# Could It Really Happen? Beef Producers' Risk Perceptions of an Agroterrorism Event Occurring in Oklahoma

Category: Research Paper

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## Abstract

The purpose of this statewide study was to determine Oklahoma beef producers' perceptions of the susceptibility of the state's beef industry to a terrorist attack. Participants in this study were randomly selected from a population of 48,000 beef producers in Oklahoma. All 470 respondents completed a telephone survey conducted by the Oklahoma Agricultural Statistics Service. Descriptive statistics, *t*-tests, and cross tabulations were used to analyze the data. Oklahoma beef producers perceived that the beef industry was susceptible to an agroterrorism event, believed the feedlots to be at an elevated level of threat, were confident in their own operation's bio-security measures, believed their own operation was not susceptible to an agroterrorism event, and did not believe they had enough information about protection from terrorism to the beef industry. This study is one of two parts originating from a doctoral dissertation. The first part was presented at the North Central Region Conference of the American Association of Agricultural Educators in Ames , IA September 2006, titled "Preparing for an Agricultural Crisis: Information Source Preference for Beef Producers."



Keywords: Agroterrorism, Agricultural Crisis, Beef Producer Risk Perception, Crisis Planning

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## Introduction/Purpose

Prior to September 11, 2001, the United States had been a potential target for acts of terrorism. "The U.S. is vulnerable to an agricultural bioterrorism incident specifically targeting key animal or plant commodities" (Horn, 1999, p. 3). Horn (1999) maintained that the awareness of this threat has increased within the intelligence and counterterrorism communities during the past two years; the United States Department of Agriculture has worked with these communities to position agriculture to anticipate and respond to such a threat.

After September 11, 2001, the possibility of intentional threats to agricultural safety became a reality. Agriculture Secretary Ann Veneman said, "The intentional threats to agricultural products and our food supply have required us to do much more; we have been working closely with other federal agencies, state agriculture departments, academia, and the agriculture sector on many fronts to secure and strengthen planning and preparedness" (2002, p. 1).

In the event of a terrorist attack against agriculture, the public will be forced to make life-sustaining decisions in regard to their health, safety and the food they provide to their families. State agencies, special interest groups and the media will have the responsibility of disseminating communication to consumers and producers alike.

Correct and helpful information is critical for the public to facilitate their way through the crisis. "Public relations practitioners suggest any organization should be as open and forthright as possible" (Newsom, Scott, & Turk, 1989; and Pinsdorf, 1987, as cited in Seeger & Ulmer, 2001). Effective crisis management relies on the foundation of effective planning and

communication before, during and after the incident (Fink, 1986; Henry, 2000; and Seeger, et al., 2003).

Henry (2000) maintained being prepared is the first step. "Anticipate every possible crisis. Then develop a communications plan for each potential crisis. Be prepared to respond immediately; this is essential if one hopes to avoid a crisis or be able to manage one if the inevitable happens" (p.22). Seeger, et al. (2003) maintained the inability to move through effective recovery after a crisis can be brought on by poor communication.

"A focused regional, if not local, effort at understanding the particular facets of the industry that impact the individual community is required for agroterrorism prevention and response planning. More importantly, a national strategy must be developed to eliminate confusion, redundancy and miscommunications" (Lane, 2002, n.p.)

Seeger, et al. (2003) further maintained organizations may inhibit the public's ability to effectively assess the potential harm and risk of a situation if the organization has failed to supply or support a healthy exchange of information.

Seeger, et al. (2003) stated "a fundamental goal of crisis management is to try to reduce the uncertainty of potential harm for both the organization and the stakeholders" (p. 139). Has enough information been exchanged to reduce uncertainty or allow the public to successfully assess the risk or harm to potential attacks to American agriculture? This study was aimed to answer this question.

Therefore, the purpose of this study was to determine Oklahoma beef producers' perceptions of the susceptibility of the state's beef industry to a terrorist attack. Specifically, this study addressed the following research questions:

1. What are Oklahoma beef producers' perceptions of the susceptibility of the state's beef industry to an agroterrorism event?
2. How did Okalhoma beef producers' perceptions toward the susceptibility of the state's beef industry to agroterrorism differ based upon the demographic variables of age, farm size, and education level?

## Methods/Procedures

This study is one of two parts, originating from the same survey for a doctoral dissertation. The first part was presented at the North Central Region Conference of the American Association of Agricultural Educators in Ames, IA in September 2006, titled "Preparing for an Agricultural Crisis: Information Source Preference for Beef Producers." Both papers share the following procedures and methodology.

For this study, a beef producer was operationally defined as any individual owning at least one animal of any beef cattle breed. Descriptive research was chosen as the research method since the study dealt with beef producers' perceptions regarding potential agroterrorism events causing an agriculturally related crisis.

The target population of this study was all beef producers in Oklahoma. The population, according to the state's Agricultural Statistics Service (SASS), was approximately 48,000 beef producers. The list frame of the state's beef producers was updated each year through property assessment records. The number was fluid and approximated due to the fluctuation of citizens investing in the ownership of cattle or selling off their cattle and divesting in the beef industry. A random sample of 2,000 names from the target population was selected using a computerized random selection process. For this study, using the survey population, Krejcie and Morgan

(1970) suggested a minimum of 381 respondents for a 95% confidence level and a sampling error of +/- 5%.

The original questionnaire was divided into three parts, each part coinciding with the three objectives of the primary study; for this paper, only the first objective was used. Questions 1-4 ascertained attitudinal perceptions of risk using categorical questions, and question number five was a 5-point Likert-type question assessing level of threat using the Department of Homeland Security's threat levels: 1 = Low, 2 = Guarded, 3 = Elevated, 4 = High, and 5 = Severe (Ashlock, 2006). At the end of the survey, demographic information was collected about the responding beef producers. Questions in this area were closed-ended or partially closed-ended.

To minimize measurement error, the construction of the questionnaire was completed under the guidance of a panel of experts in both the academic and beef cattle production fields. Data were collected by the OASS using in-house computer-aided telephone interviewing procedures. Data collection error was controlled by conducting a formal interviewer training session to familiarize the interviewers with the instrument. The OASS used seasoned interviewers to ensure ease of use with the computer system. A comparison of early and late respondents was examined to control for nonresponse error based on guidelines set forth by Lindner, Murphy, and Briers (2001). Using a *t*-test, no significant difference between early and late responders was shown to exist. Data were analyzed and interpreted using frequencies, percentages, means, modes, standard deviations, and cross tabulations.

## Results/Findings

The data collection period was during the week of July 14-16, 2005, July 27-29, 2005, and August 8-13, 2005, for a total of 12 days. A random sample ($n$ = 2,000) was drawn from the

overall target population of beef producers in Oklahoma ($N$ = 48,000). Of the sample population, 678 completed calls were made providing the researcher with 470 usable responses.

*Findings related to Demographics of Oklahoma Beef Producers*

The typical Oklahoma beef producer was male (69.72%) and had at least some high school education (59.80%). The average age of the typical beef producer was 59.5, with a range from 24 to 90 years of age; and the producer owns a computer with access to the Internet (62.3%).

Beef producers are primarily employed within the beef industry (57.90%) owning a cow-calf operation (87.45%), with 1 to 49 head of cattle (35.12%). Other operation sizes included 31.06% of respondents owning from 100 to 499 head, 23.83% owning 50 to 99 head, 5.96% owning 500 to 999 head, and 2.13% owning 1,000 or more head of cattle.

*Findings related to Beef Producers' Perceived Risk*

Research question one sought to determine beef producers' perceived level of susceptibility regarding the Okalhoma beef industry. Survey questions one through five were designed to answer this research question.

Survey question one asked respondents to rate their level of agreement with a statement regarding Oklahoma's susceptibility to an agroterrorism event using a 5-point Likert-type scale (1 = Disagree, 2 = Somewhat Disagree, 3 = Neither Agree nor Disagree, 4 = Somewhat Agree, 5 = Agree). When asked to describe their level of agreement with the statement: "The Oklahoma cattle industry is susceptible to an agroterrorism event," a majority (63%) of the state's beef producers agreed with the statement: somewhat agree, 31.5%; agree 31.5%; neither agree nor disagree, 16.6%; somewhat disagree, 8.1%; and disagree, 12.3%; (Table 1).

Table 1

*Beef Producers' Perceptions on Beef Industry Susceptibility to Agroterrorism*

| | Agreement Percentage | *M* | *SD* |
|---|---|---|---|
| Disagree | 12.3 | 3.62 | 1.33 |
| Somewhat Disagree | 8.1 | | |
| Neither Agree/Disagree | 16.6 | | |
| Somewhat Agree | **31.5** | | |
| Agree | **31.5** | | |

*Note:* Classification based on the scale: *M* = 4.20 or higher = Agree; 3.40-4.19 = Somewhat agree; 2.60-3.39 = Neutral; 1.80-2.59 = Somewhat Disagree; and 1-1.79 = Disagree

After a cross-tabulation by the demographics of age, farm size and education level, the data revealed no trend within each group regarding beef producers' level of agreement in the possible susceptibility of Oklahoma beef to agroterrorism. The mean scores for each age decade showed no change in the trend of the means, and all scores remained in the "somewhat agree" range (Table 2): 20s, *M* = 3.60; 30s, *M* = 3.62; 40s, *M* = 3.50; 50s, *M* = 3.67; 60s, *M* = 3.64; 70s, *M* = 3.61; 80s, *M* = 3.57; and 90s, *M* = 4.00. This trend was prevalent when looking at the age decade and removing the group with only one respondent, the 90s.

When analyzing the same question as compared to farm size and its effect on perceptions relating to each beef producers' agreement level of beef industry susceptibility, the trend remained in the "somewhat agree" range until it reached beef producers with 1,000 head of cattle or greater and dropped to the "neutral" range: 1-49 head, *M* = 3.54; 50-99 head, *M* = 3.55; 100-499 head, *M* = 3.79; 500-999 head, *M* = 3.82; and 1,000 or more head of cattle, *M* = 2.80.

When assessing the beef producers' level of agreement in the beef industry's susceptibility to agroterrorism, educational level was constant: no formal education, *M* = 3.70; high school, *M* = 3.54; associate's degree, *M* = 3.66; bachelor's degree, *M* = 3.71; master's degree, *M* = 3.51; education specialist, *M* = 4.00; professional degree, *M* = 5.00; and doctorate degree, *M* = 3.80 (Table 2).

Table 2

*Beef Producers' Perception of Susceptibility Cross-Tabulated by Age, Farm Size, and Education Level*

| | Susceptibility | |
|---|---|---|
| Age Decade | *M* | (*n*) |
| 20s | 3.60 | 5 |
| 30s | 3.62 | 29 |
| 40s | 3.50 | 66 |
| 50s | 3.67 | 97 |
| 60s | 3.64 | 135 |
| 70s | 3.61 | 107 |
| 80s | 3.57 | 23 |
| 90s | 4.00 | 1 |
| | | |
| Farm Size | *M* | (*n*) |
| 1 to 49 Head | 3.54 | 158 |
| 50 to 99 Head | 3.55 | 112 |
| 100 to 499 Head | 3.79 | 146 |
| 500 to 999 Head | 3.82 | 20 |
| 1,000 + Head | 2.80 | 10 |
| | | |
| Education Level | *M* | (*n*) |
| No Formal education | 3.70 | 57 |
| High School | 3.54 | 224 |
| Associate's | 3.66 | 77 |
| Bachelor's | 3.71 | 62 |
| Master's | 3.51 | 35 |
| Education Specialist | 4.00 | 1 |
| Professional | 5.00 | 1 |
| Doctorate | 3.80 | 5 |

*Note:* Classification based on the scale: *M* = 4.20 or higher = Agree; 3.40-4.19 = Somewhat agree; 2.60-3.39 = Neutral; 1.80-2.59 = Somewhat Disagree; and 1-1.79 = Disagree

Survey question two asked respondents to rate their perception of the level of threat with multiple types of beef cattle operations using a 5-point Likert-type scale (1 = Low, 2 = Guarded, 3 = Elevated, 4 = High, 5 = Severe). The scale used the threat levels identified by the Department of Homeland Security. Oklahoma beef producers reported "Ranches" to have a "Low" threat level (*M* = 1.78); "Livestock Exhibitions," "Low to Guarded" threat level (*M* = 2.51); "Local Marketing Facilities," "Low to Guarded" threat level (*M* = 2.11); "Regional

Marketing Facilities," "Low to Guarded" threat level ($M$ = 2.57); "Background Operations," "Low to Guarded" threat level ($M$ = 2.29); "Stocker Operations," "Low to Guarded" threat level ($M$ = 2.22); and "Feedlots," "Elevated" threat level ($M$ = 3.17) (Table 3).

Table 3

*Beef Producers' Perceptions Regarding Level of Threat to Multiple Operation Types*

| | Threat Level Percent | | | | | | |
|---|---|---|---|---|---|---|---|
| Operation Type | Low | Guarded | Elevated | High | Severe | *M* | *SD* |
| Ranches | **52.60** | 26.80 | 12.80 | 4.90 | 2.60 | 1.78 | 1.02 |
| Livestock Exhibitions | **37.20** | 31.50 | 16.40 | 12.80 | 1.70 | 2.51 | 6.41 |
| Local Marketing Facility | **38.70** | 28.30 | 18.70 | 11.70 | 2.60 | 2.11 | 1.12 |
| Regional Marketing Facility | 26.60 | **31.30** | 24.70 | 13.80 | 3.40 | 2.57 | 4.59 |
| Background Operation | **48.10** | 26.40 | 16.80 | 6.40 | 1.90 | 2.29 | 6.41 |
| Stocker Operations | **41.30** | 30.40 | 17.20 | 7.40 | 3.40 | 2.22 | 4.60 |
| Feedlots | 18.50 | 23.00 | **30.40** | 19.40 | 8.30 | 3.17 | 6.38 |

*Note:* Classification based on the scale: $M$ = 4.20 or higher = Severe; 3.40-4.19 =High; 2.60-3.39 = Elevated; 1.80-2.59 =Guarded; and 1-1.79 = Low

Survey question three asked respondents to state whether they thought their own operation was susceptible to an agroterrorism event. Of the respondents, 62.8% disagreed with the possibility; 26.8% agreed; and 10.4% answered "don't know" (Figure 1).

Survey question four asked respondents to answer "Yes" or "No" to: "Do you believe you have enough information about protection if a terrorist act were directed to the beef industry in Oklahoma?" Of the respondents, 58.7% said "No;" 27.2% said "yes;" and 14.0% answered "Don't Know" (Figure 2).

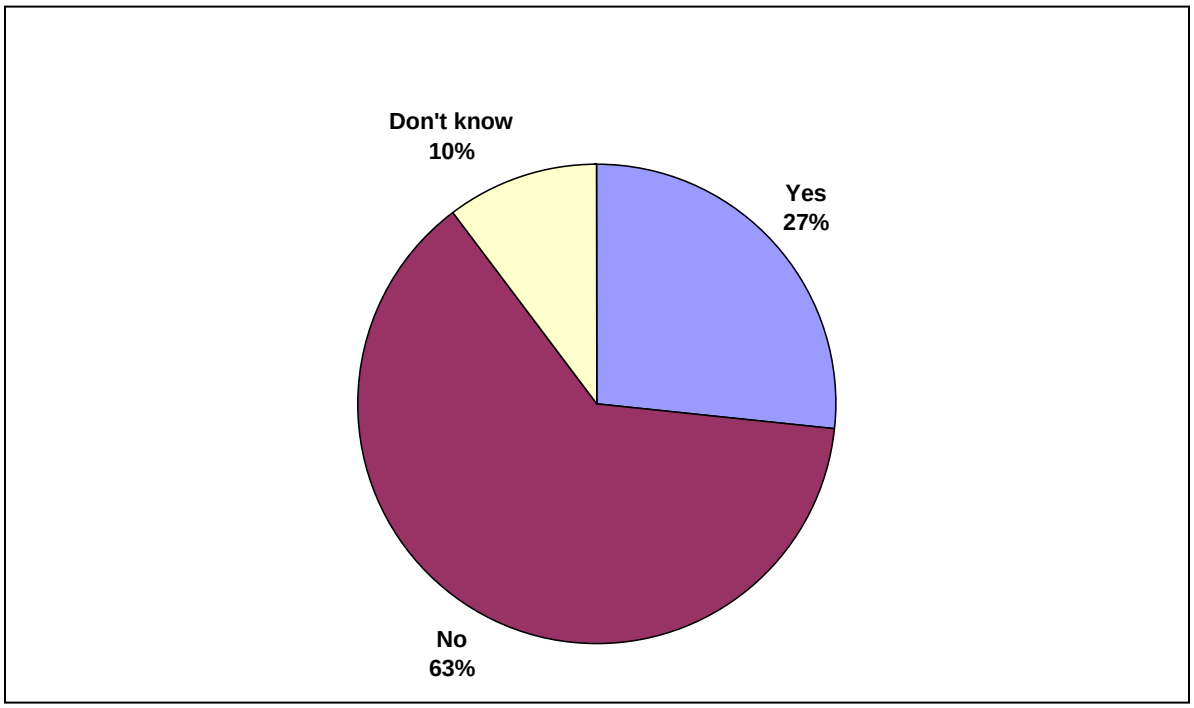


*Figure 1. Beef Producers' Perceptions Regarding Susceptibility of Own Operation to Agroterrorism*

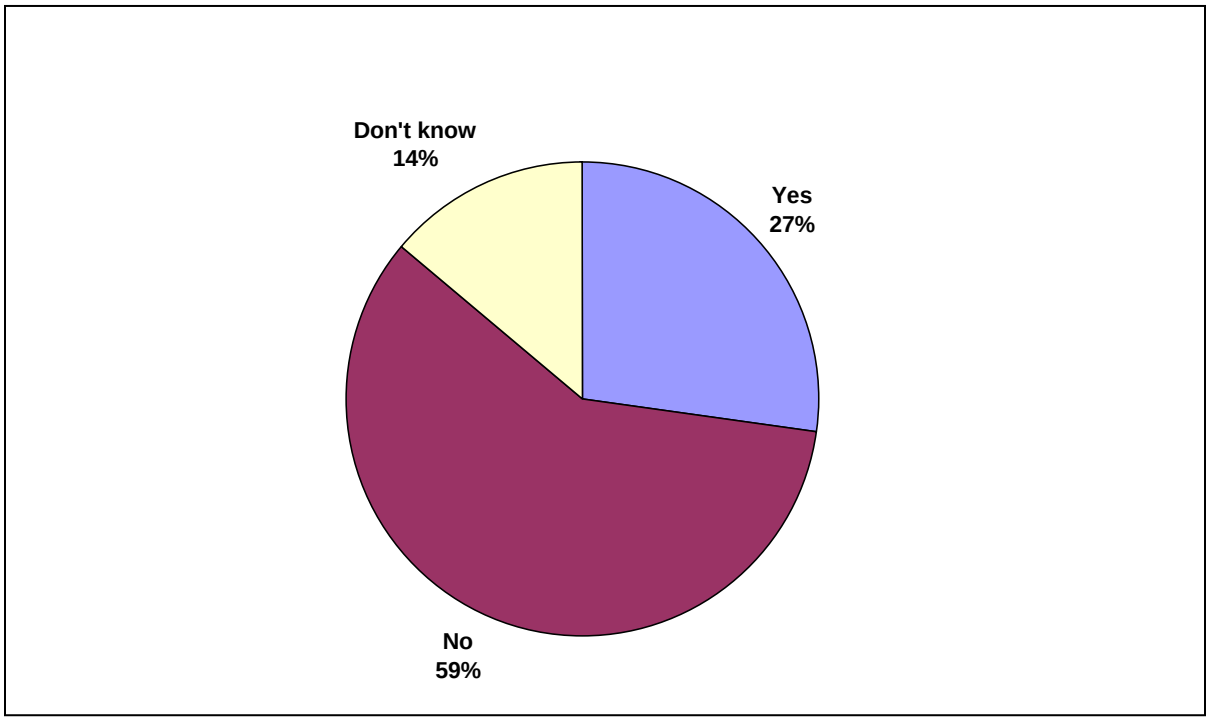


*Figure 2. Beef Producers' Perceptions Regarding Protection Information from Agroterrorism*

Survey question five sought to determine the perceptions of beef producers regarding bio-security measures. When asked "How confident are you in your own bio-security measures," the majority (60.2%) was confident; of those, 38.7% were confident and 21.5% were very confident. Twenty percent were neutral, 10.4% were slightly confident, and 9.4% were not confident ($M$ = 3.53) (Table 4).

Table 4

*Level of Confidence in Own Bio-Security Measures*

| Confidence Level | Percent | *M* | *SD* |
|---|---|---|---|
| Not Confident | 9.40 | 3.53 | 1.21 |
| Slightly Confident | 10.40 | | |
| Neutral | 20.00 | | |
| Confident | **38.70** | | |
| Very Confident | 21.50 | | |

Note: Classification based on the scale: $M$ = 4.20 or higher = Very Confident; 3.40-4.19 = Confident; 2.60-3.39 = Neutral; 1.80-2.59 = Slightly Confident; and 1-1.79 = Not Confident

Examining this question further by the demographics of age, farm size, and education level, the data revealed no trend regarding beef producers' level of confidence in their own bio-security measures. The mean scores for each age decade showed a slight increase in the trend of the means, but all scores remained in the neutral range (Table 5): 20s, $M$ = 3.00; 30s, $M$ = 3.21; 40s, $M$ = 3.58; 50s, $M$ = 3.62; 60s, $M$ = 3.42; 70s, $M$ = 3.68; 80s, $M$ = 3.48; and 90s, $M$ = 3.00.

When analyzing the same question as compared to farm size and its effect on perceptions relating to each beef producers' own confidence level of bio-security, the trend remained somewhat constant until it reached beef producers with 1,000 head of cattle or more: 1-49 head, $M$ = 3.63; 50-99 head, $M$ = 3.48; 100-499 head, $M$ = 3.44; 500-999 head, $M$ = 3.57; and 1,000 or more, $M$ = 2.80.

Table 5

*Beef Producers' Perception of Confidence Cross-Tabulated by Age, Farm Size, and Education Level*

| | Confidence | |
|---|---|---|
| Age Decade | *M* | (*n*) |
| 20s | 3 | 5 |
| 30s | 3.21 | 29 |
| 40s | 3.58 | 66 |
| 50s | 3.62 | 97 |
| 60s | 3.42 | 135 |
| 70s | 3.68 | 107 |
| 80s | 3.48 | 23 |
| 90s | 3 | 1 |
| | | |
| Farm Size | *M* | (*n*) |
| 1 to 49 Head | 3.63 | 158 |
| 50 to 99 Head | 3.48 | 112 |
| 100 to 499 Head | 3.44 | 146 |
| 500 to 999 Head | 3.57 | 20 |
| 1,000 + Head | 2.8 | 10 |
| | | |
| Education Level | *M* | (*n*) |
| No Formal education | 3.75 | 57 |
| High School | 3.62 | 224 |
| Associate's | 3.35 | 77 |
| Bachelor's | 3.39 | 62 |
| Master's | 3.37 | 35 |
| Education Specialist | 1 | 1 |
| Professional | 4 | 1 |
| Doctorate | 3 | 5 |

Note: Classification based on the scale: *M* = 4.20 or higher = Very Confident; 3.40-4.19 = Confident; 2.60-3.39 = Neutral; 1.80-2.59 = Slightly Confident; and 1-1.79 = Not Confident

When assessing the beef producers' bio-security level of confidence, educational level was inversely related with perceptions of confidence level. The level of confidence generally decreased as the educational level of beef producers increased: no formal education, *M* = 3.75; high school, *M* = 3.62; associate's degree, *M* = 3.35; bachelor's degree, *M* = 3.39; master's degree, *M* = 3.37; education specialist, *M* = 1.00; professional degree, *M* = 4.00; and doctorate,

*M* = 3.00. This trend was prevalent in all groups except the two groups with only one respondent, education specialist and professional.

*Overall findings related to Oklahoma beef producers' perceptions of agroterrorism risk*

The typical beef producer believes the Oklahoma beef industry is susceptible to an agroterrorism event (63.0%). Typical beef producers believe feedlot operations (*M* = 3.17) and local marketing facilities (*M* = 2.57) to be the most threatened types of operations, at an elevated and guarded level of threat, respectively. Typical beef producers' are confident in their own operation's bio-security measures (60.2%); believes their own operation is not susceptible to an agroterrorism event (62.8%); and, does not believe that they have enough information about protection from terrorism to the beef industry (58.7%).

When comparing the cross-tabulated mean scores of the demographic variables of age, farm size, and education level, no prevailing trend was shown to influence perceptions of the level of agreement the beef producer reported regarding the susceptibility of the Oklahoma beef industry to agroterrorism. When analyzing the variable of farm size, beef producers with herd sizes of 1,000 or more head reported a decline in opinion to a "neutral" agreement level regarding susceptibility.

