THE INTER-MEDIA AGENDA SETTING INFLUENCE OF TRADE PUBLICATIONS

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By
Sharienne Marie Sweeney

The Ohio State University
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Master's Examination Committee:

Dr. C. Ann Hollifield, Adviser

Dr. Gerald M. Kosicki

Approved by:

Adviser,
Department of
Agricultural Education

ABSTRACT

This study investigated the possible inter-media agenda setting among four types of media: general interest newspapers, agricultural trade publications, general interest magazines and supermarket trade publications. A model of expertise of influence among publications of different genres was developed. Using human coders, three attributes of coverage of recombinant bovine somatotropin (rBst) were identified in a sample of stories taken from 1980 to 1995.

These three categories: the development of rBst, small farms versus large farms in the adoption of rBst and, the human health aspects of rBst were chosen to see if trade publications cover social and political issues affecting economically valuable technologies for their industry, and if general interest media influenced such coverage.

RBst is a growth hormone for cattle that encourages greater milk production and feed efficiency in lactating cows. The hormone is produced with bioengineered bacteria.

There did not seem to be any evidence supporting inter-media agenda setting evidenced by the long gaps between one genre's first coverage and another genre's coverage. These gaps ranged from six months to longer than a decade.

The general interest media led coverage in the economic as well as the technologic issues. The agricultural trade magazines led the coverage in the social issue of the effects of rBst use on human health. The supermarket trade publications did not lead any coverage and actually seemed to avoid the controversy.

Dedicated to:

God, for putting beauty in my life.

My Parents, for teaching me to recognize it.

And Dennis, for magnifying it.

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I will love you and hate you forever for this.

VITA

Bachelor of Science in Agriculture	The Ohio State University	1993
Editor/reporter	Coshocton Tribune	1993-1996
Technical writer	ATS Ohio	Summer 96
Communication consultant	ATS Ohio	Dec. 96
Graduate research assistant	The Ohio State University	1996
Graduate teaching assistant	The Ohio State University	1997

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CHAPTER 1

1. Introduction

Since the beginning of mass communication research, scholars have labored to determine the effects of media on the country's population. Current research trends, including agenda setting theory, supports weak short-term media effects and a strong long-term effect on society. If the effects of the media on the population are strong, then it is important to understand how the media's agenda is set to understand the powerful forces involved in shaping thoughts and opinions of Americans.

"Agenda setting offers an explanation of why information about certain issues, and not other issues, is available to the public in a democracy; how public opinion is shaped; and why certain issues are addressed through policy actions while other issues are not" (Dearing and Rogers, 1996, p.2).

Some levels of agenda setting, such as the media's influence on public opinion, have been studied in-depth since the coining of the word in 1972 by McCombs and Shaw (Dearing and Rogers, 1996). In particular, how the media agenda sets the public's agenda as defined by the polling question, "What is the most important problem facing America today?"

The effects of one general interest medium, such as daily newspapers and news magazines, on another have also been investigated. However, in mass communication

research, there have been few studies that investigate the specialized media, particularly the trade press, and how, or if, it interacts with other media. This is a serious oversight when researchers note the number and influence of trade publications. The circulation for the magazines in the top 10 trade magazine categories was more than 22 million (Folio magazine, 1997). The Gale Directory of Publications and Broadcast Media indexes 8,403 trade, technical and professional publications and another 560 agricultural publications for a total of 8,963 trade publications. In contrast, magazines of general circulation in the United States total 2,853 – only a third of the trade publication total (Fischer, 1997).

Not only in sheer numbers does the trade magazine business stand out. Its revenues compete favorably with general circulation magazines. The 1996 Folio top 500 magazines reports many trade publications with revenues above $6 million for the year. Two of the top 10 revenue producing magazines are trade publications. The top 10 categories of trade publications earned nearly $2 billion in revenues (Folio magazine, 1997). Some studies have shown that these trade magazines are not only a force in sheer numbers, they also might be influential in setting policy (Hollifield, 1995). With such a large number of publications, the large amount of publishing revenue and possible policy-setting power, it is important to understand how trade magazines function in our society.

In their book, *Agenda-Setting*, Rogers and Dearing (1996) discuss influences of both content and sources over the general interest news media's agenda. These include editorial gatekeepers of information for both the media and public relations, spectacular news events and influential media. Yet, when Rogers and Dearing suggest further research, they state little is known about who these influential media are. There is some

evidence that helps identify some influential media. Previous research shows the *New York Times'* seems to have agenda-setting power for the national general interest media (Merriam, 1989). There is some indication that science magazines, such as *Science* and *Nature* also play an important part in preparing the nation's science news diet every week (Dearing, 1996).

Beyond these few examples, there are not many studies that investigate the influential media part of Dearing and Roger's model of agenda-setting theory. This study provides a look at the effects of the trade press and other influential media using inter-media agenda setting among four different kinds of media: general interest national newspapers, general interest weekly news magazines, national agricultural trade publications and national retail food publications.

CHAPTER 2

2. Background

Agenda setting

The issues found in the news media from day-to-day constitutes the media's agenda. Issues do not magically appear in print or on the broadcast news. They have to come from somewhere.

Assumptions

This study is based on three assumptions about how the media work.

1. Stories and issues covered in publications come from somewhere. That is, the reporters and editors do not make them up. They are inspired through a variety of sources and inspiration.

2. Different publications publish stories at different times. The time difference is the result of a combination of factors which research is just beginning to clarify. Some of the factors are differences in resources devoted to a particular topic and the reporters' and editors' contacts.

3. Different ideals for different publication performance influences when these stories are published.

McQuail (1990) developed normative theories of media performance. These theories are: the Free Press Model, the Social Responsibility model, the Authoritarian model, the Soviet model and the Democratic participant model. Because this research was conducted on American publications, it is assumed the authoritarian model (outright government control of all publications) and the Soviet model (control of any anti-party information) are not key influences of publication performance included in this study. That leaves the Free Press model, the Social Responsibility model and the Democratic Participant model as possible explanations for performance of the media in this study.

The Free Press model, based on the writings of Mill, Locke and Milton, assumes the marketplace of ideas will regulate and control the information published. No government control, with a few exceptions, is necessary to ensure the public gets the information it wants (Severin, 1992).

The Social Responsibility model holds that everyone with something to say should have access to the press. This means that if the press does not allow access, the government has the responsibility to ensure this access (Severin, 1992).

The Democratic Participant model requires that all members of the society have access to publication or broadcast channels equally and that that access not be mediated by a third party, such as an editor, publisher or the government.

Of the three models, the one that is most likely to describe the situation for all of the publications in this study is the Free Press model, where the information published is controlled largely by the marketplace of ideas. The Democratic Participant model did not exist until recently with the advent of the Internet. Even yet, Internet access is still

controlled by some level of economic or geographic variables. The Social Responsibility model is not common in the United States, except in the case of broadcasting, where government regulations are lessening as cable and the Internet become more popular (Severin, 1992).

The Free Press model indicates that market drives content decisions, but there are many types of market, and each publication defines its own market (or audience), causing differences in content. Nowhere is this seen with greater clarity than in the specialized press, but it is also seen to varying degrees with the general-interest media.

If editors and reporters strive to please their readers, it seems logical that, based on the audience of a publication, the coverage of the same issue would be different for different audiences. Therefore, the coverage for a given audience will be different for another audience on the same topic.

Media Agenda

Researchers have been trying to find the governing factors that place an issue on the media agenda. One model proposed by Dearing and Rogers (1996) show gatekeepers, influential media and spectacular news events, set the media agenda.

Some of the sources have been shown to be Presidents and the Congress, (Goodman, 1994) information subsidies from government agencies (Weaver and Elliott, 1985; Turk, 1985), corporate entities (Duhe', 1993; Walters, 1992), and non-profit organizations and charities (Griffin, 1995).

Other studies have shown the members of the media, particularly reporters, act as filters, or gatekeepers, for themselves. Weaver found that although the media did pass

along about half of the information from local council meetings, the emphasis did not correlate with the emphasis from the meetings, nor did all the information on the agenda make it into the newspaper (Weaver and Elliott, 1985).

Other evidence indicates the news media's agenda is set by a combination of all of the above gatekeepers, news events and 'something else.' Merriam (1989) found that many things worked together to give the drug issue top billing in media coverage in 1986 and for years before and after. Politicians were part of this process, as were big news events and non-profit organizations' campaigns. Yet only part of the media agenda was accounted for by these sources.

The other factors that explain the media agenda were 'real world' indicators such as a rise in the incidence of drug use or people being treated for drug addiction. However, when set against the number of drug-related incidents, coverage of AIDS rose while the 'real world' indicator dropped (Danielian and Reese, 1989).

The sociological evidence that inter-media agenda setting occurs is scant. A sociological study of newsrooms found that smaller papers tend to watch the news choices and placement of the larger papers for guidance (Breed, 1950). An article by a former reporter for USA Today noted the daily news broadcasts helped determine what was front-page news for the paper, providing another bit of evidence this happens in at least isolated incidents (Prichard, 1987).

The national newscasts have been shown to be very similar in both Watergate and coverage of Iran (Capo, 1983; Altheide, 1982), and national newspaper coverage has also

been found to converge on an issue (Reese and Danielian, 1989). The wire services have been shown to influence much of the country's news as well (Donohue, 1978).

All of these phenomena can be explained in part by information subsidies and news events influencing coverage, but Reese argues there is another influence as well as these at work in media agenda setting.

"Lacking any objective evidence [real world indicator] of a drug epidemic or crisis, we must look to the media themselves to determine why the drug issue received such a concentrated amount of coverage in such a short time"(Reese and Danielian, 1989, p.30).

These media Reese was speaking about were the influential media Dearing and Rogers placed on their model (Dearing, 1996).

Influential media

Research shows there are two types of influential media:

1. Media that influence other media of similar type or genre (Reese and Danielian, 1989; Capo, 1983; Altheide, 1982; Mazur, 1997; Donohue, 1978; Whitney, 1991).

2. Media that influence across genre lines because they have 'expertise' in an area of interest (Whitney, 1991; Miller, 1994; Rogers, 1991; Caudill and Ashdown, 1989).

Similar genre

Inter-media agenda setting among media of similar genre has been the most studied form of inter-media agenda setting (Whitney, 1991).

Whitney stated that it is most common for information to flow within media of similar type as opposed to flowing from specialized to general-interest media (Whitney, 1991). For example, the *Washington Post* seems aware of how the *New York Times* covers issues and vice versa. Realizing that information flows among the publications within the same genre, it would be reasonable to assume the same in the specialized press. *Wired* is probably aware of *what PC World* publishes about the World Wide Web and *Ohio Farmer* would be expected to be aware of how the *Farm Journal* covers an issue. Danielian and Reese found evidence to support these findings in the general interest press and the specialized press (Danielian and Reese, 1989).

