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A comparison of levels of bias in environmental and food safety articles : agricultural versus news periodicals

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A comparison of levels of bias in environmental and food safety articles:

Agricultural versus news periodicals

by

Barbara Kathryn Whitaker

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Barbara Kathryn Whitaker
has met the thesis requirements of Iowa State University

Signatures have been redacted for privacy

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ABSTRACT

The primary purpose of this study was to evaluate bias levels over time in regards to the environment and food safety in two types of periodicals—news and agricultural. A secondary purpose was to determine the types of bias. A final purpose was to determine what these bias levels meant to the periodical and the agricultural industry objectivity as a whole.

Members of the Coalition for Agriculture Image Promotion determined the important agricultural issues for the study. Six periodicals, three popular news—*Newsweek*, *Time*, and *U.S. News & World Report*—and three popular agricultural—*Farm Journal*, *Progressive Farmer*, and *Successful Farming*—were reviewed for their coverage of the identified issues. Two techniques were used to evaluate the data: the Hayakawa-Lowry News Bias Category and framing techniques. The Hayakawa-Lowry method placed sentences into one of nine categories: report attributed/unattributed, inference labeled/unlabeled, judgment attributed/unattributed, favorable/unfavorable, or other. Framing categories included: the number of sources, authors, charts/pictures, date and length of articles.

What agricultural industry communication specialists perceived as important issues in agriculture was different than the pattern of coverage of these issues in popular periodicals. Agricultural professionals ranked the issues, most important to least important, as: E.coli, hog operation pollution, Salmonella, and pesticide use. However, the coverage of each topic was almost the opposite, most coverage to least. Also, popular news periodicals covered environmental and food safety issues more (62%) than popular agricultural periodicals (38%). Pictures were more frequently used than charts when covering

environmental and food safety issues. Additionally, journalists relied heavily on governmental and educational sources for their factual information. Overall, agricultural periodicals contained more report information and fewer inferences and judgment information. The review of literature revealed that journalists have the writing skills, but lack the technical knowledge to write about agricultural issues. All periodicals showed some level of bias. Generally, news periodicals were biased unfavorably toward agriculture, and agriculture periodicals were favorably biased toward agriculture. Finally, *Time* contained a significantly higher percentage of biased information than *Progressive Farmer*. Readers should realize that bias occurs, identify it, and react accordingly in selecting publications from which to get information.

CHAPTER 1. INTRODUCTION

Agriculture affects people in all walks of life. From the stearic acid in the tires of automobiles, to insulin for diabetics, to milk for newborn babies, to sugar in lollipops, agriculture is a part of daily life (National Cattlewomen's Association, 1991). Recently, agricultural issues have come to the forefront of periodical news. More specifically, environmental and food safety issues are receiving increased coverage by the news media. This study will evaluate coverage of several major issues over the last ten years relative to the stated topics both in news and agricultural periodicals.

Environmental and food safety reporting in agricultural and news periodicals has gone through many changes during the past decade. This media interest has created a boost in environmental and food safety reporting (LaMay & Dennis, 1991). With this rapid increase in articles about the environment and food safety comes some concern. Are journalists injecting too much bias into their articles because they may lack crucial knowledge about the subject area?

Prior to 1980, journalists were criticized for viewing environmental and food safety issues as unimportant. In the early 1980s, environmental and food safety issues were becoming more and more complex. The quality of articles, however, was not increasing with the complexity of the issues. Journalists did not do much to establish new and better sources. They were either not looking for objective and knowledgeable sources or they had trouble finding them (LaMay & Dennis, 1991).

Journalists also depended too much on local officials for their information. Background information empowers readers and viewers, giving them information with which to make decisions. A good example of this information gap is the alar controversy.

In 1989 apples were treated with alar, a pesticide designed to preserve their appearance. However, use of the pesticide caused some sickness and a nationwide panic. Media hype about the controversy caused several orchards to go out of business, grocery stores to discontinue the sale of all apple products, and schools to eliminate the inclusion of any apple products on their menus. These examples demonstrate the negative effects media hype can cause. Numerous officials and environmentalists admitted the alar pesticide issue was blown far out of proportion (LaMay & Dennis, 1991).

The creation of Earth Day in 1990 dramatically increased the coverage of environmental and food safety issues in the media. The emergence of investigative reporting that exposed environmental cover-ups and food safety issues also contributed to the increase. Most recently, hog waste run-off and mad cow disease have become hot topics in the media – news and agricultural alike.

In light of poor technical knowledge, increased opinion statements rather than factual statements, and more issues to address, it is vitally important to evaluate objectivity in reporting as it relates to bias levels in popular periodicals. How do news periodicals really compare to agricultural periodicals? Is one more biased than the other? Does either type of publication use reliable sources of information, or do they merely editorialize the items of the reporter? Identifying specific issues in agriculture and the coverage of these issues in two types of periodicals may address the objectivity of reporting.

Thus far, no study has addressed bias levels in two types of periodicals on the same issue. This evaluation could result in more factual and improved articles. This study addressed bias levels regarding environmental and food safety issues in two types of periodicals. Findings from this study could aid educators in developing critical coursework

relative to objective environmental and food safety reporting. The findings could also aid journalists in developing a more distinctive system for evaluating controversial topics.

Statement of the Problem

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 is the level of bias in news periodicals versus agricultural periodicals when reporting environmental and food safety issues in agriculture?" We know the bias levels of technical articles, like agriculture, have the potential to be greater than bias levels of less technical issues (LaMay & Dennis, 1991). However, are news periodicals more or less biased than agricultural periodicals?

Rationale

Several factors contributed to the need to study bias levels of environmental and food safety articles in popular news and agricultural periodicals. Since the start of events like Earth Day, the number of environmental articles in periodicals has increased. Additionally, the controversy which ensued after the articles on apples treated with alar, sparked a comparable rise in food safety articles. Because journalists with immense, little, or no amount of knowledge are reporting about agriculture's relationship with the environment and food safety, it is vitally important that the bias levels of their articles be assessed over a period of time. As the food safety issues become more scientific and the environmental issues become more controversial, the level of bias in reporting must be evaluated. A review of literature revealed: 1) environmental articles in news periodicals are negatively biased against agriculture, and 2) journalists may not be adequately taught proper ways to eliminate bias from their articles.

In response to the increased number of articles, it is important to evaluate how bias levels have changed over time. Additionally, findings from this study could be used to educate journalists – agricultural and news alike – about the delicate issue of bias in reporting about environmental and food safety issues. The findings may also aid educators in colleges and universities in adequately developing coursework to train journalists about environmental and food safety issues.

Purpose of the Study

The primary purpose of this study was to evaluate bias levels over time on specific issues in two types of periodicals – news and agricultural – in regards to the environment and food safety. A secondary purpose was to determine the types of bias. A final purpose was to determine what these bias levels meant to the periodical and the agricultural industry objectivity as a whole. Specifically, this study addressed the following research questions:

1. Which environmental and food safety topics were important to agricultural professionals?
2. What was the level of bias of the articles on these identified topics?
3. How did the coverage of those topics compare in both types of periodicals?

Definition of Terms

For the purposes of this study, terms were defined operationally as follows:

1. Popular news periodicals: The top three news periodicals, based on circulation rates for 1995, were provided by the Gale Directory of Publications and Broadcast Media (Troshynski and Ulener, 1995). They include *Newsweek* (3,227,010), *Time* (5,405,246), and *U.S. News & World Report* (2,295,448).

2. Popular agricultural periodicals: The top three agricultural periodicals, based on circulation rates for 1995, were provided by the Gale Directory of Publications and Broadcast Media (Troshynski and Ulener, 1995). They include *Progressive Farmer* (426,313), *Successful Farming* (488,222), and *Farm Journal* (730,145).
3. Environmental issues: Issues about agriculture's relationship with the environment and natural resources (Frick et al., 1995).
4. Food safety issues: Issues about agriculture's relationship with food safety and possible health hazards to the general public.
5. Articles: An article was defined for *Newsweek*, *Time*, *U.S. News & World Report*, and *Successful Farming*, as any article the Reader's Guide Abstract Index selected when keyword searches pertaining to specific issues were entered into the computer. Because *Farm Journal* and *Progressive Farmer* periodicals are not indexed in either the Reader's Guide Abstract Index or in yearly periodical indices, articles were defined as those found by hand by the researcher that related to the specified issues.
6. Bias: The New Webster's Dictionary and Thesaurus (Cayne et al., 1992) defines bias as "a temperamental or emotional leaning to one side..." (p. 94). Stevenson & Greene (1980) defined bias as "the failure to treat all voices in the marketplace of ideas equally" (p. 116). According to Friedman and Rogers (1991), bias is "...introducing spurious associations and reaching unreliable conclusions, by failing to consider other influential or other explanations..." (p. 20).

Assumptions

The following assumptions were made for this study:

1. The bias levels found in specific articles regarding agricultural and news periodicals was representative of all six periodicals falling into those two categories.
2. The coder fully understood and accurately placed sentences into the proper categories.
3. The ten-year period chosen was sufficient to cover the evolution of bias levels about environmental and food safety articles over time.
4. The six periodicals chosen were representative of true “popular” periodicals among the general public based on circulation rates.

Limitations of the Study

1. Results of the study are only generalizable to environmental and food safety articles in each of the six periodicals reviewed.
2. Two agricultural periodicals, *Farm Journal* and *Progressive Farmer*, both contain differing body copy among regional publications. However, only the core body copy was evaluated for both periodicals so each periodical could be equally compared.

CHAPTER 2. LITERATURE REVIEW

The purpose of this study was to determine and evaluate the level of bias in both news and agricultural periodicals. Chapter one described the importance of evaluating coverage of environmental and food safety issues in these two types of periodicals.

In this chapter the theoretical and historical framework of journalistic reporting of general news and specific topics relative to agriculture will be discussed. Also, research and literature regarding demographics of journalists, sources which journalists use, where and how people acquire their news, and who dictates the importance of issues will also be reviewed.

To effectively evaluate coverage of major agricultural issues, we must first identify ways in which people communicate. According to Hayakawa (1990), communication is much more than throwing massive amounts of information at an audience and expecting them to read and understand every sentence.

Communication Models

SMCR Model

The SMCR Model of Communication (Berlo, 1960) addresses four areas: source, message, channel, and receiver. The source and the message constitute the encoding process; the channel and receiver make up the decoding process.

Shannon and Weaver (1949) created a mathematical model of communication that suggests valid questions in this process can be broken into two categories. First, "Is the source credible?" "Does this source provide accurate, trustworthy, timely information to its audience?" Second, "Is the message clear and understandable?" "Does this message come with a hidden agenda attached?"

During the decoding process, the channel and receiver aspects are addressed. Shannon and Weaver (1949) suggested that we ask ourselves, "Is the channel accessible or only available to people with certain income or educational levels?" "What is the financial cost of accessing that channel?" Finally, "Does the receiver have a vested interest in the message?" "Is the receiver actively listening?"

Communication Networks

Hayakawa (1990) defined communication by using three different categories of sentences or statements: facts, inferences, and judgments. He believed that by categorizing sentences and statements, one could determine the level of communication and bias standards. Hayakawa (1990) stated, "Reports adhere to the following rules: first they are verifiable; second, they exclude, as far as possible, inferences, judgments, and the use of 'loaded' words" (p. 24).

According to Hayakawa (1990), there are no degrees of verifiability. When something is verifiable, it either is verifiable or it is not verifiable. For example, the statement is made, "The cow is a bull." It is either a bull or it is not. Another example: "The sow had six piglets." The sow either had six piglets or she did not. Generally, verifiable statements are trusted to be factual information.