The same trend was found when beef producers were asked to provide a level of confidence in their own operation's bio-security measures. The beef producers' confidence level did not change based on age, farm size, or education level. Only in the case of reported farm sizes with herd size above 1,000 head was there any change in agreement level. As with susceptibility, beef producers perceived a decline in confidence to the "neutral" level in comparison to the other producer's answers remaining in the "somewhat confident" level.

## Discussion/Conclusions

Based upon the findings, the following conclusions were reached: the typical Oklahoma beef producer perceives the state's cattle industry is susceptible to terrorist activities targeting the beef industry. Specifically, operations with large numbers of cattle and public access are perceived to be more susceptible to an agroterrorism event versus smaller, private cattle operations.

It was concluded that although the typical beef producer in Oklahoma feels confident in their own operation's bio-security measures, this feeling may be overconfidence due to the producers' reported lack of information about protection from terrorism to the beef industry.

Finally, it was concluded that pertinent agroterrorism information has been poorly communicated to the typical Oklahoma beef producer regarding bio-hazard safety and protection. This lack of information may have affected the producers' varying reported perceptions between personal farms vs. statewide industry risk. This conclusion supports previous research by Fink, 1986; Henry, 2000; Seeger et al. 2003; and Lane, 2002 which implore the need for pre-crisis communication efforts to plan effectively and recover from a crisis event.

Does this lack of information about protection imply typical beef producers are overconfident in their own ability to prepare for an agroterrorism event? Or, does the lack of information imply an inability to assess or predict the level of threat to the beef industry as a whole? Regardless, there are different levels of uncertainty.

It is unclear through this level of inquiry whether the typical beef producer is more certain about their own operation and uncertain about larger operations. The producers may simply not have a level of knowledge of agroterrorism protection to allow for an informed opinion. In either situation, more information regarding agroterrorism and crisis planning must

be provided at the producer level. Therefore, it is imperative to further explore this knowledge level gap and its effect on the producers' ability to effectively negotiate the different stages of a crisis. This implication is supported by Seeger et al. (2003) who suggested that poor communication can influence the ability to move through effective crisis recovery efforts.

*Recommendations for Future Research*

Pre-crisis dissemination of information is imperative. Effective preparation levels are dependent upon accurate and timely information. It is recommended to assess the level of preparedness of the larger, publicly accessed marketing facilities and feedlots; which were subsequently identified by Oklahoma beef producers as at a higher risk to agroterrorism. This initial assessment will allow for the determination of the type of information needed to provide feedlots and marketing facilities opportunities to create a more effective crisis plan based upon current preparedness levels. It is recommended that future research be conducted to determine the perceptions of feedlot and marketing facility owners and managers in regard to perceived preparation levels, as well as to their perceptions of risk to their operations.

Once the gap of knowledge regarding preparedness is assessed on the large, public operation level, it is recommended that private beef producers in Oklahoma participate in the assessment of their own operation to determine the local level knowledge gap. Once these gaps are identified, the information needed to increase the level of knowledge can be disseminated, thereby reducing any uncertainty created by the lack of information creates.

Neulip and Grohskopf (2000) said "Communication satisfaction may be a part of communication competence, in that competent interactants may be especially adept at reducing uncertainty" (p. 74). It is suggested that future research be conducted to determine how communication competence affects the communication satisfaction and the uncertainty reduction

of beef producers seeking information about possible crisis events. This type of study may be used to correlate levels of communication competency with levels of perceived uncertainty or lack of information.

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# ACE Members' Spheres of Influence

Research Paper Submission for the
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Abstract

Agricultural journalists and agricultural communicators are called upon to develop print or broadcast news releases or educational material on such complex issues as global warming, zoonotic animal diseases, pandemics, trade tariffs, water quality, or other issues. Two questions arise: whether agricultural journalists and agricultural communications are trained or educated to cover these issues, and whether their training has an impact on the way they cover these issues. The purpose of the study was to determine the perceptions of members of the Association for Communications Excellence in Agriculture, Natural Resources, and Life and Human Sciences (ACE) as to their training and the training needs of future agricultural journalists and agricultural communicators. ACE members in the electronic media, graphic design, information technology, international, leadership and management, media relations, photography, publishing, and writing special interest groups ($n$=136) were asked to fill out a descriptive survey. In this study, ACE members indicated that they value training for agricultural journalists and agricultural communicators and also consider university training important, though not a background in agriculture. Although they thought that professional ethics are important, they were middle-of-the-road about whether agricultural journalists and agricultural communicators practiced professional ethics.

Keywords: ACE, journalist training, agricultural journalists, agricultural communications

## Introduction

Agricultural journalists and agricultural communicators are asked to develop news releases or other educational material such complex issues as global warming, zoonotic animal diseases, pandemics, trade tariffs, water quality.

Two questions arise: whether agricultural journalists and agricultural communicators are trained or educated to cover these issues, and whether their training has an impact on the way they cover these issues.

They need to be able to gather extensive background on the issues, oftentimes very quickly, and to be able to sift out true from false in the volume of information available now.

Agricultural journalists and agricultural communicators need to learn how best to utilize emerging technology, which includes computers and the Internet.

And increasingly, ethics are being called into question in all professions, but especially in the media.

> Since there are no laws of journalism, no regulations, no licensing and no formal self-policing, and since journalism by its nature can be exploitative, a heavy burden rests on the ethics and judgment of the individual journalism and the individual organization where he or she works. (Kovach & Rosenthiel, p. 180)

Convergence and corporate ownership of some media outlets are making transparency and ethics increasingly important.

> In the eyes of many media critics, ownership convergence raises significant concerns. In 1983, in the first edition of Media Monopoly, journalist and academic Ben H. Bagdikian predicted that "a handful of corporations would control most of what the average American reads, hears, and sees." And he worried that the concentration of ownership; and control of content by companies with an interest in preserving the status quo would stifle the diversity of voices necessary to produce an accurate "picture of reality" in news coverage (Gordon, 2003, ¶38).

Agricultural journalists and agricultural communicators need to practice a professional code of ethics if they have one. If they do not have one, they need the tools to develop one.

Agricultural journalists and communicators communicate directly through news releases and news stories transmitted through traditional newspapers, Web sites, broadcasting or podcasting, or they write and edit publications and fact sheets that are delivered in paper form or electronically. They broker news between farmers, ranchers, and the rest of the agricultural industry, Cooperative Extension specialists or researchers, and the mainstream media.

> Agricultural communicators understand that a lack of knowledge about a subject leads to misconceptions and the distribution of misinformation; therefore, they promote the exchange of agricultural information to the people involved in agriculture, as well as, the lay public. (Townsend, 2003, p. 1)

Agricultural societies began publishing information for farmers in the 1790s, and agricultural journals began in the 1800s. Metropolitan dailies began employing farm writers in the mid-1800s (Boone, Meisenbach, & Tucker, 2000).

> The Smith–Lever Act of 1914 funded Cooperative Extension activities that had already begun at most agricultural colleges. To take advantage of the growing farm periodical base and promote the work of researchers and Extension specialists, agricultural colleges began hiring information specialists who edited publications and wrote research articles in a format acceptable to the public (Ibid, p. 13).

Thus began the work of the agricultural journalist and communicator.

A little more than 100 years later, a study by Buck and Barrick (1995) described the typical agricultural communicator as male, an average of 40 years old, as having worked in agricultural communications for about 20 years, and having a degree in English, journalism or agricultural journalism. Some of those surveyed did not consider themselves to be agricultural communicators, despite their membership in an organization that had agricultural communications as part of its mission. There was no agreement on what qualifications yield the best agricultural communicator (Buck & Barrick, 1995).

The purpose of this study was to determine the perceptions of members of the Association for Communications Excellence in Agriculture, Natural Resources, and Life and Human Sciences (ACE) concerning their own training and the training needs of future agricultural journalists and communicators.

The Buck and Barrick study intentionally left out the international component to their study. Additionally, one purpose of their study was to ascertain the perceptions of members toward the organization they belonged to. While this study dwelt somewhat on members' perceptions toward ACE, it focused primarily on their attitudes toward training and what impact that training had on the material they produce.

The research was based on two questions posed by Becker (2003): What are the larger forces of society that have impact on journalism training and education? What are the effects of training and education on journalists and the larger society in which they perform their work?

"In the end," Becker asked, "does it really matter how journalists are educated?" (p. xiv)

The 2002 American Journalist study found that U.S. journalists thought so. They "continued to regard journalistic training as the greatest influence on their news values, and a majority thought that the quality of journalism has been rising steadily at their news organizations" (Poynter, 2003, ¶ 6).

This research was based on a multilayered model developed by Esser (2003) on the influential factors in journalism and the impacts of society; legal and economic factors; organizations and institutions; and journalism training on the work of journalists.

The study looked at the perceptions of agricultural journalists and agricultural communicators in four spheres: societal, institutional, contextual, and subjective.

The societal sphere is the historical cultural frame area (Esser, 1998). It includes freedom of the press; press history; press-state relations; press self-conception of its role in society; journalistic traditions (objectivity, partisanship, and investigative reporting); and political culture and environment.

The contextual sphere is the legal, normative, and economic level (Esser, 1998). Included in this sphere are economic conditions of the media market and competition, press law, regulation and standards of the profession, influences of unions and associations, and the journalism training system.

The institutional, or organizational, level includes job profiles, structure of the newsroom and other organizational structures, influence of management and/or owner, editorial procedures and control, and editorial technology (Esser, 1998).

The subjective, or individual sphere, includes subjective values and political attitudes, desire for self-realization, professional values and role conceptions, professionalism, and socio-demographics and biographical factors (Esser, 1998).

All of these, Esser wrote, have an influence on each other, on other societal systems, and on the "self-conceptions and journalistic activity of the media sectors at the core" (p. 308). But, they also "prevent subjective values and motives from landing unfiltered in the contents of the media" (p. 308).

For this study, journalism and communications were defined differently by function. Boone, Meisenbach, and Tucker (2000) wrote, "Journalism refers to reporting and editing for journals, newspapers and broadcast media. Communication, a broader term, includes entertainment, information, persuasion and advocacy" (p. 102).

Agricultural communications and mass communications are similar in many ways (Boone, Meisenbach, & Tucker, 2000). Parallel skills are used by practitioners of both. What differs is the communicators' knowledge of technical subject matter. Boone, Meisenbach, and Tucker wrote that the agricultural communicator is expected to bring a level of specialized knowledge into the agricultural field typically not required of the mass communicator.

This study was based on the two questions: "What are the larger forces of society that have impact on journalism training and education?" and, "What are the effects of training and education on journalists and the larger society in which they perform their work?" and drew from Esser's four spheres (1998).

## Methods

A descriptive Web-based survey was developed based on the Esser model (1998). The survey included four sections to represent the four spheres of Esser's model: societal, institutional, contextual, and subjective. Some of the questions were reworded from the American Journalist survey, conducted by Indiana University's School of Journalism and sponsored by the John S. and James L. Knight Foundation (Poynter, 2003). Finally, general demographic data about the respondents was collected.

The Association for Communications Excellence is an international association of writers, editors, photographers, graphic designers, videographers, electronic media producers, marketing and public relations practitioners, researchers, Web developers, database programmers, distance education specialists, educators and managers (ACE, 2006). They are employed at universities, government agencies and research organizations in the public sector, and companies and firms in the private sector. Most of the 637 members are based at universities in the United States.

The following special interest groups were surveyed: electronic media, graphic design, information technology, international, leadership and management, media relations, photography, publishing, and writing. The purpose of the survey was to ascertain the training of those who actively explain agriculture to readers and viewers; that is the reason for the exclusion of those strictly in marketing activities within their organizations.

Reliability analysis for the four scales yielded Cronbach's alpha coefficients of .54 to .73. All data analysis was conducted using SPSS 13®. The global concepts were measured using Likert-type 5-point scales. For analysis, mean scores were calculated and the responses ranked for the five scales.

The first e-mail was sent to members on August 24, 2006, and the reminder was sent September 8, 2006. A total of 136 of the 585 members of the special interest groups took part, a response rate of 23%.

Early and late respondents were defined by the waves of responses based on prompts (Lindner, Murphy, & Briers, 2001). No significant difference was found. Therefore the results of this study may be generalized to all ACE members that belong to the SIGs included in the population.

One limitation could be that some members may have had a concern about filling out a survey through a third-party system (SurveyMonkey). Also, there may have been confusion as to the definition of agricultural journalist and agricultural communicator, even though it was defined at the beginning of the study. A third limitation is that there was only moderate reliability for the study.

## Results

One hundred thirty-six ACE members responded to the survey. The demographic questions were not required for completing the survey. However, of 96 respondents, 32% indicated they had a bachelor's degree, and 40% indicated they had a master's degree from a university. Of 95 respondents, 35% said they were very prepared, 48% said they were somewhat prepared for a career in agricultural journalism, and 39% said they were very prepared and 50% said they were somewhat prepared for a career in agricultural communications. These results are consistent with the survey data based on the four spheres of influence.

In the individual, or subjective, sphere, respondents most agreed with the statements that membership in a professional organization was beneficial for agricultural journalists ($M = 4.25$) and agricultural communicators ($M = 4.33$) . They also agreed that agricultural journalists ($M = 4.10$) and agricultural communicators ($M = 4.17$) should be motivated by increasing the knowledge of issues that affect members of society and that

agricultural communicators should be motivated by helping society ($M$ = 4.12). They disagreed with the statement that agricultural journalists ($M$ = 1.64) and agricultural communicators ($M$ = 1.61) did not need continual training opportunities in their respective fields. Means for the statements are in Table 1.

In the societal or cultural sphere, ACE members agreed with the statements that agricultural journalism ($M$ = 4.11) and agricultural communications ($M$ = 4.07) make positive contributions to farmers' and ranchers' knowledge of pertinent issues. They agreed that freedom of the press should be defined by the people ($M$ = 3.91) and that agricultural journalism ($M$ = 3.90) and agricultural communications ($M$ = 3.89) make positive contributions to the general public's knowledge of pertinent issues. They disagreed with the statement that freedom of the press should be defined by political parties ($M$ = 1.46). Table 2 provides the means for the statements relating to the societal/cultural sphere.

In the institutional or organizational sphere, ACE members agreed with the statement that producing agricultural journalism of high quality was important to agricultural journalists ($M$ = 4.32). They also agreed that job descriptions in agricultural journalism ($M$ = 4.12) and agricultural communications ($M$ = 4.17) should be fluid to adapt to changing technology. They disagreed with the statement that advertisers should play a large role in the editorial decisions in agricultural journalism ($M$ = 1.61). Table 3 provides the data for the institutional or organizational sphere.

In the contextual sphere, ACE members strongly agreed with several statements: continually learning about one's field is necessary for agricultural journalists ($M$ = 4.60); internships or on-the-job training are important in preparing agricultural journalists for their careers ($M$ = 4.56); and continually learning about one's field is necessary for an agricultural communicator ($M$ = 4.56).

They agreed that a strong understanding of professional ethics is important for agricultural communicators ($M$ = 4.43) and agricultural journalists ($M$ = 4.43).

They disagreed with the statements governmental licensing or registration is positive for agricultural journalists ($M$ = 1.88); governmental licensing or registration is positive for agricultural communicators ($M$ = 1.93); and governmental regulation is positive for agricultural journalism ($M$ =2.04).

Table 4 provides the means for statements within the contextual sphere

Table 1

*Descriptive Statistics for Individual /Subjective Sphere*

| **Agricultural Journalists** | | |
|---|---|---|
| Statement (n=136) | *M* | *SD* |
| Membership in professional organizations is beneficial. | 4.25 | .710 |
| The knowledge of issues that affect members of society should be a motivating factor for agricultural journalists. | 4.10 | .660 |
| Monetary rewards should be a motivating factor. | 4.10 | .660 |
| Agricultural journalists are more effective if they have an agriculture background. | 3.60 | 1.014 |
| In general, agricultural journalists are satisfied in their careers. | 3.44 | .583 |
| Quality of agricultural journalism has improved. | 3.41 | .835 |
| Training in agricultural journalism is less important than on-the-job experience. | 2.65 | .937 |
| International experience is necessary. | 2.60 | .931 |
| Agricultural journalists do not need continual training opportunities in field. | 1.64 | .772 |

| **Agricultural Communicators** | | |
|---|---|---|
| Statement (n=136) | *M* | *SD* |
| Membership in professional organizations is beneficial. | 4.33 | .637 |
| The knowledge of issues that affect members of society should be a motivating factor. | 4.17 | .633 |
| Agricultural communicators should be motivated by helping society. | 4.12 | .599 |
| In general, agricultural communicators are satisfied in their careers. | 3.58 | .549 |
| Agricultural communicators are more effective if they have an agriculture background. | 3.50 | 1.094 |
| Agricultural communicators should be motivated by monetary rewards. | 3.24 | .876 |
| Training in agricultural communications is less important than on-the-job training. | 2.80 | .952 |
| International experience is necessary. | 2.60 | 1.038 |
| Agricultural communicators do not need continual training opportunities in field | 1.61 | .743 |

*Table 2*

*Descriptive Statistics for Societal/Cultural Sphere*

| **Agricultural Journalists** | | |
|---|---|---|
| Statement (n=136) | *M* | *SD* |
| Agricultural journalism makes a positive contribution to farmers' and ranchers' knowledge of pertinent issues. | 4.11 | .560 |
| Agricultural journalism makes a positive contribution to the general public's knowledge of pertinent issues. | 3.90 | .657 |
| Agricultural journalists have a positive reputation among farmers and ranchers. | 3.88 | .548 |
| Agricultural journalists should be self-regulated. | 3.63 | .861 |
| In general, agricultural journalism has a positive reputation in society. | 3.41 | .674 |
| They do a high-quality job of analyzing complex issues. | 3.25 | .740 |
| The majority practice investigative reporting when needed. | 2.87 | .737 |

| **Agricultural Communicators** | | |
|---|---|---|
| Statement (n=136) | *M* | *SD* |
| Agricultural communicators make a positive contribution to farmers' and ranchers' knowledge of pertinent issues. | 4.07 | .653 |
| Agricultural communicators make a positive contribution to the general public's knowledge of pertinent issues. | 3.89 | .663 |
| Agricultural communicators have a positive reputation among farmers and ranchers. | 3.73 | .657 |
| In general, agricultural communicators have a positive reputation in society. | 3.50 | .598 |

| **General** | | |
|---|---|---|
| Statement (n=136) | *M* | *SD* |
| Freedom of the press should be defined by a country's people. | 3.91 | 1.044 |
| Freedom of the press should be defined by a country's culture. | 2.70 | 1.140 |
| Freedom of the press should be defined by governments. | 2.20 | 1.166 |
| Freedom of the press should be defined by political parties. | 1.46 | .634 |

Questions were based on a 5-point scale (1 = strongly disagree, 5 = strongly agree).

Table 3

*Descriptive Statistics for Institutional/Organizational Spheres*

**Agricultural Journalists**

| Statement (n=136) | *M* | *SD* |
|---|---|---|
| Producing agricultural journalism of high quality is important. | 4.32 | .665 |
| Job descriptions should be fluid to adapt to changing technology. | 4.12 | .549 |
| Producing agricultural journalism of high quality is important to management. | 3.83 | .802 |
| Covering stories in more media (print, radio and television) will make coverage more thorough. | 3.70 | .874 |
| Producing agricultural journalism of high quality is important to owners. | 3.68 | .934 |
| Covering stories in more media (print, radio and television) will make coverage better. | 3.38 | .871 |
| Agricultural journalists should have autonomy in making editorial decisions. | 3.35 | .887 |
| Advertisers should play a large role in the editorial decisions. | 1.61 | .660 |

Questions were based on a 5-point scale (1 = strongly disagree, 5 = strongly agree).

**Agricultural Communicators**

| Statement (n=136) | *M* | *SD* |
|---|---|---|
| Job descriptions should be fluid to adapt to changing technology. | 4.17 | .586 |
| Agricultural communicators have autonomy in making decisions. | 3.15 | .971 |

**General**

| Statement (n=136) | *M* | *SD* |
|---|---|---|
| Viewers of agricultural broadcasts are looking to be entertained rather than informed. | 2.11 | .667 |
| Readers of agricultural publications are looking to be entertained rather than informed. | 2.08 | .663 |

Table 4

*Descriptive Statistics for Contextual Sphere*

**Agricultural Journalists**

| Statement (n=136) | *M* | *SD* |
|---|---|---|
| Continually learning about one's field is necessary. | 4.60 | .554 |
| Internships or on-the-job training are important in preparing careers. | 4.56 | .614 |
| A strong understanding of professional ethics is important. | 4.43 | .558 |
| A university degree is necessary to prepare for careers. | 3.93 | .902 |
| Professional ethics are practiced by the majority. | 3.67 | .495 |
| They do a good job of self-regulation. | 3.34 | .651 |
| They have a standard code of ethics. | 3.04 | .867 |
| A background in agriculture is necessary AJ. | 2.92 | .975 |
| They are noted for their objectivity. | 2.83 | .743 |
| Unions are positive. | 2.70 | .840 |
| Governmental licensing or registration is positive. | 2.04 | .846 |
| Governmental regulations are positive. | 1.88 | .746 |

Questions were based on a 5-point scale (1 = strongly disagree, 5 = strongly agree).

**Agricultural Communicators**

| Statement (n=136) | *M* | *SD* |
|---|---|---|
| Continually learning about one's field is necessary for an AC. | 4.56 | .614 |
| A strong understanding of professional ethics is important for AC. | 4.43 | .519 |
| A university degree is necessary to prepare AC for their careers. | 3.91 | .912 |
| Professional ethics are practiced by the majority of AC. | 3.71 | .541 |
| AC have a standard code of ethics. | 2.90 | .817 |
| A background in agriculture is necessary for AC. | 2.84 | 1.024 |
| Unions are positive for AC | 2.61 | .895 |
| Governmental licensing or registration is positive for AC. | 1.93 | .800 |

## Discussion

Becker's first question (What are the larger forces of society that have impact on journalism training and education?) could be answered by examining those things ACE members valued in the societal and contextual spheres.

ACE members see their work as having value and merit to their audience, both the agricultural sector and society as a whole. They see their work as providing a service; they believe their audience wants to be educated. That is their role in society. This supports Townsend's (2003) conclusion that agricultural journalists and communicators are aware of their obligation to their audiences.

ACE members value autonomy as agricultural journalists and communicators. They value freedom from governmental, political party, union, or other organization restrictions and regulations. Those should have little or no impact on the job ACE members do, they believe.

Professional ethics for agricultural communicators and journalists were valued, and members thought they played a role in how well they did their jobs. However, they neither agreed nor disagreed when asked if those professionals practiced ethics regularly.

The answers to Esser's second question (What are the effects of training and education on journalists and the larger society in which they perform their work?) could be drawn from the institutional and individual spheres.

ACE members considered university and on-the-job training and continuing education to have a valuable influence on their professionalism and the way they do their job. This is consistent with the 2002 American Journalist study by Poynter (2003). While they felt a university degree was important; they did not see agricultural courses or an agricultural background as being necessary for a career in agriculture journalism or agricultural communicators.

Fluid job descriptions to adapt to changing technology would help ACE members do a better job of responding to societal needs, they felt. Presenting agricultural stories in several formats (such as print, radio, and television) would benefit audiences, they believed.

Advertisers, subscribers, and entertainment for readers or viewers should not have a role in determining editorial decisions in or have an influence on agricultural journalists or on the work they turn out. Agricultural journalists should be motivated by producing work of high quality, and agricultural journalists and communicators should be motivated by increasing the knowledge of the audience they serve.

Based on the results of the study several recommendations are proposed:

- Since members value training and their membership in a professional organization greatly, ACE is in a unique and valuable position to offer continuing education to its members. This could include workshops on ethics and changing technology for both agricultural journalists and communicators. Since they believed presenting stories in a multi-media format would improve coverage, workshops could be offered on those skills as well.

- ACE members as both agricultural journalists and communicators believe they have a positive reputation in society. Further research should be conducted on how they define that positive reputation and whether, in actuality, their perceptions are true.
- Since there was only moderate reliability in this study, the instrument needs to be modified and strengthened to further test Esser's model, especially in the individual/subjective sphere.
- ACE members were ambivalent about job satisfaction. Further studies could be conducted on what factors contribute to job satisfaction for agricultural journalists and communicators.

ACE combines many disciplines and its members come from many educational backgrounds. Because of that ACE may want to investigate the adoption of a formal code of ethics for its members or update them on the rules of ethics within their disciplines.