Not only are these publications aware of their competition, some evidence indicates that there are, in some cases, media who act as leaders on issues. The *New York Times* is one of those found to be influential for other media (Reese and Danielian, 1989; Rogers, 1991), but it is not the only voice of leadership in the media. Mazur includes the news magazines, particularly *Time* and *Newsweek*, in this circle of influential publications (Mazur, 1997).

Across genre

Of greater interest for this study is the across-genre influential media. Those publications which act in this role do so because of an expertise in an area of interest. There has been some evidence that there is a crossover of coverage between the specific and general levels of media of this kind.

Miller found that sometimes the general interest media serve this function for more specialized press. The *New York Times* is regarded as the leader for international stories,

the *Washington Post* leads national domestic issues. Some specialized press also functions in this way. *Rolling Stone* is considered an authority for counterculture anti-establishment stories (Miller, 1994).

Trade publications could play a similar role to the *New York Times* as that paper plays to other general interest media. Reporters covering specialized beats such as agriculture, business, and science, are likely reading the publications going to the industry insiders of the fields they cover.

There is some evidence that the specialized press leads the general interest press as well as vice versa. Science publications, especially *Science,* the *New England Journal of Medicine* and the *Journal of the American Medical Association*, lead coverage in their respective fields (Rogers, 1991). The *New England Journal of Medicine* was shown to have inspired 128 stories in eight daily newspapers in a 12-month span (Caudill and Ashdown, 1989).

It is reasonable to assume this influence is not a one-way street. The editors of specialized publications likely read general interest publications, if not on the job, then as a part of their leisure reading. Those editors are likely to be influenced by the general media as well -- particularly on certain issues, such as consumer ethical issues and possibly political issues.

Hollifield found that the general interest media, as well as the non-communication industry trade press were far more likely to mention the social and political aspects of the NII (Hollifield, 1997b). The results of her study shows that trade publications "tend to

become supporters of, rather than reporters of, the industries they cover" (Hollifield, 1997b).

Expertise model

If we assume that publications are working under the Free Press model and that they strive to serve their readers based on the publication management's interpretation of its audience, then the question remains of what factors might influence the gatekeeping process in different publications that determine whether a specific story is of interest to the readers. In other words, what factors will spur different publications to begin following a story at different times. Two possible influencing factors are resources and the second is greater expertise in an area.

If all publications had unlimited resources, we could assume that there would only need to be one publication because it would have all the information anyone needed. Since that is not the case, resources must be one of the limiting factors in the publication of information. If one publication has greater resources, it means that publication is more likely to get a story if all other things are equal.

The second explanation is that some publications have people with greater expertise than other publications in certain areas. Even if one publication has more resources than another, it might not get a story because its reporters are unaware of the source of the story or are unable to interpret the importance of a story.

Of the two, this study is based on the assumption that topical expertise will be the most limiting factor determining when a publication begins publishing information on an important story. Although some publications have far greater overall resources, the

number of reporters devoted to a specific topic at such larger publications actually might be smaller than those devoted to that same topic at a smaller, but more specialized, publication. After covering a specialized topic for a while, reporters learn who, among potential sources, has the best information and what kind of information is the most important. Reporters who only venture into a field when there is a story of wider interest, spend much of their time learning these things about a topic, rather than getting the story.

With the assumptions that some publications' reporters have greater expertise in a topic than others, and that the trade press and general interest press could influence each other's coverage of issues, and that the trade press are less likely than the general interest media to cover the social and ethical issues that relate to technological or industry issues in particular (Hollifield, 1997b), we can imagine something like a highway of expertise. On this highway (Figure 2.1), technologic, political and economic information flows to the general interest media from the specialized media while the coverage of social and ethical issues that might relate to key technological or industry stories flow from the general interest media to the trade press.

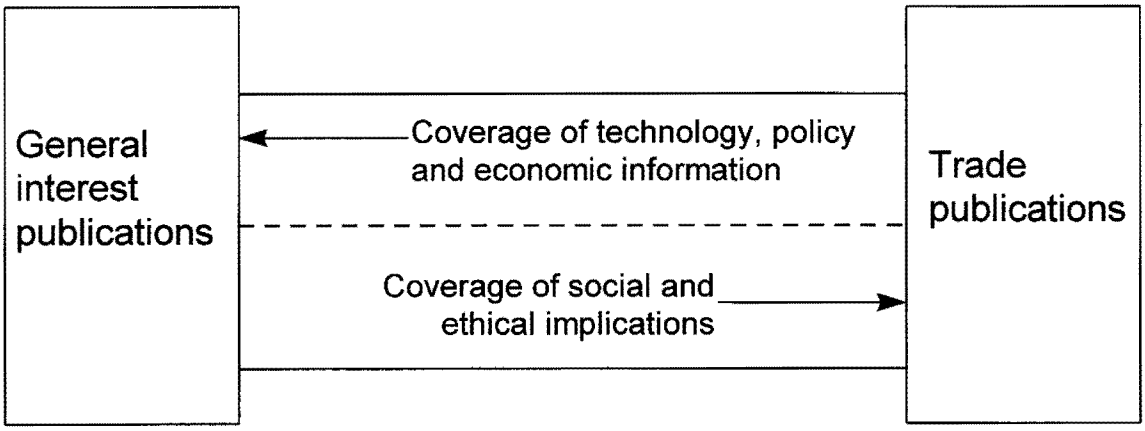

Figure 2.1: The expertise model of inter-media agenda-setting.

Sub-issues

The Expertise model assumes any larger issue is made up of various sub-issues, such as social, economic, ethical, technological and political issues. Sub-issues are various angles which a story about a primary issue can be written. Sub-issues allow for a single issue to remain on the media agenda for a long time as in the issue of AIDS. AIDS was a primary issue covered extensively in the general interest media in the 1980s (Rogers, 1991). However, not every story about AIDS could have the same angle or sub-issue. Some stories covered the diagnosis of the disease, others covered the Reagan administration's response to the disease, still others covered the search for the virus and a cure for the infection. Each of these stories dealt with a sub-issue of the primary issue – AIDS. These sub-issues are one of the reasons the AIDS story is still being covered by the media (Rogers, 1991).

Recent research shows the media is somewhat effective in creating salience in the audience about sub-issues. A study in Japan investigated Tokyo residents' knowledge of the ethical and political ramifications of a larger issue (McCombs, 1997), and a study that examined whether the public was aware of sub-issues about the environment both found that the media were successful in transferring information about sub-issues to readers (Atwater, 1985). It is assumed that if the population can grasp sub-issues from media coverage, reporters can do the same. This opens the door for investigating inter-media agenda setting on the sub-issue level.

It has been shown that for larger 'macro-issues,' there are some sub-issues that are covered more than other issues. Newspapers and other general interest media have been

found to devote a small percentage of their coverage to the social and ethical implications of a new technology. A study conducted by Priest (1995) in 1994 investigated the coverage of rBst in 1991 and the first half of 1992 and found that coverage of ethical and social issues was weak. Of the 600 arguments presented in the 132 articles, 35 percent concerned the benefits and 48 percent concerned economics. But, only 7 percent addressed environmental issues and only 8 percent discussed ethics (Priest, 1995).

Specialized press

The specialized press plays an important role in the American media and includes trade publications. As shown above, specialized press may influence coverage of an issue in general interest publications. The trade press might play a role in the formation of public policy and possibly help keep members of an industry informed about activities and events of importance to the leaders in that field. Yet, it has been the subject of very little research.

What limited research there is tells us the trade press might act as an insider communication channel — particularly in policy debates affecting an industry (Hollifield, 1997),

Such an influence can be powerful for both an industry and the publication. In a study of two journalism trade publications (*Editor and Publisher* and *The Journalist*) *Editor and Publisher* was shown to successfully endorse professional ethics. Cronin (1993) states that the magazine's survival probably depended upon endorsement of professional ethics. In agriculture, trade publications have been shown to be of similar

importance for those in agriculture. Farmers have been shown to trust the agricultural trade press more than other sources of agricultural news (Adams, 1984; Marquart, 1995).

If this policy/agenda setting applies to the coverage of rBst, then the American public, as well as dairy farmers need to know which publications are influencing whom and when this influence is occurring.

Avoiding social and ethical coverage has been found to be even greater in the trade press. The general interest media have been found to cover more ethical and social aspects of economically valuable technologies than trade publications involved in the industry that technology might benefit (Hollifield, 1997b). Therefore, agricultural trade publications can be expected to lead coverage in economic, political and technological news about agricultural issues, but the general interest media is more likely to cover social and ethical issues than the agricultural trade press.

Challenges in agenda setting

Agenda setting research has its own limitations when used for the foundation for a study. Kosicki lists four requirements in the evidence to verify agenda setting has occurred:

1. "First researchers should present evidence about the media content that is the purported cause of the effect under consideration.

2. "Second, researchers should present evidence that the people alleged to be affected have, in fact, been exposed to the content.

3. "Third, researchers should control for other extraneous factors to guarantee the internal validity of the media effect stimulus and to rule out competing causal explanations for the effects they find.

4. "Fourth, researchers should specify the processes or mechanisms involved" (Kosicki, 1993, p.107).

Although no single study can satisfy the above list, Kosicki argues that after 30 years of concentrated research in this area, researchers should be working to satisfy these needs.

In the space and time of a master's thesis it is impossible to answer all four challenges. This study is intended as a preliminary study and fulfills only the first of the above requirements. The results should not be interpreted as proof of the presence of inter-media agenda setting, but only an indication that further study is warranted.

The founder of agenda-setting theory agreed that more in-depth investigation needs to be done in agenda setting. McCombs outlined three areas for further research in agenda setting that are only beginning to be investigated.

1. The first is how framing and agenda setting interact. McCombs calls this intersection of frame and agenda setting, or the agenda of attributes. He writes that this occurs at the sub-issue level of issues.

2. The second is to use different issues or exemplars to investigate how widespread this effect is.

3. The third is for longitudinal investigation of one primary issue and its sub-issues (attributes) (McCombs, 1997).

To better answer the challenges of agenda setting research posed by Kosicki and McCombs, this study was designed to fit two of McCombs' requirements. This study investigated one exemplar over a period of 15 years as McCombs suggests in number three, and rBst has not been the subject of long-term agenda-setting research as AIDS and the drug issue have -- fulfilling number two.

Framework for the study

The primary purpose of this study was to investigate whether the trade press could be setting the general interest media's agenda on technological political and economic issues dealing with an industry-specific innovation. Of secondary interest are the effects traveling the other direction from the general interest media to the trade publications. To investigate those questions, it is necessary to understand how agenda setting is presumed to manifest itself in content and how the trade press functions. In addition, a background on bioengineering and recombinant bovine somatotropin is provided to assist understanding of the exemplar used to investigate the research question and the subsequent results.