An inference, on the other hand, may not be factual. Inferences are statements about the unknown based on the known (Hayakawa, 1990). They are not capable of verification, at least not at the time they are made. While inferences are important, they are not always made accurately. The quality of the inference depends on the circumstances from which it stems and from the reader's knowledge of the subject area. Some of the characteristics of inferences are that they: 1) rely on personal or subjective opinions, conclusions, beliefs, or

feelings; 2) attempt to interpret events; 3) talk about the implications of an event; 4) attempt to make generalizations; 5) attempt to make predictions; 6) attempt to tell what a certain event means; 6) attempt to evaluate; 7) attempt to say what other people think or feel, as opposed to a report of what other people say they think or feel; and 8) attempt to explain someone's reasons or motives for doing something.

The third category, judgments, tells whether the person approves or disapproves of a situation, person, etc. This type of statement is considered highly biased because it directly relates to feelings rather than facts (Hayakawa, 1990). For instance, if a journalist disapproves of the sanitation standards in a 2,000 head hog-finishing unit, that statement is considered to be that journalist's judgment, not a fact.

These models, though simplified, begin to address the debate between the kind of information people receive – objective versus subjective. Throughout the history of reporting this debate has remained constant.

History and Scope of Reporting

With increasing scrutiny on the agricultural industry, environmental and food safety issues and their portrayal in the mass media have become increasingly complex. Prior to the 1970s, issues and periodicals that covered these issues were quite general and vague (LaMay & Dennis, 1991). The two best known periodicals in the United States, *Life* and *Look*, were considered general prior to the 1970s and thus did not provide much complex information (Merrill & Lowenstein, 1971). Specialized periodicals that focused on the more technical nature of these issues came later. Agricultural periodicals on the other hand, were considered neither "general" nor "specialized" and have been in existence for over forty years. The audience for these agricultural periodicals was fairly homogeneous. As the

American farmer's demographics and characteristics began to differ, so did the content of these general farm periodicals. The audience became much more heterogeneous and the issues became much more complex in nature (Merrill & Lowenstein). Two examples of specialized agricultural periodicals today include *Feed Stuffs* and *Hog Farm Management*.

In the early 1970s, journalists' preoccupation with the international scene rather than the American homefront was highly criticized. This criticism caused journalists to fuse environmental reporting with science reporting in the early 1980s (LaMay & Dennis, 1991). As the latter part of the 1980s approached, the emergence of highly technical environmental and food safety issues occurred. Journalists and their stories could no longer survive on the fusion of environmental and science reporting. Thus, environmental coverage became an issue of its own (Friedman & Rogers, 1991). Coincidentally, the 1988 issue of *Time* magazine named Earth as its "Planet of the Year." This step, coupled with increased coverage, moved the environment from a "fringe issue, largely forgotten over the past decade, to an issue of paramount concern to the public" (Ryan, as cited in LaMay & Dennis, 1991, p. 85).

With this influx of agricultural reporting comes many questions. What is the demographic make-up of the journalists reporting these critical environmental and food safety issues? Where do journalists get their sources? How accurate is the coverage; is it objective or subjective? Who dictates the importance of issues? Where do people get a majority of their information? How influential are the media on people's perceptions of agriculture, particularly the environment and food safety issues?

Demographics of Journalists

Lichter, Lichter, and Rothman (1986) conducted a study on the demographics of various media elites. These elite organizations were defined as three daily and three weekly

newspapers—the *New York Times*, the *Washington Post*, and the *Wall Street Journal*, three newsmagazines—*Time*, *Newsweek*, and *U.S. News & World Report*, and news departments of four networks—NBC, ABC, CBS, and PBS. To provide comparisons with another leadership group, the researchers surveyed executives from six *Fortune*-listed corporations, ranging from oil companies to retail chains.

The random sample of media was composed of mainly white males aged 30 to 40 years. One in five were female. Most respondents were highly educated; 93% had college degrees and 55% attended graduate school. Almost half of the respondents' fathers were college graduates and one in four fathers completed a graduate degree. Family income for nearly half of the respondents was indicated as above average in contrast to the 26% who reported it below average. Geographically speaking, almost half came from three eastern states, New York, New Jersey, and Pennsylvania, while less than three percent called the west coast home. Unlike the average, small-town citizen these journalists report to, journalists' roots strayed to the left rather than the middle of the road according to this study's findings. The researchers found a majority of journalists were willing to admit to the principle of influx of bias in news reporting. Additionally, almost a third of the respondents believed they could not be impartial when an issue was emotionally charged.

Lichter, Rothman, and Lichter (1986) noted several studies regarding demographics of journalists were parallel to their findings. The conservative population among major media elites ranges from 10 to 21 percent across these various surveys.

In 1985, the *Los Angeles Times* (Bozell & Baker, 1990) polled 3,000 members of the general public about their views and attitudes regarding the economy, social issues, and politics. These same questions were asked of 2,703 news and editorial staffers from over 600

newspapers mentioned by the public as influential. Fifty-five percent of the staffers regarded themselves as liberal. This study indicated a shift to the left in news reporting. The researchers were able to make some comparisons between press and public attitudes.

Current journalists' views and attitudes were of great importance to Lichter, Lichter, and Rothman (1991). The respondents were master's students enrolled at Columbia University School of Journalism. White males, in contrast to today's journalists, dominated the student group less. Almost half were female and one in five respondents came from minority groups. However, in three different categories, the responses indicated a liberal viewpoint much like today's leading journalists. Well over 60% considered themselves liberal; 63% believed the government should guarantee jobs for everyone. Additionally, half had no religious affiliation and only 8% of those that did affiliate with a religious organization attended services regularly. Many respondents considered two traditionally conservative periodicals as untrustworthy; however, the traditionally liberal publications were considered much more reliable sources.

Proving this point further, the Media Research Center (as cited in Lee & Solomon, 1990) identified 178 current and former big media reporters, editors, producers, and executives having ties at one time to a liberal political group or the Democratic political party. Only 57 of the 178 were connected to conservatives or the Republican political party. Additionally, *Time*, *Newsweek*, and *U.S. News & World Report* consistently employ journalists who have had previous employment with liberal politicians (Lee & Solomon).

Many studies regarding the demographics of journalists agree on their high level of education and intelligence. Lichter, Rothman, and Lichter (1986) stated the task of

researchers was to prove a relationship, if any, between the journalists' view of the world and how they presented that view to the public.

Sources

With this demographic information in mind, the sources these journalists employ becomes an equally important issue. Variety, accessibility, and credibility are all factors that may determine the quality of sources and stories journalists develop (LaMay & Dennis, 1991).

Researchers for the Media Monitor (LaMay & Dennis, 1991) found journalists use government officials almost one-third of the time. A group of environmental reporters attending a press workshop cited government officials as their primary source, followed by environmental groups. Ranking far behind were industry officials, scientists, and private citizens (LaMay & Dennis). Government officials have many appeals like accessibility and credibility; however, journalists who lack the technical knowledge and are in search of an "easy" source often target them.

A report by the International Food Information Council (IFIC) Foundation ("In the News," 1998) found reporters were beginning to seek out academic researchers rather than relying heavily on governmental sources when reporting about food safety issues. When the study compared its' 1997 findings to a similar 1995 study, scientific experts replaced government officials for the number two slot.

Too often in the past journalists have relied on government officials for quotes, even when the officials were not directly involved in a study. Going to the most knowledgeable source, which frequently means an academic researcher, shows a more responsible effort by journalists. (Friedman, 1998, p. 4)

Contrarily, some researchers noted more than two out of three reporters preferred

liberal activist groups of environmental information – the Sierra Club and the

Environmental Defense Fund – over more conservative sources. One in four preferred individuals not involved or primarily associated with the environment or food safety issues (Lichter, Lichter & Rothman, 1991). The National Resources Defense Council (NRDC) used actress Meryl Streep as their spokesperson during the apples treated with alar controversy. Streep had no technical or scientific background. However, compared to scientists and agriculturists, she drew equal credibility ratings with the public (LaMay & Dennis, 1991). Other researchers (Stevenson & Greene, 1980) confirmed this bias in news through a Gallup survey. Only a small minority of the general public believed the news was unbiased; the majority believed it was somewhat slanted.

Another researcher (Reiman, 1977) noted when an ambiguous event is reported by journalists, labeling and categorization become more apparent. Several journalists may witness the same event but have very different accounts of the story. Their background and sources used affect this journalistic decision. For example, if a journalist has little or no agricultural background, he or she may have certain theories relative to the industry.

...[journalists] may unconsciously confirm their theories by using a restricted range of sources with limited perspectives, by asking a set of questions of sources that are overly limited in scope and type, or by handling sources in ways that elicit theory-confirming evidence. (Stocking & Gross, 1989, pp. 32-33)

Demographics and journalists' sources both play a major role in the accuracy of coverage Americans receive. Journalists are often encouraged to act, think, breathe, and report objectively rather than subjectively. Realistically, though, they are human and are prone to make bad judgments. So, what version does the public receive? This may be dependent upon organizations, communities, and cultures where they work (Stocking & Gross, 1989).

Objectivity versus Subjectivity

One culture that may contribute to the objectivity of stories is the inevitable—politics. Panelists at a recent journalism conference admitted politics can play a role in determining which environmental stories are investigated (Chepesiuk, 1993). One journalist reiterated, “Reporters sometimes view the environmental beat as a mission in which the fate of the world and its people are at stake” (Chepesiuk, 1993, p. 18). If this is true, people may have trouble in distinguishing which journalist to listen to and trust for a majority of their information regarding environmental and food safety issues.

When we speak about the agricultural industry and topics that directly relate to the environment or food safety, thousands upon thousands of pages of information could be collected and disseminated. In reality, journalists must take that immense amount of information and condense it into a readable and comprehensible text for the intended audience. This act of determining and qualifying information as more important, less important or not important at all inevitably brings bias into the picture.

The New Webster’s Dictionary and Thesaurus (Cayne et al., 1992) defines bias as “a temperamental or emotional leaning to one side...” (p. 94). In regards to reporting, one group of researchers (Stevenson & Greene, 1980) defined it as “the failure to treat all voices in the marketplace of ideas equally” (p. 116). Bias in science, according to Friedman and Rogers (1991), is “...introducing spurious associations and reaching unreliable conclusions, by failing to consider other influential or other explanations...” (p. 20).

The training and experience many journalists receive is more than adequate when dealing with non-technical issues. However, they often lose the battle of accuracy and bias when complexity enters the arena. One journalism researcher (Chepesiuk, 1993) reiterated a

feeling among journalists that journalists may lack crucial training and experience when covering technical issues. Fico and Soffin (1995), in discussing the fairness in news reporting, stated that if one point of view on an issue is given more attention than others, its public salience will increase, thus altering public debate on that issue.

A study by Sandman et al., (1987) comparing content analysis and expert analysis in New Jersey newspapers found that nearly 70% of the paragraphs evaluated for their study did not discuss risks associated with the issue at all. The assumption of the reporters and editors was the reading public was familiar with the risks and did not need to be told again. Additionally, the researchers reported that the information presented in the newspaper was more alarming than reassuring. Finally, the newspaper journalists tended to avoid technical details.