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# The Newest White Meat: Selected Consumers' Attitudes and Taste Perceptions of "All-Natural" Pork

**Research Paper Submission**

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**Abstract:** Consumer concerns about the food production system have encouraged the current growth in the availability of organic produce and meat in the marketplace. These products are often perceived as better for the environment, healthier, safer, and produced under more ethical guidelines. Price and taste attributes can play a significant role in the consumer's decision to purchase organic or natural products. Two focus groups were conducted to discover consumers' attitudes toward all-natural pork and how taste and price influence intent to purchase. After discussing the terms "organic" and "natural," participants engaged in affective testing, a form of sensory evaluation, of several pork products. Overall, participants had positive association with the terms "organic" and "natural." Participants associated "all-natural" with perceptions of animal welfare, higher quality feed, and no preservatives or chemicals in the final pork product. Personal taste preferences played a central role in the affective testing of different all-natural pork cuts. Consumers said being able to taste the product influenced their intent to purchase. Future research should continue to evaluate consumers' understanding of the terms organic and natural, and how taste and price influence purchasing decisions. Agricultural communications marketing professionals should integrate product sampling in marketing campaigns, or indicate aspects of taste on product labels.

**Keywords: organic meat, natural meat, niche marketing, pork, sensory evaluation, consumer behavior, intent to purchase**

## Introduction

Consumers increasingly express concern about how their food products are produced, processed, and regulated (Barkema, 1993; California Institute for Rural Studies, 2005). The organic label is intended as a marketing tool for agricultural products (Boström & Klintman, 2003), but "natural" and "all-natural" labels are also being used more often on meat and poultry products. Consumers have begun to equate preference for food that is healthy, safe and ethically produced with the term organic. Concern for human health and safety motivates consumers to buy organic food as insurance and/or investment in health (Yiridoe, Bonti-Ankomah, & Martin, 2005; Zehnder, Hope, Hill, Hoyle, & Blake, 2003). In recent years, these concerns have encouraged rapid growth in the organic and natural food markets. Consumers' perceptions of natural-labeled meats has, however, not been extensively explored, despite the growth of this market.

Although not in the top-selling categories, organic meat is the fastest-growing segment of the $14 billion organic food business. From 2004 to 2005, organic meat sales grew 55%, to $256 million, but organic meat still accounts for only 0.22% of overall meat sales (Organic Trade Association, 2006). According to ACNielsen LabelTrends (as cited in Moran, 2006), natural labeled meat sales in mass merchandiser stores have nearly doubled since 2003 to $681.3 million. The growing organic and natural meat markets suggest that factors relating to perceptions about the production of meat may be an increasingly important consideration in consumer purchasing decisions.

An increase in consumers' interest, combined with confusion about organic products, led to the establishment of the U.S. Department of Agriculture National Organic Program and national organic standards in October 2002 (California Institute for Rural Studies, 2005). These standards were established to assure consumers that so-labeled products are produced, processed, and certified to meet the consistent national organic regulations (National Organic Program, 2002). The organic standards provide a set of guidelines for food to be labeled organic that affect the growing, handling and processing of organic food. For organic meat production, the standards prohibit the use of antibiotics and growth hormones, require animals to be fed 100% organic feed, and require animals to have access to outdoors and access to pasture for ruminants. The term "natural" (or all-natural) refers only to the processing of meat once the animal is slaughtered. It is defined by the USDA as containing "no artificial ingredients, coloring ingredients, or chemical preservatives; and the product and its ingredients are no more than minimally processed" (Food and Safety Inspection Service, 1999).

During the time consumer interest in organics was increasing, U.S. market hog prices fell to historically low levels, leading to the establishment of niche pork markets in the late 1990s. Niche pork markets claim product differentiation in two general ways – superior or unique product quality and social or credence attributes (Honeyman, Pirog, Huber, Lammers, & Hermann, 2006). All-natural pork is part of the niche pork market.

Marketing natural products as higher quality than conventional products has a unique set of challenges. Natural pork products attempt to signal quality to consumers through credence attributes, which are product attributes that can not be assessed before purchase or after use and depend on the amount of trust perceived in the producer or brand. Consumer demand for quality increases as more products encompass credence attributes, but quality signaling to consumers is difficult with these products (Auriol &

Schilizzi, 2003). Previous research has demonstrated that quality signaling is most easily accomplished through the use of a certified label (Caswell & Mojduszka, 1996; Auriol & Schilizzi, 2003). The USDA organic label is a certified label, but natural labels are not certified. Signaling quality for all-natural pork requires an understanding of consumers' attitudes surrounding the term "all-natural" and the product itself. Discerning consumers' perceptions of quality, price, and taste associated with organic and all-natural pork is crucial for effective marketing and regulation of these products.

## Literature Review

*Theory of Planned Behavior*

The theory of planned behavior both explains and predicts behavioral intentions. The theory states that a person's behavioral intention is essentially determined by three factors: the attitude that the person holds towards the behavior; the degree of social pressure felt by the person to perform or not perform the behavior; and the degree of control that the person feels he or she has over performing the behavior. Although dependent on the application, the more positive the attitude and subjective norm with respect to a behavior, and the greater the perceived control, the stronger the intention is to perform the behavior (Ajzen, 1991).

The theory was originally developed to explain social behaviors, but has since proved applicable to explain consumers' food choice (Sparks, Conner, James, Shepherd, & Povey, 2001; Scholderer, Bredahl, & Magnusson, 2004). Shepherd (1999) contends that it generally offers good prediction of behavior, and can be used to determine the relative importance of different factors in influencing food choice. For example, Bredahl, Grunert and Frewer (1998) explain that attitudes toward buying genetically modified food are determined by perceived attributes and consequences of buying and consuming that product, and by the attitude the person has toward food production in general. With food products, perceived behavioral control is based on a person's competence in judging risks and benefits of a product in purchase situations, and on time and access to those products.

Scholderer and Grunert (2001) showed that the theory is still useful in situations when consumers' food purchase intentions are inconsistent with their actual behavior. The inconsistency may indicate that situational factors, such as labeling, shelf positioning, and packaging, play a predominant role. The theory of planned behavior can be applied to describing consumers' purchasing behavior in regard to organic and all-natural food. The three factors of the theory might be applied to this topic as: personal attitudes toward organic and all-natural foods, social and cultural factors, and the degree of personal involvement in food purchases. Social and cultural factors (subjective norms) may be viewed as related to the cultural definition of "natural" in terms of pork production, the increasing prevalence of these products in supermarkets, and/or family status (e.g. "What do I want to feed my family?").

*Theories of Risk Perception*

Consumer behavior is shaped by risk perception. Risk analysis theory falls within the psychometric paradigm, which explains the psychological basis of people's perceptions of risk. The theory suggests that laypersons evaluate risk qualitatively in rich

detail based on perceived control and understanding of the risk, whereas experts tend to evaluate risk empirically, focusing on probability and severity of the risk (Slovic, 1987). In people's subjective evaluation of risk, nine general properties of activities or technologies emerge. These are (1) voluntariness of risk, (2) immediacy of effect, (3) knowledge about the risk as perceived by the persons who are exposed to the potentially-hazardous risk source, (4) knowledge about the risk in science, (5) control over the risk, (6) newness, i.e. are the risks new and novel or old and familiar ones, (7) chronic/ catastrophic, (8) common/dread, i.e. whether people have learned to live with and can think about the risk reasonably and calmly, or is it a risk that people have great dread for, and (9) severity of consequences (Fischoff, Slovic, Lichtenstein, Read, & Combs, 2000).

Perceptions of knowledge, newness or unfamiliarity, and the potential immediacy of consequences are highly correlated with consumer perception of food risk (Yeung & Morris, 2006). Food risk perceptions are conceptualized in terms of risk to human health, the environment, the economy, animal health, and future generations (Miles & Frewer, 2001). Ethical concerns about food production practices and food safety also encourage public food risk perceptions. Communication about risks must be a two-way process between the expert and public for optimal effectiveness (Slovic, 1987). Understanding public perception of risk provides insight into effective food safety communication and how the public will react to new technology (Knox, 2000).

Theories of risk perception may help us understand why consumers prefer to buy natural or organic meat to avoid those risks. Risk perceptions may be amplified by the increasing prevalence of these products in grocery stores. The "no" repetition associated with natural claims (e.g., no chemical additives, no preservatives, no antibiotics) may be telling the consumer that those are food risks. Other forms of risk perception associated with livestock production are the risk to the environment, society morals and animals, better known as ethical risks. Ethical risk perceptions are gaining importance, but typically rank below health and meat safety risk perceptions. However, pork and poultry come up most often when consumers perceive risks to animal welfare (Verbeke & Viaene, 2000).

*Price Attitudes*

Research has shown that the market for niche pork products seems to be divided between consumers who value pork raised without antibiotics or growth stimulants and not fed animal by-products and consumers who value price (R Parker & Associates, Inc. & Ashcraft Research, 2005). However, studies have shown that other meat attributes, such as taste, appearance, tenderness, and leanness rank above price in meat purchasing decisions (Food Processing Center, 2001, Diel & Associates, 2001; Dransfield, et al., 2005). Although consumers list higher nutritional value as a reason to purchase organic food, no scientific evidence has shown a difference in nutritional content between organic and conventional foods (Kouba, 2003).

Cues to a product's intrinsic attributes, such as labels (e.g., all-natural, produced without hormones, or lean), affect consumers' perceptions of its quality (Zeithaml, 1988). Consumers are generally willing to pay more for pork products with labels using terms positively associated with pork production, such as "family-farm raised," "no antibiotics," "no hormones," and "environmentally friendly production practices" (Freese, 2000; Hurley, Miller, & Kliebenstein, 2006; R Parker & Associates, Inc. &

Ashcraft Research, 2005). A survey of consumers in north central U.S. found that 34% of respondents were willing to pay a 10% premium for all-natural products. However, a consumer would need to be convinced that it is worth a premium of 15, 20 or even 25% to buy organic and/or all-natural meat because food safety, tenderness, and taste rank above price (Food Processing Center, 2001). An online survey of 200 female consumers found that price was the most influential factor in purchase decisions of niche pork products, and 49% of respondents ranked price above every other attribute tested (R Parker & Associates, Inc. & Ashcraft Research, 2005).

Grannis and Thilmany (2001) used market surveys to estimate consumer willingness-to-pay for natural pork products in Colorado, New Mexico, and Utah. They found that a significant proportion of respondents were willing to pay a 9% premium for natural ham and a 10% premium for natural pork chops. A study with European consumers found that consumers were willing to pay about 3% extra for pork when all characteristics of appearance and labeling stating 'home country produced' and 'raised outdoors' were available. After tasting the labeled product, they were willing to pay between 4% and 10% more (Dransfield, et al., 2005).

*Taste Perceptions*

Preferences for meats are most strongly affected by changes in color/appearance and texture (Risvik, 1994). Whether or not niche market pork production affects sensory qualities of pork is not clear. Edwards (2005) found a majority of studies evaluating taste differences between pigs raised outdoors and pigs raised indoors have shown no difference in juiciness or tenderness, and no studies showed a difference in meat flavor.

Sensory evaluation is the science of judging and evaluating the quality of a food by the use of the senses, i.e. taste, smell, sight, touch and hearing (Oregon State University Food Resource, 1998). Researchers in the field of sensory evaluation have expressed the need to include sensory evaluation into marketing strategies, something not commonly seen in agricultural communications, because taste is an individual experience affected by a number of things, including cultural influences, psychosocial influences, situational variables and expectations (Cardello, 1995b).

Jaeger (2006) proposed synthesizing research in communication and marketing with research in sensory evaluation to enable a more complete understanding of the non-sensory factors that influence consumers' relationships with and decisions regarding food. Integrating the two fields of research reveals that non-sensory factors, including convenience, price, production technology, personal health, branding, and societal issues account for consumers' food related behaviors.

## Purpose

Consumer trust in information about food-related risks is related to perceptions of accuracy, knowledge, and concern for public welfare. The media are the most trusted source of food-related risk information, while trust in information from industry sources (such as marketing) may be hindered by perceptions of selfish, economic interests (Frewer, Howard, Hedderley, & Shepherd, 1996). In order to be effective, marketing strategies for organic or all-natural food must consider a wide range of consumer reaction

and response, including attitudes and social and/or cultural characteristics that may affect purchase behaviors.

The largest niche pork marketers reside in the north central United States, which may explain why much of the existing marketing and consumer research regarding niche market pork attributes has been localized to the central and western regions of the United States. About 68% of the U.S. hog herd resides in the Corn Belt area, where they have access to that region's abundant supplies of feed grains and soybean meal (Davis & Lin, 2005). The southeastern United States has 20% of the hog herd, which is the second largest concentration in the nation. Pork consumption is highest in the Midwest, followed by the South. Pork is an integral part of the distinct cuisine in the southern United States and a staple ingredient in southerners' diets (Egerton, 1993). The prevalence of the hog industry and pork consumption in the southeastern United States, combined with a lack of relevant consumer research conducted in this region therefore makes it a good location to explore consumers' perceptions of niche pork products.

The purpose of this study was to describe consumers' attitudes and taste perceptions of pork products with an "all-natural" label. The following objectives guided the research:

1) To describe consumers' perceptions of the terms *organic* and *all-natural* in reference to pork,
2) To describe participants' taste perceptions of all-natural pork, and
3) To understand how consumers' taste perceptions of all-natural pork affect their attitudes toward the price of those products.

## Methods

A focus group methodology was employed for this study. "Focus groups can provide insight into complicated topics where opinions or attitudes are conditional or where the area of concern relates to multifaceted behavior or motivation" (Krueger, 1994, p. 45). Consumer focus groups in Europe have been used to research consumers' decision-making process when purchasing pork products (Dransfield et al., 2005).

On July 15, 2006, the researchers conducted two focus groups in Gainesville, Florida, with a total of 15 participants (seven in one session, eight in the other). A local market research firm was hired to randomly select participants who met a set of criteria that comprised the sampling frame for the study. A screening questionnaire identified people who were the primary purchasers of food for their households and meat eaters. These questions were asked to guarantee the participants would be familiar with food packages and willing to engage in the taste testing portion of the focus groups. Each session lasted two hours and the moderator followed standard focus group procedures (Krueger, 1994; Morgan, 1997). The moderator used a structured questioning route to provide consistency between the two sessions (Morgan, 1997). This questioning route was peer-reviewed by a panel of experts familiar with focus group procedure. Participants included eight females and seven males, ages ranged from 25 to 55+, with white, African American, and Hispanic ethnic representation. Participants were given $50 to compensate for their time.

Each session began with general introductions to encourage participants to become comfortable in the group setting. Participants were asked to provide information

about their food and meat shopping behaviors. Discussion then centered on participants' understanding of the terms "organic" and "all-natural" in reference to pork products.

In the second half of each session, participants engaged in affective testing (one component of sensory evaluation or sensory analysis). The purpose of affective testing is to gather subjective data of the product being evaluated. The first taste test was a comparison of an all-natural pork loin to a conventional pork loin. For the purpose of this study, "conventional" is used to describe pork products that were not produced in ways that would qualify them for all-natural or organic status. The all-natural pork used in consumer testing was natural pork (in accordance with USDA policy) from pigs raised outdoors on pasture, and produced with 1) no antibiotics, 2) no meat by-products in feed, and 3) growers following an animal welfare protocol. This taste test used a double-blind technique for both sessions to ensure that neither the participants nor the moderator knew which product was the all-natural pork.

Once both samples had been tested, the moderator asked participants to compare the two pork loins to determine which one they preferred and to assess if there was a perceived difference between the two samples. After tasting each sample, each participant recorded initial reactions on a short survey feedback form to aid in their evaluation of each product. Following the comparison taste test, the moderator asked participants for their reactions about the products tasted and allowed the group to guess which product was the all-natural pork and which product was the conventional pork. Participants were then told by the chef which sample was the all-natural pork loin and the moderator asked for reaction. Following the comparison taste test, participants tasted all-natural ground pork and all-natural spare ribs, but no comparison samples were utilized with these products.

The moderator then led participants in a price threshold exercise with four cuts of pork (loin roast, chops, ground pork, and spare ribs). These cuts were chosen because they are most commonly purchased by consumers and represented a typical range of price differences. For each cut, the moderator showed the price per pound for the all-natural product and the conventional product. Participants were then asked for their reaction to the price difference and as well as if they would be willing to pay for the all-natural product (as it was always more expensive).

The focus group sessions were recorded using audio, video, and field notes, and sessions were transcribed and analyzed by using Glaser's (1978) constant comparative technique. Researchers looked for common themes, similarities and dissimilarities, observations of non-verbal cues, interactions, and reactions to product and price threshold stimuli. Transcripts were coded for themes, and categories created. As themes emerged, they were compared to existing categories to look for common relationships. New categories were created for distinct themes that did not fit existing categories. An audit trail, including original data analysis, codes, semantic relationships, and listing of all domains, was kept for verification and trustworthiness.

## Results

*Objective 1: To describe consumers' perceptions of the terms organic and all-natural in reference to pork.*

To explore this objective, participants were asked to define the terms "all-natural" and "organic" as associated with pork products. Participants in both groups had similar responses, indicating perceptions of the term "all-natural" as meaning "no" – no preservatives, no additives, no antibiotics, no hormones, no extra liquids in the meats, no phosphates, no chemical fertilizer. They also associated the term with the idea that the livestock animals from which these products were produced would be farm raised, fed natural foods, and/or fed organic foods. According to a participant, "All-natural means it has less bad stuff." Another remarked, "That it was a real animal." Several participants focused on the free range aspect, particularly in group one, and all had negative reactions to use of chemicals, feeling all-natural conveyed less chemicals used in a food product.

The connection between all-natural, absence of chemicals, and free range production was made by several participants. One said:

> I would hope that it means fewer hormones and fewer antibiotics. I would hope that all-natural would mean that somebody's grandparents raised it on a farm somewhere rather than they were locked in a little metal cubbyhole where they couldn't turn around with a feeding tube in one end and an IV in the other side. Filling it full of things just to keep alive long enough to get it to slaughter.

Although most participants in both groups felt the term "all-natural meant" "not loaded with chemicals," some expressed skepticism as to the validity of manufacturer claims in this respect. "I don't think that anything is truly natural. I'm skeptical," was a common response. Another theme that emerged here was that the term might be a marketing or advertising ploy. A participant in the second group called the term, "a form of advertisement. I don't believe it."

With respect to meat and pork products and labeling, participants immediately brought up a local chicken producer, which participants perceived as having promoted its products as "no hormones, no antibiotics, no additives, no preservatives." One participant summed up this theme, saying:

> …Teach me, show me, that if you say, at Bob's Farm when we sell you our pork and it says all-natural, it means we didn't put a bunch of preservatives in it…it wasn't pumped full of water, and nothing was added, phosphates weren't added. Like that Sanderson Farms, the chicken people. I mean they say 'Oh, we don't have any phosphates.' I don't know if phosphates are good for me or bad for me, but when they tell me they don't have any I start thinking maybe we should get that chicken.

Participants said pork with this label designation would be fresher and "untreated." One participant termed it, "All pig and nothing but pig." Some indicated they would expect to have to pay more for this product.

When asked to define what the term "organic" meant to them, participants in both groups had both positive and negative reactions. Some immediately thought of test tubes, or tasting like cardboard. Participants in both groups said that organic "was better for you." One commented, "Fruit and veggies don't taste as good, but it's better for you." Several members of both groups indicated that organic foods were very important to them. "Organic is really important to me. My wife and I grow organic tomatoes, but it's difficult to make it organic, and it takes a while to do it because of pesticides and such.

No pesticides is an important factor." (Other members of this participant's group spent some time picturing tomatoes as representative of organic foods they would be interested in.) Said another:

> To me the organic thing is huge. The only thing I want is stricter standards so when it says 100% organic or USDA certified organic, I want to know what it means, like we were saying about the all-natural. [Organic] means you don't have to worry, this was raised by tested methods that are safe, healthy and natural.

Participants in both groups identified organic as having more to do with food coming from the garden or "the earth." Organic foods are "without chemicals, pesticides, hormone-free, from animals fed organic and not meat products, but may not look as pretty." Some thought organic food would taste better and be fresher. Most perceived organic foods to cost more. A typical quote under this theme was, "Organic means it tastes better and is healthier for me." Most participants equated organic food as fruit and vegetable produce; few considered the term organic as relating to meats. One participant made the observation, "I think more of gardening than meat as organic. I hope what the pig is eating is organic."

Only one out of seven in the first group and two out of eight in the second group were organic shoppers, due to price considerations. Some indicated they sometimes buy organic vegetables, but not other products. Price was a factor for most participants, as well as differences in family members' food preferences. One woman offered, "My husband doesn't care …if he wants it, he'll eat it. But if I see two products on the shelf and they're the same price and one says all-natural or organic, I'll buy that. But if it's a two or three dollar difference, I'll buy whatever is cheaper."

When discussing their perceived criteria for all-natural and organic foods in group one, all participants agreed that these were "individual concerns." One participant said:

> I'm not that concerned, because after getting away from home-grown things I figure something's not going to be good for you no matter what you do. It's great to take precautions, nothing's 100%, and I think every shopper is going to be different about that.

*Objective 2: To describe participants' taste perceptions of all-natural pork.*

To address this objective, participants moved to another room which had been set up with tableware and silverware. They then participated in a double-blind taste testing of an all-natural roasted pork loin produced by a local company as compared to a similarly cut and prepared conventional product.

Before the identity of the pork products was revealed, both groups said they could taste a difference between the two pork dishes. Both groups preferred the texture and flavor of the all-natural pork sample and said the conventional pork was drier, not as flavorful, and "mushier." Typical comments from participants that fell under this category included the following: "The second one just doesn't have the flavor the first one has."

"I noticed mostly the texture, 'cause I don't like mushy meat. I think it should be kind of firm. So the second one tasted mushier."

"Yes, I thought the first sample was moist and flavorful, even the skin portion that I ate was not greasy. And the second portion just seemed to be a little bit more dense and dry."

There was some difference between groups with respect to their perceptions as to which meat product was all-natural and which one was conventionally produced. Group one associated what they perceived as good taste with the all-natural pork and labeled the all-natural pork as all-natural. Group two associated poor taste and the seemingly leaner pork with all-natural and labeled the conventional pork as all-natural. Group one noticed a color difference between the two and said that the conventional one may have artificial coloring added. Both groups noticed a difference in texture, attributing this to free range production practices. "Because the (all-natural pork) was firmer, maybe it's because those pigs got to run around more and have more muscle."

After the moderator told the participants which sample was which, both groups said they would buy the all-natural pork they had tasted. In the first group, a participant stated, "I would now buy all-natural. I would look for a label that says all-natural." All participants in this group then concurred.

After the blind taste comparison, participants in both groups were given the opportunity to taste several other all-natural pork products and record and state their reactions. Participants tasted all-natural ground pork, and then spare ribs from the same company. Although most were not familiar with the company's pork, and did not buy these cuts regularly, participants found this product appealing on several fronts. They found the ground pork "not fatty or greasy"; "less fatty than hamburger"; "tastes just like pork", although both groups thought it needed seasoning. The majority of participants in both groups liked and would purchase this product. Both groups then went on to be served and asked their reaction to an all-natural spare rib. The participants said the ribs they tasted were too dry; however, both groups also noted that people have different taste preferences for ribs in terms of how dry they are. Three members of both group one and group two stated they liked the all-natural ribs. In the first group, the majority of members said they would buy it; however, no one made this claim in the second group.

*Objective 3: To understand how consumers' taste perceptions of all-natural pork affect their attitudes toward the price of those products.*

To explore this objective, the moderator used index cards marked with the price per pound of four cuts of pork (loin, chops, ground pork, and ribs) three of which participants had tasted. The moderator showed the prices for both all-natural and conventional products, and then asked participants about their willingness to pay. Starting with the pork loin, all participants in both groups (except for one in group two that preferred to buy meat from a butcher) said they would buy the all-natural product because they had tasted it and liked the taste. The per pound price differential on this cut was $4.25 for the conventional product, as compared to $5.69 for the all-natural product. Both groups also said that because they liked the taste, they didn't really care how much more it cost after comparing conventional to all-natural, although they did note the higher price. As one participant stated, "So I would pay it. And because it's all-natural. But it is quite a bit more." Said another, "I tasted it and I'd rather, honestly, I'm like I don't care how much more it costs, I would pay the $5.69, but again all people are not going to try it…"

Both groups said taste is the key to convince people the product is worth more money. For this reason, both groups suggested a way to market this product would be to focus on using samples at the grocery store.

Both groups were willing to pay more for the all-natural ground pork product, finding the $1.85/$2.99 price differential not a barrier. With respect to the ribs, only three out of seven in the first group and two out of eight in the second group would pay the $3.80 per pound for the all-natural product as compared to the $2.45 per pound for the conventional product. Finally, the moderator held up prices for loin chops, which the groups had not taste tested, to determine how taste affects attitudes toward price. The price per pound for conventional loin chops was $3.85 per pound; for the all-natural product, $5.99. Both groups said the price difference seemed too steep. Seven out of eight in group two and four out of seven in group one would not purchase it because it was too expensive.

## Conclusions, Discussion, and Recommendations

Participants had positive associations with both organic and all-natural pork products, with exceptions regarding taste, price, and trust in the information source, which are consistent with factors that typically dissuade consumers from purchasing these products (Yiridoe, et al., 2005; California Institute for Rural Studies, 2005).