Agenda-setting processes

Two major studies conducted with content analysis show how inter-media agenda setting would appear in the results of a content analysis.

Media agenda setting, whether among media of the same genre or a different genre, has two processes by which it manifests itself according to Reese and Danielian (1989).

1. One publication leads coverage in other publications of an issue, called leading. For example the *New York Times* breaks a story that is followed by a story on the

same issue in the *Washington Post* then the *Los Angeles Times* and then other print publications. This leading is most pronounced when the issue breaks over a longer period of time rather than in a few days.

2. A spectacular news event drives coverage to a simultaneous peak (Reese and Danielian, 1989).

Reese and Danielian (1989) called these two phenomenon 'convergence' and defined it as, "the process by which the media discover issues, respond to each other in a cycle of peaking coverage, before largely dismissing the issues" (Reese and Danielian, 1989, p.30).

Danielian and Reese found that as the length of time the publications' coverage was similar, each medium's agenda appeared to be set by another medium as opposed to other forces (Danielian and Reese, 1989). However, when prompted by outside events, the media tend to act in concert rather than play follow the leader.

In his study of AIDS coverage, Rogers (1991) found a 13-to-17 month delay between the time when the science publications covered a topic and the general interest publications carried related coverage. He investigated AIDS reports in magazines like the *New England Journal of Medicine* and *the Journal of the American Medical Association* and in *Science* to determine what issues were covered. When corrected for the time lag, Rogers found the coverage in the general interest media was similar in issue content to the earlier coverage that had appeared in the specialized press.

Bioengineering and rBst

In this study, recombinant bovine somatotropin was chosen as the issue, or exemplar, for several reasons: it was a major industry story and science story and had many sub-issues including social, ethical and economic. Issues surrounding rBst was widely covered in both the general interest media and the trade press, and it was an issue in both media types for a long time. Additionally, the publication of the results of the study of the effects of rBst on lactating cattle by the Cornell researchers provides an identifiable point from which to start the analysis of articles.

Priest (1995) justifies the study of biotechnology in mass media as the "premier example of the interplay between public opinion, media coverage, public policy and the scientific view... rDNA (any recombinant genetic technology) is the highest of high-tech science" (p.44)

Bioengineering, and rBst in particular, presents an interesting question to the American people and to the press.

Concerns about rBst's impact and safety were debated in the pages of many kinds of media including farm publications such as *Farm Journal*, *Successful Farming*, Dairy publications such as *Hoard's Dairyman* and *Dairy Herd Management*, retail food publications such as *Supermarket Business* and *Progressive Grocer* and general interest news magazines like *Time* and *Newsweek* and newspapers like the *New York Times* and the *Washington Post.*

"(Bioengineering) has sparked a battle for the hearts, minds and stomachs of American consumers. If the debut of the first bioengineered agricultural products is any

indication, it should be some battle," reports an article in *Marketing News*, a publication of the American Marketing Association (Miller, 1994).

Proponents of bioengineering claim the impact of bioengineering to be "as significant as farm mechanization, the development of hybrid crops and the use of agrichemicals" (Fraley, 1988). Opponents claim there are more negative effects of rBst than any benefits could possibly outweigh. Charges range from an increase in antibiotics in the milk supply to unnamed and feared health risks (Miller, 1994).

Not only humanitarian concerns fuel the debate over biotechnology. Companies like Monsanto have an enormous investment in the success of its version of rBst, marketed as Posilac. Flanigan reports Monsanto invested $6.6 billion dollars in biotechnology and planned to release 40 products developed through bioengineering before 2000 (Flanigan, 1993). Posilac alone is expected to earn its developers $500 million a year according to a report in Chemical Week (Lucas, 1995).

History of rBst

The first mention of recombinant bovine somatotropin came in 1981, and as this study was being conducted in 1997, it still made news in both the general interest media and the trade press. Such a long period of coverage (16 years and counting) allows closer investigation of inter-media agenda setting.

Bst, also known as bovine growth hormone, or BGH, is a protein hormone produced by the cow's pituitary gland. There are two kinds of Bst. The naturally-occurring hormone produced by the pituitary gland in cattle is referred to as Bst, while the manufactured version is identified as rBst. Each mammal makes a unique version of

somatotropin. The hormone controls natural growth processes, growth of the mammary gland and milk production.

When Bst is injected into lactating cows, milk production increases by 10 percent to 15 percent on the average. Scientists developed a way to alter bacteria's genetic code by implanting the bovine version of somatotropin's genetic code to make the protein chain into the bacteria to make marketable quantities of the hormone (Council for Agricultural Science and Technology, 1993). Previously, the pituitaries of 500 cows needed to be collected to give one cow, one dose of Bst for one day's production. By creating bacteria with the Bst gene and then allowing the bacteria to grow and multiply, rBst became an economic possibility for farmers to use in milk production in the 1980s.

In 1981, researchers at Cornell University, Peel and Bauman (Peel, 1980), found that rBst could be highly profitable for dairy farmers. Dale Bauman continued to lead the research to discover the proper dosage and the effects of the hormone on cattle.

After the milk production increase was verified by Bauman and his researchers, as well as other dairy scientists, Monsanto applied to the Food and Drug Administration for permission to market the hormone to dairy farmers. The drug was approved in November 1993 and went on sale in February 1994 (The Drug Information Laboratory and Medicine, 1996).

Jeremy Rifkin, president of the Foundation on Economic Trends, a nonprofit group concerned with environmental issues, opposed the approval of rBst for cows and led his group and many others in a fight against its approval. The debate between Rifkin's foundation and the FDA and the drug companies included several issues studied in this

research: the economic issue of larger farms benefiting more from the adoption of rBst than smaller farms and causing the farms with fewer cows to go out of business, and the social issue of the human health impact of rBst on consumers. Although Bst had been injected into children's bloodstream in the 1950s (in an effort to cure dwarfism) with no ill effects, there was still some concern about its adoption for lactating animals (The Drug Information Laboratory and Medicine, 1996). The health concern was that the increase in milk production could cause an increase in udder infections and increase the amount of antibiotic residues in the nation's milk supply.

During the 16 years between the 1980 Cornell research on Bst in lactating cattle and this study, some of the 'real world' events concerning rBst include:

June 16, 1980; Peel and Bauman, researchers at Cornell University present their research showing a significant increase in milk production when cows are injected with Bst (Peel, 1980).

March 15, 1981; Genentech Inc., and the Monsanto Company of St. Louis report they succeeded in producing a natural hormone that promoted meat and milk growth in cattle by means of recombinant DNA technology (Genentech has cattle hormone,1981).

August 23, 1989; Five of the nation's largest supermarket companies announced they had taken steps to make sure that dairy products that carry their stores' brands did not contain milk from cows treated with rBst (Schneider, 1989).

August 23, 1989; Ben and Jerry's Homemade Inc., makers of popular premium ice cream, became the nation's first large food company to actively campaign against bovine somatotropin (Schneider, 1989).

January 11, 1990; A veterinarian dismissed from the Food and Drug Administration announced the agency's review of rBst had been marked by overly close ties to the animal drug industry (Schneider, 1990b).

March 22, 1990; The Wisconsin Legislature voted to bar temporarily the use or sale of rBst except for research (Milk with experimental hormone, 1990c).

April 27, 1990; Gov. Tommy G. Thompson of Wisconsin approved legislation that temporarily barred the sale or use of rBst. The action was the first prohibition of a product of genetic engineering anywhere in the country. In approving this legislation another temporary ban of the drug in neighboring Minnesota went into effect (Schneider, 1990d).

August 23, 1990; The Food and Drug Administration reported that rBst was harmless to human health (Schneider, 1990c).

November 22, 1990; Food and Drug Administration announced the government's review of rBst took longer than expected and would not be completed by Spring of 1991. This announcement delayed the expected approval of the drug by nearly three years (Associated Press, 1990).

November 30, 1990; Rifkin's group, Foundation on Economic Trends, sued the Department of Agriculture charging that it had helped begin a million-dollar

public relations campaign for rBst while its safety was still being investigated by the Food and Drug Administration. Rifkin also petitioned the FDA to stop any promotion of the product by agency officials and to stop marketing milk from cows experimentally injected with the hormone (U.S. sued, 1990b).

December 4, 1990; Consumers Union, the publisher of Consumer Reports, questioned the safety of rBst and urged the Food and Drug Administration to immediately halt sales of milk with traces of the drug (Schneider, 1990a).

December 8, 1990; Milk from cows injected with rBst was declared safe for human consumption by the National Institutes of Health (Wisconsin leaders back curb, 1990a).

February 12, 1991; The Food and Drug Administration ordered Monsanto to stop promoting rBst while the drug was still under government review (Monsanto told to halt promotion, 1991).

May 12, 1991; The Office of Technology stated rBst poses no danger to cows or to humans who drink their milk (Andrews, 1991).

August 4, 1993; The Senate-House budget included a provision in the budget bill to impose a three-month moratorium after FDA approval before bovine growth hormone could be sold (Cow-hormone flap ends, 1993).

November 5, 1993; The Federal Food and Drug Administration approved rBst (Schneider, 1993).

February 3, 1994; Kroger Company, the nation's largest supermarket chain, the Southland Corporation, owners and franchisers of 7-Eleven convenience stores, and Pathmark Stores Inc. took steps to ensure their suppliers did not use milk from rBst-treated herds (Schneider, 1994c).

February 4, 1994; First sale of Posilac by Monsanto (Schneider, 1994b).

February 7, 1994; The Food and Drug Administration warned dairy producers and distributors not to mislead consumers with labels on milk and other dairy products that do not fulfill its guidelines about labeling rBst-treated milk (Schneider, 1994a).

April 15, 1994; Responding to consumer concern about what is in milk, two states, Vermont and Maine moved to limit the use of rBst (Schneider, 1994d).

April 17, 1994; Two House committee chairmen and a Vermont Congressman accuse the Food and Drug Administration of collaborating with the manufacturer of rBst in clearing the new drug for sale (Schneider, 1994e).

February 1, 1995; The Monsanto Company announced that about 11 percent of the nation's dairy farmers were using rBst to increase milk production in their cows (Feder, 1995).

September 6, 1995; The first day when most dairy products sold in Vermont were required to be labeled if they are made with milk from cows treated with rBst (Associated Press, 1995).

Research questions

The purpose of this study is to investigate two research questions.

1. Do trade publications influence general interest media in their coverage of economic and technology issues dealing with the trade publications' specific area of expertise?

2. Do general interest publications influence coverage of ethical and social issues about economically valuable innovations in trade publications' area of expertise?