The International Food Information Council (IFIC) Foundation ("In the News," 1998) conducted a quantitative and qualitative content analysis of food and nutrition reporting in the national media during the months of May through July 1997. The study revealed which topics were reported on more or less frequently, the extent of that coverage, and who those sources were that lent perspective. Thirty-eight national and regional media outlets (metropolitan newspapers, wire services, national magazines, network and local television news, and syndicated talk shows) were analyzed and compared to the findings of a similar study conducted in 1995. Food-borne illness was the number one topic. However, the report found the media failed to provide necessary context for consumers to make informed choices about their own food selections. While one-third (34%) of the stories reviewed in 1997 (compared to 15% in 1995) included contextual information the citations were vague. They referred to "studies" or "researchers" rather than specific names or universities.

With the increasing number of policy issues related to agriculture coming before the public, fairness, or lack of bias, in mass media coverage of agriculture is of concern. A professor of Mass Communication and former executive editor of an award-winning newspaper emphasized objectivity in reporting should be encouraged by editors because journalists often lean toward advocacy, rather than objective journalism (Chepesiuk, 1993).

Contrarily, how can we expect journalists to be experts in objectivity when they are just as susceptible to fallibility as anyone else in any other profession? If a racist judge rules on a race-related case, can his decision be trusted to be wholly objective? Certainly, journalists are not perfect and may sometimes be advocates rather than objective. It is a fine line to draw. Do journalists set the importance of issues or does the public?

Theoretical Framework

Two theories explain who sets the public agenda. The first is the agenda setting theory. Shaw and McCombs (1977) described this theory as one where the media helps set the agenda. First, salient issues represent public debate. In other words, what the media covers should be important to the public. According to researchers, public opinion, political choice, or both may set the public's agenda. This theory is much more reliable when applied to newspapers and magazines rather than television because the written audience is more active than the passive television audience. Situations where the agenda-setting theory is not applicable include when: issues change, historical events intercede, public "pet" issues are involved, the public sets the media's agenda, and media cycles occur.

Another plausible explanation is the knowledge gap theory. This theory says that as the infusion of mass media information into a social system increases, the segments of the population with a higher socio-economic status tend to acquire this information at a faster

rate than the lower status segments. Thus, the gap in knowledge between these two segments increases, rather than decreases (Tichenor, 1980). It may be possible that high socio-economic status journalists may be widening the gap between their high and low status readers.

Importance of Issues

Several studies have determined that the mass media play a major role in shaping America's agenda. (In fact, commodity groups like the National Cattlemen's Beef Association, the National Pork Producers, and America's Dairy Producers pump millions of dollars every year into extensive advertising and marketing campaigns because they too believe the media are highly influential (Klaidman, 1991).)

In a 1998 court case ("Jurors take their seats," 1998), several Texas panhandle cattle producers sued Oprah Winfrey, her company, and a guest for the absence of objectivity. Her story on Bovine spongiform encephalopathy, known as BSE or "mad cow disease" to her viewing audience, appeared to be one-sided according to agriculturists. The plaintiffs felt the media negatively influenced public opinion by reporting one-sided information, and this misinformation caused producers to lose \$10.3 million in beef sales. The case was originally tried under the Texas Veggie Libel Law; however, the suit was dismissed and tried under the first amendment law instead. While the case is undergoing appeals, the jury found in favor of the defendant, Oprah Winfrey, her production company, and her guest, Howard Lyman.

Other researchers agree with the environmental journalist's role in shaping public agendas. LaMay and Dennis (1991) emphasized the importance of environmental journalists and their influence on shaping what issues deserve the public's immediate

attention. Where does this objectivity end and the advocacy begin? Essentially, reporters have a responsibility to themselves and their public to educate themselves on key issues, especially those regarding the environment and food safety, and to provide sound information.

When *Time* magazine first began, the periodical summarized important news stories. In the summary, the journalist would propose a theory and then support it with evidence. Over time, this journalist's theory became the only one. Another periodical, *Newsweek*, followed a similar style of writing (LaMay & Dennis, 1991). This type of writing may have contributed to bias rather than the objectivity readers anticipate. These journalists and future journalists described above work for media institutions that provide the American public with a majority of their news.

News Sources

Rusher (1988) defines the sources where most Americans get their news as: two major wire services – Associated Press and United Press International, three major commercial television networks – ABC, CBS, NBC, one noncommercial television network – PBS, “all news” networks on cable television – CNN, CNBC, FOX, three newsmagazines – *Time*, *Newsweek*, and *U.S. News & World Report*, and three newspapers – the *New York Times*, the *Washington Post*, and the *Wall Street Journal*.

In addition to the sources Rusher (1988) cited, the World Wide Web and online news sources are also a source of information for those Americans with access to a computer and a modem. Obviously, not *all* Americans get the news from just these sources. However, it is fair to say that most receive information from them, especially opinion leaders. Note that all

of the sources the public turns to for accurate and fair news have little to no direct connection with the agricultural industry.

Throughout history, agriculturists, unlike the general public, have relied on entirely different sources for their information, including agriculture. Several studies affirm the importance of *farm* magazines, newspapers, and publications to the agricultural community as a major source of accurate information (Braden, 1981; McNeil-Sanders, 1991; Yarbrough, 1988). As we begin to enter the twenty-first century, many farmers continue to rely heavily on general farm magazines like *Successful Farming*, *Progressive Farmer*, and *Farm Journal* (McNeil-Sanders).

Summary

In this chapter the literature pertaining to the journalists' demographics, how and where they acquire news is presented, and where the public acquires this information has been reviewed. This review of literature revealed that people receive a majority of their information from the mass media; and journalists generally (1) have little technical or agricultural background, and (2) use convenient and accessible sources that may not always be the most credible.

Several studies note that the factuality of technical agricultural information is not completely accurate in news periodicals. Coincidentally, many highly technical topics regarding the environment and food safety issues are sometimes grossly distorted by the mass media. Current research, however, has failed to adequately evaluate coverage of key agricultural issues in two types of periodicals—news and agricultural. Agricultural communicators are interested in how the mass media portray important issues to the public.

A review of literature revealed three major deficiencies: (1) a lack of factual technical information among news journalists reporting, (2) a lack of technical knowledge among news journalists, and (3) a lack of comparison between agricultural and news journalists reporting.

Shaw and McCombs (1977) and Tichenor (1980) supplied the theoretical framework for this study. According to the former researchers, the media sets public agenda. Tichenor, however, proposes that the gap between the higher and lower socio-economic statuses may be widening.

CHAPTER 3. METHODOLOGY

Chapter one described the importance of determining bias levels of environmental and food safety articles in two types of periodicals. The purpose of this study was to determine and evaluate the level of bias of specific issues relative to the agricultural industry in both news and agricultural periodicals. The objectives for this study were (1) to determine which issues were important to agricultural professionals, (2) determine the level of bias of articles on those identified issues, and (3) compare coverage of those issues in both types of periodicals.

Chapter two provided a theoretical and historical framework for reporting in both news and agricultural periodicals. Research and literature regarding demographics of journalists, sources which journalists use, where and how journalists acquire their news, and theories of who dictates the importance of issues were presented.

In this chapter, the methods used to address the research questions are discussed. Specifically, the research design, variables, sample, instrumentation, data collection procedures, and data analysis are addressed.

Research Design

This study used a descriptive design. It was conducted to describe the level of bias regarding environmental and food safety issues in agricultural and news periodicals. Three agricultural periodicals – *Farm Journal*, *Progressive Farmer*, and *Successful Farming* – and three news periodicals – *Newsweek*, *Time*, and *U.S. News & World Report* – for the ten year period, 1987-1996, were evaluated for the purpose of this study.

Population and Sample

For this study, important issues in agriculture were identified by examining recent press coverage of agricultural issues. An expert panel of professionals in agriculture was selected to rank these issues in order of importance. These individuals included all members of the Coalition for Agriculture Image Promotion, CAIP ($N = 24$). However, due to position changes and restructuring, only 22 were available for the study.

CAIP is comprised of representatives from the following organizations: Agribusiness Association of Iowa, Iowa Corn Promotion Board, Iowa Farm Bureau Federation, Iowa Egg Council, Iowa 4-H Foundation, Iowa Newspaper Association, FFA Foundation, Iowa State University, Iowa Pork Producers Association, Midland Dairy Council, Iowa Department of Agriculture and Land, Iowa Dairy Products Association, Iowa-Nebraska Farm Equipment Association, Living History Farms, Iowa Soybean Association, Iowa Beef Industry Council, Iowa Turkey Federation, Iowa Sheep Industry Council, and the Iowa Association of Electric Cooperatives. Some groups have two representatives.

Because all CAIP members either teach a component of agricultural communication at a university or lead public relations, marketing or communication efforts for key agricultural organizations, they were chosen to rank important agricultural issues.

From the 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 (Appendix C). 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.

The articles included in the study were all articles during the ten-year period from 1987-1996 and published in these three agricultural periodicals and three news periodicals. For the purpose of this study, the articles evaluated were limited to stories regarding the top four environmental and food safety issues identified by respondents. An article was defined for *Newsweek*, *Time*, *U.S. News & World Report*, and *Successful Farming*, as any article the Reader's Guide Abstract Index selected when keyword searches pertaining to specific issues were entered into the computer. The researcher evaluated *Farm Journal* and *Progressive Farmer* by hand because their articles were not indexed in either a computer database or a yearly index. Articles relating to the above mentioned issues were identified. Additionally, *Farm Journal* and *Progressive Farmer* both have differing article content from region to region. Thus, the researcher only evaluated the core body copy featured in every *Farm Journal* periodical and every *Progressive Farmer* periodical regardless of region.

Instrumentation

For the purpose of determining bias, the Hayakawa-Lowry method was used. Hayakawa (1990) placed sentences into three different categories: report, inference, or

judgment. Lowry (1971) expanded upon this categorization by adding nine separate categories for sentence placement:

1. Report attributed (RA) - information is factual and attributed to a source.
2. Report unattributed (RU) - information is factual without citing someone as the source.
3. Inference labeled (IL) - statements about the unknown based on the known. Often interpretations or generalization of events. Labeled inferences use "tip-off" specific words such as appear, could, may, perhaps, possible, . . . to let the reader know the information is subjective to some extent.
4. Inference unlabeled (IU) - same characteristics described for category three, only without "tip-off" words. Considered to have more bias because the "tip-off" is not used to "warn" the reader.
5. Judgment attributed, favorable (JAF) - statements of the writer's approval or disapproval of an event, person, object, or situation that are attributed to a source and favorable toward the subject.
6. Judgment attributed, unfavorable (JAU) - same as category five, only unfavorable to the subject.
7. Judgment unattributed, favorable (JUF) - statements of the writer's approval or disapproval of an event, person, object, or situation that are not attributed to a source, but are favorable toward the subject.
8. Judgment unattributed, unfavorable (JUJ) - same as category seven, only unfavorable to the subject.
9. Other (O) - all other sentences. Normally includes rhetorical questions, and introductory statements.

Sentences were coded as report attributed (RA) if the information was capable of being verified. Some rules the researcher followed in coding sentences as report attributed included: (1) reports of an inference someone else made, and (2) if the attribution took the form of a direct or an indirect quote. However, the report of a judgment sentence someone else made was coded as a judgment sentence, attributed (either JAF or JAU). The main difference between RA and report unattributed was that RU sentences were straightforward reports the author made without citing someone else as being the source of that particular information.