As found in consumer perceptions of all-natural beef (Diel & Associates, 2001), participants associated no hormones and no antibiotics to their perception of all-natural pork. However, the focus group discussions brought out additional perceptions participants associated with all-natural pork, including hogs that are raised outdoors, fed higher quality food, and no use of preservatives or chemicals in the final pork product. Participants also revealed that they do not understand why or how particular additives in meat are bad for them, but when marketing makes claims about not having additives, they are more inclined to buy that product or favor food products with the "no" labeling theme.

Despite the focused discussion of organic and all-natural pork, participants equated the terms more to fresh produce, particularly tomatoes. This may be due to the limited availability of organic meat products in supermarkets. Meat was not allowed to be labeled organic until a provisional label was approved by the USDA in 1999, whereas organic gardening dates back to the 1950s (Dimitri & Greene, 2002; "Organic Foods," 2006).

In general, consumers' attitudes toward all-natural and organic pork were based on beliefs associated with the absence of risk to their health and the improved welfare of the hogs in the production and processing of those products. The perceived risk factors were similar to those cited by organic consumers (Hammit, 1990).

Research has shown that the consumer decision-making process is complex. Consumers' perceptions of the terminology meant to appeal to concerns about pork production and processing only play a small part of that process. To examine other factors, consumers' taste and price perceptions of all-natural pork were explored.

Personal preference plays a large role in taste perceptions (Risvik, 1994). Some participants expressed differing preferences for moistness, texture and flavor, and that

influenced their reaction to the taste of the pork product samples. Previous experience with the cuts of pork may also have influenced their taste perceptions (Cardello, 1995a).

All participants in both groups perceived a difference in flavor and texture between the all-natural and conventional pork loins in the double-blind taste test, preferring the all-natural pork loin. Participants were aware they tasted an all-natural pork loin and a conventional pork loin, so they were anticipating a difference. The anticipation may have amplified their perceived differences. Previous studies conducted with trained taste panels vary in their findings of sensory differences between organic and conventional foods (Dransfield, et al., 2005; Fillion & Arazi, 2002; Jonsäll, et al., 2002).

Interestingly, participants had different preconceived notions of how all-natural food would taste, which influenced how they evaluated the provided samples. Group one associated good flavor and texture with the all-natural product, but group two associated the leaner and less flavorful sample with the all-natural product. This suggests that a segment of consumers may perceive all-natural meat to taste better, while another segment may perceive it to taste inferior to conventionally produced products.

Intent to purchase all-natural pork relied heavily on the fact that participants had tasted the products. The majority of participants said they were willing to pay more for the all-natural pork because they had tasted it. As a result of trying the product, participants were able to experience the consequences without the investment, thus reducing the perceived risk in the consumer decision-making process. Through experiencing both intrinsic (taste) and extrinsic (labeling, marketing) attributes, the quality of a food products seemingly easier for consumers to evaluate (Zeithaml, 1988).

Both groups were willing to pay more for the all-natural pork loin and ground pork, but were split between their willingness to purchase all-natural ribs and all-natural loin chops. The indecision was due to personal taste preferences and differing price-value attitudes.

The difference between the all-natural pork loins and all-natural pork chops was $0.30 per pound. When asked about their intent to purchase these two cuts of pork, all participants said they would be willing to purchase the pork loin, because they had been able to taste it. Several participants said the pork chops were too expensive. Even though the $1.44 price difference between the conventional and all-natural pork loin seemed high to the participants, they were willing to pay for the all-natural pork because they preferred the taste.

Based on the result of this study, more studies are needed to examine consumers' perceptions of the terms organic and all-natural, especially in the area of meat production and processing. The participants in these focus groups had some preconceived notions about the terms, but could not clearly differentiate between them. Future research should investigate how consumers interpret these terms, as well as where they get information about meat production and processing and how the media frames natural and organic meats. Future studies should triangulate data from related populations, such as restaurant owners and chefs, because they influence the available food choices for consumers. Understanding food professionals' perceptions of the use of natural and organic pork in restaurants would demonstrate the perceived value of these products in the restaurant setting.

A major implication of this study for agricultural communications professionals is that the success of communications aimed at marketing niche food products may rest on

the ability to include product sampling strategies while appealing to consumers' taste perceptions with marketing materials. Being able to taste the all-natural pork product was an important factor to motivate consumers to purchase the product. As Jaeger (2006) found, it is valuable to integrate taste in marketing communications strategies. Based on the results of this study, food marketers should consider integrating point of purchase sampling, or developing labeling and marketing materials that appeal to and emphasize how the product tastes.

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# Outline Processor Markup Language (OPML) as a News Reporting and Organizational Tool

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**Abstract**

Outline Processor Markup Language (OPML) has existed for several decades. The file format has primarily been used to organize volumes of computer programming code by software engineers. However, its uses can be for online information delivery, including news, and used as a news organizational tool.

A variety of examples are explained as part of an experiment with the OPML format to determine if it could be used as a reporting tool for agricultural communications public relations practitioners.

The work includes discussion of creating a lightweight database of media outlets by county throughout Texas, and an attempt to organize individual news contacts within various departments through Texas Cooperative Extension and the Texas Agricultural Experiment Station. These tools can be used as a media contact list and accessed when pitching a variety of region-specific news articles.

Also discussed include examples of ways to organize lists of information, including individual contacts with varying degrees of specialization, frequently called upon when writing news articles.

**Key words:** News, media, software, Extension, database, programming, database, tool.

# Outline Processor Markup Language (OPML) as a News Reporting and Organizational Tool

## Introduction

Outline Processor Markup Language (OPML) for personal computers has existed for several decades. The programming language is designed to keep structural lists of information and is perfect for writers or other professionals who are required to keep lists of detailed information.

OPML can organize documents such as legal briefs, stories, presentations, directories and product specifications.

The programming language is an alternative tool for agricultural communications public relation practitioners who produce volumes of news articles and maintain numerous lists of contacts for news.

OPML is an XML-based format that allows exchange of outline-structured information between applications running on different operating systems and environments (Winer, 2000).

OPML has been used as an organizational tool for news stories by the author generated from coverage of educational programs and research initiatives within Texas Cooperative Extension and the Texas Agricultural Experiment Station. The reason this format was chosen rather than using a traditional database was because of its sharing capability. A variety of OPML editing software can interpret the files and be shared among users.

Perhaps one reason why OPML has yet to become popular among computer users is because few know of its existence. The format has many applications, whether writing or information retrieval.

This paper will help explain the format and how it can be used for writing and as a lightweight information database.

### Method/Process

The history of outlining dates to the 1960s with one of the first outliners developed by Douglas C. Engelbart. The engineer used outlining as part of his computer

programming research. Among the 20 patents he is responsible for, the mouse is one of the most recognized.

Dave Winer, a software developer, used outlining during his undergraduate study at the University of Wisconsin and the format was the backbone of several software applications he has developed throughout his programming career. He found outlining an easy solution to organize volumes of programming code when creating software applications.

After researching the history of OPML, an experiment began by the author to see if the technology could be used to better organize news sources and information.

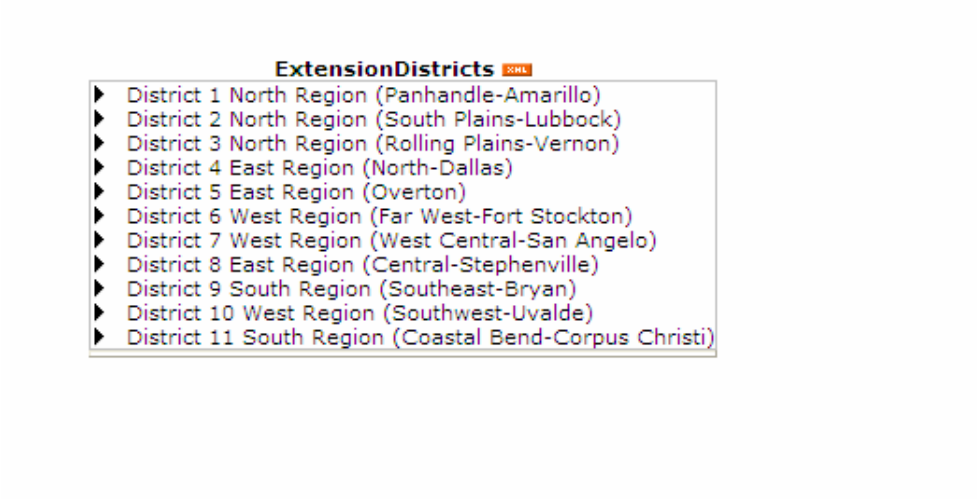
During the course of the project, the author began to maintain several lists of information, which included keeping track of news stories written for the year, lists of individual contacts in various departments, and a comprehensive list of media outlets throughout Texas by county. The media list is quickly accessible on the Web when pitching breaking news to a specific region of the state.

The list of media outlets by county would allow news and public affairs specialists within Extension and the Experiment Station, other emergency respondents to access information quickly during a time of crisis. Currently, no such complete database exists nor is readily available and presented in outline hierarchical structure.

**Results/Outcomes**

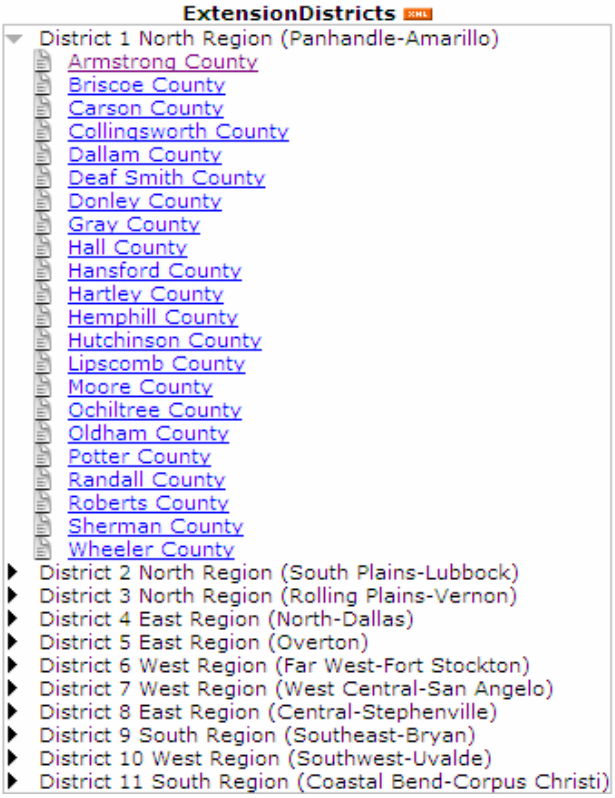
To introduce the OPML programming language as displayed through a Web browser, the screen capture in Figure I is an Extension District Directory created by the author. The online HTML example is available at http://cowhand.tamu.edu/extensiondistricts.html

**Figure 1: Extension District Directory**



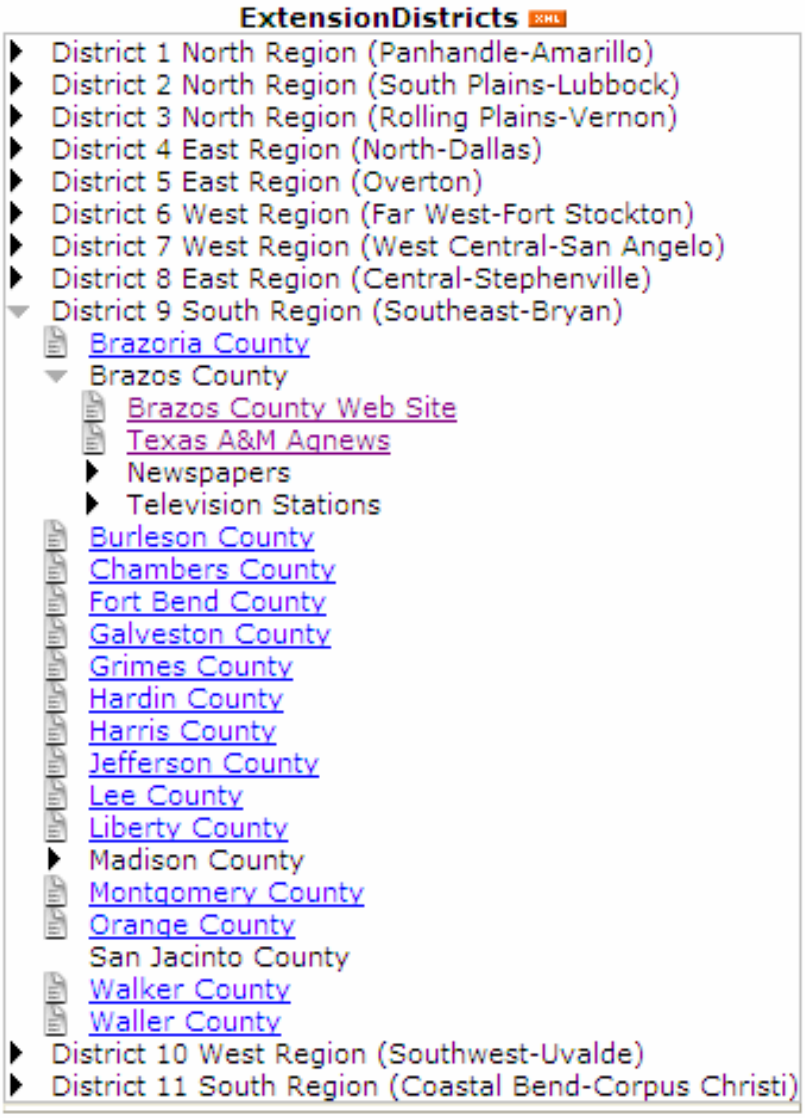

In Figure 2, when a wedge is clicked, an expanded listing of counties is displayed under a specific Extension Region.

**Figure 2: Extension District 1 North Region**



In Figure 3, under each county, information such as newspapers and television stations is included. These listings are hyperlinked to the media outlets' Web site where contact information can be found.

**Figure 3: Extension District 9 South Region**




Further expansion of the black wedge under Brazos County reveals detailed media outlets by respective format (newspaper, television, etc.) Each of the media outlets contains a hyperlink, which directs the user to the appropriate media online site for contact information (Figure 4).

**Figure 4: Extension District 9 South Region Media Listings**

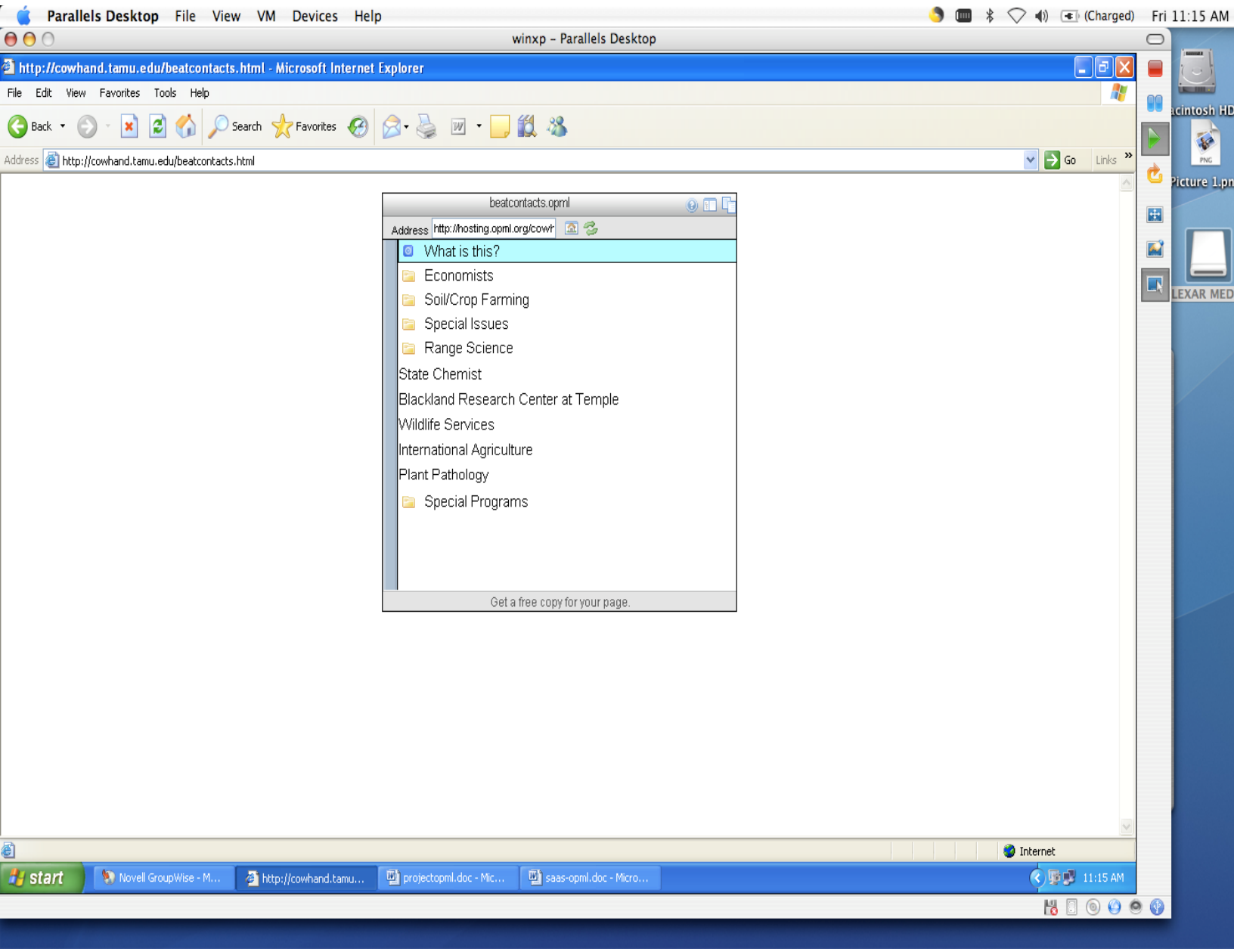

The goal of the OPML format according to Winer is as follows:

"The purpose of this format is to provide a way to exchange information between outliners and Internet services that can be browsed or controlled through an outliner. The design goal is to have a transparently simple, self-documenting, extensible and human readable format that's capable of representing a wide variety of data that's easily browsed and edited.

"As the format evolves, this goal will be preserved. It should be possible for a reasonably technical person to fully understand the format with a quick read of a single Web page. It's an open format, meaning that other outliner vendors and service developers are free to use the format to be compatible with Radio UserLand or for any other purpose." (2000, Winer)

The format can be used to keep a contact list of beat sources among various departments. This becomes a handy tool for quick reference to specialists within a certain subject area. Figure 5 is a screen capture of an OPML file of beat contacts. The online example can be found at http://cowhand.tamu.edu/beatcontacts.html

**Figure 5: OPML File of Beat Contacts**



Coding an OPML file requires the use of eXtensible Markup Language (XML) and the use of tags. The following is an example OPML file which can be found online at http://cowhand.tamu.edu/beatcontacts.opml :

```
<?xml version="1.0" encoding="ISO-8859-1" ?>
<!-- OPML generated by OPML Editor v10.1a3 on Fri, 12 May 2006 16:37:25 GMT -->
<opml version="1.1">
<head>
<title>beatcontacts.opml</title>
<dateCreated>Mon, 13 Feb 2006 21:26:58 GMT</dateCreated>
<dateModified>Fri, 12 May 2006 16:37:25 GMT</dateModified>
<ownerName>bfannin</ownerName>
<ownerEmail>b-fannin@tamu.edu</ownerEmail>
<expansionState>1, 2, 4, 5, 7, 9, 10, 13, 16, 23</expansionState>
<vertScrollState>1</vertScrollState>
<windowTop>109</windowTop>
<windowLeft>405</windowLeft>
<windowBottom>929</windowBottom>
<windowRight>1149</windowRight>
</head>
<body>
<outline text="<b>Economists</b>">
<outline text="Beef" created="Mon, 13 Feb 2006 19:18:57 GMT">
<outline text="David Anderson, 845-4351, danderson@tamu.edu" created="Mon,
13 Feb 2006 19:19:12 GMT" />
</outline>
</outline>
<outline text="<b>Soil/Crop Farming</b>" created="Mon, 13 Feb 2006 19:20:09
GMT">
<outline text="Cotton" created="Mon, 13 Feb 2006 19:20:37 GMT">
<outline text="Robert Lemon" created="Mon, 13 Feb 2006 19:20:42 GMT" />
</outline>
<outline text="Small Grains" created="Mon, 13 Feb 2006 19:20:59 GMT">
<outline text="Gayle Morgan" created="Mon, 13 Feb 2006 19:20:50 GMT" />
</outline>
</outline>
<outline text="<b>Special Issues</b>" created="Mon, 13 Feb 2006 19:21:58
GMT">
<outline text="Drought" created="Mon, 13 Feb 2006 19:19:33 GMT">
<outline text="Carl Anderson, 845-8011, canderson@tamu.edu" created="Mon,
13 Feb 2006 19:19:40 GMT" />
```

```
 <outline text="Travis Miller, 845-4008, tdmiller@tamu.edu" created="Mon, 13
    Feb 2006 19:19:55 GMT" />
   </outline>
<outline text="Farm Policy" created="Mon, 13 Feb 2006 19:23:29 GMT">
 <outline text="James Richardson, 845-5913, JWrichardson@tamu.edu"
    created="Mon, 13 Feb 2006 19:23:34 GMT" />
 <outline text="Joe Outlaw, 845-3060, joutlaw@tamu.edu" created="Mon, 13 Feb
    2006 19:23:41 GMT" />
   </outline>
   </outline>
<outline text="<b>Range Science</b>" created="Mon, 13 Feb 2006 19:23:43
    GMT">
 <outline text="Wayne Hamilton, 845-5589, wt-hamilton@tamu.edu"
    created="Mon, 13 Feb 2006 19:26:26 GMT" />
   </outline>
 <outline text="<b>State Chemist</b>" created="Fri, 12 May 2006 16:33:23
    GMT" />
 <outline text="<b>Blackland Research Center at Temple</b>" created="Fri, 12
    May 2006 16:36:08 GMT" />
 <outline text="<b>Wildlife Services</b>" created="Fri, 12 May 2006 16:36:15
    GMT" />
 <outline text="<b>International Agriculture</b>" created="Fri, 12 May 2006
    16:36:23 GMT" />
 <outline text="<b>Plant Pathology</b>" created="Fri, 12 May 2006 16:36:27
    GMT" />
<outline text="<b>Special Programs</b>" created="Fri, 12 May 2006 16:36:35
    GMT">
 <outline text="Stiles Farm Field Day" created="Fri, 12 May 2006 16:36:59 GMT"
    />
 <outline text="Blackland Income Growth Conference" created="Fri, 12 May 2006
    16:37:10 GMT" />
   </outline>
   </body>
   </opml>
```

To create an OPML file, you can code by hand using Notepad on a PC or Text Edit on an Apple Macintosh computer. However, the process can be simplified by using an OPML software application specifically engineered for creating OPML files. The OPML Editor, debuted by Winer in 2006, can be found at http://www.opml.org and is available for both PC and Mac platforms. Another free tool that is for the Mac only is by the Omni Group called Omni Outliner, available at http://www.omnigroup.com/applications/omnioutliner/ .

The OPML Editor is the preferred software because it can be used not only as an outliner, but to author an online blog. There are other features the OPML Editor software

offers, such as news subscriptions via Really Simple Syndication (RSS) and exporting lists of news RSS feeds as an OPML file that can be shared with other users.

The Omni Outliner software is a good, lightweight outlining tool and perfect for users who have never worked with an outlining tool previously.

**Discussion/Conclusions**

OPML is a flexible programming language that can serve a variety of uses, not just as a news reporting aid. A news organization could use the format to outline an entire online news site. For example, if you are the New York Times and you would like to offer your site in OPML, what advantage would that be to readers?

If you had every section of the paper as part of one outline (News, World News, Business, Technology, etc.) that would enable you to import much of the online edition of the paper into an online newsreader program or outline editor through one OPML file. One could select those sections that they are most interested in and then share with others by exporting, much like you do now with RSS news feeds.

Many large newspapers now offer syndicated news feeds on their Web sites. These news feeds, once subscribed, can be viewed through newsreaders, such as MyYahoo! And Google News, without ever having to visit the publication's Web site.

OPML allows a user to export their favorite RSS subscription lists and share with another user. OPML could be a useful tool for journalists, who are always seeking contact information, background information on a subject. Extension specialists in a variety of departments could be coded in the OPML format, allowing for sharing of these files among journalists.

However, there's little awareness of OPML as a news-reporting tool in the print industry and this could be changed if agricultural communications practitioners offered training and education through workshops, etc.

In conclusion, the format is open to a broad range of uses, leaving it up to the imagination of the OPML file creator to provide the content.