CHAPTER 3

3. Methods

Introduction

Inter-media agenda-setting studies examine how other media set a medium's agenda of coverage. There has been strong evidence this occurs among the elite media (Reese and Danielian, 1989) and from the elite media to the rest of the general interest media (Dearing and Rogers, 1996). By investigating trade publications and general interest media together, it is possible to see whether trade publications may also play a role in agenda setting.

This study investigates inter-media agenda setting between trade publications and general interest media. By examining the coverage of an important issue and its related sub-issues, it is possible to look for evidence indicating inter-media agenda setting. The issue chosen for investigation in this study was rBst or recombinant bovine somatotropin. Its sub-issues, or attributes, include ethical and social implications as well as the political and economic implications.

Hypothesis

Hypothesis 1 and 2

Under the free market model of media performance, it is assumed that publications' coverage of issues will be driven by the editors' and publishers' perceptions of the

information about which their readers will want and need to know. Consequently, since different types of publications strive to serve the information needs of different types of readers, it would be expected that different publications will develop expertise and sources in different topic areas. Miller (1978) argues that specialized media influence other media in certain areas where the elite media holds 'expertise,' such as the Rolling Stone's influence over media coverage of 'counter-culture,' and specialized science publications act in the same role (Dearing and Rogers, 1996). Knowing this, it is reasonable to conclude that the agricultural trade press might act as an 'expert' media and influence other media coverage of agricultural issues.

However, it has also been shown that with some issues, the trade press tends to ignore social and ethical issues concerning new technology that might have strong economic impacts on the industry's financial well-being (Hollifield, 1997b). Therefore, agricultural trade publications can be expected to lead coverage in economic, political and technological news about agricultural issues, but the general interest media is more likely to cover social and ethical issues than the agricultural trade press.

If the reader-centered assumption for the selection of stories for coverage in these publications, the same assumptions can still hold true. Therefore:

H1: The agricultural trade press will have reported the development of rBst before the general interest press reports on this sub-issue.

H2: The agricultural trade press will have reported the economic impact of the adoption of rBst on small farms versus large farms before the general interest press reports on this sub-issue.

Hypothesis 3

Priest found that the general interest media tends to cover ethical and social issues about new technology only rarely (Priest, 1995). Hollifield found that the trade press tends to cover the social and ethical impact of innovations far less than publications not directly affected by the innovation (Hollifield, 1997b). If the general interest media discuss the ethical and social impacts of a technology, even if only superficially, these general interest publications might force the trade publications to cover the social and ethical implications. Therefore:

H3: The general interest media will report the social implications (human health issue) of adoption of rBst for use in lactating cows before the agricultural trade press.

Hypothesis 4 and 5

As Hollifield found in trade publications not related to the communication industry, trade publications covering economically valuable technologies that are not directly part of the field do cover the social and ethical impacts of that technology (Hollifield, 1997b). Therefore, it is likely the supermarket trade press covered the social and political aspects before the agricultural trade publications. However, because the elite media such as the *Washington Post* and *New York Times* tend to lead coverage of issues in other media (Miller, 1978), it is likely that the general interest media carried the social and ethical sub-issues, or attributes, before the supermarket publications. Therefore:

H4: The retail food press will publish social issues (human health) before the agriculture publications

H5: The retail food press will publish social issues (human health) after the general interest publications.

Variables

For this study, the independent variable is the media type. The dependent variable is the time of publication. To investigate the interaction of these two variables, rBst stories were used.

Justification of variables

Media genre.

Media genre was chosen as an independent variable because genre of media has been shown to make a difference in content (Hollifield, 1997b; Cherry, 1985; Gussow, 1984; Mazur, 1981; Miller, 1978). As mentioned in Chapter 1, this study is based on the assumption that most media are reader-centered as opposed to advertiser centered or social responsibility-centered. If this is true, then the readers' interests and needs, as determined by the editors and reporters, drive the editorial content more than the advertisers' needs. Specialized media such as trade publications by definition have different readers from general interest media and their readers' needs differ as well.

Time of publication.

Time of publication is an interval or period between the distribution of one periodical and its subsequent edition. Rogers and Dearing state that time is the critical factor in determining who or what sets the media's agenda. Only if publication of an item in one medium precedes that in another medium can researchers claim one sets the other's

agenda. By looking at the date an item was published, it is possible to determine which media type covered which rBst issues first.

This lag between publication times will vary. When inter-media agenda setting occurs within genre, the lag time is not as long as the 13 to 17 months lag time Rogers found between different genres (Rogers, 1991).

rBst stories.

rBst stories were chosen because they can be found in both the trade press and the general interest media, allowing a longitudinal study of an exemplar with the ability to look at sub-issues. rBst-inspired stories included sub-issues about the economic, social, political and ethical sub-issues of its development and adoption with implications for industry, stockholders, farmers, policy makers and the public.

Sub-issue.

Sub-issue is the 'second level' of agenda setting and is where frames and agenda setting meet (McCombs, 1997). McCombs argues that to keep agenda setting a valuable theory for research, studies should go beyond simple issue agenda setting to the sub-issue level.

Operational definitions

Media genre.

Four types of media genre were chosen for this study: dairy trade publications, supermarket trade publications, general interest daily newspapers and general interest weekly newsmagazines. Each category was defined as in Ulrich's International Periodicals Directory for 1996 (The Broker International Serials Database, 1996).

Ulrich's International includes circulation data for periodicals published around the world.

Trade publications.

Trade publications were defined as print media publications that narrowly focus their editorial content to serve the information needs of readers who have a professional interest in a specific industry or industry segment (Hollifield, 1997b). General interest media are geared toward consumers with varied topical interests (Hollifield, 1997b).

For this study, dairy trade publications and supermarket trade publications were chosen from Ulrich's Guide to Periodicals based on circulation and first date of publication. To be chosen for the sample, the magazine (1) had to be listed as a trade publication, (2) had to be published since at least 1980 and (3) needed to be the largest two or three in circulation in its genre as listed in Ulrich's Guide (The Broker International Serials Database, 1996).

The national dairy trade publications were *Dairy Herd Management* (circulation 106,364), and *Hoard's Dairyman* (circulation 130,000), and national retail food publications were *Supermarket Business* (circulation 73,535) and the *Progressive Grocer* (circulation 70,313).

General interest publications.

The general interest publications, defined as newspapers and newsmagazines, were chosen after the literature revealed these media were influential in setting other publication's agendas (Reese and Danielian, 1989; Danielian and Reese, 1989). Based on Reese and Danielian's research, the media chosen for this study were: general interest

national newspapers the *New York Times* and the *Washington Post*, national general interest newsmagazines *Time*, *Newsweek* and *U.S. News & World Report*

Time of publication.

Time of publication was the first day of an edition's issue date. For the daily publications that will be the date printed on the paper. For the weekly and bi-weekly, such as *Hoard's Dairyman* and *Time*, the date will be the date printed on the cover. For the monthly publications, the time of publication will be the first of the month of publication, i.e. a June 1986 publication date will be defined as June 1, 1986, for the purposes of this study.

rBst story.

rBst story is a story which mentions bovine somatotropin, rBst, Bst, bovine growth hormone or BGH in the headline, subheads lead or pull-quotes. If a story had a feature-type lead and headline, but was obviously about Bst (i.e. mentioned "this hormone" or the effects of Bst mentioned in the headline, lead, sub-heads or pull-quotes) also were included. Stories not meeting this criteria were not deemed important enough stories to have been likely to have had an effect on other media personnel or their story choices.

Sub-issues.

Stories were coded for content based on four categories, or sub-issues. If a story contained references to any of the events listed below, they were coded into the appropriate category.

1. Monsanto, Elanco, Eli Lilly, Upjohn or American Cyanamid's development of rBst (invention).

2. Large vs. small farmers - running farmers out of business (must make the size comparison).

3. Social issues of the adoption and use of rBst, particularly the health effects on humans from drinking rBst-treated milk.

Sample

A multi-stage sampling method using both Nexis' on-line database and back-issues of publications yielded 270 stories for this content analysis.

Stories in the *New York Times*, *Washington Post*, *Newsweek*, *Time*, *US News and World Report*, *Supermarket Business* and *Progressive Grocer* were called up on Lexis-Nexis. To choose the stories, the following terms were used: bovine somatotropin, bovine growth hormone, rBst, rBGH, Bst and BGH. The result of this search comprised the study sample for the newspapers, newsmagazines and the supermarket trade publications. From this list, the stories which did not list any of the search words or a specific reference to the hormone, later identified as Bst, in the lead, headline or sub-headlines were removed from the sample leaving 79 stories for this analysis. For all but the dairy publications, a search on Lexis/Nexis was conducted to pull the sample on Thursday, July 24, 1997. The New York Times has been indexed by Lexis-Nexis since June of 1980, the Washington Post since Jan. 1, 1977, Supermarket Business and Progressive Grocer since January, 1983. Because they were not indexed since the beginning of the study period, the researcher found copies from 1981 and 1982 and did a hand check for stories similar to the hand check done for stories in the dairy trade magazines.

Nexis does not index *Hoard's Dairyman* and *Dairy Herd Management*, so an alternate method of sample collection was devised for the two dairy publications. To collect the sample from the dairy publications, all copies of the magazine from 1980 until 1997 were visually scanned by the researcher to find stories matching the rBst story criteria as listed above. *Hoard's Dairyman* had an index that indexed Bst after 1985. After hand checking two years of the magazine on microfilm, a search was conducted using the index. The agreement between the index to the hand coding was 100 percent for both years. After that, the index was used to collect the rest of the *Hoard's Dairyman* stories.

Dairy Herd Management's index did not agree with the hand coding. Many stories fitting the criteria were not indexed, so all years of *Dairy Herd Management* were done by paging through each magazine. After all stories were collected from the two dairy magazines, they were digitally scanned into the computer and run through optical character recognition software. Some of the stories were not scannable due to old microfilm or copying problems. These were read into the computer using voice recognition software to prepare them for computer coding. From this sampling method, 191 stories were found to fit the rBst-story criteria.

Media

Below is an editorial and circulation synopsis of the nine media included in this study.

Hoard's Dairyman.

Hoard's Dairyman is written to inform and educate the American dairy farmer and it reaches its 113,638 subscribers 20 times a year. The editorial material is focused on commercial dairymen who produce and sell milk. Emphasis is placed on feeding, breeding, and animal health, as well as general dairy farm management techniques.

The publication has had consistency in management as well as reporting. W.D. Knox is only the third editor in 112 years of publishing. The magazine has three full-time reporters, two of which have nearly 30 years of experience. *Hoard's Dairyman* is still published by the same publishing company that founded the magazine more than 100 years ago, W.D. Hoard and Sons Co.