Inferences, on the other hand, were not capable of being verified. The researcher followed the guidelines set forth by Lowry (1971) regarding labeled inferences: (1) they

relied on personal or subjective opinions, conclusions, beliefs, or feelings, (2) they attempted to interpret events, (3) they talked about the implication of an event, (4) they attempted to make generalizations, (5) they attempted to make predictions, (6) they attempted to tell what a certain event means, (7) they attempted to evaluate, (8) they attempted to say what other people think or feel, as opposed to a report of what other people say they think or feel, and (8) they attempted to explain someone's reasons or motives for doing something. Two exceptions to predictions were those reports of up-coming events that could be verified and predictions attributed to another source. Labeled inferences were set off by "tip-off" words, whereas unlabeled inferences were not.

Judgment sentences were defined simply. They included any statement of approval or disapproval of an occurrence, person, or object that was described. The attributed/unattributed status was the same as used for report sentences.

In the case a sentence was "mixed" – could be coded into two different categories – it was coded into the next lowest category. For instance, if a sentence contained both an RA and an RU sentence, it was coded as an RU sentence.

The researcher began the coding process by first reading each sentence completely. Then the general category was established – fact, report, or inference. Once the general category was defined, the researcher then chose the appropriate sub-category.

In addition to employing the Hayakawa-Lowry method, framing techniques described by Berelson (1952) were also used. Goffman (1974) referred to frames as "schematic of interpretation...which enable people to locate, perceive, identify and label 'occurrences of information'" (p. 55). (The following frames were used to interpret data: 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, topic of article – E.coli, Salmonella, pesticide use, or hog operation pollution. Berelson (1952) describes the importance of framing data as "...qualitative analysis usually contains quantitative statements in rough form. They may be less explicit but they are nonetheless frequency statements about the incidence of general categories" (p. 116).

Altheide (1996) recommended dividing information into the following categories when evaluating periodicals: date, topic, assignment of an article number, location – what section, length, and author. Once the information was framed and placed into a sentence category, the information was tallied.

Validity and Reliability

An expert panel consisting of members of the College of Agriculture and the Department of Journalism and Mass Communication at Iowa State University reviewed the instruments developed for the study. Revisions were made based upon recommendations of the panel. Lowry (1971) established construct validity of the Hayakawa News Bias Categories and dealt with inter-rater reliability through the development of a tested rater manual. A copy of the manual was secured for the study. Inter-rater reliability was established at $r = .90$.

Data Collection Procedures

When searching for articles on E.coli, Salmonella, and pesticide use in the Reader's Guide Abstract Index, the keywords used were, *E.coli*, *Salmonella*, and *Pesticide Use*, respectively. Only those articles dealing with pesticide use and health hazards were

included. This addition of health hazards matched the primary purpose of this study – to evaluate environmental and food safety articles. Keywords used to identify hog operation pollution included: *hog, pig, hog operation, pig operation, hog pollution, pig pollution, and hog operation pollution*. The same issues were used when searching *Farm Journal* and *Progressive Farmer*.

Framing categories used for each article included: title of article, periodical, date, number of authors, length of article, number and content of pictures and charts, and section the article appeared.

Data Analysis

The alpha level was set a priori at .05. To assess the contribution each variable made to the study, frequencies, crosstabulation, ANOVA, and Scheffe's Post Hoc tests were performed. The analyses focused on the number of articles relative to issue and periodical, relationship of bias and periodical, and levels of bias of the four issues in the six periodicals.

Frequencies determined the importance of issues, the number of articles – per year, per issue, and per periodical, the number of authors per article, the number of charts and pictures featured, the length of articles, and the sections these articles appeared. This information was useful in determining the current level of coverage in both types of periodicals. Crosstabulation allowed the researcher to determine the number of articles per periodical and year as well as the number of articles per issue and year.

The other tests focused primarily on describing the results of the first research question of the study – determining which issues were important to agricultural professionals, as well as a portion of the second research question – determining the level of bias of those issues. However, the ANOVA and subsequent post hoc analysis focused on

the final question of the study – how the coverage compared for four major issues in two types of periodicals. Scheffe was chosen since the researcher wanted a more conservative alpha level.

CHAPTER 4. FINDINGS

Chapter one described the importance of determining bias levels of environmental and food safety articles in two types of periodicals. The purpose of this study was to determine and evaluate the level of bias of specific issues relative to the agricultural industry in both news and agricultural periodicals. The objectives for this study were:

1. To determine which issues were important to agricultural professionals.
2. To determine the level of bias of articles on those identified issues.
3. To compare coverage of those issues in both types of periodicals.

Chapter two provided a theoretical and historical framework for reporting in both news and agricultural periodicals. Research and literature regarding demographics of journalists, sources which journalists use, where and how journalists acquire their news, and who dictates the importance of issues were presented.

Chapter three described the methods used to address and analyze the research questions. Specifically, the research design, variables, sample, instrumentation, data collection procedures, and data analysis were discussed.

In this chapter, findings of the study are presented. These results address specific questions pertaining to the importance of issues, the level of bias of those issues over a ten-year period, and the coverage of those issues in two types of periodicals.

Agricultural Professionals Responses

A total of 22 (91.6%) of the agricultural professionals returned completed ranking sheets. The research question addressed in this section is: "*What issues were important to agricultural professionals?*" Data presented in Table 4.1 describe the rankings of eight various environmental and food safety issues among 22 respondents. Respondents were asked to

rank the issues in order of importance, on a scale of 1 to 9 from most important (1) to least important (9). Thus, those issues with the lowest sums were identified as the most important issues from 1987-1996. The issues that emerged as "important" from those professionals were, in order of importance, E.coli with a sum of 42, hog operation pollution with a sum of 61, Salmonella and pesticide use both with sums of 73. Other issues listed by the respondents included: urban sprawl, genetically modified organisms, roundup ready corn, and respiratory ailments from confinement operations workers.

Periodical and Issue Demographics

The news periodicals had slightly more articles about the four important issues than did the agricultural periodicals during the ten-year period. Table 4.2 shows approximately

Table 4.1. Importance of Top Agricultural Issues

Issue	<u>M</u>	<u>SD</u>	Sum
Alar	6.63	1.54	126
E.coli	2.21	1.40	42
Hepatitis A	4.47	2.37	85
Hog Operation Pollution	3.21	2.35	61
"Mad Cow" Disease	4.63	2.06	88
Ozone Depletion	6.00	2.29	114
Pesticide Use	3.84	2.03	73
Salmonella	3.84	1.38	73
Other	7.74	2.40	147

Table 4.2. Number of Articles in News and Agricultural Periodicals

Types of magazines	f	%
<i>Newsweek</i>	18	24.3
<i>Time</i>	16	21.6
<i>U.S. News & World Report</i>	12	16.2
<i>Farm Journal</i>	6	8.1
<i>Progressive Farmer</i>	14	18.9
<i>Successful Farming</i>	8	10.8

62% of the environmental and food safety articles were presented in news periodicals, leaving only 38% of the coverage in agricultural periodicals.

On a per issue basis, the number of pesticide use articles outnumbered the other three topics almost three to one as shown in Table 4.3. Slightly more than 71% of the articles focused on pesticide use, whereas the remaining 28% was split among the remaining three issues – E.coli, hog operation pollution, and Salmonella – in each of the six periodicals.

Because the purpose of this study was to evaluate bias during a ten-year period, 1987-1996, the number of articles that appeared in all six periodicals during each year was also evaluated. Table 4.4 demonstrates the fluctuation of articles during that time period. Almost 34% of the articles were printed during 1989. Over 20% were published in 1993-1994. Only one article appeared during 1995.

Table 4.3. Number of Articles

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

Table 4.4. Number of Articles Per 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

While the largest yearly number of articles appeared in 1989, the *type* of issue covered most frequently was of equal importance. Table 4.5 shows the breakdown of coverage between year and topic. Pesticide use received the most coverage over the ten-year period and was the leading topic in six 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. Salmonella garnered 11 articles; E.coli and hog operation pollution shared third place with 5 articles each.

Table 4.5. Comparison of Article Topic by 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 4.6 shows the number of articles in each periodical by year. The periodical with the most overall environmental and food safety coverage was *Newsweek* (18 articles), followed by *Time* (16 articles), *Progressive Farmer* (14 articles), *U.S. News & World Report* (12 articles), *Successful Farming* (8 articles), and *Farm Journal* (6 articles).

Periodicals regularly print articles in special sections. Data in Table 4.7 reveals the section of the periodical in which each article appeared. Fifteen percent of all articles appeared in the Business/National Affairs section. Over 13% of the articles appeared in the

Table 4.6. Comparison of the Number of Articles Covered by Periodical and by Year

Year	<i>Newsweek</i>	<i>Time</i>	<i>U.S. News & World Report</i>	<i>Farm Journal</i>	<i>Progressive Farmer</i>	<i>Successful Farming</i>	Total
1987	3		3	1	2	1	10
1988	3	2	1		1		7
1989	6	6	3	2	5	3	25
1990		2	1		1		4
1991		2	2		1		5
1992	1	1		1			3
1993	2	2	1		1	2	8
1994	2				3	2	7
1995	1						1
1996		1	1	2			4
Total	18	16	12	6	14	8	74

Feature and Health sections. 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.

Table 4.7. Numbers, Percentages, and Categories of Article Sections

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

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 4.8 revealed that of all 74 articles, almost 70% of the articles were one page or less. Furthermore, 97% were three pages 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.

Table 4.8. A Comparison 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	23.0
2 1/2 - 3 pages	5	6.8
More than 3 pages	2	2.7

Althiede (1996) stated that the use of pictures and charts was another form of framing information in periodicals. The number of charts was low (Table 4.9). Twelve articles (16.2%) contained only one chart. Sixty-two articles (83.8%) contained no chart at all. Pictures were more popular. Table 4.10 shows that 32 articles (43.2%) contained one picture, whereas 12 articles (16.2%) displayed two. Sixteen articles (21.6%) showed no picture.

Table 4.9. Number and Percent of Charts per Article

Number of Charts	f	%
0	62	83.8
1	12	16.2

Table 4.10. Number and Percent of Pictures per Article

Number of Pictures	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

The number of reporters assigned to an article may be an indicator of the importance that management places on a subject. In this analysis, the number of authors listed varied from zero to six (Table 4.11). Whereas, 21% of the articles had no author listed; 67.6% of the articles had at least one author, 10 articles (13.5%) had two authors, 13.5% of the articles had three authors, and four articles (5.5%) listed four or more authors.

Table 4.11. Number and Percent of Authors Listed in Articles

Number of Authors	f	%
0	16	21.6
1	34	45.9
2	10	13.5
3	10	13.5
4	2	2.7
5	1	1.4
6	1	1.4

Source Information

The sources used by each periodical (agricultural and news alike) were evaluated as well. 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 4.12 reveals that 30% of the articles cited one or more activist sources, whereas the remaining 70% used no activist source. An activist source included groups such as: Greenpeace, Public Voice for Food and Health Policy, California Public Interest Research Group, Center for Science in Public Interest, Humane Farming Association, Alliance for Food and Fiber, Environmental Working Group, National Coalition Against the Misuse of Pesticides, Americans for Safe Food, Natural Resources Defense Council, Food Animal Concerns Trust, Mothers & Others for Pesticide Limits, and Public Citizen advocacy group.