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**Perceptions of Influence on College Choice by Students Enrolled in a College of Agricultural Sciences and Natural Resources**

Category: Research Paper (Graduate Student)

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**Perceptions of Influence on College Choice by Students Enrolled in a College of Agricultural Sciences and Natural Resources**


## Abstract

Chapman (1981)found specific student characteristics and a series of external influences that guide college choice of traditional age (18-21) students. A study was conducted to determine which of these characteristics and external influences affected the undergraduate college-choice process when enrolling in the College of Agricultural Sciences and Natural Resources of a Midwestern University in an effort to evaluate current recruitment practices. According to this study, campus visits were the most useful source of information to students. Nearly 93% of participants agreed that the information (recruitment efforts) of this Midwestern University was satisfactory in providing enough information to make a college choice. Parents or guardians provided the most influence on participants of this study in deciding on college choice. The two most influential institutional characteristics participants noted were opportunities after graduation and the academic reputation of the university, respectively.



**Keywords:** recruitment, student characteristics, college choice

**Perceptions of Influence on College Choice by Students Enrolled in a College of Agricultural Sciences and Natural Resources**

## Introduction

Agriculture by nature is a vast and complex industry. It encompasses professions ranging from production to law. With technological developments, consumer interest, governmental polices, and the threat to U.S. food systems increasing, this industry will see more employment opportunities for U.S. graduates, specifically those graduating from the fields of food, agriculture, and natural resources (Goeker, Gilmore, Smith, & Smith, 2004). A national study conducted by the Cooperative State Research, Education, and Extension service of the U.S. Department of Agriculture and the Purdue University College of Agriculture (Goeker et al., 2004) found there will be approximately 52,000 employment opportunities for students graduating between 2005 and 2010 and about 49,300 expected qualified graduates to enter the workforce during the same time frame. As academic institutions struggle to educate students with the tools that ensure their success in industry, so must these institutions ensure their own successes by continuing to recruit students. To enhance recruitment efforts, academic institutions must understand what influences students' decisions to attend college (DesJardins, Dundar, & Hendel, 1999; Martin, 1996; Chapman, 1981).

Chapman (1981), found specific student characteristics and a series of external influences that guide college choice of traditional age (18-21) students. This model was the theoretical basis for this study. The influencing factors of students to attend college are continually changing (DesJardins et al, 1999; Martin, 1996; Boatwright & Ching, 1992); therefore, it is imperative for institutions, colleges, and departments to continue to understand these factors and how their own identities affect enrollment.

## Review of Literature

Chapman's (1981) model of influence on college choice suggests there are student characteristics and external influences that affect the college choice decision. Chapman identified student characteristics as socioeconomic status, aptitude, level of educational aspiration, and high school performance. External factors were separated into three distinct categories: significant persons, fixed college characteristics such as location, and college effort to communicate with prospective students.

*Influence of significant persons*

A study by Rocca, Washburn, and Sperling (2003) found a significant person in a student's college decision-making process may include friends, parents, guardians, other relatives, alumni, teachers, and counselors. A significant person may influence a student's college choice by helping shape a student's expectations of a particular college, providing direct advice about a college, or by already attending or having attended a particular institution (Chapman, 1981).

Most agree that parents or guardians are influential in a student's college choice (Rocca et al., 2004; Reis & Kahler, 1997, Scofield, 1995; Donnermeyer & Kreps, 1995). Schuster, Constantino, and Klein (1988) and Trent and Medsker (1968) found parents or

guardians as influential to college choice. Boatwright and Ching (1992) suggested that peers are more influential than parents or guardians today compared to ten years ago. Rocca et al. (2004) and Reis and Kahler (1997) found students' friends ranked high in influence when choosing a college. Other persons of influence found in the literature were relatives who attended the university (Washburn, 2002), agricultural teachers (Reis & Kahler, 1997), and students attending a potential university (Greer, 1991).

*Influence of institutional characteristics*

Institutional characteristics include academic reputation, quality of facilities, class size, student reputation, cost, financial aid/scholarship availability, variety of majors, and location (Rocca et al., 2003).

Donnermeyer and Kreps (1994) and Washburn (2002) found financial incentives such as scholarships, good job opportunities, and potential income to be the second most influential factor in influencing freshman enrollment. St. John (2000) found "student aid offers have an immediate and direct effect on whether students enroll. They also have an influence on whether students can afford to continue their enrollment (pg. 72)." Cole and Fanno (1999) found that 20% of students from Oregon State University who transferred out of the College of Agricultural Sciences said they entered the college because of financial support.

Academic reputation may be one of the most influential institutional characteristics in determining student college choice (Rocca et al., 2004; Washburn, 2002; Schuster et al., 1988; Gorman, 1974). Gorman (1974) and Washburn (2002) both found academic reputation to be the most influential institutional characteristic.

In addition to financial incentives and academic reputation, cost and location (Schuster et al., 1988) and preparation for employment (Washburn, 2002) are influential institutional characteristics.

*Influence of college efforts to communicate with students*

Chapman (1981) found that one of the first ways a college responds about enrollment concerns is to evaluate how it finds and recruits prospective students. This is one of the initial ways a college responds because efforts to communicate with students can be changed more quickly than fixed characteristics (Chapman, 1981).

Kealy and Rockel (1987) discovered campus visits have the greatest effect on student perception of college quality. Washburn (2002) found campus visits to be the most useful source of information prospective students used to choose a college. More than half of matriculants used information from campus visits to make their college choice (Washburn, 2002). Gorman (1974) found campus visits and personal contacts with the institution or with current students to be influential. Rocca et al. (2004) found printed materials to be the most influential source of information in the early stages of the college-choice process, and campus visits and personal contacts to be the most important sources of information in the later stage.

Washburn (2002) found non-matriculants used personal contact the least to influence their college choice, in fact 11.5% of non-matriculants used college-specific information to assist their college choice (Washburn, 2002).

## Purpose

The purpose of this study was to identify the recruitment efforts and external influences affecting the undergraduate college-choice process when enrolling in the College of Agricultural Sciences and Natural Resources at Oklahoma State University.

## Research Questions

The specific research questions guiding this study were:

1. How useful were sources of recruitment information in helping students make the decision to enroll in the College of Agricultural Sciences and Natural Resources at this Midwestern University?
2. How influential were characteristics of the institution, selected individuals, degree program characteristics, and social interaction opportunities in helping students make the decision to enroll in the College of Agricultural Sciences and Natural Resources at this Midwestern University?
3. When did students begin the decision-making process in selecting a college or university, selecting a major, and finalizing the decision to attend this Midwestern University?

## Methods/ Procedures

This study used an internet survey developed based on previous research related to influencing factors of college choice decisions (Washburn et al., 2001; Rocca et al., 2003) to identify the recruitment efforts affecting undergraduate college-choice for students enrolling in the College of Agricultural Sciences and Natural Resources at this Midwestern University. The 39-question instrument was created using FreeOnlineSurveys.com. This service provided the researcher the ability to use an unlimited number of questions per survey, download individual responses, and offered password protection (http://www.FreeOnlineSurveys.com). The instrument was tested for validity and reliability. A panel of experts consisting of personnel representing the College of Agricultural Sciences and Natural Resources academic programs office, this Midwestern University's high school and college relations office, and the Department of Agricultural Education, Communications, and 4-H Youth Development reviewed the instrument establishing face and content validity. Reliability was tested using a Chronbach's Alpha reliability analysis. The overall reliability coefficient was .962 for the final data.

The study used a random sample of full-time (registered for at least 12 credit hours) undergraduate students enrolled in the College of Agricultural Sciences and Natural Resources at this Midwestern University during the spring 2005 semester. The size of the total population was 1,744 students, and a random sample of 1,035 students was sent a pre-notice e-mail on February 11, 2005. After removing 51 students due to invalid e-mail addresses, the sample was reduced to 984 students. The researcher used an adapted form of Dillman's Tailored Design method (2000) to encourage participation. Three initial rounds of e-mail were sent out in one-week intervals. After the three weeks, 229 had responded. The process was repeated a second time and reached a 95% confidence level (Krejcie & Morgan, 1975). An additional 500 students were randomly selected and 110 responded, totaling 339 responses (22.8% response rate). Non-response

error was controlled by comparing the age, gender, and academic classification of early participants and late participants. [Reference? here]

Frequencies, percentages, means, and standard deviations were used to describe the influence of recruitment information sources, institutional characteristics, influential people, degree program characteristics, and social interaction opportunities. Descriptive statistics were tested using the Statistical Package for Social Sciences 12.0 for Windows (2004) to interpret the data.

## Results/ Findings

Participants in the study were 38.1% (*n*= 129) male and 61.1% (*n*= 207) female with 82.3% (*n*= 279) being of white or non-Hispanic ethnicity. Age of participants ranged from18 to 55 with more than 94.8% (*n*=309) falling within the age range of 18 to 24. The mean age was 21.3 with a standard deviation of 3.94. Academic classification of the participants were 36.0% (*n*=122) seniors, 27.1% (*n*=92) juniors, 15.6% (*n*=53) sophomores, 20.1% (*n*=68) freshmen, and 1.2% (*n*=4) did not respond.

This study surveyed students from all majors within the College of Agricultural Sciences and Natural Resources. More than one-fourth (85) of the participants were animal science majors. According to this Midwestern University Division of Enrollment Management and Marketing and Institutional Research and Information Management (2004), animal science is the largest major in the university (Table 1).

Table 1

*Distribution of Participants by Major*

| Major | Frequency | Percent (%) |
|---|---|---|
| Animal science | 85 | 25.1 |
| Pre-veterinary science | 50 | 14.7 |
| Agricultural communications | 32 | 9.4 |
| Agricultural education | 31 | 9.1 |
| Agribusiness | 30 | 8.8 |
| Biochemistry and molecular biology | 28 | 8.3 |
| Agricultural economics | 16 | 4.7 |
| Horticulture | 15 | 4.4 |
| Plant and soil science | 15 | 4.4 |
| Landscape architecture | 12 | 3.5 |
| Environmental science | 10 | 2.9 |
| Forestry | 5 | 1.5 |
| Entomology | 3 | 0.9 |
| No response | 3 | 0.9 |
| Biosystems and agricultural engineering | 2 | 0.6 |
| Landscape contracting | 2 | 0.6 |

Because of the population, students may have entered the university as freshmen or transferred from another university. Nearly one-third (32.7%) of participants (*n*=111) entered this Midwestern university from another university or junior college. The majority (63.7%, *n*=216) entered the university as freshmen. Twelve did not respond.

Agricultural association was measured in several ways, including group or club involvement, immediate family's agricultural involvement, and immediate family's income from production agriculture. Participants denoted that 53.1% (*n*=180) were involved in 4-H; 59.3% (*n*=201) were involved in FFA; 51.9% (*n*=176,) were not involved in production agriculture, and 47.2% (*n*=160) was involved in production agriculture.

*Information Sources*

The first research question was to determine the usefulness of recruitment materials in aiding students' decision to enroll in the College of Agricultural Sciences and Natural Resources at this Midwestern University.

Participants were given 28 information sources and asked to indicate the usefulness of these resources in aiding their decision to enroll, using a scale of 1 to 5, with 1 indicating "not useful" and 5 indicating "very useful." If an information source was not used, participants were asked not to select a level of usefulness. The most useful and most used source of information was visiting campus with a mean usefulness of 3.95 and a standard deviation of 1.24. A majority (87.6%) of participants indicated that they had visited the campus. Information sources with a mean usefulness level of 3.00 or better were considered important in the recruitment process. Other sources of information with mean usefulness levels of more than 3.00 were personal conversation with a professor, 71.7%; degree program information on a Web site, 77.3%; printed university publications, 72.3%; College of Agricultural Sciences and Natural Resources publications, 71.0%; and the university Web site information, 71.7%. The least used and least useful information source was the Noble Foundation's Ag Venture program, 43.4%. The Noble Foundation's Ag Venture program had the lowest mean level of usefulness, 1.45 and a standard deviation of 0.96. A list of all information sources is in Table 2. In addition to determining what information sources were used and their usefulness, information was sought about student satisfaction with the information sources. Participants were asked if the information needed to make an informed decision was present during the decision-making process.

Table 2

*Information Sources Used and Usefulness*

| Source of Information | Used Percent | Usefulness M (rank) | SD |
|---|---|---|---|
| Visit to campus | 87.6 | 3.95 (1) | 1.24 |
| Personal conversation with a professor | 71.7 | 3.43 (2) | 1.50 |
| Degree program information on a Web site | 77.3 | 3.36 (3) | 1.41 |
| Printed OSU publications | 72.3 | 3.23 (4) | 1.39 |
| Printed CASNR publications | 71.0 | 3.15 (5) | 1.50 |

| | | | |
|---|---|---|---|
| OSU Web site information | 71.7 | 3.07 (6) | 1.41 |
| CASNR Web site information | 63.1 | 2.81 (7) | 1.49 |
| Personal conversation with a CASNR representative | 65.2 | 2.80 (8) | 1.49 |
| Personal conversation with an OSU admissions or high school and college relations representative | 67.6 | 2.72 (9) | 1.45 |
| Letter and/or information mailed from a CASNR representative | 63.4 | 2.58 (10) | 1.46 |
| Information obtained at a CASNR recruitment booth at FFA events | 62.5 | 2.53 (11) | 1.50 |
| Participation in FFA events on OSU campus | 57.8 | 2.53 (11) | 1.59 |
| Letter and/ or information mailed from an CASNR representative | 64.0 | 2.46 (13) | 1.39 |
| Participation in an OSU on-campus recruitment program | 58.4 | 2.38 (14) | 1.49 |
| Letter and/ or information mailed from a professor | 50.4 | 2.18 (15) | 1.49 |
| Participation in Animal Science "Big Three" Judging Field Days | 51.6 | 2.15 (16) | 1.55 |
| Visits by OSU representative to your school | 56.6 | 2.13 (17) | 1.43 |
| Participation in athletic events on OSU campus | 51.9 | 2.09 (18) | 1.43 |
| Participation in other student events on OSU campus | 52.5 | 2.03 (19) | 1.41 |
| Phone call from an a CASNR representative | 53.4 | 2.02 (20) | 1.35 |
| Phone call from an OSU admissions or high school and college relations representative | 51.3 | 1.94 (21) | 1.33 |
| TV, radio, newspaper, or magazine advertisements | 51.6 | 1.77 (22) | 1.12 |
| Participation in an CASNR on-campus recruitment program (Future Ag Leaders Conference) | 47.8 | 1.75 (23) | 1.34 |
| Participation in 4-H events on campus | 47.5 | 1.73 (24) | 1.29 |
| Participation in an OSU promotion event sponsored by OSU alumni in your area | 49.0 | 1.72 (25) | 1.17 |
| Visit by CASNR representative to your school | 46.6 | 1.63 (26) | 1.10 |
| Information obtained at an on-campus multicultural event through participation in REAP program | 44.2 | 1.51 (27) | 1.04 |
| Participation in the Noble Foundation's Ag Venture program | 43.4 | 1.45 (28) | .96 |

The participants who responded "not satisfied" were asked to identify what additional information would have been helpful. Two ideas that were mentioned frequently was to provide more information on transfer credit from junior college or other universities to this Midwestern University and more information directly from the College of Agricultural Sciences and Natural Resources.

*Influences*

Participants ranked the level of influence of institutional characteristics, selected individuals, degree program characteristics, and influence of social interaction using a scale from 1 to 5, 1 indicating "not influential" and 5 indicating "very influential."

Opportunities after graduation were the most influential institutional characteristic with a mean level of influence of 4.03. Academic reputation, quality of facilities, campus environment, and scholarships awarded were influential characteristics participants sought in choosing a college.

Fourteen total institutional characteristics had a mean level of influence greater than 3.00. Influential individuals were measured by giving the participants a list of 15 potentially influential individuals, and they were asked to rank the level of influence for each of the individuals in terms of college-choice decisions. To determine the individuals used for input, the participants were asked not to select a level of influence if they did not consult that particular individual on college-choice decisions.

The most used and most influential individual in university selection was a parent or guardian. This individual received a mean level of influence of 3.31 and was used by 93.8% of participants (Table 3). More than 70% of participants used all individuals except community college counselors in the university selection process.

Seven degree program characteristics were used to measure participants' influence of the degree program. Participants were asked to rank the influence of degree program characteristics
in making college-choice decisions using a scale of 1 to 5, 1 indicating "not influential" and 5 indicating "very influential." The most influential degree characteristic was career
Table 3

*Influence of People in Selection of University*

| | Used | Level of Influence | |
|---|---|---|---|
| People | Percent | M (rank) | SD |
| Parent or guardian | 87.6 | 3.41 (1) | 1.24 |
| OSU graduate | 71.7 | 2.94 (2) | 1.50 |
| Relative who attended OSU | 77.3 | 2.70 (3) | 1.41 |
| High school agriculture teacher | 72.3 | 2.63 (4) | 1.39 |
| Friend in college | 71.0 | 2.61 (5) | 1.50 |
| CASNR faculty and/or staff | 71.7 | 2.40 (6) | 1.41 |
| Agriculture or 4-H extension Educator | 63.1 | 2.38 (7) | 1.49 |
| Current CASNR student | 65.2 | 2.38 (8) | 1.49 |
| Other high school teacher | 67.6 | 2.16 (9) | 1.45 |
| OSU high school and college relations representative | 63.4 | 2.13(10) | 1.46 |
| Friend in high school | 62.5 | 2.12 (11) | 1.50 |
| High school guidance counselor | 57.8 | 1.98 (11) | 1.59 |
| Community college instructor | 64.0 | 1.84 (13) | 1.39 |
| High school science teacher | 58.4 | 1.49 (14) | 1.49 |

opportunities after graduation with a mean level of influence of 4.18 and a standard deviation of .99. Quality of facilities (3.84) as well as quality and reputation of courses (3.76) and faculty (3.71) influenced student decisions.

*Decision Making*

Participants were asked when they began the process of selecting a college and were asked to choose one of five categories based on grade classification. More than one-fourth (26.8%) of the participants began their decision-making process before the ninth grade. By the time participants had finished the eleventh grade, 78.3% (266) had begun the decision-making process.

Participants were asked to determine when they finalized their decision to attend this Midwestern University. Eight response options were given for participants. About one-fourth (26.6%) of participants had made the decision to attend this university before their senior year of high school. The majority (60.4%) made their decision to attend this university during the twelfth grade or while attending community college (18%) (Table 4).

Table 4

*Final Decision to Attend University*

| Grade | Frequency (rank) | Percent (%) |
|---|---|---|
| During 12th grade, 1st semester | 74 (1) | 21.8 |
| During 12th grade, 2nd semester | 70 (2) | 20.6 |
| Community college | 61 (3) | 18.0 |
| No response | 44 (4) | 13.0 |
| During 11th grade | 43 (5) | 12.7 |
| Before 9th grade | 29 (6) | 8.6 |
| During 10th grade | 12 (7) | 3.5 |
| During 9th grade | 6 (8) | 1.8 |

## Conclusions/ Discussion

*Information sources*

Campus visits were the most useful source of information. This is consistent with the literature in that others found campus visits to be useful (Boyer, 1987; Gorman, 1974; Kealy and Rockel, 1987; Washburn, 2002; and Rocca et al., 2004). Printed publications and letters from an admissions representative were used by more than half of the participants. Washburn (2002) found more than half used printed publications as an information source. Sources of information considered useful were campus visits, personal conversation with a professor, degree information from a Web site, and printed publications from the university, college or department. Nearly 93% of participants agreed the information they used was satisfactory.

*Influences*

Participants in this study noted the two most influential institutional characteristics were opportunities after graduation and the academic reputation of the university. Rocca et al. (2004) identified these characteristics to be the most influential. Gorman (1974), Shuster et al. (1988), and Washburn (2002) found academic reputation to be influential in student college choice. Donnermeyer and Kreps (1994) found scholarships and incentives to be one of the most important factors. Cole and Fanno (1999) found financial incentives to be key in college choice, while financial incentive ranked fifth in this study. The least influential institutional characteristic in this study was prominence of university athletic teams, which is consistent with previous research (Rocca et al., 2004; Washburn, 2002).

In reference to significant individuals, participants noted a parent or guardian was the most influential. This was consistent with the majority of the literature (Broekemier and Seshadri, 1999; Donnermeyer and Kreps, 1994; Rocca et al., 2004; and Washburn,

2002). Greer (1991), however, found that parents did not strongly influence their children's decisions to attend a particular college. Agricultural teachers were the fourth most influential individual in this study despite their mean level of influence being below 3.00 on a 1 to 5 scale, I indicating "not influential" and with 5 indicating "very influential."

Career opportunities was the most influential degree program characteristic in this study and being the most influential in the Washburn (2002) and Rocca et al. (2004) studies. Of the seven degree program characteristics listed, the number of students in the major fell below a mean influence of 3.00 based on a 5-point scale, with 1 indicating "not influential" and 5 indicating "very influential."

*Decision Making*

This study found 78% of students who participated had begun the process of choosing a college by the time they started the 12th grade (senior year) of high school. This was representative of the findings in the Rocca et al. (2004) and the Washburn (2002) studies. More than 60% of participants had finalized their decision to attend this university during the 12th grade (senior year) of high school or while attending community college.

Since the college student is ever changing, it is important to continue to research the factors that influence college choice. As the research indicates, significant persons, institutional characteristics, and communication efforts influence the college-choice process. Considering that parents or guardians tend to be the most influential person in a student's college choice, more research needs to be conducted to identify background information of these individuals and what factors they use to influence the college-choice process. More recruitment efforts need to be made to include significant persons in the recruitment process. Materials may need to be developed to educate this group as well as the prospective students about institutional characteristics.

With institutional characteristics such as academic reputation being identified as influential in a students' decision to attend a particular college, it is imperative that each institution identify and understand its unique positive and negative traits. With academic reputation being so influential, it is important to maintain a strong and positive academic image. Efforts to increase this reputation must be made. Research should be conducted to determine the attributes of academic reputations a prospective student finds to be the best marks of a prestigious institution. This may help an institution improve its own image and prevent negative perceptions.

As indicated, campus visits are one of the most influential sources of information used by prospective college students. Institutions need to continue to increase opportunities to attract prospective students onto their campuses and strive to provide a positive experience. Whether an informal or a formal visit, a professor should be available to assist in the presentation. Printed materials are important sources of information. Although printed materials are influential, it is important to note that more and more prospective students are using Web sites as sources of information. In this study, both the university Web site and the college Web site ranked directly under printed materials as the most useful source of information. Research should be done with prospective students to assist in the development of information presented on university Web sites. Research should focus on the ease of use of university Web sites.

Considering when students are beginning the college-choice process, recruitment efforts should focus on prospective students earlier than high school. It is important to note that a large majority of prospective students finalize their decision in the 12th grade or final year of high school. Rocca et al. (2004) said that campus visits are most influential during the final stages of choosing a college. Therefore, it is important to study if campus visits are occurring more often during a students' senior year.

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**Finding Golden Rice in the GMO arena:**

**The framing of Golden Rice and agricultural biotechnology in Philippine newspapers**

(*Research Paper*)

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**Finding Golden Rice in the GMO arena:**
**The framing of Golden Rice and agricultural biotechnology in Philippine newspapers**


## ABSTRACT

This study investigates how Philippine print media framed GMOs, particularly golden rice, to determine how golden rice fits within the whole picture of the GMO controversy. A content analysis of two leading nationally circulated newspapers in the Philippines and two regional newspapers was conducted to allow a comparison of national and regional newspapers in terms of coverage intensity as well as the frames used to explain golden rice to their respective audiences. Results show that Philippine newspapers' coverage from 2000 to 2004 was very minimal (187 articles) and predominantly framed articles around regulatory concerns. Golden rice received dismal coverage from the four newspapers --- regional newspapers did not cover it at all while national newspapers published only five stories. GMOs as a general issue, however, were discussed in an average of three articles per month. A majority of these articles were found in two national news dailies. Both regional newspapers were negative toward the whole GMO issue but national newspapers were split. These findings suggest that golden rice is still neither a local nor a national issue. The absence of the coverage of golden rice in the local print media and the very low coverage in national newspapers can be attributed to the fact that unlike *Bt* corn, golden rice is still deep in its testing phase. It suggests that golden rice has yet to become a part of the mainstream media agenda.



***Keywords:*** *Golden rice, genetically modified organisms, agricultural biotechnology, frames, framing*

## INTRODUCTION

The media offer an important avenue for public debate. Ideally, the media facilitate communication of various issues among stakeholders in society and provide assertions and counter assertions from different sides of a debate. They can frame biotechnology in different ways so as to make it more salient in the minds of audiences and influence public perceptions (Nisbet & Lewenstein, 2001). From a risk communication perspective, the media can set an agenda that can significantly raise awareness about agricultural biotechnology although such awareness may be transitory and not permanent (Marks, Kalaitzandonakes, Allison & Zakharova, 2002). However, the media have been accused of sensationalistic and biased coverage of biotechnology by both sides in the debate (Marks & Kalaitzandonakes, 2001). In the early 1990s, media coverage in the United States and the United Kingdom was largely in favor of agrobiotechnology, stressing its potential benefits. Later, events such as the outbreak of madcow disease in Europe and threats to the Monarch butterfly from *Bt* corn in the United States have affected the tone of coverage regarding biotechnology on both sides of the Atlantic (IFIC, 2001 as cited by Nisbet & Lewenstein, 2001). Many believe that the media coverage of science is more interested in sensationalism than the truth. The coverage, they contend, is much focused on trendy discoveries rather than on basic research and development. They further argue that the media overstress risks, which causes undue public anxiety and fear (Hartz & Chappell, 1997).