The reporting budget for the magazine is about $400,000 a year and this includes the three reporter/editors, a copy editor and 20 to 30 contributing writers from dairy science departments across the country (Ewing Row, Managing Editor, personal communication, Nov. 25, 1997).

The reporters are familiar with the science of agriculture. All three full-time editorial staff members have science degrees and two have masters in science, not journalism, fields. Every year, the three attend numerous scientific conferences, and the contributing writers extend the number even more (Row, personal communication, Nov. 25, 1997).

The magazine is published 20 times per year on the 10th and 25th of the month, except for June, July, November, December when only one edition is published on the 10th of the month. An average of 60 advertisers are in each magazine, keeping the

editorial to advertising ratio at about even. The annual subscription is individual $14, or $3 per individual copy (W.D. Hoard and Sons, 1997).

Dairy Herd Management.

Dairy Herd Management is a trade publication serving commercial U.S. dairy farms. The primary readers are owners, managers, supervisors and foremen of commercial dairy operations with 30 or more cows or replacement heifers. Those fitting this description receive the magazine for free (Vance Publishing Corp.,1997).

The magazine has four full-time editorial staff, including one copy editor. As with *Hoard's Dairyman*, *Dairy Herd Management* staff attend a large number of scientific conferences each year. All of the editorial staff have a bachelor's degree and the editor, Tom Quaife, has his master's degree. Quaife has more than 20 years of reporting experience, two others on his staff have about four years of experience (Tom Quaife, managing editor, personal communication, Nov. 25, 1997).

Subscription rates are $1 per copy for those not fitting the above qualification. On average, there are about 55 advertisers each month, with about 45 percent of the magazine devoted to editorial material. The magazine is distributed monthly. Owners and managers of dairy operations comprise nearly 90 percent of the magazine's readership (Vance Publishing Corp.,1997).

Supermarket Business.

This magazine's articles are targeted for supermarket retail and wholesale decision makers across the country and reach 73,535 subscribers each month. It is published by Howfrey Communications, Inc., and the editor is Ken Partch.

Subscriptions for the publication run $85 a year or $10 per copy (Bacon's Magazine Directory, 1997).

Progressive Grocer.

Progressive Grocer provides essential information and guidance for more effective food distribution through this nation's retail outlets as well as research and reporting on grocery management. It's nationwide circulation of 54,000 is concentrated in areas of high population (Randy Schneider, personal communication, 1997).

Progressive Grocer Associates publishes the monthly magazine and Steve Weinstein is the editor. A subscription is $99, or $10 per copy (Bacon's Magazine Directory, 1997).

New York Times.

The *New York Times* serves more than 1 million readers across the country every Sunday and nearly that every day. The motto: "All the news that's fit to print," clearly describes the editorial mission of the paper. The *New York Times* strives to have complete coverage of world events, entertainment, sports, and business news. The paper has been shown in several instances to set the agenda for media across the country (Paneth, 1983).

With a reporting staff of more than 1,000, and a science reporting staff of 11 with six more regular contributors, the New York Times covers a wide range of science news. The reporters do not regularly attend scientific conferences, but prefer to get science news from other channels such as science journals and personal contacts (Cornelia Dean, science editor, personal communication, Nov. 25, 1997).

The range of experience and education is great for the *New York Times'* science reporters. All have a bachelor's degree and some have masters and Ph.D.s. Experience

ranges from about five years up to 30 years of reporting experience (Cornelia Dean, science editor, personal communication, Nov. 25, 1997).

Subscription rates vary, but in general, an individual subscription is $280, or 50 cents per copy (Oxbridge Communications, 1997).

Washington Post.

The *Washington Post*, founded as the Democratic newspaper, has since become an influential source of news from the nation's capital. It is considered the leader in daily political news from Washington D.C. The Post's editorial mission is to serve the consumer's need for timely, quality news (Paneth, 1983).

Science reporting resources for the *Washington Post* are considerable. Of the several hundred reporters working for the paper, six are dedicated to science reporting and several more on the health desk cover health science issues. The paper runs a weekly science page with 75 percent editorial on that page. Timely stories run in the paper throughout the week, but are not dedicated science space (Rob Stein, science editor, personal communication, Nov. 25, 1997).

Science reporters at the Post have 10 to 20 years of reporting experience on average. All have bachelor's degrees and several have master's degrees. The staff reporters do not regularly attend scientific meetings – only one or two per year. The reporters depend on other channels to get science news (Rob Stein, science editor, personal communication, Nov. 25, 1997).

The newspaper's circulation in 1995 was reported to be 793,660 (Oxbridge Communications, 1997).

Time.

Time magazine is reputed to be the weekly newsmagazine with the highest circulation with 4,150,223 readers as of June 30, 1997 (Roseanne Edie, personal communication, 1997). This magazine, published since 1923 has grown to include an international, as well as national, audience. Time's man/woman/thing of the year award given at the end of each year has been shown to put people and issues on the public agenda (Dearing and Rogers, 1996).

Time has 11 writers, editors and reporters dedicated to science reporting as well as two full-time contributors who work nearly exclusively for science coverage, according to Philip Elmer-DeWitt, assistant managing editor and science editor.

Since becoming science editor two years ago, Elmer-Dewitt said the department has averaged a cover story per month about science, which means 12 to 13 pages dedicated to science news. On average, he said the department gets seven or eight pages of coverage each issue. Last year's Man of the Year issue highlighted a scientist and gave the department 24 pages of science coverage, but that is unusual, he said.

All of the science writers for *Time* have college degrees and most have at least some graduate work, some in medical school or law. None of them has a Ph.D.

The average reporting experience is around 10 to 15 years of reporting experience, with several reporters and correspondents having more than 20 years of science reporting experience. Elmer-DeWitt said the staff tries to attend about a dozen scientific conferences each year including medical meetings, AIDS conferences and even the

American Geophysical Union. But, the writers depend mostly on the scientific journals for their science information.

Newsweek.

Newsweek is published weekly by the Washington Post Company. It's worldwide circulation is 4.1 million although the domestic circulation is unavailable. The editor is Maynard Parker and there are five Assistant Managing Editors. (Jan Angilella, personal communication, 1997)

US News and World Report.

The third largest newsmagazine (Nourie, 1990) with a circulation of 2,295,448 nationwide works to put widely varied business, technology, culture, and political developments in the clearest and most engaging perspective for its readers (Melissa Maclean, personal communication, 1997).

US News and World Report is the most editorially conservative of the three newsmagazines. Its readers are older, have more education, higher income and are more centrally located than the readers of the other two news magazines (Nourie, 1990).

Publications' Resources

Although the *New York Times* and the *Washington Post* have many more resources than do *Dairy Herd Management* and *Hoard's Dairyman*, when one looks at the relative resources for the coverage, *Hoard's* and *Dairy Herd Management* come out way ahead in dairy coverage. The times might have 11 full-time science reporters, but probably not one of them is dedicated to dairy coverage. Science reporters for general interest publications have such a large amount of information to scan from thousands of scientists and

hundreds of scientific journals. Dairy reporters only have a few scientific journals to follow and only several hundred scientists doing research.

Another concern in the disparity of resources could be in education and sophistication of reporters. In this case, it appears that in education, the *New York Times* and *Washington Post* don't have anything on the *Hoard's Dairyman* staff, where two of the three reporters have master's degrees in scientific fields and many researchers from universities are contributing writers. However, only one of the *Dairy Herd Management's* staff has a master's degree and the experience of the other writers is limited.

Content Analysis

As Kosicki (1993) argues, a variety of research methods are needed to determine if possible effects and relationships indicating inter-media agenda setting could be occurring between the genres of study, this study is meant only as a preliminary study to investigate whether there is evidence of inter-media agenda setting between the trade press and the general interest media.

Rogers and Dearing (1996) note that content analysis has been the most common method used to determine the media's agenda. Content analysis is the most logical method to use to determine how much media writes about an issue. It allows the researcher to look at content in an objective, systematic and quantitative way (Stempel, 1981).

Unit of analysis

A story was both the unit of analysis and the context unit for this study.

Category definitions

1. Monsanto, Eli Lilly (Elanco), Upjohn or American Cyanamid's development of rBst.

In this category, coders were instructed to look for the invention of the technique (recombinant technology) or development of Bst. Only those stories about the companies developing rBst, as opposed to Bst, and had the recombinant technology mentioned were counted.

2. Large vs. small farmers - running farmers out of business (must make the size comparison).

This category looked at the size of the farm and the relative advantage or disadvantage of using rBst based on that size. Coders were instructed to look for the comparison between large farms and small farms and how rBst would impact farms economically in different ways depending on the farm's size.

3. Social issues of the adoption and use of rBst Health effects on humans from drinking rBst-treated milk.

Coders were instructed to look for stories concerned with the human health aspect of rBst, whether it was positive, negative or neutral. Coders were not to positively code stories dealing with the health of the cattle.

Intercoder reliability

Six coders and the researcher were given a random sample of 27 stories. The sample was selected by a random number generator.

Five of these randomly chosen stories were selected by the researcher for the training session. These stories were chosen from the random sample, but were selected to contain at least one mention of each variable.

These six coders met in a training session October 17, 1997. The five training stories were coded as a group and the results were discussed until the researcher felt everyone understood the categories. Then coders received a packet of 27 stories to code in the next two hours.

Agreement percentages were calculated on the 27 stories. Holsti's calculation for intercoder reliability gave a 0.98 intercoder reliability or higher for each category. The variable "rBst development" intercoder reliability coefficient was calculated at 0.99. The "large versus small farms" intercoder reliability coefficient was calculated at 0.99 and the "human health" category intercoder reliability coefficient was 0.98. All were above the recommended 0.80 intercoder reliability coefficient.

After reliability was established, coders received packets of 50 stories to read and code. One coder was unavailable for this final coding, so the majority of the stories were coded by five coders. The stories were assigned to try to give each coder stories from each publication and from different dates of publication. However, some publications had one story, making this impossible. Each coder did code stories from each media genre.

For the final discussion chapter, the researcher pulled each story identified as the first to report each variable and verified the presence of the identified variable in the stories. In all cases, the researcher found the identified variables as identified by the coders and did not find extraneous variables identified by the coders.

Measurement

A comparative analysis of the rBst coverage in the four media types was used to investigate the four hypotheses. Using content analysis to locate the first incidence of each sub-issue and to follow the amount of coverage per media type, this study compared the differences among the media types to see if media type was a contributing factor to issue coverage.

Finding the research articles in the dairy publications first would support the contention that the trade press may set the general press' agenda for economically valuable innovations. Although not proof of cause and effect, the time order does lend credibility to the existence of inter-media agenda setting between the general interest media and the trade press.