Table 4.12. Number and Percent of Activist Sources Cited

Number of Activist Sources Cited	f	%
0	52	70.3
1	13	17.6
2	7	9.5
3	1	1.4
6	1	1.4

The number of agricultural sources was also evaluated, and the results are shown in Table 4.13. Approximately 16.2% of the articles cited one agricultural source, slightly less than activist sources; however, 63.5% of the articles used no source. Another 20% of the articles used two or more agricultural sources. Agricultural sources included groups such as: American Egg Board, various farmers and ranchers, National Cattlemen's Beef Association, National Livestock and Meat Board, National Pork Producers Association, National Broiler Council, agricultural engineers, Certified Organic Farmers, International Apple Institute, California Commission for Sustainable Agriculture, Farm Bureau, Ducks Unlimited, and the American Council on Science and Health.

Table 4.14 reveals that almost 40% of the articles used one or more business sources. Whereas almost 24% cited one source, 60% used no business source. Business sources included in this category were: Raley's Supermarket, Hyatt Hotels, Prestage Feeds, Jack-in-the-Box Restaurant, McDonald's, *Gourmet Magazine*, Applied Microbiology, Inc., Mycogen Corporation, Kroger, Chem-Lawn, NutriClean, DuPont, National Restaurant Association,

Table 4.13. Number and Percent of Agricultural Sources Cited

Number of Agricultural Sources Cited	f	%
0	47	63.5
1	12	16.2
2	9	12.2
3	3	4.1
4	3	4.1

Table 4.14. Number and Percent of Business Sources Cited

Number of Business Sources Cited	f	%
0	44	59.5
1	18	24.3
2	9	12.2
3	2	2.7
4	1	1.4

Gerber, Beech Nut, Maxwell Training, WesPak, Ralph's Supermarket, Uniroyal, Cellgene, and Organic Farms, Inc.

The number of educational sources cited is shown in Table 4.15. Approximately 30% of the articles used one educational source, whereas 38% cited no educational source.

Table 4.15. Number and Percent of Educational Sources Cited

Number of Educational Sources Cited	f	%
0	28	37.8
1	23	31.1
2	18	24.3
3	2	2.7
5	2	2.7
6	1	1.4

Educational sources included in this category were: journals – Journal of the American Medical Association; and universities – Cornell, Duke University, Iowa State University, Michigan State University, North Carolina State University, Pennsylvania State University, Purdue University, Stanford, University of California-Berkley, University of California-Davis, University of California-Irvine, University of Georgia, University of Hamburg-West Germany, University of Illinois, University of Iowa, University of Massachusetts-Amherst, University of Missouri, University of Nebraska, and the University of Nevada-Reno.

Table 4.16 shows that almost 30% of the articles used one or more governmental sources. By contrast, 40% refrained from using a governmental source. Sixteen articles (21.6%) used two to three sources. Governmental sources for this category included: United States Department of Agricultural, Environmental Protection Agency, Food and Drug Administration, United States Fish and Wildlife Service, United States General

Table 4.16. Number and Percent of Governmental Sources Cited

Number of Governmental Sources Cited	f	%
0	29	39.2
1	22	29.7
2	8	10.8
3	8	10.8
4	4	5.4
6	2	2.7
7	1	1.4

Accounting Office, Centers for Disease Control and Prevention, Food Safety and Inspection Service, various state health departments, and United States trade representatives.

Sentence Category Comparisons

The research questions addressed in this section are – "*What was the level of bias of the articles on hog operation pollution, E.coli, Salmonella, and pesticide use?*" and "*How did the coverage of those issues compare in both agricultural and news periodicals?*" *Time* magazine was the only periodical with at least one article about each issue; *U.S. News & World Report* and *Farm Journal* only reported on two issues during the ten year period, *Salmonella/pesticide use* and *hog operation pollution/pesticide use*, respectively. Overall, news periodicals contained 46 articles (62%) and agricultural periodicals contained 28 articles (38%) pertaining to the four issues (Table 4.17).

Table 4.17. Number of Articles by Issue and Periodical

Periodical	Number of Articles			
	Hog Operation Pollution	E.coli	Salmonella	Pesticide Use
<i>Newsweek</i>		2	3	13
<i>Time</i>	1	1	3	11
<i>U.S. News & World Report</i>			4	8
<i>Farm Journal</i>	1			5
<i>Progressive Farmer</i>	2		1	11
<i>Successful Farming</i>	1	2		5

Hog Operation Pollution

Four periodicals covered the hog operation pollution issue—*Time* (1 article), *Farm Journal* (1 article), *Progressive Farmer* (2 articles), and *Successful Farming* (1 article). A total of five articles were presented about this issue over the decade. All five articles contained some report attributed (RA) information. The *Time* article contained the lowest percentage (7%), whereas one of the *Progressive Farmer* articles contained the highest percentage of RA statements (50%).

Both of the *Progressive Farmer* articles contained no judgment attributed favorable (JAF) statements; the remaining three articles contained some JAF statements. The highest percentage of JAF statements occurred in *Successful Farming* (32%). In the judgment attributed unfavorable (JAU) category, 100% of *Time* articles, 100% of *Farm Journal* articles, 50% of *Progressive Farmer* articles, and 100% of *Successful Farming* articles contained JAU

statements. The highest percentage was found in the *Time* article (24%). None of the five hog operation pollution articles contained judgment unattributed favorable or unfavorable statements.

E.coli

Three periodicals covered the E.coli issue – *Newsweek* (2 articles), *Time* (1 article), and *Successful Farming* (2 articles). A total of five articles were presented about E.coli during the ten-year time frame. All five E.coli articles contained some sort of report attributed statements. The highest and lowest percentages of RA statements were both found in *Successful Farming*, 49% and 20%, respectively.

In the judgment attributed favorable category, *Time* contained no JAF statements. The highest percentage of JAF statements was again found in *Successful Farming* (15%). In the judgment attributed unfavorable category, *Time* had no applicable statements. However, the highest percentage of JAU statements was found in *Successful Farming* (17%).

Both *Time* and *Successful Farming* contained no judgment unattributed favorable statements. Exactly 50% of *Newsweek* articles had some JUF statements. *Successful Farming* was the only periodical of the three that contained no judgment unattributed unfavorable statements.

Salmonella

Salmonella was covered by all three news periodicals – *Newsweek* (3 articles), *Time* (3 articles), and *U.S. News & World Report* (4 articles), and one agricultural periodical – *Progressive Farmer* (1 article). A total of 11 articles were written about Salmonella from 1987-1996. The highest percentage of report attributed statements came from *Progressive Farmer* (64%); the lowest percentage came from one of the *U.S. News & World Report* articles (11.5%).

In the judgment attributed favorable category, 33% of *Newsweek* articles, 67% of *Time* articles, and 75% of *U.S. News & World Report* articles contained JAF statements. The same trend was almost identical for the judgment attributed unfavorable category; however, 50% of the *U.S. News & World Report* articles contained JAU statements.

One of the eleven *Salmonella* articles contained some amount of judgment unattributed favorable statements—*U.S. News & World Report*. For the final category, judgment unattributed unfavorable, the following periodicals contained some sort of JUU statements—33% of *Newsweek* articles, 67% of *Time* articles, and 25% of *U.S. News & World Report* articles. The *Progressive Farmer* article contained no type of judgment statements.

Pesticide Use

The pesticide use issue received the most coverage with 53 total articles. All six periodicals reported on this issue—*Newsweek* (13 articles), *Time* (11 articles), *U.S. News & World Report* (8 articles), *Farm Journal* (5 articles), *Progressive Farmer* (11 articles), and *Successful Farming* (5 articles). Fifty-two of the 53 articles contained report attributed statements. The highest percentage of RA statements was found in one of the *Progressive Farmer* articles (80%).

In the JAF category, 38.5% of *Newsweek* articles, 45.5% of *Time* articles, 75% of *U.S. News & World Report* articles, 80% of *Farm Journal* articles, 45.5% of *Progressive Farmer* articles, and 40% of *Successful Farming* articles contained JAF statements. Approximately 62% of *Newsweek* articles, 63.6% of *Time* articles, 87.5% of *U.S. News & World Report* articles, 40% of *Farm Journal* articles, 36.4% of *Progressive Farmer* articles, and 20% of *Successful Farming* articles contained JAU statements.

In the judgment unattributed unfavorable (JUF) category, 46% of *Newsweek* articles, 54.5% of *Time* articles, 37.5% of *U.S. News & World Report* articles, 40% of *Farm Journal* articles, 36.4% of *Progressive Farmer* articles, and 40% of *Successful Farming* articles contained JUF statements. The highest percentage of JUF statements was found in one of the *Newsweek* articles (31%). Finally, 69.2% of *Newsweek* articles, 90.9% of *Time* articles, 20% of *U.S. News & World Report* articles, 40% of *Farm Journal* articles, 63.6% of *Progressive Farmer* articles, and 0% of *Successful Farming* articles contained JUU statements. The highest percentage of JUU statements was found in one of the *Progressive Farmer* articles (24%).

In Table 4.18, all four issues had approximately the same proportion of RA statements. However, a higher percentage of RU statements were found in hog operation pollution articles (35%) compared to Salmonella articles (22.3%). Salmonella articles contained the highest percentage of IL statements (16%), whereas hog operation pollution articles contained the lowest percentage (8%). The IU category, pesticide use articles had the highest percentage (23%) and E.coli articles had the lowest (8.3%). The JAF category percentages fell between 3.5% (pesticide use) and 10% (hog operation pollution). Less than five percent of the statements were found in both the JUF and JUU categories.

News and Agricultural Periodical Comparisons

Table 4.19 shows the relationship of bias between each periodical, news and agricultural alike. All of the agricultural periodicals had a higher percentage of RA statements than all of the news periodicals. However, in the RU category, the periodical with the highest percentage was *Progressive Farmer* (30%) and the periodical with the lowest

Table 4.18. Comparison of Number and Percent of Sentence Categories by Issue

Sentence Category	Issue							
	Hog Operation Pollution		E.coli		Salmonella		Pesticide Use	
	f	%	f	%	f	%	f	%
RA	64	28.0	40	30.1	88	29.0	671	28.0
RU	80	35.0	37	27.8	67	22.3	629	26.0
IL	18	8.0	16	12.0	48	16.0	210	9.0
IU	22	9.6	11	8.3	52	17.3	565	23.0
JAF	10	4.4	12	9.0	12	4.0	61	2.5
JAU	23	10.0	10	7.5	13	4.0	88	3.5
JUF	0	0.0	2	1.5	2	1.0	45	2.0
JUU	0	0.0	2	1.5	14	4.7	95	4.0
O	11	5.0	3	2.3	5	1.7	48	2.0

Note. f = number of sentences. RA = report attributed, RU = report unattributed, IL = inference labeled, IU = inference unlabeled, JAF = judgment attributed favorable, JAU = judgment attributed unfavorable, JUF = judgment unattributed favorable, JUU = judgment unattributed unfavorable, and O = other.

percentage was *U.S. News & World Report* (24%). In both the IL and IU categories, all of the agricultural periodicals had lower percentages of statements than the news periodicals.