Certainly, the public's need for reliable information calls for scientists to establish partnerships with journalists to communicate accurate scientific information to the public. However, the gap between scientists and the press is greater in developing countries where discussions of biosafety and bioproduct quality are few and far between. Most developing country journalists are unfamiliar with the subject matter, and the biosafety regulatory mechanisms are not yet in place (Public perception, 1995).

This study investigates how the Philippine press communicated the risks inherent in and the potential benefits that can be derived from golden rice. Tremendous mass media coverage of transgenic research and development has made this a social issue in contrast to a purely scientific one. This means that to some extent, public acceptance of this technology lies in the hands of those who can influence mass media coverage and subsequent policy and funding initiatives that are no longer in the hands of scientists (Abbott & Lucht, 2000). Thus, expanding the debate on golden rice ensures that a multiplicity of perspectives is present and is considered as a variety of stakeholders determine how genetic engineering is used and applied in Philippine agriculture.

## THEORETICAL FRAMEWORK

### Golden Rice

Golden rice is a variety of rice genetically modified to contain beta-carotene, a source of Vitamin A, which lends it a golden glow. It was developed to combat Vitamin A deficiency that can cause blindness. The World Health Organization estimates that 250,000 to 500,000 of these children become blind every year, and about 50% of them die within a year. In 1998, the Philippine National Nutrition Survey found that about 8.2% of children (age 6 months to 5 years) and about 7.1% of pregnant women suffer from Vitamin A deficiency. Golden rice and other GMOs rich in Vitamin A are considered part of the solution to this problem (Friedlander Jr., 2003) because staple food crops like rice with this nutrient can be widely distributed. Golden rice is seen as a tool to carry out this strategy (A Golden, 1999). Like other GM crops, golden rice is also controversial. While proponents of golden rice argue that it is a potential solution to world

hunger and malnutrition, opponents contend that (1) it would only destroy the world's rich biological diversity because GM products are living organisms and therefore can multiply and reproduce (Toms, 2003); (2) it can act like a Trojan horse, serving to fast-track the acceptance of GM crops in developing countries (The False, 2001); (3) it contains very low levels of beta-carotene anyway --- less than what is needed to fight Vitamin A deficiency, and cheaper and more proven solutions are still available to fight malnutrition (Brower, 2001); and (4) it is not a universal remedy and it should not be seen as one. "It is not a technology for the poor but selfishly caters only to the interests of the few who already have much. For Asian farmers who have everything to lose with every planting season, transgenics may be the biggest gamble they have yet to take. There is no certainty, and the odds are already playing against their favor" (All That Glitters, 2001, p. 4).

**Media coverage of agricultural biotechnology**

Many scientists bemoan their observation that media reporting tends to present a distorted image of science. Journalists, they claim, report scientific controversies as binary problems that oversimplify what are usually very complex situations. Reporters, they decry, tend to ignore other socially important aspects, such as intellectual property protections, wealth and knowledge disparities and the ethics of the technology. Thus, many important facets of the debate are not sufficiently covered in the media (Jasanoff, 2003). There are two reasons why science reporting in the media often fails the public. First, media practitioners strongly aim to get the "other side of the story" even if it does not necessarily represent the thinking of most people in the scientific field. The presentation of both sides of an issue surely makes great copy, but the practice can make the issue ambiguous rather than clarify it. The second and perhaps more important reason why scientific controversies are not well presented in the modern media is because scientific controversies are rarely just about science. For example, complex scientific principles seldom fit in a ten-column inch story or a two-minute news piece (Aidala, 2002). Aidala (2002) argues that most reporters fail to adequately convey the scientific enterprise to the public because they are ill-equipped to translate highly technical issues into the modern media format. Another aspect in the debate over whether the media adequately cover biotechnology is the fact that the media are not monolithic entities. Apparently, the coverage of issues varies widely from print to broadcast to online platforms. In newspapers, stories about biotechnology may range from short non-bylined news pieces to long and comprehensive series that include graphics and explanatory sidebar stories (The Odd, 2002).

Marks, *et al*. (2002) observe that print media coverage of biotechnology has focused on the environmental risks rather than on its potential benefits. Whether this has played an important role in shaping public opinion about biotechnology is unclear. There are two factors that might determine why coverage becomes more negative or controversial for some issues: the efforts of individuals, groups and institutions to publicize the issue, and the journalists' understanding or framing of an issue (Abbott & Lucht, 2000).

**Framing as a theory of mass media effect**

Framing theory is based on the idea that the media focus attention on certain events and then place them within a field of meaning. Journalists choose how the news is organized and what frame to use in presenting the news; hence, a frame refers to the way the media organize and present events and issues and the way audiences interpret what they receive. Certainly, this form of agenda-setting does not only tell people *what to think about, but also how to think about*

*it* (Framing, 2004). Frames can be used both in the presentation and interpretation of news. Frames are "devices embedded in political discourse" in the case of media frames, and as "internal structures of the mind" in the case of individual or audience frames (Kinder and Sanders, 1990, p. 74). Frames, largely unspoken and unacknowledged, organize the world mutually for journalists who report it and in some important degree, for people who rely on their reports (Gitlin, 1980). Frames are abstract notions that organize or structure social meanings.

Gamson & Modigliani (1987) conceptually defined a media frame as "a central organizing idea or story line that provides meaning to an unfolding strip of events… The frames suggest what the controversy is about, the essence of the issue" (p. 143). Entman (1993), elaborating on how the media provide audiences with schemas to interpret events, says that "to frame is to select some aspects of a perceived reality and make them more salient in a communication text, in such a way as to promote a particular problem definition, casual interpretation, moral evaluation, and/or treatment recommendation" (p. 52). Media frames serve as working routines for journalists to quickly identify and classify information and to package it for efficient relay to audiences (Gitlin, 1980). This concept of media framing can include the intent of the sender, but the motives can also be unconscious ones (Gamson, 1989). The framing and presentation of events and news in the mass media can thus systematically affect how recipients of the news come to understand these events (Price, Tewksbury, & Powers, 1995).

Media frames and audience frames can be studied as independent variables or as dependent variables (Scheufele, 1999). This study investigates media frames present in the coverage of the Philippine newspapers' coverage of golden rice as the independent variable.

Considering the foregoing literature, this study asks:

1. How intensely was golden rice and GMOs covered in Philippine newspapers? How many articles were published per month? Where were the articles placed?
2. What kinds of frames were used by newspapers to frame golden rice and GMOs? How many frames (average) were used per article? What was the dominant frame?
3. What was the tone of the newspaper coverage—was it positive, balanced, negative, or devoid of tone (neutral)?

## METHODOLOGY

*Research design and sampling procedure*

To allow for a comparison of national and regional newspapers in terms of coverage intensity as well as the frames used to explain golden rice and agricultural biotechnology to their respective audiences, a systematic content analysis of two leading nationally circulated newspapers in the Philippines (*Philippine Daily Inquirer* and *Manila Bulletin*) and two regional newspapers (*The Bohol Chronicle* and *Sun.Star Cebu*) was conducted. The sample included news articles about golden rice, *Bt* rice, *Bt* corn and GMOs in general. This approach was taken to provide a comparison of the coverage of other GM crops and to determine how golden rice fits within the whole picture of the GMO controversy.

The Philippines was selected for this study because rice is of critical importance in the diet of Filipinos. The Philippines is also home to key rice research institutions, such as the International Rice Research Institute (IRRI), that are playing an important role in research and development related to this crop. Bohol province was chosen as the study site because it is the largest agricultural province in the Central Visayas region, and has officially ban genetically modified organisms (including golden rice) because of their alleged negative effects on the environment and human health even though tests showed that GM crops planted in several

provinces in Mindanao and Luzon were safe for human health and the environment and that they have increased yield (Visayan Farmers, 2004).

The *Philippine Daily Inquirer* (PDI) and the *Manila Bulletin* (MB) are the leading newspapers in the country. *The Bohol Chronicle* has been the independent newspaper since 1954 in Bohol while the *Sun.Star Cebu* is Cebu province's leading daily newspaper with the largest readership and the biggest advertising share.

The following media frames used in this analysis were based on the frames identified by Abbott & Lucht (2000):

**Health frame.** This frame talks about GMOs, especially golden rice, in relation to human health and how safe they are for human consumption. It often contains words such as "toxin" and "allergens."

**Economic frame.** This frame zeroes in on the role of food and giant agricultural companies such as Syngenta, Monsanto and Du Pont in genetic modification of agricultural products. This frame also includes the costs of seeds, actions of multinational corporations, profit and other money matters associated with GMOs.

**Regulation frame.** This frame involves information about national, regional and local policy pronouncements about GMOs, the implementation of regulatory codes and guidelines for GMO use, the entry of GMOs like golden rice into the country or provinces, field trials and increase of land devoted to GM crops, and the commercialization of GM products.

**Research frame.** This frame features research and results related to GMOs.

**Moral frame.** This frame links golden rice to religious and moral beliefs (e.g. golden rice as an unacceptable intervention in God's creation, or GM crops as the product of technical skills and intellect bestowed by God).

**Labeling frame.** This frame discusses the debate regarding the labeling of raw and processed products that have genetically altered ingredients.

**Environment frame.** This frame focuses on the possible beneficial or harmful effects of GMOs on the environment.

**Definition frame.** This frame explains or defines GMOs, genetically altered agricultural products, the process of genetic engineering or biotechnology research. For example, "GMOs are organisms engineered to contain genes from unrelated species."

**Other.** News articles that contain any frames that do not belong to any category above fall under this "other" category.

Every news article was analyzed to determine the dominant frame --- the main organizing frame of the article. There is only one dominant frame in a news article, even if the article may contain one or more frames. The most frequently occurring frame within a story was considered the dominant frame.

The general orientation or tone of each article was coded as follows:

**Positive coverage**. News articles that highlight the potential of GMOs, specifically golden rice to open more opportunities in agriculture and the economy, to provide more food, to promote human health, and to protect the environment are considered as having a positive valence. Positive stories see GMOs as safe, helpful, important, beneficial, morally acceptable and/or healthy. A code of '3' was assigned to articles that showed positive tone.

**Balanced coverage.** An article is considered as having a balanced orientation if both positive and negative points about GMOs are depicted as having more or less equal weight. A story with a balanced orientation received a code of '2.'

**Negative coverage.** Articles that see GMOs, especially golden rice, as dangerous, a threat, a "Trojan horse", unnecessary, immoral and/or harmful to human health are coded as having a negative orientation (coded as "1").

**Neutral coverage.** News articles that do not depict either positive or negative views about GMOs, particularly golden rice, are considered as showing a neutral orientation. They were coded as zero.

The five-year period of analysis, from January 1, 2000, to December 31, 2004, included the time when golden rice arrived in the Philippines (2001) and the contentious public debate it generated. A total of 187 articles, six from *The Bohol Chronicle*, 14 from the *Sun.Star Cebu*, 68 from the *Manila Bulletin*, and 99 from the *Philippine Daily Inquirer* were analyzed for this study. Each news story was used as the unit of analysis. Data were analyzed using descriptive statistics.

Prior to the final analysis, the intercoder reliability, which involved two coders including the author, was calculated using Holsti's (1969) formula: $CR = 2(M)/N_1 + N_2$. It utilized news articles not included for the final analysis. The test earned a score of 91.25%.

## RESULTS

### Intensity of Coverage

The five-year period produced a total of 187 news articles, which included five articles about golden rice, four about *Bt* rice, 113 about *Bt* corn and 65 about general GMOs.

As Table 1 shows, the national newspapers published five golden rice-related articles (four from the *Manila Bulletin* and one from the *Philippine Daily Inquirer*) indicate poor coverage of golden rice. For all topics relating to GM crops, the *Manila Bulletin* had 68 articles while the *Philippine Daily Inquirer* printed 99 articles. These two newspapers had more or less the same number of articles about *Bt* corn (51 from the *Manila Bulletin* and 56 from the *Philippine Daily Inquirer*). Both had equal numbers of articles about *Bt* rice. However, they differed significantly in the coverage of GMOs as a general topic. The *Manila Bulletin* had 11 GMO articles compared to 40 from the *Philippine Daily Inquirer*. This suggests that national newspapers gave the same weight to stories about new specific biotech crops, but differed in their coverage of the general GMO topic. Indeed, the GM issue as a whole was not well-covered in regional newspapers but the national print media paid relatively more attention to it. In general, however, the controversy over genetically modified organisms was not a staple in the Philippine media agenda. The total of 187 news articles for a five-year time period is certainly not remarkable for a country that has been debating GMOs for years, especially in Bohol, which was approved for its Provincial Ordinance No. 2003-10, otherwise known as "The Safeguard against GMOs" ordinance that instituted stringent measures to protect the health of the people as well as the ecological soundness of the province from the potential catastrophic ill-effects of GMOs. Needless to say, *Bt* corn received more attention than either golden rice or *Bt* rice because *Bt* corn was the first GM crop the country experimented with at the field trials. It was also later released for commercial growing.

On average, there were only three articles per month in all four newspapers combined. A considerable increase was noted in 2003, as the mean became seven articles per month but the coverage dropped to three articles per month in 2004. Most of the articles were printed in May 2003, triggered by a hunger strike led by Roberto Versola of Philippine Greens, who demanded a moratorium on the commercialization of *Bt* corn.

Only three news articles from the *Philippine Daily Inquirer* were placed on the front page – one article was about golden rice while the two other articles were related to *Bt* corn. The articles found in *The Bohol Chronicle* and *Sun.Star Cebu* were all located on inside pages. The *Manila Bulletin* clippings did not contain page numbers so their page location could not be ascertained.

**Media Frames**

Table 2 lists the overall frames identified in the 187 stories examined in the study. Numbers of the articles containing each of the eight frames were as follows: regulation (156), health (125), environment (103), economic (94), research (62), definition (47), labeling (20), and moral frames (8). The dominant frame, which is the most frequently used frame, was the regulation frame, found in 120 of the 187 articles (64.17%).

*Manila Bulletin* explained golden rice more broadly compared to the *Philippine Daily Inquirer* by using more frames. Its four news articles contained at least three or more frames per story, while the one article from the *Philippine Daily Inquirer* used only two frames, health and environment. Neither newspaper used moral or labeling frames. The dominant frame used by *Manila Bulletin* in its coverage of golden rice was regulation frame while the health frame was found to be the dominant frame in the *Philippine Daily Inquirer*. The regional newspapers printed no articles about golden rice. Moral frames did not receive any attention in the coverage of golden rice perhaps because the involvement of the church or other religious sectors was negligible even though the Vatican believed that GM foods could be the solution to global hunger and malnutrition (Vatican Hails, 2003). There was only one religious source mentioned by the *Manila Bulletin*. It is emphasized, however, that results cannot be generalized due to close-to-none coverage of golden rice of the national newspapers. *Manila Bulletin* had four articles while *Philippine Daily Inquirer* had only one.

In like manner, neither of the national newspapers used moral or labeling frames in their discussions about *Bt* rice and both of them had regulation frame as its dominant frame. Regional newspapers did not have news articles about *Bt* rice.

With regard to their coverage of *Bt* corn, both local newspapers skip moral frame in their reports. While regulation was the dominant frame in *The Bohol Chronicle*, but the *Sun.Star Cebu* had two equal dominant frame modes: regulation and economic. A total of 107 news articles, 51 in *The Manila Bulletin* and 56 in the *Philippine Daily Inquirer*, discussed *Bt* corn. Unlike regional newspapers, national dailies used all frames including moral and labeling frames. They had regulation as the dominant frame. The same is true in their use of frames in the coverage of GMOs in general.

**Tone of Coverage**

The coders were asked to determine if the stories' orientation toward a GM topic was positive, balanced, negative or neutral. Table 3 shows that 34% (64 news articles) were negative, 25% (46 news articles) were balanced, 24% (44 news articles) were positive, and 18% (33 news articles) were neutral toward specific GM issues. While the regional newspapers were predominantly negative about everything except *Bt* corn, the national newspapers were split on the general topic. The *Manila Bulletin* exhibited balanced to positive coverage while the *Philippine Daily Inquirer* showed neutral to negative presentation of the whole GMO issue.

*Table 1. Overall number of articles per year in the coverage the whole GMO issue*

| Year | Topic | Newspaper | | | | Grand Total |
|---|---|---|---|---|---|---|
| | | Bohol Chronicle | Sun.Star Cebu | Manila Bulletin | Philippine Daily Inquirer | |
| **2000** | Golden rice | 0 | 0 | 2 | 1 | 3 |
| | *Bt* rice | 0 | 0 | 0 | 0 | 0 |
| | *Bt* corn | 0 | 0 | 0 | 5 | 5 |
| | GMO | 0 | 1 | 0 | 4 | 5 |
| ***2000 Total*** | | ***0*** | ***1*** | ***2*** | ***10*** | ***13*** |
| **2001** | Golden rice | 0 | 0 | 1 | 0 | 1 |
| | *Bt* rice | 0 | 0 | 0 | 2 | 2 |
| | *Bt* corn | 0 | 0 | 0 | 10 | 10 |
| | GMO | 1 | 3 | 1 | 14 | 19 |
| ***2001 Total*** | | ***1*** | ***3*** | ***2*** | ***26*** | ***32*** |
| **2002** | Golden rice | 0 | 0 | 0 | 0 | 0 |
| | *Bt* rice | 0 | 0 | 0 | 0 | 0 |
| | *Bt* corn | 0 | 0 | 8 | 2 | 10 |
| | GMO | 0 | 2 | 6 | 2 | 10 |
| ***2002 Total*** | | ***0*** | ***2*** | ***14*** | ***4*** | ***20*** |
| **2003** | Golden rice | 0 | 0 | 0 | 0 | 0 |
| | *Bt* rice | 0 | 0 | 0 | 0 | 0 |
| | *Bt* corn | 1 | 4 | 25 | 35 | 65 |
| | GMO | 1 | 0 | 4 | 16 | 21 |
| ***2003 Total*** | | ***2*** | ***4*** | ***29*** | ***51*** | ***86*** |
| **2004** | Golden rice | 0 | 0 | 1 | 0 | 1 |
| | *Bt* rice | 0 | 0 | 2 | 0 | 2 |
| | *Bt* corn | 0 | 1 | 18 | 4 | 23 |
| | GMO | 3 | 3 | 0 | 4 | 10 |
| ***2004 Total*** | | ***3*** | ***4*** | ***21*** | ***8*** | ***36*** |
| ***Grand Total*** | | ***6*** | ***14*** | ***68*** | ***99*** | ***187*** |

*Table 2. Kinds of frames and dominant frames used in the coverage of the whole GMO issue*

| Frames | Topic | Newspaper | | | | | | | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BC | | SSC | | MB | | PDI | | | |
| | | Freq | Dominant | Freq | Dominant | Freq | Dominant | Freq | Dominant | Freq | Dominant |
| Regulation | Golden rice | 0 | 0 | 0 | 0 | 3 | 2 | 0 | 0 | **3** | **2** |
| | *Bt* rice | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | **3** | **1** |
| | *Bt* corn | 1 | 1 | 1 | 2 | 43 | 30 | 50 | 43 | **95** | **76** |
| | GMOs | 5 | 4 | 9 | 6 | 11 | 8 | 30 | 23 | **55** | **41** |
| ***Regulation Total*** | | ***6*** | ***5*** | ***10*** | ***8*** | ***58*** | ***41*** | ***82*** | ***66*** | ***156*** | ***120*** |
| Health | Golden rice | 0 | 0 | 0 | 0 | 4 | 1 | 1 | 1 | **5** | **2** |
| | *Bt* rice | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 0 | **3** | **1** |
| | *Bt* corn | 1 | 0 | 4 | 0 | 30 | 7 | 32 | 4 | **67** | **11** |
| | GMOs | 5 | 0 | 9 | 1 | 8 | 1 | 28 | 4 | **50** | **6** |
| ***Health Total*** | | ***6*** | ***0*** | ***13*** | ***1*** | ***44*** | ***10*** | ***62*** | ***9*** | ***125*** | ***20*** |
| Environment | Golden rice | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | **2** | **0** |
| | *Bt* rice | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | **1** | **0** |
| | *Bt* corn | 1 | 0 | 2 | 1 | 23 | 2 | 31 | 2 | **57** | **5** |
| | GMOs | 5 | 0 | 6 | 0 | 8 | 0 | 23 | 1 | **42** | **1** |
| ***Environment Total*** | | ***6*** | ***0*** | ***8*** | ***1*** | ***32*** | ***2*** | ***56*** | ***3*** | ***102*** | ***6*** |
| Economic | Golden rice | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | **2** | **0** |
| | *Bt* rice | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | **2** | **2** |
| | *Bt* corn | 1 | 0 | 3 | 2 | 33 | 10 | 27 | 4 | **64** | **16** |
| | GMOs | 1 | 0 | 3 | 1 | 3 | 1 | 19 | 3 | **26** | **5** |
| ***Economic Total*** | | ***2*** | ***0*** | ***6*** | ***3*** | ***40*** | ***11*** | ***46*** | ***9*** | ***94*** | ***23*** |

***Legend :*** ***BC*** *- The Bohol Chronicle* ***SSC*** *- Sun.Star Cebu* ***MB*** *- Manila Bulletin* ***PDI*** *- Philippine Daily Inquirer*

*Table 2. Continued…*

| Frames | Topic | Newspaper | | | | | | | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BC | | SSC | | MB | | PDI | | | |
| | | Freq | Dominant | Freq | Dominant | Freq | Dominant | Freq | Dominant | Freq | Dominant |
| Research | Golden rice | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | **3** | **1** |
| | *Bt* rice | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | **2** | **0** |
| | *Bt* corn | 1 | 0 | 0 | 0 | 20 | 1 | 14 | 3 | **35** | **4** |
| | GMOs | 1 | 0 | 4 | 0 | 3 | 1 | 14 | 4 | **22** | **5** |
| ***Research Total*** | | ***2*** | ***0*** | ***4*** | ***0*** | ***28*** | ***3*** | ***28*** | ***7*** | ***62*** | ***10*** |
| Definition | Golden rice | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **1** | **0** |
| | *Bt* rice | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** | **0** |
| | *Bt* corn | 1 | 0 | 3 | 0 | 15 | 0 | 16 | 0 | **35** | **0** |
| | GMOs | 3 | 0 | 3 | 0 | 0 | 0 | 4 | 0 | **10** | **0** |
| ***Definition Total*** | | ***4*** | ***0*** | ***6*** | ***0*** | ***16*** | ***0*** | ***20*** | ***0*** | ***46*** | ***0*** |
| Labeling | Golden rice | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** | **0** |
| | *Bt* rice | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** | **0** |
| | *Bt* corn | 0 | 0 | 2 | 0 | 0 | 0 | 5 | 0 | **7** | **0** |
| | GMOs | 3 | 1 | 2 | 1 | 1 | 0 | 7 | 2 | **13** | **4** |
| ***Labeling Total*** | | ***3*** | ***1*** | ***4*** | ***1*** | ***1*** | ***0*** | ***12*** | ***2*** | ***20*** | ***4*** |
| Moral | Golden rice | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** | **0** |
| | *Bt* rice | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** | **0** |
| | *Bt* corn | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | **2** | **1** |
| | GMOs | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 3 | **6** | **3** |
| ***Moral Total*** | | ***0*** | ***0*** | ***0*** | ***0*** | ***0*** | ***1*** | ***8*** | ***3*** | ***8*** | ***4*** |
| ***Grand Total*** | | ***29*** | ***6*** | ***51*** | ***14*** | ***219*** | ***68*** | ***314*** | ***99*** | ***613*** | ***187*** |

***Legend :*** ***BC*** *- The Bohol Chronicle* ***SSC*** *- Sun.Star Cebu* ***MB*** *- Manila Bulletin* ***PDI*** *- Philippine Daily Inquirer*

*The Bohol Chronicle*'s unsupportive coverage of GMOs was expected because of the official ban on genetically altered crops in the province. Seven out of 14 articles from the *Sun.Star Cebu* were also negative (four were balanced, two were neutral and one was positive), implying a lack of support for the government's approval of GMO testing in the country. The *Sun.Star Cebu*'s negative portrayal of transgenic crops can be attributed to the fact that Cebu is the home province of the Department of Agriculture's Region VII office that approved Resolution No. 2003-235. Because Cebu is located near Bohol, the official ban could have permeated throughout the sub-national region. The *Sun.Star Cebu*'s limited number of articles about GMO topics was perhaps due to the province's non-agricultural orientation. Its limited but negative coverage reflects Cebu's worry about feeding a bustling metropolis with GM products from prime agricultural provinces such as Bohol.