C.J. Peel and Dale E. Bauman's Cornell research in Bst's impact on lactating cows was published in May of 1980 by the Dairy Science Journal as a part of the American Dairy Science Association's Annual Meeting (Peel, 1980). If the first publication in the study to mention Bauman's research were a dairy publication in the June or July issue, and the first mention in the general interest press were in August, then the argument for inter-media agenda setting in this case would be strengthened.

CHAPTER 4

4. Findings

Description of data

This chapter describes the data collected and the findings.

Variables

The sample consists of 270 stories with the first published on March 16, 1981, nearly a year after Bauman's presentation of his research findings. The last publication date is December 1, 1995.

The category with the most stories with mentions in the sample was the human health issue with 38.7 percent of all stories about rBst's effects on human health (Table 4.1). This indicates that almost four out of 10 stories addressed the reader's concerns about their own, or their children's health. The development of rBst and the economic issue of large vs. small farms were included in about 14 percent and 16 percent of the stories respectively.

Variable	Number of stories	Percent of stories*
Health	105	38.7
RBst development	43	15.9
Large vs. Small farmers	39	14.4

Table 4.1: The number and percent of stories containing mentions of each variable. *note - percent column does not add up to 100 percent because not all stories mentioned any of the categories and some mentioned more than one.

Media genre

The four media genre: general interest newspaper, dairy trade publications, general interest magazines and supermarket trade publications, did not cover the rBst story equally (Table 4.2). The dairy trade publications had, by far, the most stories about the hormone, despite being published much less frequently than any of the general interest media publications and having a smaller total news hole with which to work. In just the

two publications, *Dairy Herd Management* and *Hoard's Dairyman*, 189 stories of the 271 in the total sample were published in the 15-year period of study. This comprised more than two-thirds of the study stories. The general interest newspapers carried 72 stories between them in the same time period, totaling 26 percent of the sample. The general interest magazines carried five stories about rBst from 1980 to 1995 and the supermarket trade publications published four. Each amounted to about 2 percent of the total sample.

Genre	Number of Stories	Percent of stories
Dairy trade publications	189	69.7
General interest newspapers	72	26
General interest magazines	5	1.8
Supermarket trade publications	4	1.5

Table 4.2: The number and percent of rBst stories written in each genre.

Publications

Diary Herd Management carried the most stories about rBst in the 15-year period of the study with 106 stories and nearly 40 percent of the story sample (Table 4.3). *Hoard's Dairyman* carried nearly as many with 83 or 30 percent of the sample. The general interest newspapers carried 72 stories in all, with the *New York Times* leading the way with 49 stories or 18 percent of the sample. The *Washington Post* published 23 stories accounting for 8.5 percent of the sample. The general interest magazines were led by the

three stories in *Time* magazine. *U.S. News & World Report* and *Newsweek* had one story each. The supermarket publications carried five stories total. *Progressive Grocer* led coverage with three stories, while *Supermarket Business* carried one.

Publication	Genre	Number of stories	Percent of stories
Dairy Herd Management	Ag. Trade pub.	106	39.1
Hoard's Dairyman	Ag. Trade pub.	83	30.6
New York Times	Gen. Int. newspaper	49	18.1
Washington Post	Gen. Int. newspaper	23	8.5
Time Magazine	Gen. Int. magazine	3	1.1
Progressive Grocer	Supermarket Trade Pub.	3	1.1
Newsweek	Gen. Int. magazine	1	.4
U.S. News & World Report	Gen. Int. magazine	1	.4
Supermarket Business	Supermarket Trade Pub.	1	.4

Table 4.3: The number and percent of stories published in each publication from 1980 to 1995.

Variables by genre

Health stories accounted for the highest percentage of mentions in this sample at 105 mentions out of 270 stories. Here, the agricultural trade press carried more human health issue mentions than did the general interest newspapers with 54 stories versus 47 (Table

4). However, 65 percent of the rBst stories in the general interest newspapers dealt with the human health issue, while the 54 stories in the agricultural trade press only equaled 28.6 percent of the rBst coverage. The general interest trade magazines followed with three stories, accounting for 60 percent of the number of stories in that genre and the supermarket trade publications only ran one story, which was 20 percent of the genre's coverage.

	General interest newspapers	Agricultural trade publications	General interest magazines	Supermarket trade publications	Total*
Health	47	54	3	1	105
percent	65.3 %	28.6 %	60.0 %	20.0 %	38.7 %
Development of rBst	28	11	3	1	43
percent	38.9 %	5.8 %	60.0 %	20.0 %	15.9%
Large vs. small	26	12	1	0	39
percent	36.1 %	6.3 %	20.0 %	0.0	14.4 %

Table 4.4: Number and percent of stories with mention of each variable by genre.

*note - percent column does not add up to 100 percent because not all stories mentioned any of the categories and some mentioned more than one.

The economic issue of large versus small farms and which will benefit the most from the technology was found in 36.1 percent of the coverage of the general interest newspapers and only in 6.3 percent of the agricultural trade press coverage. Only one story in the general interest magazines mentioned this issue and the supermarket press ignored it entirely.

For the development of rBst, nearly 40 percent of the general interest newspaper stories mentioned the companies developing the drug for sale or the process, while only 5.8 percent of the agricultural trade press did the same. The general interest magazines hit the topic three times in their coverage and the supermarket trade press covered it once.

Analysis

First mention of rBst by genre

Each genre picked up the rBst story at different times in the 15 years of the study. The general interest newspapers picked up the story first and published an rBst story in March of 1981 (Table 4.5). The *New York Times* story dealt exclusively with Monsanto and Genentech's development of the recombinant technology to make rBst. Nine months later, the dairy trade publications picked up the Cornell research and reported it. It wasn't until 1989 that the general interest magazines and the supermarket publications jumped into the story. It must be noted that Rogers, Dearing and Chang (1991) found a 13 to 17-month lag between the scientific community agenda and the media agenda in their study of AIDS coverage.

Genre	Date	Year/month gap
General interest newspapers	3/16/81	
Dairy publications	12/01/81	0/9
General interest magazines	5/29/89	8/2
Supermarket publications	9/01/89	8/6

Table 4.5: First mention of rBst by genre with the year and month gap indicated since first publication

First mention of rBst by publication

The first mention of rBst in any publication came in March of 1981 in the *New York Times* (Table 4.6). It wasn't until December of that same year that *Dairy Herd Management* mentioned the hormone.

Publication	Date	Year/month gap
New York Times	03/16/81	
Dairy Herd Management	12/01/81	0/9
Hoard's Dairyman	02/25/82	0/11
Washington Post	03/27/85	4/0
Time Magazine	05/29/89	8/2
Supermarket Business	09/1/89	8/6
U.S. News & World Report	09/24/90	9/6
Newsweek	12/06/93	12/9
Progressive Grocer	01/01/94	12/10

Table 4.6: First mention of rBst by publication with the year and month gap indicated since first publication.

Two months later, the other agricultural publication, *Hoard's Dairyman*, followed with an rBst story. Three years passed before the *Washington Post* carried information about the hormone, and another four before *Time* magazine and *Supermarket Business* picked up the story. A year later, *U.S. News & World Reports* carried its first story. It

wasn't until FDA approval of the sale of the drug that *Newsweek* jumped in, and *Progressive Grocer* waited until after the hormone went on the market to write its first story.

Frequency by year

To better understand the results of this study, the overall number of rBst stories per year is shown below (Figure 4.1).

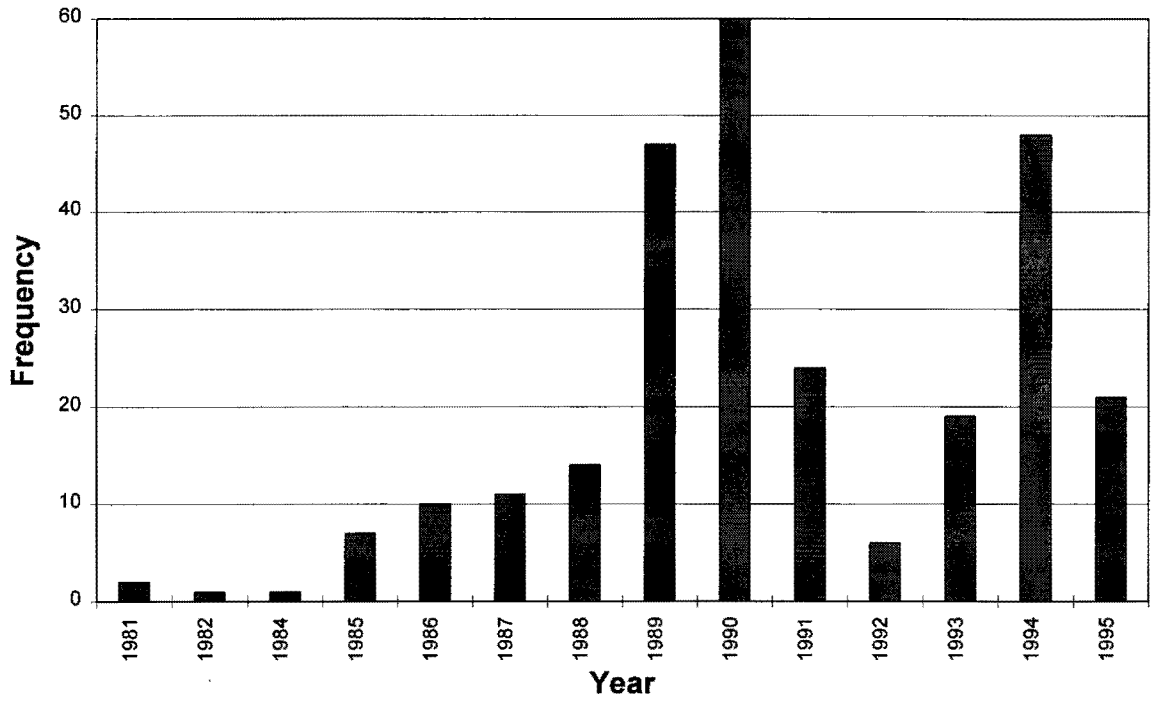

Figure 4.1: The number of rBst stories published each year during the study. There were 270 stories in the sample.

Hypothesis 1 RBst development

H1: The agricultural trade press will have reported the development of rBst before the general interest press reports on this sub-issue.

The hypothesis for rBst development was not supported by this research (Table 4.8). For rBst development, coders were instructed to only look for the mention of the companies developing the drug and its delivery system for the market, not the research dealing with the safety and efficacy of the product. With this definition of rBst stories, the first mention was found in the *New York Times* in March of 1981, almost a year after Dr. Dale Bauman presented his findings to the dairy research field.

Genre	Date	Year/month Gap
Gen. Int. Newspaper	3/16/81	
Ag. Trade Pub.	8/1/86	5/5
Supermarket publication editorial	9/1/89	8/6
Gen. Int. Magazine	12/6/93	12/9

Table 4.8: Date of the first mention of rBst development and subsequent publication by genre with the year and month gap since the first mention.