Newsweek had the highest percentage of statements from the JAF category (26%) while the remaining periodicals ranged from 7.5% (*Successful Farming*) to 2% (*Time and Progressive*

Farmer). Two of the three agricultural periodicals contained a lower percentage of JAU

Table 4.19. Comparison of Number and Percent of Sentence Categories by Periodical

Sentence Category	Periodical											
	<i>Newsweek</i>		<i>Time</i>		<i>U.S. News & World Report</i>		<i>Farm Journal</i>		<i>Progressive Farmer</i>		<i>Successful Farming</i>	
	f	%	f	%	f	%	f	%	f	%	f	%
RA	213	24.0	110	19.0	99	23.0	133	39.0	218	37.0	90	36.0
RU	242	27.0	140	24.5	105	24.0	83	24.0	180	30.0	63	25.0
IL	105	11.7	67	12.0	53	12.0	19	5.5	28	5.0	20	8.0
IU	205	23.0	156	27.0	91	21.0	68	20.0	96	16.0	34	14.0
JAF	23	26.0	11	2.0	20	5.0	13	4.0	10	2.0	18	7.5
JAU	32	3.6	28	5.0	39	9.0	12	3.5	8	1.0	15	6.0
JUF	15	2.0	10	2.0	8	2.0	2	1.0	12	2.0	2	1.0
JUU	33	3.7	42	7.4	12	3.0	6	1.5	18	3.0	0	0.0
O	21	2.4	7	1.1	3	1.0	6	1.5	24	4.0	6	2.5

Note. f = number of sentences. RA = report attributed, RU = report unattributed, IL = inference labeled, IU = inference unlabeled, JAF = judgment attributed favorable, JAU = judgment attributed unfavorable, JUF = judgment unattributed favorable, JUU = judgment unattributed unfavorable, and O = other.

statements than all three news periodicals. Successful Farming contained the highest percentage of JAU statements among the agricultural periodicals (6%). All three news periodicals contained the same percentage of JUF statements (2%), whereas the agricultural periodicals all fell below 2% or less. In the JUU category, all of the agricultural periodicals

contained lower percentages than the news periodicals.

The highest percentage of report attributed sentences in a news periodical article was 48%. The highest percentage of RA statements in an agricultural periodical article was 80%. All 48 news articles reported less than 50% of their information from report attributed sentences. However, 60% of agricultural articles reported 50% or less of their information from the same type of sentences. The remaining 40% of the article content was 50% or more report attributed sentences.

The same trend was true for report unattributed sentences. Again, all 48 news articles had less than 50% of their information from report unattributed sentences. Although a majority of agricultural articles consisted of less than 50% report unattributed sentences, 11% contained 50% or more RU sentences.

Although Hayakawa (1990) stated that inferences cannot be verified (unlike report sentences), inferences are more desired than judgments made by either the author, another source, or an anonymous source. Inferences were coded one of two ways, labeled or unlabeled. Labeled inferences (IL) were considered more trustworthy than unlabeled inferences (IU) because words served as a warning to the reader. This sentence "might" be biased or "perhaps" this explanation is wrong.

The researcher considered more than 10% inference labeled sentences in an article as less objective information. They are not verifiable statements. Approximately 65% of the news periodical article content consisted of more than 10% IL statements; 35.7% of the agricultural periodical articles consisted of more than 10% IL statements.

Again, the 10% parameter was used for the inference unlabeled (IU) sentences. A similar trend was repeated in this category, although the percentages were somewhat

higher. News periodicals contained more than 10% IU statements in 80.4% of the articles; 64.3% of agricultural periodical articles were found to have the same characteristics.

Judgment sentences are opinions made by either the author, an identified source, or an unidentified source. They are either attributed or unattributed to a source and favorable or unfavorable toward the subject. The attributed criterion follows the same procedure as the report category.

The news and agricultural periodicals' content was almost identical in the JAF category. Approximately 46% of news and agricultural periodical articles contained no JAF sentences. The remaining 54% of the articles contained some sentences in this particular category.

The judgment attributed, unfavorable sentences (JAU) between the two types of periodicals showed marked differences; however, about 67% of the news periodicals content contained JAU sentences. On the other hand, 39.3% of agricultural periodicals content contained sentences from this category.

In the case of judgment unattributed, content is not attributed to any source. A majority of news and agricultural articles contained less than 50% of their content from judgment unattributed, unfavorable sentences (JUF). Approximately 39% of the articles that appeared in news periodicals contained some JUF sentences, compared to 29% of articles that appeared in agricultural periodicals.

About 59% of the articles that appeared in news periodicals contained a portion of JUU sentences; whereas, 32.1% of articles in agricultural periodicals contained some highly biased statements.

Table 4.20. Comparison of Number and Percent of Sentence Categories by Type of Periodical

Sentence Category	Periodical Type			
	News		Agricultural	
	f	%	f	%
RA	422	22.0	441	37.0
RU	487	26.0	326	27.5
IL	225	12.0	67	6.0
IU	452	24.0	198	16.7
JAF	54	2.9	41	3.5
JAU	99	5.0	35	3.0
JUF	33	2.0	16	1.3
JUU	87	4.6	24	2.0
O	31	1.5	36	3.0

Note. f = number of sentences. RA = report attributed, RU = report unattributed, IL = inference labeled, IU = inference unlabeled, JAF = judgment attributed favorable, JAU = judgment attributed unfavorable, JUF = judgment unattributed favorable, JUU = judgment unattributed unfavorable, and O = other.

When the two types of periodicals were compared to one another (Table 4.20), news periodicals contained less report and inference statements than agricultural periodicals. However, in the JAF category, agricultural periodicals contained slightly more than news periodicals (3.5% and 2.9%, respectively). In the remaining three judgment categories, news

periodicals contained a higher percentage of JAU, JUF, and JUU statements than did the agricultural periodicals.

To evaluate overall levels of bias, a "bias score" was calculated (Table 4.21). The bias in each article was rated by assigning a numeric score to each statement type. RA and RU

Table 4.21. Mean Scores of All Six Periodicals

Periodical	<u>M</u>	<u>SD</u>
<i>Newsweek</i>	211.67	42.27
<i>Time</i>	247.19	41.35
<i>U.S. News & World Report</i>	231.13	43.00
<i>Farm Journal</i>	188.42	31.98
<i>Progressive Farmer</i>	180.79	77.70
<i>Successful Farming</i>	180.50	63.39

Note. The mean score was tabulated by multiplying the percentage of each article's sentence categories using the following factors: RA=1, RU=1, IL=2, IU=3, JAF=4, JAU=5, JUF=6, JUU=7. Thus, the higher the mean score, the more biased the periodical.

statements were considered the least biased (RA, RU = 1). IL statements were slightly more biased (IL = 2). Each succeeding statement category received an additional point (IU = 3, JAF = 4, JAU = 5, JUF = 6, and JUU = 7). The overall bias score for the article was tabulated by multiplying the bias score times the percentage of each type of statement contained in each article. The articles were then grouped by periodical type. Table 4.21 shows the mean index scores of each of the six periodicals. The higher the mean score, the more biased the periodical. As indicated in this table, *Time* is the most biased periodical (M = 247.19). A

one-way ANOVA test was conducted on the six periodicals across all eight sentence categories. Table 4.22 shows a significant difference in the percentage of articles containing biased statements. Scheffe's post hoc analysis revealed the difference to be between *Time* and *Progressive Farmer*. *Time* was determined to have significantly more biased statements than did *Progressive Farmer*.

Table 4.22. One Way ANOVA for All Six Periodicals

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Between Groups	5	9818.25	3.55*
Within Groups	68	2766.05	

*p = .007.

The six periodicals were then grouped into two categories, news and agricultural periodicals. A comparison was then made between the two categories. Table 4.23 shows the grand mean index scores for each of the periodicals. A *t*-test indicated a significant difference between news and agricultural periodicals (Table 4.24). The levels of bias contained in news periodicals were significantly higher than those in agricultural periodicals.

Judgment unattributed statements, whether favorable or unfavorable, are indicators of bias in reporting. Readers should be wary of articles with these types of statements. Only *Successful Farming* presented articles which contained no JUU or JUF statements. *Time* articles contained the highest percentage of judgment unattributed statements (7.4%).

Table 4.23. Grand Mean Index Scores of News versus Agricultural Periodicals

Type of Periodical	Grand Mean Score	<u>SD</u>
News	229.10	44.00
Agricultural	182.34	64.41

Note. The grand mean score was tabulated for news periodicals by adding the news index scores together and for agricultural periodicals by adding the agricultural index scores together. Thus, the higher the mean score, the more biased the type of periodical.

Table 4.24. t-test Analysis of News versus Agricultural Periodicals

Source	<u>df</u>	<u>MS</u>	<u>t</u>
News Periodicals	1	38054.50	13.76*
Agricultural Periodicals	72	2765.67	

* $p = .000$.

Note. News periodicals included: *Newsweek*, *Time*, and *U.S. News & World Report*.

Agricultural periodicals included: *Farm Journal*, *Progressive Farmer*, and *Successful Farming*.

Other indicators of bias are inference labeled and unlabeled statements. Though not as likely to produce bias as judgement statements, both IL and IU statements should be avoided if the intent of the article is to present a neutral view of the situation being reported. Again, *Time* was the most serious violator of IU bias and *Successful Farming* was the least biased. All news periodicals contained more than 10% IL statements compared to less than 10% in all agricultural periodicals.

Based upon analysis of variance and post hoc tests, all news periodicals were considerably more biased than were agricultural periodicals. *Progressive Farmer* reported articles containing the least amount of bias. *Time* articles contained the greatest amount of bias. In terms of levels of bias, periodicals ranked as follows (from least to most): *Successful Farming*, *Progressive Farmer*, *Farm Journal*, *Newsweek*, *U.S. News & World Report* and *Time*.

CHAPTER 5. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Chapter one described the importance of determining bias levels of environmental and food safety articles in two types of periodicals. The purpose of this study was to determine and evaluate the level of bias of specific issues relative to the agricultural industry in both news and agricultural periodicals. The objectives for this study were to (1) determine which issues were important to agricultural professionals, (2) determine the level of bias of articles on those identified issues, and (3) compare coverage of those issues in both types of periodicals.

Chapter two provided a theoretical and historical framework for reporting in both news and agricultural periodicals. Research and literature regarding demographics of journalists, sources which journalists use, where and how journalists acquire their news, and who dictates the importance of issues were presented.

Chapter three described the methods used to address the research questions. Specifically, the research design, variables, sample, instrumentation, data collection procedures, and data analysis were discussed.

Chapter four presented the findings of the study. Specific research questions were addressed pertaining to the importance of issues, the levels of bias of those issues over the ten-year period under consideration, and the type of coverage of those issues in two types of periodicals.

This chapter summarizes the problem, rationale, purpose, procedures, and discusses the findings of the study. Conclusions and recommendations are made based upon the findings of the study.

Statement of the Problem

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 focused on the question, "What is the level 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.

Several factors contribute to the need to study this objectivity versus subjectivity debate. The scope of agricultural journalism has changed drastically since the push for a more environmentally sound earth in the late 1980s. Reporting about the environment and food safety has moved from an insert in newspapers to headline news. It is vitally important to evaluate how headline news is presented by both agricultural and news periodicals, as well as how people perceive what they read. A review of literature revealed journalists have the writing skills, but lack the technical knowledge when agriculture enters the arena.

In light of the increase in the past decade of environmental and food safety reporting, it is important to know who is reporting, where they get their information, how that information is presented, and who dictates the importance of the topics. Additionally, the findings of this study may aid journalists and agricultural educators in adapting to this changing scope of agricultural reporting.

Purpose

The primary purpose of this study was to evaluate bias levels over time on specific issues in two types of periodicals – news and agricultural – in regards to the environment and food safety. A secondary purpose was to determine the types of bias. A final purpose was to determine what these bias levels meant to the periodical and the agricultural industry objectivity as a whole. Specifically, this study addressed the following research questions:

1. Which environmental and food safety topics were important to agricultural professionals?
2. What was the level of bias of articles on those identified topics?
3. How did the coverage of those topics compare in both types of periodicals?