The differing tone of the two national newspapers was not expected. The *Manila Bulletin* was in favor of golden rice. Its four articles had a positive tone, but the *Philippine Daily Inquirer*'s single article about golden rice was negative. The national newspapers' coverage of other GM crops (*Bt* rice and *Bt* corn) and even of GMOs in general was also different. In the two articles about *Bt* rice, the coverage of the *Manila Bulletin* was split (one article was positive while the other was negative). The *Philippine Daily Inquirer*'s coverage in its single article about *Bt* rice was balanced. For coverage of *Bt* corn, generally, the *Manila Bulletin* was positive while the *Philippine Daily Inquirer* was negative.

In addition, coverage of the whole GMO issue for both national dailies was polarized. Of the 11 articles in the *Manila Bulletin*, six were positive while only 2 of 40 articles in the *Philippine Daily Inquirer* were positive. Overall, more than half of the articles (56%) published by the *Manila Bulletin* were positive, while the majority of the articles (65%) from the *Philippine Daily Inquirer* were negative. This bi-polar tone of coverage can be attributed to the fact that for many, the *Manila Bulletin* is regarded as being pro-administration regardless of who is in power. It is also recognized for its optimistic journalism. *Manila Bulletin* has been reported these days to be one of the newspapers that strongly supports the current admistration, which is pro-GMO (Wikipedia, 2006). The *Philippine Daily Inquirer*, on the other hand, "maintains the freedom to take a position regardless of external and internal pressure and respects independent thinking and freedom to express views and opinions" (Philippine Daily Inquirer, 2006). The newspaper's negative coverage of the whole GMO issue also might have resulted from the information sources cited in the articles. It frequently mentioned religious sectors, which are known to strongly oppose GMOs.

## IMPLICATIONS AND CONCLUSIONS

Golden rice received dismal newspaper coverage. The regional newspapers did not cover golden rice at all. National newspapers published only five stories specific to golden rice. GMOs as a general issue, however, were discussed in an average of three articles per month. A majority of these articles were found in two national news dailies. The minimal coverage in the regional newspapers is surprising, especially when the province of Bohol enacted a province-wide ban and declared itself a GMO-free zone. At this level of opposition, there is surprisingly very little said in the media on either the supporters or detractors of GMOs that may have been indicative on how this legislative opposition came about. With the GMO ban's premise as being sanctioned by majority of the Bohol population, the Department of Agriculture was compelled to ratify the ban, despite the pro-GM stance of the Philippine government. A related component to this study,

the survey results (Mula, 2006), however, indicates very low knowledge and awareness levels on GMOs among the farmer respondents. With negligible awareness and knowledge levels, how was the supposedly strong anti-GMO stance of the Bohol population came about? Who's stance did the GMO ban represent? To what degree were farmers involved in the policy decision process?

*Table 3. The coverage print media in the whole GMO issue*

| Newspaper | Topic | Positive | Balanced | Negative | Neutral | Total |
|---|---|---|---|---|---|---|
| *The Bohol Chronicle* | Golden rice | - | - | - | - | - |
| | Bt rice | - | - | - | - | - |
| | Bt corn | - | - | 1 | - | **1** |
| | GMOs | - | - | 5 | - | **5** |
| | **Total** | **-** | **-** | **6** | **-** | **6** |
| *Sun.Star Cebu* | Golden rice | - | - | - | - | - |
| | Bt rice | - | - | - | - | - |
| | Bt corn | 1 | 3 | 1 | | **5** |
| | GMOs | - | 1 | 6 | 2 | **9** |
| | **Total** | **1** | **4** | **7** | **2** | **14** |
| *The Manila Bulletin* | Golden rice | 4 | - | - | - | **4** |
| | Bt rice | 1 | - | 1 | - | **2** |
| | Bt corn | 27 | 14 | 7 | 3 | **51** |
| | GMOs | 6 | 2 | 2 | 1 | **11** |
| | **Total** | **38** | **16** | **10** | **4** | **68** |
| *Philippine Daily Inquirer* | Golden rice | - | - | 1 | - | **1** |
| | Bt rice | - | 1 | 1 | - | **2** |
| | Bt corn | 3 | 15 | 22 | 16 | **56** |
| | GMOs | 2 | 10 | 17 | 11 | **40** |
| | **Total** | **5** | **16** | **41** | **27** | **99** |
| ***Grand Total*** | | ***44*** | ***36*** | ***64*** | ***33*** | ***187*** |

These findings suggest that golden rice is still neither a local nor a national issue. The absence of the coverage of golden rice in the local print media and the very low coverage in national newspapers can be attributed to the fact that unlike *Bt* corn, golden rice is still deep in its testing phase, which implies that golden rice has yet to become a part of the mainstream media agenda, perhaps when it gets released for commercial production and consumption, and entered into the Philippine food chain, coverage can increase. On the other hand, if conflict begets coverage, perhaps the humanitarian aspect of golden rice in its supposed potential to alleviate world hunger and malnutrition may have minimized opposition, and subsequently, coverage. These same humanitarian benefits aspect have seemingly softened the negative stance of GM

detractors in Europe on golden rice (Greenpeace Approves, 2001), and may have the same pacifying effect among GM opponents in the Philippines.

National newspapers made use of more frames compared to regional newspapers. This indicates that national papers tend to present GMO topics from a more varied set of perspectives, compared to their regional counterparts. Results also reveal that national newspapers use more information sources. The use of more sources may have contributed to the variety of frames in national newspapers. Compared to regional papers, national newspapers have considerably more resources apparently due to their wider scope, enabling them to engage in more intensive investigative reporting – making use of more information sources, and field more reporters in covering GMO stories.

The minimal set of frames in the regional coverage, such as the negative regional coverage in Bohol, may also contribute to the development of a more defined stance on the GMO issue among the audience in the province; hence, Bohol has a considerably negative position on GMOs manifested in their GMO ban. It can be implied that the exposure to more frames, and subsequently to more varied perspectives on the GMO issue, may result to ambivalence or indecision, rather than lead to more defined positions, as more effort is required in processing two-sided information. Audiences can either make more intelligent decisions, or get confused and undecided. Study results reinforce this assumption as it indicates a split between the two national newspapers, with the *Manila Bulletin* showing a positive orientation, and the *Philippine Daily Inquirer* registering a negative slant.

The *Philippine Daily Inquirer* may have allocated more manpower and resources in covering the GMO beat as evidenced by its relatively heavier coverage of the subject. This may indicate that the *Inquirer* has a larger information resource-base than the *Manila Bulletin*. More information sources can mean a wider network of key informants to supply regular news feeds and can prime the paper on scoops on the topic. More information sources can also mean a more effective and comprehensive referral system -- more informants can lead to more information -- and this abundant information resource contributes to a more intensive and sustained coverage of the issue. The *Philippine Daily Inquirer* utilized more sources from academia to the religious sector, while the *Manila Bulletin*'s sources were limited to those in academia, government, public officials, business/industry and non-government organizations. The *Philippine Daily Inquirer* mentioned more religious sources, particularly the highly influential Catholic Bishop's Conference (CBCP) than the *Manila Bulletin*.

In a country whose religious sector has a longstanding reputation of militancy, the anti-GM stance of the church might have colored the negative discourse about the topic. In an overwhelmingly Roman Catholic country, the church maintains an impressive reach and influence among the population – from the cities to the remote villages in the countryside. The position of the religious sector, therefore, can be a telling force in the GM dispute. However, this negative position of the religious sector is surprising in the light of the pro-GM stance of the Vatican (Vatican Hails, 2003), which lauded GM foods to hold the answer to world starvation and malnutrition. The regional newspapers' orientation toward golden rice cannot be determined due to absence of coverage. Regional newspapers are, however, were predominantly negative on GMOs in general. *The Bohol Chronicle*'s negative GMO was expected because of the GMO ban in effect in the province. The *Sun.Star Cebu* was likewise found to show negative coverage. Considering the close proximity of Cebu to Bohol, the negative atmosphere on GMOs in Bohol may have been an effective influence as although Cebu City is the primary metropolitan hub in

the Central Philippines, corn is its primary agricultural crop and is extensively grown its rural outlying towns, hence, the supposed threat of *Bt* corn becomes an important issue.

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# Editor Preferences For The Use Of Scientific Information In Livestock Publications

Category: Research Paper

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**Editor Preferences For The Use Of Scientific Information In Livestock Publications**


## Abstract

Editors of monthly livestock publications were surveyed to determine their perceptions of the amount, type, and sources of scientific information used in their respective publications during 2005. Editors' identification of the most important topics agreed with audience perceptions of information needs and previous studies of information provided by agricultural journals, although lower rankings of policy and worker/employee safety information contradicted the importance of magazines identified by audiences in previous studies. The importance of certain gatekeeping criteria to editors reflected the general standards of accuracy and newsworthiness found in journalism, as well as editors' perceptions of their livestock audiences' information needs. The number and sources of information preferred coincided with source characteristics as criteria for using scientific information. The specific sources most preferred by editors also demonstrated the orientation of editors with other gatekeepers and the audience in selecting appropriate information for publication. Scientific information published during 2005 was similar to editors' rankings of topic importance and source preferences. The depths and overall use of scientific information during 2005 also supported the importance of delivering understandable scientific information to their agricultural audiences.



**Keywords:** Agriculture, livestock, media, gatekeeping, magazines, science

## Editor Preferences For The Use Of Scientific Information In Livestock Publications

### Introduction

The rate of acquisition of information by individuals is doubling every year (Fortin & Pierce, 1998), and information has become one of agriculture's most valuable resources (Maddox, 2001). Information is critical to decision-making processes, and agricultural producers' demands for information have increased with increased market instability, increased complexity in production technologies, and an increased need for financial planning and control (Ortmann, Patrick, Musser, & Doster, 1993). To meet their information needs, farmers and ranchers use sources of agricultural media an average of 6.2 hours per week, with one in four using media 10 or more hours per week (Harris Interactive, 2005).

The types of media and other information sources preferred by agricultural producers are as diverse as the types of agricultural production they pursue, although print sources have consistently received high rankings as information sources (Gloy, Akridge, & Whipker, 2000; Harris Interactive, 2005; Maddox, 2001; Suvedi, Campo, & Lapinski, 1999). Specifically, magazines have been shown to be an important source for various types of agricultural information across demographic and socioeconomic groups (Brashear, Hollis, & Wheeler, 2000; Brown & Collins, 1978; Bruening, 1992; Gloy et al.; Harris Interactive; Jones, Sheatsley, & Stinchcombe, 1979; Maddox; Ortmann et al., 1993; Suvedi et al.). Agricultural magazines and newspapers are read by nearly all farmers and ranchers at least once a month, and agricultural producers ranked magazines among the most credible, timely, knowledgeable, and respected sources of information (Harris Interactive).

Agricultural audiences have long acknowledged magazines as important sources of information related to management, production practices, and policy (Batte et al., 1990; Brashear et al., 2000; Brown & Collins, 1978; Foltz et al., 1996; Ford & Babb, 1989; Harris Interactive, 2005; Jones et al., 1979; Murphy, 1960; Ortmann et al., 1993; Schnitkey et al., 1992). Specific information needs consistently recognized by farmers and ranchers include animal nutrition, animal health, markets, management, technology, and genetics and reproduction (Foltz et al.; Murphy). Much of this information could be considered scientific, defined by Agnes et al. (2003) as "based on, or using, the principles and methods of science."

Gatekeepers determine the type, usefulness, and sources of agricultural information reaching farmers (Shoemaker, Eichholz, Kim, & Wrigley, 2001). Lewin (1947) originally identified gatekeepers as people through which information or goods must pass, who in turn influenced the flow of ideas through society. Later studies found media gatekeepers' decisions were influenced by age, education, organizational position, relations with colleagues, personal values, community integration, publisher attitudes, and the routines of news work (Donohew, 1967; Johnstone, Slawski, & Bowman, 1972; Shoemaker et al.; White, 1950).

In the magazine industry, the influence of the editor as a gatekeeper may be particularly strong, as magazines typically have smaller staffs. Magazine editors also tend to be more cognizant of what information they want a specialized magazine audience to receive (Fowler & Smith, 1981), which makes magazine editors an ideal subject for use in gaining insights into perceptions about the use of specific information for selected

audiences. Those insights then can be used to refine the media's role in inducing images, perceptions of reality, and individual uses of information (Wiegman, Gutteling, Boer, & Houwen, 1989).

This study sought to determine the use of scientific information in monthly livestock magazines to assist editors, writers, and sources of scientific information in coordinating an efficient flow of information from scientific professionals to livestock producers. The study was guided by four objectives:

1. Determine the importance of selected scientific topics to editors of livestock publications.
2. Determine what gatekeeping criteria editors of livestock publications used to determine the use of scientific information.
3. Determine editors' preferences for the use of sources of scientific information
4. Determine editors' perceptions of the amount, type, and sources of scientific information published during 2005.

## Methods

Editors of monthly magazines registered as 2005 publication members of the Livestock Publications Council and publishing more than six issues per year were selected for this study. The population size was 54 editors, and a census was used due to the small population size.

Descriptive survey methodology was used to determine the use of scientific information in livestock publications. Survey responses were obtained using a Web-based questionnaire designed according to the principles of the Dillman Tailored Design Method (2000). Questions were adapted from a survey of daily newspapers by Cartmell (2001) and a literature review of sources of information preferred by agricultural producers. Two editor preferences were measured using an interval scale of one to five, with a midpoint of three as the most desirable response.

A panel of experts reviewed the survey instrument to establish face and content validity. In addition, the survey instrument was pilot tested using editors of weekly livestock publications that were 2005 publication members of the Livestock Publications Council. Pilot test data were used to calculate a Cronbach's alpha of 0.86 for scaled questions.

Editors were initially contacted via telephone on Jan. 26, 2006; Jan. 27, 2006; and Jan. 30, 2006, to request participation in the online survey. Editors who verbally agreed to complete the survey were sent a personalized e-mail on the day of the call further explaining the survey and providing the link to the survey. A personalized e-mail reminder was sent to editors on Feb. 7, 2006. The initial data collection period ended on Feb. 23, 2006. Thirty-nine responses were obtained during the data collection period for a response rate of 72 percent.

Nonresponse error was controlled for by comparing the characteristics of early and late respondents to the survey, using the later 50 percent of respondents as the late respondents (Lindner & Wingenbach, 2002). No visual differences in the means of selected items were found between the early and late respondents.

Quantitative data were analyzed using the Statistical Package for Social Sciences 11.0 for Mac OS X. Descriptive statistics, including means, standard deviations, modes,

ranges, frequencies, and percentages, were used to interpret the data and describe the editors' responses.

## Findings

*The importance of scientific topics to editors*

Editors ranked the relative importance of 14 potential scientific topics (see Table 1). All editors who responded to the survey answered this question. Animal health was ranked first overall and received a ranking of one, two, or three from a majority of the editors. Management was ranked second and received the same number of first-place rankings as breeding and genetics, which was third. Following breeding and genetics were, in order of importance based on means, animal nutrition, marketing, commercial production, research, financial, policy/regulatory, training/education, food safety, animal welfare, worker/employee safety, and human nutrition.

*Gatekeeping criteria*

Editors ranked the importance of eight gatekeeping criteria to their decisions about the use of scientific information in their publications (see Table 2). All respondents answered this question. Accuracy of content was the most important criteria for 30.8 percent of editors and ranked first according to the means, followed closely by trustworthiness of sources. Interest to the audience was the third most important criterion, followed by impact of content on the industry, timeliness of content, whether content improved the quality of information

Table 1
*Importance of Scientific Topics*

| Topic | M | Order |
|---|---|---|
| Animal health | 3.42 | 1 |
| Management | 3.83 | 2 |
| Breeding and genetics | 3.91 | 3 |
| Animal nutrition | 4.97 | 4 |
| Marketing | 5.34 | 5 |
| Commercial production | 6.06 | 6 |
| Research | 7.36 | 7 |
| Financial | 7.41 | 8 |
| Policy/regulatory | 8.66 | 9 |
| Training/education | 9.14 | 10 |
| Food safety | 9.31 | 11 |
| Animal welfare | 9.50 | 12 |
| Worker/employee safety | 10.36 | 13 |
| Human nutrition | 11.31 | 14 |

provided tothe audience, quality of writing, and availability of space. Timeliness of content was the only criterion that did not receive a ranking of one from at least one editor.

Table 2
*Importance of Gatekeeping Criteria*

| Criteria | M | Order |
|---|---|---|
| Is the content accurate? | 2.64 | 1 |
| Do I trust the source(s) of the information? | 2.85 | 2 |
| Is the content of interest to the audience? | 3.79 | 3 |
| Does the content have an impact on the industry? | 4.05 | 4 |
| Is the content timely? | 4.76 | 5 |
| Does the content improve the quality of information provided to the audience? | 5.05 | 6 |
| Is the content well-written? | 6.21 | 7 |
| Is space available? | 6.67 | 8 |

*Editors' preferences for sources of scientific information*

Editors estimated the average number of sources they recommend a writer use when reporting scientific information. Twenty-six editors recommended two to four sources be used in a scientific story, although eight editors recommended only a minimum of one source and four editors indicated an average number of sources was not always encouraged. One editor noted the number of sources to be used was left to the judgment of the writer.

Editors also identified from a provided list of sources those they would suggest to writers seeking scientific information (see Table 3). University faculty or staff were selected by all editors as a source of scientific information followed closely by Cooperative Extension, veterinarians, and the USDA. The top four sources were selected by more than 80 percent of editors. More than half of editors selected industry participants or producers and breed organizations, which were followed by agribusinesses, independent consultants, commodity groups, nonbreed industry organizations, and private interest groups. One editor indicated sources of information recommended would depend on the subject matter.

Table 3
*Sources Suggested for Use in a Scientific Story*

| Source | n | % |
|---|---|---|
| University faculty or staff | 39 | 100.0 |
| Cooperative Extension (Extension Agent/Specialist) | 36 | 92.3 |
| Veterinarian(s) | 35 | 89.7 |
| USDA | 33 | 84.6 |
| Industry participant(s) or producer(s) | 23 | 59.0 |
| Breed organization(s) | 21 | 53.8 |
| Agribusiness(es) | 19 | 48.7 |
| Independent consultant(s) | 17 | 43.6 |
| Commodity group(s) | 14 | 35.9 |
| Nonbreed industry organization(s) | 11 | 28.2 |
| Private interest group(s) | 7 | 17.9 |
| Other | 2 | 5.1 |

*Publication of scientific information during 2005*

Editors reported the topics (see Table 4), number and type (see Table 5) of sources, depth (see Figure 1), and overall use (see Figure 2) of scientific information in their publications during 2005. The topic covered by the largest number of publications was breeding and genetics, followed by animal health, animal nutrition, research, management, commercial production, and marketing. More than half of the magazines included information on these topics during 2005. Slightly less than half of the publications included information about policy/regulatory, animal welfare, financial, and food safety; and about one-third of the publications covered training/education, human nutrition, and worker/employee safety. Two publications indicated information was provided about other scientific topics.

A majority of editors indicated two to four sources were cited in scientific stories published during 2005, while about one-third of the editors reported a minimum of one source was used. Three editors did not know how many sources were used or indicated sources were not used.

All sources of scientific information in the provided list were used during 2005, according to the editors. University faculty or staff were used in the most publications, followed by Cooperative Extension, veterinarians, the USDA, industry participants or producers, agribusinesses and/or breed organizations, nonbreed industry organizations, independent consultants, commodity groups, and private interest groups. One editor indicated government sources were used, and one indicated none of the sources listed were used.

A majority of the editors indicated scientific information published during 2005 was “written for average producers” and “included technical information in a format

average producers can apply in their operations." Seven editors indicated information was more technical than information written for average producers, and three indicated information was written more broadly than information that could be applied by the average producer. Two editors indicated published scientific information was broad and included few details, and none of the editors reported publishing scientific information that was technical.

Slightly less than one-third of editors reported publishing scientific information in approximately half of their 2005 issues, and slightly less than one-third of editors reported at least one scientific story was published in each issue. Seven editors indicated scientific information was published in fewer than half of 2005 issues, while five reported publishing scientific information in more than half of issues but not in every issue. Four editors indicated scientific stories were published two times or fewer during 2005.

Table 4
*Topics Published during 2005*

| Topic | n | % |
|---|---|---|
| Breeding and genetics | 38 | 97.4 |
| Animal health | 36 | 92.3 |
| Animal nutrition | 33 | 84.6 |
| Research (animal; ongoing or specific) | 30 | 76.9 |
| Management | 29 | 74.4 |
| Commercial production | 27 | 69.2 |
| Marketing | 25 | 64.1 |
| Policy/regulatory | 19 | 48.7 |
| Animal welfare | 18 | 46.2 |
| Financial | 17 | 43.6 |
| Food safety | 17 | 43.6 |
| Training/education | 14 | 35.9 |
| Human nutrition | 13 | 33.3 |
| Worker/employee safety | 11 | 28.2 |
| Other | 2 | 5.1 |

Table 5
*Sources Used in Scientific Stories Published during 2005*

| Source | n | % |
|---|---|---|
| University faculty or staff | 36 | 92.3 |
| Cooperative Extension (Extension Agent/Specialist) | 35 | 89.7 |
| Veterinarian(s) | 28 | 71.8 |
| USDA | 27 | 69.2 |
| Industry participant(s) or producer(s) | 23 | 59.0 |
| Breed organization(s) | 22 | 56.4 |
| Agribusiness(es) | 22 | 56.4 |
| Non-breed industry organization(s) | 17 | 43.6 |
| Independent consultant(s) | 15 | 38.5 |
| Commodity group(s) | 14 | 35.9 |
| Private interest group(s) | 9 | 23.1 |

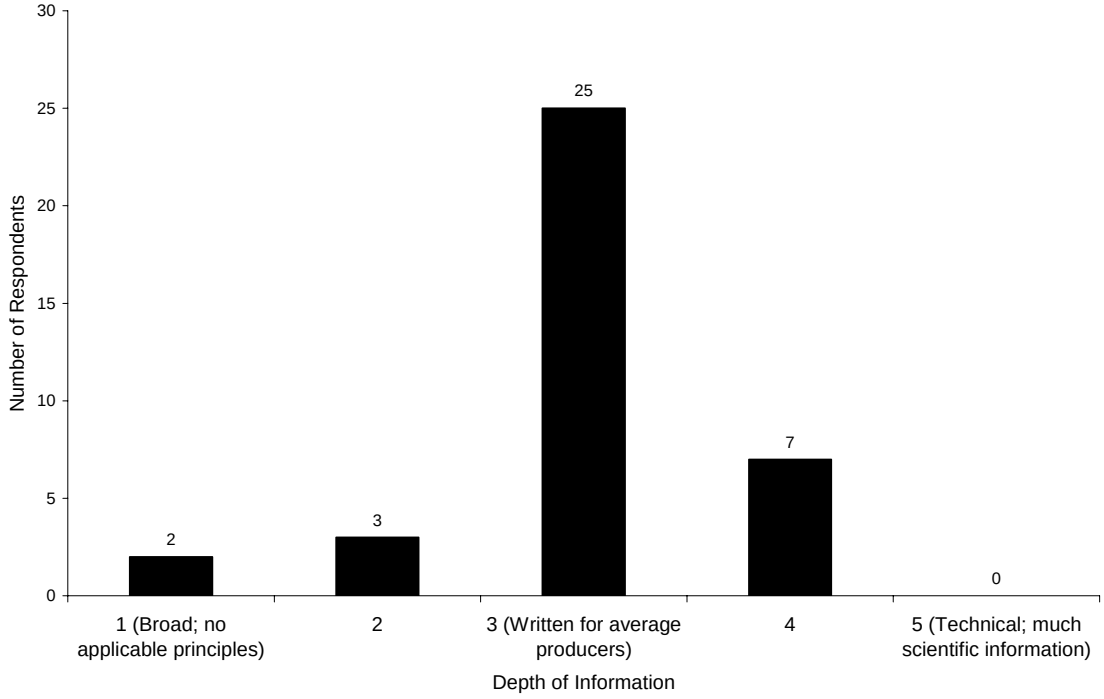


*Figure 1.* Average depth of scientific information published during 2005.