The next mention of the companies developing the drug did not come until 1986 in the agricultural trade publication *Dairy Herd Management*. This nearly five-and-a-half-

year lag does not indicate that the agricultural publications did not mention rBst until then. Both trade publications first mentioned the product within 12 months after the *New York Times'* article. It only indicates the agricultural publications did not mention the companies preparing the drug for market until then. The trade publications concentrated on the research conducted by Peel and Bauman and how the drug might be used by dairy farmers. Nevertheless, even recognizing the difference in how the two publications covered the story and how those differences were coded in this study, the *New York Times* still beat the agricultural trade press in breaking the story about rBst. Thus, this hypothesis was not supported.

It is noted that the time lag between when rBst first appeared on the agenda of a scientific conference and when the *New York Times* first reported the development was less than the 13-to-17 month lag found by Rogers et. al. (1991) to be common between publication of a breakthrough in a science journal and the time the general interest media publishes the story. However, the trade press reported its first rBst story long after the 17 months

It wasn't until eight years later the supermarket publications mentioned the development of rBst by the companies trying to get approval for the drug. That mention was found in an editorial by the editors of *Supermarket Business*. *Newsweek* led the coverage of rBst development in 1993 for the general interest magazines, 12 years after the first publication in the *New York Times*.

Hypothesis 1 was rejected because the *New York Times* carried the story of Monsanto's development of the recombinant technique for rBst nine months before the

agricultural trade press carried any mention of rBst. The *New York Times* story came nearly five-and-a-half years before the trade press' first mention of the development of the drug by the companies.

Hypothesis 2 Large vs. Small

H2: The agricultural trade press will have reported the economic impact of the adoption of rBst on small farms versus large farms before the general interest press reports on this sub-issue.

For large farms vs. small farms, the hypothesis that the agricultural trade press would have reported this first was not upheld. This issue was defined as an economic issue dealing with the size of the farm. The *Washington Post* picked up this angle first in March of 1985 (Table 4.9). Nearly two years later the agricultural trade publications picked up the story. It wasn't until 1990, five-and-a-half-years after the first mention of this issue in the sample that the general interest trade magazines picked up on this angle. The supermarket publications did not mention this issue at all.

Genre	Date	Year/month gap
Gen. Int. Newspaper	3/27/85	
Ag. Trade Pub.	2/1/87	1/11
Gen. Int. Magazine	9/24/90	5/6

Table 4.9: Date of the first mention of large versus small farms issue and subsequent publication by genre with the year and month gap since the first mention.

As with Hypothesis 1, Hypothesis 2 was also rejected. Once again, it appears the trade press does not act as experts for the general interest media -- in this case, not even for economic issues that directly affect the industry the trade press covers.

Hypothesis 3

H3: The general interest media will report the social implications (human health issue) of adoption of rBst for use in lactating cows before the agricultural trade press.

Hypothesis 3 was not supported by the data. The human health issue, which deals with positive, negative or neutral effects of injecting cows with rBst on human health, first appeared in the dairy trade publication *Dairy Herd Management* in December 1985, four years after its first coverage of the hormone (Table 4.10).

Genre	Date	Year/month gap
Ag. Trade Pub.	12/1/85	
Gen. Int. Newspaper	6/23/86	0/6
Gen. Int. Magazine	9/24/90	4/9
Supermarket publication	5/1/94	8/5

Table 4.10: Date of the first mention of the human health issue and subsequent publication by genre with the year and month gap since the first mention.

The general interest newspaper the *Washington Post* followed six months later with its own story dealing with the human health impacts of rBst. Almost five years later, the general interest magazines joined with *U.S. News & World Report's* story in September of 1990. It wasn't until after the first sale of the drug in 1994 that Progressive Grocer followed with its coverage of the human health issue, representing the only coverage of this issue by the supermarket trade publications.

The agricultural trade publications reported this issue before the general interest press. However, after careful review of how the story was reported, the agricultural trade press reported that injecting lactating cows with rBst had no effect on human health.

Hypothesis 4 and 5

H4: The retail food press will publish social issues (human health) before the agriculture publications

H5: The retail food press will publish social issues (human health) after the general interest publications.

The data did not support hypothesis 4 either (Table 4.11).

Genre	Date	Year/month gap
Ag. Trade Pub.	12/1/85	
Gen. Int. Newspaper	6/23/86	0/6
Gen. Int. Magazine	9/24/90	4/9
Supermarket publication	5/1/94	8/5

Table 4.11: Date of the first mention of the human health issue and subsequent publication by genre with the year and month gap since the first mention.

The human health issue first appeared in the dairy trade publication *Dairy Herd Management* in December of 1985, four years after its first coverage of the hormone. The general interest newspaper the *Washington Post* followed six months later with its own story dealing with the human health impacts of rBst. Almost five years later, the general interest magazines joined with *U.S. News & World Report's* story in September of 1990.

It wasn't until after the first sale of the drug in 1994 that Progressive Grocer followed with its coverage of the human health issue, representing the only coverage of this issue by the supermarket trade publications.

Hypothesis 4 was rejected and Hypothesis 5 was accepted. For the most part, the retail food trade publications in this sample did not enter into the rBst debate. Both the

agricultural and the general interest press published information about rBst's effects on human health before the supermarket trade publications.

CHAPTER 5

5. Discussion

This preliminary study uses the expertise model to investigate possible interactions between trade publications and the general interest media. The primary purpose was to see if the agricultural trade press appears to act as a source of expertise on technology, policy and economic information for the general interest publications. A secondary goal was to see if the general interest media acts as a source of expertise for social and ethical information for the trade press.

Hypothesis 1

H1: The agricultural trade press will have reported the development of rBst before the general interest press reports on this sub-issue.

In rejecting this hypothesis the general interest press is apparently not using the trade press as experts, even for information about industry-specific technologies such as rBst.

One possible explanation could be that the companies that were working to develop the recombinant technique to make commercial amounts of rBst were more interested in informing stockholders they might have developed a marketable product rather than informing the agricultural community. Monsanto, in particular, had invested a large amount of its stockholders' money in research and development of biotechnology for nearly a decade (Duhe', 1993) and the company was probably wanting to show a payoff

to its investors. By feeding the *New York Times* the story, the company could reach its stockholders much more quickly than by publishing in the agricultural trade publications.

The above explanation is given greater strength by the sources found in the March 1981 *New York Times* story. The sources are Monsanto, Genentech's president and a Monsanto senior vice president, as listed in the story (Genentech has cattle hormone, 1981).

Another explanation for this finding could be that the general interest publications might have a direct line to the companies developing these technologies or work closely with stock analysts who do and don't need to use a secondary source such as the trade press.

A third explanation for the story order could be that the dairy trade publications missed the story. Peel and Bauman made their presentation of the findings at a meeting of dairy scientists in June 1980 (Peel, 1980). It is likely the reporters for all of the publications, if they attended the meeting, missed this small presentation in the three-day program. After all, dairy scientists had known that Bst boosted milk production for many years. The importance of this research was that it demonstrated how much production could be boosted and, in conjunction with the recombinant technique that it was possible to make enough to be a marketable product, that was viable for use by all dairy farmers. Therefore, it wasn't until the *New York Times* was notified of the importance of this story that the media noted rBst. This explanation is supported by Ewing Row, managing editor of *Hoard's Dairyman*, who was working for the publication in 1980. He said it was likely

the person covering the American Dairy Science Association Meeting just missed Peel and Bauman's presentation.

Finally, the trade publications might not be using the reader-based selection rationale for stories. If they were, they would have informed their readers of this new technology before the general interest trade press, or at least before 19 months after the research was presented.

Hypothesis 2

H2: The agricultural trade press will have reported the economic impact of the adoption of rBst on small farms versus large farms before the general interest press reports on this sub-issue.

In addition to the reasons given for the previous hypothesis, there could be another reason the agricultural trade press did not cover the large farms versus small farms issue first. The agricultural trade publications frequently are geared more toward serving the large dairy farmers, not all farmers equally. In a conversation with an editor of a major farm publication, Hollifield was told publishers for the agricultural magazines are under pressure to provide content to attract owners and operators of large farms because these owners and operators are more lucrative for the publications advertisers (Hollifield, personal communication, 1997a).

In rejecting these two hypotheses, it brings to question the action and purpose of the trade publications. If their goal is to educate and inform farmers, then they might need to rethink the strategies used to reach those goals.

Hypothesis 3

H3: The general interest media will report the social implications (human health issue) of adoption of rBst for use in lactating cows before the agricultural trade press.

The finding that the agricultural trade press reported on the human health issue before the general interest media is opposed to Hollifield's finding that the trade press tends to ignore social and ethical implications of economically valuable technology (Hollifield, 1997b). It also shows that the trade press is not dependent on the general interest media to point out these issues before it covers them.

The time order for the human health issue could be because the agricultural industry has had several battles on the human health issue front which it lost (Duhe', 1993), causing farmers to go out of business. The agriculture industry, represented by the trade press, might have been trying to be proactive and squelch worries about the effects of rBst on human health before it became an issue. This appears especially true when the content of the story is more closely examined. The first mention of human health in the agricultural press was written to assure readers there were no negative human health effect. The attempt does not appear to have been successful since almost half of the stories published dealt with this issue.

Hypotheses 4 and 5

H4: The retail food press will publish social issues (human health) before the agriculture publications.

H5: The retail food press will publish social issues (human health) after the general interest publications.

These two hypotheses were the result of Hollifield's study showing that other trade publications do tend to report social issues more than the trade publications directly affected by the technology in question. Apparently the supermarket publications in this sample were not very concerned about rBst's effect on milk and dairy sales. Their coverage was scant and did not deal with issues very much.

Inter-media agenda setting

Because the data collected in this study did not support the inter-media agenda-setting theory does not mean the theory is not valid. It could be that the rBst issue was unusual in the coverage it received. It was an innovation that came from very dated knowledge about the effects of the hormone Bst. It came from very new technology, genetic engineering, that many people did not understand.

The hypotheses could also have been unsupported because of the selected sampling frame. There are many genres of media that was interested in this innovation, and many more publications within those genres. It might be that more evidence of inter-media agenda setting would have been found if other agricultural trade publications had been examined rather than the dairy specific publications.

Expertise model

While the results of this study did not provide support for the Expertise Model of inter-media agenda setting, it does not follow that the model does not deserve further study.

Evidence from various research, such as the Reese and Danielian studies (Reese, 1989), Miller's study (Miller, 1978) and Weiss' study (Weiss, 1974) lend strength to the argument that some publications get information about specialized topics from publications with greater expertise in an area.

