No. of Sources Used	Type of Source									
	Activist		Agricultural		Business		Educational		Government	
	f	%	f	%	f	%	f	%	f	%
1	13	17.6	12	16.2	18	24.3	23	31.1	22	29.7
2	7	9.5	9	12.2	9	12.2	18	24.3	8	10.8
3	1	1.4	3	4.1	2	2.7	2	2.7	8	10.8
4			3	4.1	1	1.4	-	-	4	0.4
5							2	2.7	-	-
6	1	1.4	-	-	-	-	1	1.4	2	2.7
7									1	1.4
Total	22	29.9	27	36.6	30	40.6	46	62.2	45	60.8

Table 6. Number and Percent of Articles Appearing in Various Magazine Sections

Magazine Section	f	%
Business/National Affairs	11	14.9
Feature	10	13.5
Health	10	13.5
Cover/Special Report	6	8.1
Science	6	8.1
Environment	5	6.8
Opinion	5	6.8
Food/Nutrition	4	5.4
Horizons	3	4.1
Society/Lifestyle	3	4.1
Livestock	2	2.7
No section listed	9	12.2

sections. For example, news magazines tended to publish articles in the specialized sections of Health, Science, Special Features, and Society/Lifestyle, whereas agriculture magazines published in the specialized section of Livestock. Both types of magazines published heavily in the sections of Business/National Affairs, Environment, Opinion, and Food/Nutrition.

To a great extent the length of an article indicates the value the periodical places on the article to convey a message or generate sales. The normal length for most articles is less than one page. Table 7 revealed that of the 74 articles in the study, almost 70% of them were one page or less in length. Approximately 7% of the articles were placed in the "less than one column" category. An additional 37% of the articles were less than two columns. Two articles were more than three pages. No differences in the two types of magazines were evident in article length.

Table 7. Number and Percent of Articles by Length

Length of Article	f	%
Less than 1 column	5	6.8
1 column	6	8.1
1 1/2 - 2 columns	16	21.6
2 1/2 - 3 columns (1 page)	23	31.1
1 1/2 - 2 pages	17	23
2 1/2 - 3 pages	5	6.8
More than 3 pages	2	2.7

Althiede (1996) stated that the use of pictures and/or charts was another form of framing information in periodicals. As indicated in Table 8, 32 articles (78.4%) contained at least one picture. Sixteen articles (21.6%) had no picture. Only 12 articles (16.2%) contained charts and/or artwork. Charts tend to depict factual information. Artwork tends to present a biased view. Pictures may convey either. In these instances, the type of picture that was almost always used was one that generated an emotional response rather than one of an informative nature.

This was true for both the news and agricultural magazines. Each type of magazine framed articles through use of pictures to generate emotional responses for their particular audiences. Bias, through use of artwork, was found only in news magazines.

The number of reporters assigned to an article is often considered an indicator of the importance that management places on a particular subject. In this analysis, the number of authors listed varied from zero to six for news magazines (Table 9) and zero to three in agricultural magazines. Whereas 21% of the articles had no author listed, 34 articles (45.9%) had one author, 10 articles (13.5%) had two authors, and 10 articles (13.5%) had three authors. Although agriculture magazines had a narrower range of reported authors, like the news magazines approximately 50% of the articles in agricultural magazines were written by one author.

Conclusions

News magazines reported a higher number of articles on environment and food safety topics than did agricultural magazines, but at roughly the same percentages, given the weekly publication rate of most news periodicals. Of those articles published, pesticide use was the most reported issue (or tied for first) in eight of the ten years covered by this study.

The most used sources of information by journalists are educational and governmental. This finding supports earlier work by LaMay and Dermis (1991). However, since those are generally the easiest sources from which to get information, the quality of reporting may take a second place to thrift. Likewise, agricultural magazines tended to use several agricultural sources and no activist sources whereas news magazines tended to use several activist sources and few agricultural sources.

Table 8. Number and Percent of Pictures per Article

Number of Pictures Per Article	f	%
0	16	21.6
1	32	43.2
2	12	16.2
3	6	8.1
4	3	4.1
5	3	4.1
6	1	1.4
8	1	1.4

Table 9. Number and Percent of Authors Listed in Articles

Number of Listed Authors Per Article	f	%
0	16	22
1	34	46
2	10	14
3	10	14
4	2	2.7
5	1	1.4
		1.4

Articles are often printed in sections of the publication that appear to have no relationship to the nature of the article. This may be due more to journalistic sensationalism than to deliberate bias, although it is cause for concern. Although logic would dictate that the coverage of most environmental and food safety issues would appear in environmental and/or food/nutrition sections, articles were actually more often found in business and health sections.

The depth in reporting of environmental and food safety issues is lacking. A majority of the reviewed articles were one page or less. Few occurred as “special reports,” which received expanded coverage. Likewise, pictures were almost always used (instead of charts, which are inclined to be less biased) and tended to invoke emotional and biased responses.

There was little difference in the presentation of articles between news and agricultural magazines. Both used articles in various locations, used pictures that generated an emotional response from readers, presented stories of various lengths, used a range of reporters to cover stories, and sought information from various sources. News magazines also used artwork, which almost always conveys a biased message.

Recommendations and Implications

According to LaMay and Dennis (1991), journalists have a professional responsibility to control for bias when reporting on sensitive issues. To fairly present all sides of a story, journalists should strive to use a wider variety of sources for factual information, rather than relying heavily on governmental and educational sources (which are usually the least difficult to secure). All facets of an issue should be explored rather than merely relying on the easiest source to furnish information. This can only be accomplished if journalists are proficient in securing diverse and accurate information.

Journalists, and editors, should refrain from sensationalizing issues. Is there more emphasis on selling subscriptions than on unbiased reporting? Likewise, do periodicals rely on pictures to trigger emotions rather than focusing on objective information? Readers should exhibit caution in this area. Bias is only effective if readers allow themselves to be fooled by biased reporting. All readers should objectively evaluate all information published by both types of periodicals.

Agricultural professionals, as well as consumers, should voice their concerns and opinions regarding the coverage of important agricultural issues to both news and agricultural journalists. Likewise, journalists have a responsibility to report news both accurately and fairly. However, all of the responsibility for policing the journalism profession does not rest with journalists themselves. The general public

has a responsibility to assess information in an open and evaluative manner. If either group fails in their duties, responsible reporting and consumption of agricultural news reporting will not occur. If this process fails both consumers and agriculturists are likely to suffer from the commission, or omission, of practices that either positively or negatively affect environmental and food safety issues.

Colleges and universities should fully utilize journalistic and agricultural curricula to enhance objectivity of future journalists. Due to the complex nature of agriculture, those journalists who specialize in agricultural reporting should receive special training in agricultural journalism.

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