Procedures

For this study, important issues in agriculture were identified. An expert panel of professionals in agriculture was selected to determine issues in agriculture. The individuals included all members of the Coalition for Agriculture Image Promotion ($N=24$). The respondents ranked nine environmental and food safety issues in order of importance. The questionnaire was developed by the researcher and based on a review of literature.

An expert panel consisting of faculty members from the College of Agriculture and the Department of Journalism and Mass Communication at Iowa State University reviewed the instruments developed for the study. Revisions were made based upon recommendations of the panel.

To determine bias levels of four important issues and the level of coverage in agricultural versus news periodicals, the Hayakawa-Lowry method and framing techniques

were used. Sentences from all 74 articles were placed into one of nine sentence categories: report attributed, report unattributed, inference labeled, inference unlabeled, judgment attributed favorable, judgment attributed unfavorable, judgment unattributed favorable, judgment unattributed unfavorable, and other. The following information was placed into framing categories for each article: title of article, periodical, date, number of authors, length of article, number and content of pictures and charts, and section the article appeared. Descriptive statistics consisting of means, frequencies, percentages, crosstabulation, ANOVA, and post hoc tests were used in analyzing data.

Summary of Findings

In the study, 91.6% ($n = 22$) of the CAIP members returned the questionnaire. The remaining two members were eliminated from the study due to company restructuring. They 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.

Periodical and Issue Demographics

Of all of the periodicals that dealt with these issues, agricultural periodicals comprised 38% of the articles. The remaining 62% were news articles. Of the 74 articles identified, 46 appeared in news periodicals, whereas only 28 appeared in agricultural periodicals. This disparity may have resulted from the sheer number of total articles printed in news periodicals. However, this finding may also illustrate the theory of agenda setting. What agricultural professionals noted as important issues was different than what news periodicals covered during the time frame.

Of the six periodicals, *Newsweek* had the most articles devoted to environmental and food safety articles ($n = 18$), and *Farm Journal* had the least ($n = 6$). The remaining article count fell between those two periodicals as follows: *Time* ($n = 16$), *Progressive Farmer* ($n = 14$), *U.S. News & World Report* ($n = 12$), and *Successful Farming* ($n = 8$).

Of the total number of articles, pesticide use was covered more than the remaining three issues combined. 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%. When analyzed by year, pesticide use was the dominant issue in 1987, 1989, 1991, 1992, and 1994. In 1990, 1993, and 1996 pesticide use shared the top spot with Salmonella, E.coli, and hog operation pollution, respectively.

During the ten-year time frame set for this study, 1989 had the highest number of articles published, 25, and 1995 had the lowest turnout with only one article. Approximately half of the pesticide use articles ($n = 24$) appeared in 1989. This was probably due to two events: the alar pesticide scare and the contamination of Chilean grapes with cyanide. In 1993 E.coli was a major issue when a fast food chain sold contaminated meat that killed young children. The lack of articles in 1995 is probably due to the waning importance of the E.coli issue among the media. The number of issues published in the other eight years in which periodicals published articles, ranked from highest to lowest, were: 1987 ($n = 10$), 1993 ($n = 8$), 1988 and 1994 ($n = 7$ each), 1991 ($n = 5$), 1990 and 1996 ($n = 4$ each), and 1992 ($n = 3$).

Of the twelve different section categories, 15% of the articles appeared in the Business/National Affairs section. Approximately 13.5% of the articles appeared in the Feature and Health sections and the remaining 58% was divided among the nine other categories. Periodicals may have placed articles in the business/national affairs section to highlight the economic impact and increase the importance these environmental and food safety issues had on society.

The length of an article may indicate the depth of research and a periodical's commitment to objectivity. In 70% ($n = 50$) of the articles length was one page or less. In fact, only 7% ($n = 5$) were less than one column and 3% ($n = 2$) were more than three pages in length. About 23% ($n = 17$) were one and a half to two pages and 7% ($n = 5$) were two and a half to three pages.

The number of authors listed tends to give an article more credibility. For example, the longer an article is and the number of authors listed may indicate a higher perception of objectivity among readers. Almost 46% of the articles had one author or more. Approximately 21% of the articles had no author listed. The remaining 32.4% had two authors or more. Only two articles had five or more authors listed.

The numbers of pictures and charts were also evaluated. Overall, 16.2% of the articles contained one chart. The other 83.8% had no chart at all. Most of the charts included with text were created by the periodical rather than an objective source. However, more articles contained pictures than charts. The highest percentage of articles (43.2%) had one picture accompanying the article, and 16.2% had two pictures alongside the text. One-fifth of the articles had no picture at all. While text is important, a reader may evaluate the articles initially and sometimes solely on the picture or chart content. The pictures tended to

be show unfavorable agricultural scenes. Some examples include: warning signs, "danger" stamped on eggs, and people in the field wearing protective gear as the field is doused by a crop duster.

Source Information

Journalists sources were categorized into one of five categories: activist, agricultural, business, educational, or governmental. The number of different sources used in each article was tabulated rather than the number of times a particular source was cited.

Of all 74 articles evaluated, approximately 30% cited one or more activist sources, 40% used one or more agricultural sources, 40% relied on one or more business sources, 62% used one or more educational sources, and 60% called on one or more governmental sources. The difference between the use of agricultural sources (40%) and governmental sources (60%) was interesting. The government was apparently considered a more reliable expert about the agricultural industry than agricultural sources themselves. A majority of the articles, approximately 75%, that used any type of sources relied on only one citation. All articles refrained from using more than six different sources from one single source category. Only one article used six different educational sources, while another article used six different activist sources. This "overuse" of one type of source may have decreased the objectivity of the story.

Sentence Category Comparisons

Only five hog operation pollution articles were published. Although agricultural professionals viewed hog operation pollution as the second most important area of interest, it received the least amount of coverage. This may indicate that hog operation pollution is a

regional issue only, perceived important only by those areas in which there are high concentrations of swine operations.

Hog operation pollution articles found in *Progressive Farmer* had more report attributed statements than those found in *Time* (50% versus 7% RA statements, respectively). In this topic area, *Progressive Farmer* did the best job of maintaining fact and objectivity by reporting verifiable and attributed information. The highest percentage of judgment attributed favorable statements was found in *Successful Farming* (32%). Positively biased toward agriculture, the periodical editors may be simply telling their readers what they want to hear, thus enlarging the “gap” between the agricultural community and the general public who rely on news periodicals for their information regarding agriculture. In the JAU category, all but one article contained JAU statements. The highest percentage of JAU statements was found in *Time*. While *Time* attributed judgments to some source, they were almost all unfavorable toward the industry – an example of poor objective reporting (Lowry, 1971). None of the hog operation pollution articles contained judgment statements that were either favorable or unfavorable toward agriculture. This finding may indicate both types of periodicals favored attributed judgments, favorable or unfavorable, over those not attributed to a recognizable source.

Five E.coli articles were identified in three different periodicals. The low number of E.coli articles was an interesting and surprising finding. Agricultural professionals rated this topic as the most important issue facing agriculture, yet it received a very low amount of coverage among the six periodicals.

E.coli articles found in *Successful Farming* had the highest and the lowest percentage of RA statements (49% and 20%, respectively). *Successful Farming* also had the highest

percentage of JAF and JAU statements (15% and 17%, respectively), indicating well-balanced reporting, although a high number of judgment attributed statements. Neither *Time* nor *Successful Farming* contained JUF statements, whereas half of the *Newsweek* articles contained some JUF statements. *Successful Farming* was the only periodical of the three—*Newsweek*, *Time*, and *Successful Farming*—that contained no JUU statements. As the only publication which had no JUF or JUU statements, *Successful Farming* may be the least-biased publication in reporting about E.coli.

Eleven Salmonella articles were identified in four different periodicals. Salmonella articles found in *Progressive Farmer* had the highest percentage of RA statements (64%), indicating a conscientious effort to substantiate statements. Those articles found in *U.S. News & World Report* had the lowest percentage (11.5%) of RA statements. In the JAF category, 33% of *Newsweek* articles, 67% of *Time* articles, and 75% of *U.S. News & World Report* articles contained these statements. The same basic trend followed in the JAU category.

Only one of the articles contained any JUF statements (those favorable to agriculture). That publication was *U.S. News & World Report*. In the JUU category, 33% of *Newsweek* articles, 67% of *Time* articles, and 25% of *U.S. News & World Report* articles contained statements unfavorable to agriculture. *Progressive Farmer* had no type of judgment sentences. In this case, *Progressive Farmer* appeared to be the least biased periodical. All of the news periodicals appeared to be very biased against agriculture when reporting about Salmonella.

A total of 53 pesticide use articles were identified among the six periodicals.

Approximately 80% of the pesticide articles found in *Progressive Farmer* had RA statements.

This finding speaks highly of *Progressive Farmer's* effort to present factual information about pesticide use. About 80% of the *Farm Journal* articles contained JAF statements compared to 38.5% of the *Newsweek* articles. Here, the agricultural periodical tends to be biased toward agriculture, possibly lacking objectivity.

In the JAU category, 87.5% of the *U.S. News & World Report* articles, and 20% of *Successful Farming* articles contained JAU statements. Almost half of the *Newsweek* and *Time* articles contained some JUF statements, but less than half of the other periodicals contained the same statements. Following are the percentages: 37% of *U.S. News & World Report* articles, 40% of *Farm Journal* articles, 36.4% of *Progressive Farmer* articles, and 40% of *Successful Farming*.

The highest percentage of JUU statements was found in one *Progressive Farmer* article (24%). About 69% of *Newsweek* articles, 90.9% of *Time* articles, 20% of *U.S. News & World Report* articles, 40% of *Farm Journal* articles, and 63.6% of *Progressive Farmer* articles. None of *Successful Farming* articles contained JUU statements.

Table 4.?? Shows in overall reporting, *Progressive Farmer* seemed to do the best job of reporting unbiased, objective information and *Farm Journal* seemed to be the most biased of all the agricultural publications. In the news periodical category, *Newsweek* appeared to be least biased, whereas *Time* appeared to be most biased overall.

News and Agricultural Periodical Comparisons

The highest percentage of RA statements in a news article was 48%, whereas the highest percentage in an agricultural article was 80%. Overall, news periodicals reported 22% of information from RA statements compared to 37% in agricultural periodicals (Table 4.19). These findings indicate agricultural periodicals do a much better job of reporting

factual, verifiable information. All news articles and 60% of agricultural articles reported 50% or less of their information using RA statements. The same trend was true for RU statements. While an attributed report sentence is a more favorable category than an unattributed statement, both have the capability of being verified.

Inferences are slightly better than judgment statements because they are statements based on the known. However, unlabeled inferences fail to warn the reader and tend to have more bias. Based on the findings of this study, news periodical articles contain more IU statements than agricultural periodical articles. Approximately 12% of the news periodicals consisted of IL statements, compared to 6% in agricultural periodicals. The percentages regarding IU statements were somewhat higher. Exactly 24% of news periodicals contained IU statements, whereas agricultural periodicals contained only 16.7%.

Judgments are the least favorable category of statements. However, an attributed judgment contains less bias than one without a citation because the opinion can be tracked to a specific source. Ideally, the percentages in this category should be low in both types of periodicals. However, news periodicals tended to publish more judgment type statements than did agricultural periodicals. In the JAF category, the periodicals were fairly similar. Almost 3% of the news periodicals contained JAF statements, whereas 3.5% of agricultural periodicals contained the same type of statements. Precisely 5% of the news periodicals contained JAU sentences; 3% of agricultural periodicals contained JAU statements. The percentages were also similar in the JUF category; 2% of news periodicals and 1.3% of agricultural periodicals contained these statements. Finally, 4.6% of the news periodicals and 2% of the agricultural periodicals contained JUU statements.