From the researcher's own experience as a reporter and from talking with other reporters, anecdotal evidence indicates that sports writers read *Sports Illustrated*, Business writers read *Forbes* and the pattern is repeated according to the writer's beat.

To further investigate this model, a survey of beat reporters or a sociological study of newsrooms might uncover better evidence than this study was able to provide.

Limitations

This study is only a preliminary study in inter-media agenda setting. Because it is only one study, there are several limitations to the way the results may be interpreted.

The sample was purposely chosen to represent the largest newspapers and magazines in each genre, but this is in no way exhaustive and certainly not representative. Farmers often read four to six agricultural publications each month to keep up with trends. Reagan (1996) shows that for several types of specialized news, people prefer to get their information from more than one source. Therefore, it is not unreasonable to say that the publications in this sample, although they might be leaders in coverage, might not be the most representative of the coverage for each genre.

The content analysis design for this study would only have fulfilled the first of Kosicki's (1993) four requirements for proof of agenda setting. Had the hypotheses been accepted, then a more in-depth study of the processes by which reporters from each genre

work, looking for likely places for inter-media agenda setting occur, could be recommended.

As with any human activity, the human coding process leaves the door open for error in measurement of the variables. Reliability testing is the best way to control for this, which is why it was done. But it does not allow for all human error.

Another limitation is the choice of stories for the sample. Letters to the editor were excluded from this study. RBst generated many letters to the editor in newspapers and dairy trade publications. By leaving these out, this study may be ignoring important sources of information about ethical and social issues that led to coverage in the editorial portions of the medium.

Directions for future research

This study proposes an Expertise model of influence in inter-media agenda setting. The model is an attempt to show how inter-media agenda setting might work among publications of various genres and on different levels as proposed by Whitney (1991) and investigated by Rogers and Dearing (1988) and Hollifield (1997b).

The findings of this study point to many directions for future research. It would be interesting to compare to a similar technology advance (artificial insemination or hybrid corn) several decades earlier to see if these findings are consistent.

A study to determine how the genres framed their coverage and an investigation into the information subsidies provided to the publications would provide insight into the news process and how the reporters in each genre view various sources and their credibility.

It also would be useful to look at the letters to the editor to see if they inspired some of the social and ethical coverage seen in the newspapers and the dairy trade publications.

Conclusion

This study investigated the possible inter-media agenda setting of four types of media: general interest newspapers, agricultural trade publications, general interest magazines and supermarket trade publications. Using human coders, four attributes of coverage of recombinant bovine somatotropin (rBst) were identified in a sample of stories taken from 1980 to 1995. These four categories: the development of rBst, FDA approval of rBst, the human health aspects of rBst and the economic effects of the adoption of rBst on small farms versus large farms in the adoption of rBst, were chosen to see if trade publications cover social and political issues affecting economically valuable technologies for their industry, and if general interest media influenced such coverage.

The Expertise Model, designed to explain time differences in publication of an issue based on a publication's genre, indicates that specialized publications provide expertise in technological, political and economic information on an issue, while the general interest media fills a similar role for the specialized media in ethical and social information about an issue.

There did not seem to be any evidence supporting inter-media agenda setting evidenced by the long gaps between one genre's first coverage and another genre's coverage. These gaps ranged from six months to longer than a decade.

The Expertise Model did receive support either. The general interest media led coverage in economic and technologic information and the specialized dairy publications led coverage in the social and ethical issue studied.

The general interest media led coverage in the economic as well as the technologic issues. The agricultural trade magazines led the coverage in the social issue of the effects of rBst use on human health. The supermarket trade publications did not lead any coverage and actually seemed to avoid the controversy.

APPENDIX A

Coding Booklet

Introduction

These instructions are from the coding session held Oct. 17, 1997.

Coding sheet header

Fill out the coding sheet completely

Example: Headline Elanco gets OK to sell Soviets Bst. At the top of the story is a tag. The first part of that tag is the publication and that is DHM, which stands for Diary Herd Management. So, under publication write DHM. The second entry is the date, so the date is 6/1/89. The next entry is page, followed by story type and number of words. Some of the stories don't have all the tags, so there will be a question mark or a zero in the tag at that entry.

Coder is your name and coder number is on the sheet.

The binary system was used to code for the presence of the category in each story. A zero indicates there is no mention of that category in the story; a one indicates the story does mention the category. Coders are recommended to read the story paragraph by paragraph for ease in coding, however, the stories are coded as a whole for the study. Therefore, when a coder finds mention of one of the categories in the story they don't have to keep looking for that category any more. The frequency of the mentions in each

story is not important. When all three categories have been found in one story, the coder may discontinue reading that story and move on to the next.

Attributes

The five practice stories were: *Dairy Herd Management*: Elanco Gets O.K. to Sell Soviets BST; *Washington Post* (11/6/93): FDA clears drug to lift milk yields growth hormone is manufactured by biotechnology; *Dairy Herd Management*: BST no direct effect on milk competition; *Dairy Herd Management*: Europe Balks at using BST; *New York Times*: Wisconsin Leaders back curb on sale of growth hormone. Start with Elanco story for the coder training.

Development of rBst

We are looking for the invention (recombinant technology) or development of Bst. Phrases like: Bst was developed by.... are counted in this category. We are not looking for phrases like: scientists injected rBst, scientists found; or sold or marketing. Only those stories that talk about the companies developing rBst and have the recombinant technology. The company is not the important part, but it will usually be found with the company.

Examples from the stories: Elanco is one of four companies developing BST; (none in *Washington Post* story. It mentions drug sponsor, but it does not mention the development).

Large vs. small farms

There was a concern that when rBst was introduced it would give the large conglomerates a major advantage over the smaller farms and it would push smaller farms

out of business. In the U.S. people feel the small family farms are important enough to preserve. So, this category looks at number of cows on the farm and the relative advantage or disadvantage based on that number. Look for the comparison between large farms and small farms and how that will affect them economically. If the story says that rBst will run the small farms out of business that is an implied comparison between the size of farms. When a story discusses harming farmers, but does not mention size, it is not coded as a one because the farmers could be driven out of business because they are not good managers or because they live in a certain section of the country. That is not a size comparison. Be careful not to read too much into the story, but to code only on what is there, not the implications of what is written. This can be positive or negative. It's the issue, not whether it will be good or bad.

Example: That could put small producers at a disadvantage. Not this could drive some producers out of business.

Human health

Health risks to humans from drinking rBst-treated milk. This category does not include health effects on cattle. This includes health effects positive, negative or neutral. Again, it is the issue, not the benefits or risks. When a story talks about effects in general the assumption can't be made that the reporter is talking about health effects. Economic effects, or even health effects on cows could be the implication. Here, it gets a little difficult because when milk safety is discussed, the assumption cannot be made that this is only human health. Dairy farmers do take the colostrum and milk and feed it to the calves.

Talking to health professionals is good enough because the health officials do not deal with animal health.

APPENDIX B

Intercoder reliability

To conduct a reliability test, all coders were asked to attend a training meeting (see Appendix A for coding directions and Appendix C for the coding sheet). Coders learned the definitions of each variable one at a time on five sample stories chosen to include each variable. Then coders coded 27 stories chosen randomly from the entire set of 271 stories. Their agreement on the variables were computed and are provided in the tables below.

Category 1 - FDA development

Pairs	Agree	Disagree
Jaime & Doug	25	2
Jaime & Candace	25	2
Jaime & Dennis	26	1
Jaime & Shari	26	1
Doug &Candace	27	0
Doug & Dennis	26	1
Doug & Shari	26	1
Candace & Dennis	26	1
Candace & Shari	26	1
Dennis & Shari	27	0

Table B1: The number of stories on which coders agreed on the sample stories in the FDA development of rBst issue.

	Jaime	Doug	Candace	Dennis	Shari
Jaime	XXXXXX	92	92	96	96
Doug	XXXXXX	XXXXXX	100	96	96
Candace	XXXXXX	XXXXXX	XXXXXX	96	96
Dennis	XXXXXX	XXXXXX	XXXXXX	XXXXXX	100
Shari	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX

Table B2: The calculated percent agreement among coders on the variable rBst development. Reliability coefficient = 0.99

Category 2 - large vs. small farms

Pairs	Agree	Disagree
Jaime & Doug	26	1
Jaime & Candace	27	0
Jaime & Dennis	27	0
Jaime & Shari	27	0
Doug &Candace	26	1
Doug & Dennis	26	1
Doug & Shari	26	1
Candace & Dennis	27	0
Candace & Shari	27	0
Dennis & Shari	27	0

Table B3: The number of stories on which coders agreed on the sample stories in the large versus small farms issue.

	Jaime	Doug	Candace	Dennis	Shari
Jaime	XXXXXX	96	100	100	100
Doug	XXXXXX	XXXXXX	96	96	96
Candace	XXXXXX	XXXXXX	XXXXXX	100	100
Dennis	XXXXXX	XXXXXX	XXXXXX	XXXXXX	100
Shari	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX

Table B4: The calculated percent agreement among coders on the variable large farms versus small farms. Reliability coefficient = 0.99

Category 3 - Human health issue

Pairs	Agree	Disagree
Jaime & Doug	23	4
Jaime & Candace	23	4
Jaime & Dennis	23	4
Jaime & Shari	22	5
Doug &Candace	27	0
Doug & Dennis	27	0
Doug & Shari	24	3
Candace & Dennis	27	0
Candace & Shari	24	3
Dennis & Shari	24	3

Table B5: The number of stories on which coders agreed on the sample stories in the human health issue.

	Jaime	Doug	Candace	Dennis	Shari
Jaime	XXXXXX	83	83	83	77
Doug	XXXXXX	XXXXXX	100	100	88
Candace	XXXXXX	XXXXXX	XXXXXX	100	88
Dennis	XXXXXX	XXXXXX	XXXXXX	XXXXXX	88
Shari	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX

Table B6: The calculated percent agreement among coders on the variable human health.

Reliability coefficient = 0.98

APPENDIX C

Coding sheet

Publication

Date Page Story type

Coder

Coder #

0= no mentions; 1= issue mentioned in story

Monsanto, Elanco, Eli Lilly, Upjohn or American Cyanamid's development of rBst (invention).

Large vs. small farmers - running farmers out of business. (must make the size comparison).

Health effects on **humans** from drinking rBst-treated milk.

Coding directions

Fill out the sheet completely for each story you code.

Publication - list the two or three-letter code at the top of the story

Date: give the date at the top of the story (not today's date)

Page: found at the top in the third data section of the story tag

Story type: editorial, brief, news report or question. Found in the fourth location of the story tag.

Coder: put your name here.

Coder #: Jaime - 2; Doug - 3; Candace - 4; Dennis - 5; Shari - 6; Lisa - 7

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