A one-way ANOVA test found a significant difference in the percentage of articles containing JUU information. *Time* was determined to have significantly more judgment unattributed unfavorable articles; whereas, *Successful Farming* was determined to have significantly fewer JUU articles. No significant difference was found in the percentage of articles containing JUF information. Interestingly, these were the periodicals determined to be the most and least biased (respectively) based on index scores.

Discussion of Findings

Previous studies have documented the lack of objectivity in news journalist reporting about agriculture, specifically the environment and food safety issues. This study confirmed the results of those reports, finding agricultural periodicals report more factual information than news periodicals. A new finding of this study, however, was that popular news periodicals publish more articles regarding the four identified issues than do popular agricultural periodicals. Two of the news periodicals, *Time* and *U.S. News & World Report*, conducted a four page “special report” dedicated to pesticide use. None of the three agricultural periodicals had “special reports” on any identified important issue, pesticide or otherwise. Additionally, the two top issues that professionals in agriculture identified as of high importance, E.coli and hog operation pollution, were covered the least in both types of periodicals. Is volume synonymous with objectivity? LaMay and Dennis (1991) pointed out journalists may cover many issues, but the content may lack objectivity because of the technical nature of the subject.

The population of the target audience may explain the low number of articles that appeared in agricultural periodicals. While news periodicals report to a wide variety of consumers, agricultural periodicals focus on readers with an agricultural background or

occupation. Are these agricultural periodicals restricted on article content due to funding? Do news periodicals have more journalistic freedom due to a wider variety of funding sources?

Another reason for the number of articles in news periodicals could be the sheer number of issues published. News periodicals publish weekly, whereas agricultural periodicals publish monthly.

LaMay and Dennis (1991) concluded that journalists rely heavily on environmental/activist and governmental groups as their primary sources. This study both confirmed and contradicted their findings. This study found that a large percentage of sources came from governmental groups (60%); however, a smaller percentage of sources came from activist groups (30%). However, news periodicals used activist and business sources more than agricultural periodicals. Agricultural periodicals, on the other hand, leaned toward agricultural and governmental sources for their information.

Almost 60% of the articles in both types of periodicals included one or more pictures alongside text. Figure 5.1 shows a picture included with an article about pesticide use in a news periodical. Figure 5.2 shows another picture accompanying the same topic, but in an agricultural periodical. Both tell a story, like the text. However, the picture featured in the news periodical is biased in that it lacks objectivity. A reader may infer the crop duster sprays pesticides in large quantities with no regard to the health of neighbors or consumers of the crop.

Sentence categories were fairly consistent with previous research. Agricultural periodicals contained more report attributed/unattributed statements and less inference labeled/unlabeled statements. When comparing judgment statements, judgment attributed

favorable statements were fairly comparable. However, in the judgment attributed unfavorable category, two-thirds of the news periodicals contained some JAU statements compared to only one-third of the agricultural periodicals. Both periodicals contained a percentage of JUF statements; news contained about 39% and agricultural contained about 29%. In the most undesirable category, JUU, news periodicals had a much higher percentage than did agricultural periodicals. Almost 60% of the news periodical articles contained JUU statements compared to only 32% of agricultural periodicals. One agricultural periodical in particular, *Progressive Farming*, had the most coverage of issues among agricultural periodicals, and had the second highest index score among all publications.

Interestingly, a significant difference in the percentage of JUU statements was found between *Time* and *Successful Farming*. *Time* had many more JUU statements, overall, in their articles. However, no significant difference was found between any other sentence category or any other pair of periodicals. Consequently, not all news periodicals and agricultural periodicals are alike.

Conclusions

1. What agricultural industry communication specialists report as important issues in agriculture is different than what popular periodicals print about the agricultural industry. For example, agricultural professionals ranked the issues (from most important to least important) as: E.coli, hog operation pollution, Salmonella, and pesticide use. However, the coverage of each topic was almost exactly the opposite, most coverage to least: pesticide use, Salmonella, E.coli, and hog operation pollution.

2. Popular news periodicals cover environmental and food safety issues more than popular agricultural periodicals. News periodicals published 62% of the articles, whereas agricultural periodicals published 38%. The difference in numbers may be the result of weekly versus monthly publication for the news and agricultural periodicals.
3. The coverage of most environmental and food safety issues occurs in business and health sections more often than in environmental or food/nutrition sections. Logic would dictate the coverage would appear in environmental or food/nutrition sections. One explanation may be the periodicals view the environment and food safety issues as items of economic importance rather than specifically “environmental” or “food/nutrition.”
4. A majority of articles are one page or less and rarely occur as “special reports.” Perhaps editors of periodicals feel a short news item is better than no coverage. Also, these types of articles may not generate enough readership to warrant expanded coverage.
5. Pictures are more frequently used than charts when covering environmental and food safety issues. Likewise, the pictures used tended to invoke emotional and biased responses. Perhaps periodicals relied on pictures to trigger emotions rather than focusing on objective information.
6. There is little consensus about which agricultural issues are important. Only one of the four “important issues” (pesticide use) was covered by all six periodicals. This might indicate that both news and agricultural periodicals are truly trying to set the agenda rather than allowing readers to determine what is important.
7. Overall, agricultural periodicals contained more report attributed/unattributed information and fewer inferences labeled/unlabeled and judgment unattributed

favorable/unfavorable information. This finding indicates that agricultural periodicals; they reported more factual information as opposed to reporting biased information than did news periodicals. *Time* reported with the most bias, *Progressive Farmer* with the least amount.

8. Bias occurs in all types of reporting. Both news and agricultural periodicals contained biased reporting.

Recommendations/Implications

1. Since the number of articles in news periodicals and agricultural periodicals varies widely, additional effort should be made in increasing coverage of important issues in agricultural periodicals by training agricultural journalists to cover these topics objectively. Also, all readers should exhibit caution. 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.
2. Based on the significant difference between one news periodical (*Time*) and one agricultural periodical (*Progressive Farmer*), further research should be conducted to determine the relationship between other periodicals regarding other agricultural issues.
3. Colleges and universities should fully utilize journalistic and agricultural curriculum 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.
4. Agriculture professionals, as well as consumers, should voice their concerns and opinions regarding the coverage of important agricultural issues both to news and agricultural journalists.

5. Journalists should use a wider variety of sources for factual information, rather than relying heavily on governmental and educational sources. All sides of issues should be explored. This can only be accomplished if journalists are proficient in securing accurate information.
6. Further research should be conducted to determine the relationship of journalists' backgrounds and the level of bias in their reporting of agricultural issues. Are journalists trained in agricultural communications more likely to produce unbiased articles, or does this exposure to agriculture actually create bias toward the industry?
7. Journalists have a tremendous responsibility to report news both accurately and fairly. Likewise, the general public has a responsibility to assess information in an open and evaluative manner. If either fail 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 which either positively or negatively affect environmental and food safety issues.

APPENDIX A. HUMAN SUBJECTS APPROVAL

Last name of Principal Investigator Whitaker

Checklist for Attachments and Time Schedule. The following are attached (please check):

12. Letter or written statement to subject indicating clearly:
- a) the purpose of the research
 - b) the use of any identifier codes (names, numbers), how they will be used, and when they will be removed (see item 17)
 - c) an estimate of time needed for participation in the research
 - d) if applicable, the location of the research activity
 - e) how you will ensure confidentiality
 - f) in a longitudinal study, when and how you will contact subjects later
 - g) that participation is voluntary; nonparticipation will not affect evaluations of the subject
13. Signed consent form (if applicable)
14. Letter of approval for research from cooperating organizations or institutions (if applicable)
15. Data-gathering instruments

16. Anticipated dates for contact with subjects:

First contact: December 5, 1997

Last contact: December 19, 1997

17. If applicable: anticipated date that identifiers will be removed from completed survey instruments and/or audio or visual tapes will be erased: December 19, 1997

18. Signature of Departmental Executive Officer



11/19/97

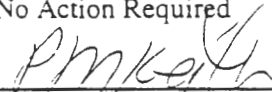
Agricultural Education & Studies

19. Decision of the University Human Subjects Review Committee:

Project Approved Project Not Approved No Action Required

Patricia M. Keith, Committee Chairperson

12-3-97
(date)


(signature of committee chairperson)

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Department of Agricultural Education and Studies
201 Curtiss Hall
Ames, Iowa 50011-1050
Administration and Graduate Programs 515 294-5904
Research and Extension Programs 515 294-5872
Undergraduate Programs 515 294-6924

December 3, 1997

To Whom It May Concern:

Permission is granted to Ms. Kathryn Whitaker to contact the members of the Coalition for Agriculture Image Promotion (CAIP) to get their input regarding a list of issues in agriculture. I am a member of this professional group which has an interest in the issues included in this survey.

If there are any questions, please let me know.

Sincerely,

Robert A. Martin
Director of Graduate Education
Professor & CAIP Member
representing Iowa State University

caa

APPENDIX B. COVER LETTER TO RESPONDENTS

December 5, 1997

Dear Agricultural Professional,

We are interested in your perceptions of the importance of particular environmental and food safety issues relative to the agricultural industry. As a professional in agriculture, you work with key agricultural issues and their impacts to society on a daily basis.

The survey should take you less than 1 minute to complete. All we are asking is that you rate issues regarding the environment and food safety in order of importance. All information will be **strictly confidential** and viewed only by the researchers. Surveys are coded for mailing purposes only and will be destroyed at the completion of the study.

Participation in this study is strictly voluntary. You were selected because of your interaction and expertise in agriculture. Please complete and return the survey so as to provide a representative sample of agricultural professionals' perceptions. Please return the survey by December 15, 1997 in the postage paid envelope.

Thank you for your time. Your assistance is greatly appreciated and will help us identify major concerns of agricultural professionals.

If you have any questions about the survey, please feel free to contact either of us at the numbers listed below.

Sincerely,

B. Kathryn Whitaker
Graduate Assistant
Iowa State University
Agricultural Ed & Studies Dept.
515/294-4349

Jim Dyer
Assistant Professor
Iowa State University
Agricultural Ed & Studies Dept.
515/294-8363

APPENDIX C. SURVEY INSTRUMENT

Environmental & Food Safety Issues

Over the past ten years (1987-1996), the agricultural industry has faced several serious issues regarding the *environment and food safety*. Please rank the following issues in order of importance (1 = most important, 8 = least important).

- _____ Alar
- _____ E.coli
- _____ Hepatitis A
- _____ Hog Operation Pollution
- _____ "Mad Cow" Disease
- _____ Ozone depletion
- _____ Pesticide Use
- _____ Salmonella
- _____ Other _____

Code # _____

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A special Aggie thank you to two people who are the reason why I came to Iowa State, Dr. Joe and Dr. Chris— WHOOP!!

To my husband, Scott, we entered this adventure together and now we're finally finishing it. I never could have done it without you.

BIOGRAPHICAL SKETCH

Barbara Kathryn Whitaker was born June 11, 1974 in Perryton, Texas. She received her Bachelor of Science in Agricultural Development from Texas A&M University in 1996. She was awarded the Buck Weirus Spirit Award in 1994 and the Outstanding Graduate Student Award in Agricultural Education in 1996. She has served as a Graduate Assistant in the Department of Agricultural Education and Studies at Iowa State University and as the VEISHEA 1998 General Co-Chair, also at Iowa State University.