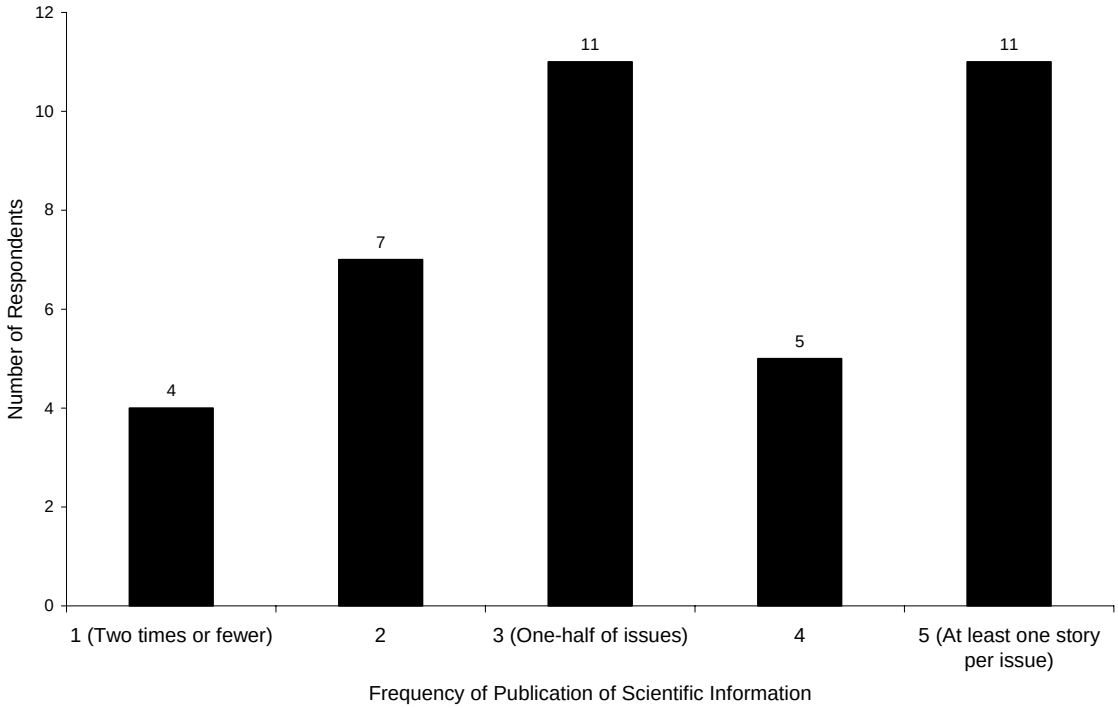


*Figure 2.* Use of scientific information during 2005.

## Discussion

*The importance of scientific topics to editors*

Editors agreed with audience perceptions of information needs established in previous studies (Batte et al., 1990; Brashear et al., 2000; Brown & Collins, 1978; Foltz et al., 1996; Ford & Babb, 1989; Harris Interactive, 2005; Jones et al., 1979; Murphy, 1960; Ortmann et al., 1993; Schnitkey, Batte, Jones, & Botomogno, 1992). Specific information needs consistently recognized by farmers and ranchers include animal nutrition, animal health, markets, management, technology, and genetics and reproduction (Foltz et al.; Murphy), while magazines have not been identified as a primary source for current financial information (Ortmann et al.). Editors in this study identified animal health, management, and breeding and genetics as the most important topics while financial information was ranked comparatively lower.

Agricultural producers frequently selected topics such as animal health and nutrition as information necessities, which could have resulted in the lower importance of policy/regulatory and worker/employee safety information. The ranking of policy/regulatory lower in the list also may be due to a perception by editors that policy information is not as scientific as the topics ranked above it, although science often plays a key role in the establishment of policies that impact agricultural producers.

Editors appeared to possess a strong understanding of livestock audience information needs. Trotter (1975) demonstrated audiences who most agree with editors tend to believe publications are edited for people similar to themselves, which would hold true for livestock publications that are generally limited by commodity or geographical interest (Schlebecker, 1983). Organizational forces, such as definitions of news and relationship to specific industries, also exert more influence on the selection of topics than editors' individual perceptions and experiences (Shoemaker et al., 2001).

Communicators in livestock organizations are more likely to have accurate perceptions of specialized livestock audiences due to their respective organizations' positions within the livestock industry and their personal industry experiences, although livestock publications editors may underestimate the importance of livestock magazines in the flow of information from research origins to applicable concepts.

*Gatekeeping criteria*

The importance of certain gatekeeping criteria to editors mirrors the high standards for accuracy and newsworthiness found in the field of science journalism (Blum & Knudson, 1997), as well as editors' perceptions of livestock audiences' information needs. Trustworthiness of source is closely related to accuracy of content, and source credibility often dictates the caliber of a story (Blum & Knudson).

Editors appeared to realize the influence sources have on the value of a story to the audience, while the positioning of interest to the audience and industry impact of information relative to other criteria show livestock publication editors grasp the concept of providing useful information to agricultural producers. Earlier studies demonstrated audience responses to scientific information increase with relevance to the reader and timeliness (Grunig, 1980; Murphy, 1960).

Editors' experiences in agriculture and livestock industries may influence their opinions of the importance of providing content connected to audience needs. The weight given to the value of scientific content to the audience and industry may result from views intrinsic to agricultural organizations (Shoemaker et al., 2001), although editors' decisions are ultimately based on their entire collection of experiences (Fowler & Smith, 1981).

Fowler and Smith (1981) also observed the decisions of magazine editors may carry more influence than decisions of gatekeepers in other mass media because the staffs of magazines are typically smaller, which promotes more direct interaction between editors and the selection of magazine content. As the staffs of many livestock publications are considerably smaller than staffs found in the mainstream media, the role of individual experiences and opinions increases in the livestock publications industry and appears to have led editors to consider stylistic, quality of writing, and space constraint concerns less important than relevance of information.

The numerically close means of accuracy and trustworthiness of sources illustrated the nearly equal importance of some gatekeeping criteria and supported previous research that demonstrated more than one criterion often is employed simultaneously in gatekeeping decisions (Dimmick, 1974). Likewise, the comparable means of interest to the audience and impact, timeliness and quality of information, and quality of writing and space availability demonstrated gatekeeping criteria may be considered as groups composing tiers in the decision-making process, with individual criteria on a tier being of similar importance at that level of decision-making.

*Editors' preferences for sources of scientific information*

The number and sources of information preferred by editors complemented the value of accuracy and trustworthiness of sources as criteria for using scientific information. By requiring multiple sources, editors allow for confirmation of information by multiple sources, ensure all potential aspects of a story are presented, and may diminish readers' doubts about objectivity.

The specific sources most preferred by editors also demonstrated the orientation of editors with other gatekeepers and the audience in selecting appropriate information for publication, and the worth of certain sources of scientific information is validated by their use in both livestock publications and the mainstream media. Editors showed a considerable preference for the top four sources, including university faculty or staff, Cooperative Extension, veterinarians, and the USDA. University faculty or staff was selected by all editors in this study, and those sources have been highly ranked by audiences and gatekeepers in previous research (Brown & Collins, 1978; Stringer, 1999). As the roots of many modern agricultural production methods can be found in university research and Cooperative Extension education programs, some bias toward these sources of information may exist in agriculture similar to bias observed as science writers formed relationships with scientists (Mazur, 1981). The preference of editors for the USDA as a source of information conflicts with previous research about gatekeepers' preferences but agrees with the value placed on government information sources by audiences (Brown & Collins; Stringer; Jones et al., 1979).

Most of the sources selected less by editors, including industry participants or producers, breed organizations, agribusinesses, consultants, commodity groups, nonbreed industry organizations, and private interest groups, have been indicated over time as important information sources by large-scale family farmers (Brown & Collins, 1978), Ohio commercial farmers (Batte et al., 1990), large corn belt farmers (Ortmann et al., 1993), and members of agricultural organizations (Harris Interactive, 2005). Similar to the results of this study, sources other than educational institutions and government agencies were ranked lower by news and agricultural periodicals (Stringer, 1999; Whitaker & Dyer, 2000), although editors of livestock publications differed from farmers and ranchers who ranked agricultural dealers and retailers highly on credibility, timeliness, and knowledge of agricultural markets (Harris Interactive).

*Publication of scientific information during 2005*

Based on the rankings of topic importance, editors seemed to be aware of audience information needs, and the topics published during 2005 reinforced the apparent accuracy with which editors understand their audiences. The importance of specific topics to editors and in publication also agrees with editors of dairy publications who listed breeding technologies, animal health, production practices, animal nutrition, and management as important themes about which their publications needed to provide information (Evans, 1981). The similar rankings of importance and publication of topics despite variations in responding publications' audiences also indicated a diverse general livestock industry audience has similar information needs, and editors' high rankings of interest to and impact of content on the audience as gatekeeping criteria indicated meeting these needs with accurate, credible information was a priority in the livestock publications industry.

The use of multiple sources for scientific stories in 2005 supported the importance of objectivity and providing appropriate context for information so readers can be educated rather than influenced. Editors' preferred sources for information mostly paralleled sources reported to be used during 2005. The reliance of editors and writers on top sources may be due to the nature of the topics and the need for accessible, unbiased information. Breeding and genetics, animal health, animal nutrition, and research

information may be explained best by the originators of the information or perceived experts, such as universities or veterinarians. Gatekeepers with backgrounds or experience in agriculture also may tend to rely on traditional sources of agricultural information, as demonstrated by the preferences of editors for those sources and the use of those sources during 2005.

The level of information published during 2005 agreed with the observation of Grantham and Irani (2004) that information should be provided at a level usable by producers with average educational backgrounds. Specialized audiences, such as livestock producers, may understand scientific terms better than broader audiences due to their more frequent use of such information, although communicators can still provide concepts in lay terms with appropriate context and create applicable principles for producers.

A majority of publications used scientific information in more than half of 2005 issues, while only four published scientific information two times or fewer during 2005. Variation in the use of scientific information resulted from differences in the purpose of the publications, although their role in providing modern, usable information agrees with Schlebecker's (1983) observation that the function of agricultural journals is to bring timely, valuable items to the attention of readers. These results demonstrated the significance of science in the livestock industry and editors' comprehension of what information will best help their audiences.

## Recommendations

Editors of livestock publications appear to be more in tune with audience needs than editors in the mainstream media, and gatekeepers in the livestock media need to maintain their awareness of these needs. Perceptions of audience needs may be enhanced through strong connections with the livestock industry, although editors must preserve objectivity to continue providing complete, accurate information to readers. The best editors will look to the future of their industries and provide information producers need to reach production goals successfully.

In selecting topics for publication, the role of magazines in the decision-making processes of farmers and ranchers should be considered. Editors may be unaware of their publications' importance in the livestock industry relative to other media, so a review of industry studies may be useful to many gatekeepers.

Accuracy and providing useful content appeared to be the primary goals of editors' gatekeeping decisions, and editors should continue to ensure accuracy of content and avoid appearances of bias through careful selection of sources. Providing useful content also should continue to be a primary goal for gatekeepers in the livestock publications industry.

Livestock magazines should continue operating under the goal of providing knowledge to producers rather than trying to influence producers. This goal may be refined and manipulated to meet the objectives of associations and other organizations that own particular publications, but such groups should provide essential information with enough context to allow producers to develop their own attitudes.

Editors should be conscious of various organizational and personal influences on their gatekeeping decisions. Institutional perceptions will become a part of editors' personal opinions and experiences, and editors and organizations should take steps to

ensure objectivity in gatekeeping decisions is maintained. Prior experiences in agriculture or the livestock industry may be particularly strong influences on editors' selection of topics and sources, and employing a system of multiple criteria for making decisions will help editors overcome innate personal biases.

Sources perceived as credible by the audience should be used to sustain the trust of magazine readers. Gatekeepers should be cautious in the selection of sources to avoid tendencies arising from their agricultural roots so producers are presented with information they may find useful but would not normally seek.

The use of multiple sources in stories is an important tool for ensuring objectivity and gaining readers' trust, and a variety of sources adds extra dimensions to information that create a complete picture incorporating context and applicable principles. Editors need an understanding of how best to achieve this, along with an understanding of audience perceptions of sources, to facilitate efficiently the flow of information from scientific sources to producers.

The use of scientific information during 2005 reported by editors demonstrated the significant impact science has in the livestock industry, further supporting the need to provide pertinent scientific information to producers. Specialized publications may not focus on topics directly related to science, but as an industry, livestock publications need to ensure producers receive adequate information to uphold the competitiveness of U.S. livestock production.

Gatekeepers and other communicators involved with livestock publications should aim to gain experiences in the livestock industry not directly related to their jobs as communicators. These experiences may enhance gatekeepers' understanding of and ability to communicate with livestock audiences.

## Implications

As livestock and other agricultural industries continue to grow and technology evolves, the importance of science to agriculture and the role of magazines in disseminating the most advanced information to producers only will increase. A gap exists, however, in research about the information needs and value of scientific information to producers. This gap has created a need for more studies of producers' information needs, although the media preferred by producers has been well established. With this study, a beginning comparison now can be made between livestock publications editors and their audiences.

Editors of livestock publications may be able to compare their practices for making gatekeeping decisions and learning about their respective sectors of the larger livestock industry to the information provided by their peers. It also may create a greater awareness of the influences on their decisions, as well as how those decisions coincide with previously reported preferences of producers for information and sources of information.

This study creates a foundation for additional studies of agricultural gatekeepers and audiences, particularly if and how information needs are being met in the face of rapid advancements in the science and technology of agriculture. As communicators involved in all types of agricultural media consider the positive results of this study and the deficiencies it revealed, steps can be taken to ensure information flows efficiently from scientists to producers to bring the greatest possible benefits throughout agriculture.

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# Putting a Good Foot Forward Online: Working with Industry Professionals to Analyze Web site Usability

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**Putting a Good Foot Forward Online: Working with Industry Professionals to Analyze Web site Usability**

**Abstract**

The Internet has opened new doors in allowing communicators a cheaper option to reaching a variety of audiences in an unfiltered and timely environment. However, the complexities of site design on the Internet have been found to close the communication channels with users who find the site to be unfriendly and confusing. This paper describes a recent partnership between an agriculture organization, whose aim is to educate about the agriculture industry in their state, and researchers in academia in which they used current usability testing methodology to determine the effectiveness of the organizations Web site. Results of the study are presented as well as recommendations for individuals considering such a partnership.

**Keywords**: Web site Usability, Professional Collaboration, Web site Design, Internet research

# Putting a Good Foot Forward Online: Working with Industry Professionals to Analyze Web site Usability

## Introduction

The agriculture and news media are continually looking toward the Internet to find information for their publications. In a study done on broadcast and print media in Florida, Bisdorf, Irani, and Telg (2003) found that reporters used the Internet in 88.9 % of their regular daily work. Rhoades (2004) concluded after surveying livestock magazine editors belonging to the Livestock Publications Council that it is important for agricultural communicators to move more toward electronic dissemination of information by packaging information for media in a manner that is most useful to them Online. As more people involved with agriculture and the media look for information online it is important for organizations whose missions are to communicate the message of agriculture to have a strong and effective Web presence. Researchers like Esrock and Leichty (1999) and O'Donovan (2001) call for communicators to think of their users and to develop sites that are not only efficient in terms of technology, but also visually pleasing. Ihator (2001) discussed in *Public Relations Quarterly* the importance of professional communicators', especially those in public relations, use of the Internet to enhance relationships and deliver unfiltered information to the public. Organizations, like those in agriculture, working with limited financial means are offered a unique opportunity with the Internet by reaching new audiences without some of the financial difficulties (Kang & Norton, 2003).

Due to the possible opportunities to communicate to broad audiences, it is important that communicators are effectively using this tool. Research has shown that some such sites are not user friendly and in turn will drive away users, making it an ineffective communication tool (Esrock & Leichty, 1999). Connections can be made to a person's first experience on a Web site to the theoretical idea of self-presentation. Theorists say that self-presentations lead others to perceive a person as trustworthy, competent, and dynamic (Dominick, 1999). Without putting forward such a perception on first click into a site with efficient design, the organization may not be as successful in communicating their message. In a media such as the Internet the usability of the site is as important as the information presented (Henika, 1999).

### *Usability*

Usability is a Web design concept that has been the focus of much related investigation and discussion among researchers and communications practitioners. Usability in reference to Web site design describes how easily someone can successfully use a site to find information (Nielson, 2000). Krug (2002) stated that users are unique and each different user is going to be looking for something different.

According to Nielson (2000) Web sites only have 10 seconds to capture users' attention as they enter the site before the users' mind wanders or the user decides to leave. When users enter a site, they scan for information; to help users find the information they seek, developers must design for better scanning (Spool et al, 1999; Krug, 2002).

The research suggests that there are several initial functions that must be done on a site to make it user friendly. According to Nielson (2000), 50% of the text in a print

document should be used online due to the brief nature of the Web. Hypertext must be used well to offer the user a deeper experience with the text (Hall, 2001). Chunking of text into smaller sections and subheads need to be put in place logically to help users move through the information (Nielson, 2000; Hall, 2001).

It is also important that the navigational structure is clear and usable for the audience. Navigation can be flawed as: 1) it is not clear to users, in that it uses terminology they do not understand; 2) it does not meet their expectations and takes them to places they do not expect to go (Nielson, 2000).

*Purpose*

In 2004, Ruth, Bortree, Ford, Braun, and Flowers analyzed Florida commodity group Web sites and concluded that the majority of the sites were not created with the needs of journalists and media members in mind. Influenced by the findings of this study the Agriculture Institute of Florida, an organization of agricultural communicators whose aim is to serve as a unified voice for the diverse agriculture industry in Florida, asked that researchers at the University of Florida help them in analyzing the effectiveness of their Web presence. They wanted to discover if their site was effectively reaching audiences through its navigation, textual material, and design.

The purpose of this paper is thus to describe the steps taken to analyze the Agriculture Institute's Web site, and to offer suggestions on how university researchers can work with communicators to ensure successful Web site design. The study described was attempting to determine if the site supported by the Agriculture Institute was effectively presenting information to its audiences (agriculturalists and media); if the objectives of the organization were effectively being portrayed through the content and design of the site; and if the design features of the site were being effectively used in the communication process. The organization was not interested in adding to the technology of their site, but improving what was currently there.

## Methodology

To discover the effectiveness of the Agriculture Institute site three research methodologies were undertaken. The research process started with a survey placed on the associations' Web site to gauge users' perceptions. This was followed with laboratory usability testing, and then analysis of the site's visibility online. This form of exploratory usability testing allows researchers to discover areas of user confusion and mistakes within the site that could cause communication disengagement (Levi & Conrad, 2002). This type of usability testing has been described as the effective method to use at any point in the developmental life cycle of a site. As this site has been online for several years, and the organization was at a crossroads to whether the site should be changed or not it was important to use such a methodology.

The 37-question Web survey used in the first stage of testing was developed based on previous evaluation surveys. The survey was examined by an expert panel to ensure validity. The form was then placed on the home page of the Agriculture Institute's Web site in order to gather data from site visitors. The instrument asked participants to report feelings on the site's usefulness, usability, and relevance. Participants were asked how they found the site, how often they visited, their perceptions of the site, their knowledge of the Agriculture Institute, and demographics. Three reminders were sent to

Agriculture Institute members to encourage participation in the survey. As the study was interested in discovering the perceptions of current users, no other solicitation past the organization and site visitors was conducted. A total of 10 surveys were completed.

The second part of the study was done through laboratory usability testing. Usability testing methods were followed as outlined by Krug (2000). This method suggested that a minimum of three participants look at the site to catch all potential problems with the site (Krug, 2000). Due to the minimal funding, three participants were thus solicited to participate in the 45-minute testing situation. One member of the media, one long time agricultural professional, and a new Agriculture Institute member were included in the testing. Researchers felt that this was an adequate cross section of the various audiences being communicated to through the site. An outside investigator, who was unfamiliar with the site and the agricultural organization, was trained with a script to ensure all participants received the same instructions from an unbiased researcher. All sessions were video tapped for later analysis by the lead investigator. A task approach was taken with the testing in which participants are given a real life task to perform (Corry, Frick, & Hansen, 1997; Krug, 2000). Individual participants were first asked to explore the site and describe what they saw, what they liked, and what they disliked about the site. They were then asked to perform a task in which they were to find information and statistics about the current state of the agriculture industry in Florida. Participants were asked to describe their thinking processes as they worked through the site. The tester took notes throughout the testing of where participants went in the site and why. All field notes were then analyzed based on current usability and Web site design research to make final recommendations for site improvement.

Lastly, an exploration was conducted through the Internet to determine the visibility of the site on major search engines, as this was a concern of the organization. Search terms were entered into the top three search engines Google, MSN, and Yahoo!, for the terms "Florida agriculture" and "Florida Agriculture Institute" to determine the ease of finding the site for new users.

## Findings

*Web Survey*

A total of 10 individuals completed the online survey that was posted on the Agriculture Institute Web site. While 10 participants cannot be generalized to the whole site's audience, it does give some insight into the users of the site. Seven out of 10 of the respondents were board members while one was a government policy maker and one was an agriculture marketer and Web site designer. Out of respondents six were female, and their experience in the agriculture field ranged from two to 30 years. When asked if they would recommend this site, eight would recommend the site and two would not. Respondents were asked to indicate on a one to five scale (1= strongly disagree to 5= strongly agree) whether they agreed or disagreed with a series of statements. The majority of respondents were neutral on the appeal of the site, the ease of navigation, relevancy of the site, and the design of the site helping in locate information. Feelings were slightly negative toward the materials being easy to find, the quantity of information available, the interactivity of the site, and the up-to-date nature of the site (Table 1).

Table 1. Means of Site Perceptions*

| Question | Mean | S.D. |
|---|---|---|
| The information is trustworthy. | 4.44 | .73 |
| The Web site is easily accessible. | 4.22 | .97 |
| The information is credible. | 4.22 | 1.30 |
| The materials are easy to use. | 3.89 | 1.05 |
| The materials are of good quality. | 3.67 | .87 |
| It is easy to find information on the site. | 3.67 | .87 |
| Ability to contact the organization easy. | 3.56 | 1.33 |
| That it is easy to locate information I need. | 3.44 | 1.01 |
| The navigation structure to be easy to understand. | 3.33 | 1.00 |
| The design of the site is helpful in finding information. | 3.33 | 1.00 |
| The site is visually appealing. | 3.22 | .97 |
| That the materials are relevant. | 3.22 | 1.20 |
| I benefit from the content available on the site. | 3.22 | .67 |
| The information is up to date. | 2.89 | 1.27 |
| There is a large quantity of information. | 2.89 | 1.17 |
| I am satisfied with the amount of interactivity. | 2.78 | 1.40 |
| The materials to be useful. | 2.38 | .52 |

*Based on a 1-5 scale (1= strongly disagree to 5 =strongly agree)

Respondents commented in open-ended questions stating the site was not up-to-date and does not contain enough useful information. It was also asked who the audience of the site was. One respondent answered by asking if "anyone outside of the Agriculture institute knows about this site?"

*Usability Testing*

Findings from the usability testing offered further insight into the good qualities of the site as well as where the communication process is breaking down. The following are a few examples of comments and actions made during the usability testing.

*News Writer*

- The story on the home page would not interest non-members.
- On the "membership" page he/she thinks the page would pull up information on how to become a member; once on the page he/she said it would be nice if they explained "how and why" a person would become a member.
- On the "newsletter" page he/she thinks the page will have a "no frills, 1-2 page newsletter"; when he/she pulled up this page he/she said it was the most impressive he/she's seen so far. He/she said they would skim the first paragraph of each story looking for info they might need and would only print it if they needed it or thought is was particularly useful. For the newsletter he/she said the Web format would serve them well over a PDF.
- On the "newsroom" page he/she thinks it would have press releases, contact information for media, and white papers; when he/she pulled up the page he/she noted the "Fact sheets" and thought that having the agricultural industry calendar linked on that page was a weird location.

*Individual in Industry (also a communicator)*

- This individual entered the site and went immediately to "Ag Links". He/she said they would leave the site, browse one of the listed sites and use the back button to get back to the Agriculture Institute "Ag links" page. He/she thinks the logos and links are enough to figure out which site he/she would want to go to, but that is because he/she is in the industry. They felt for a person who is not in agriculture or is less familiar with it, a brief description of information on what that external site is would be helpful.
- He/she had a hard time pinpointing anything that stood out on the site to them. They did say that the photos on the home page caught their eye. When on the "Ag links" page, he/she reacted positively to the color logos.
- He/she mentioned the lack of color most often when browsing the site. He/she thought black and white was really boring.
- He/she stated they did not have a memorable experience at this site but would use it if they wanted to find information about Florida agriculture as a portal to the other agriculture Web sites.

*New Board member*

- His/her first impression of the site was that there was a lot of copy and words that they would not read. He/she said they were looking for something to pop-out at them on the homepage, but nothing did. They stated that there was too much of the story presented on the homepage, and that a little bit of the story with a link to the full story would be more effective. They did like the photo however. He/she was bothered by the main story saying it does not catch their attention and was from 2005. (The study was conducted in mid 2006.)
- He/she noted that the newsletter was nice, but did not gather any knowledge from the list of volume/issue on the page. He/she was surprised and slightly bothered by the PDF format of the newsletters on the site.
- He/she noted that nothing about the site colors or logo said agriculture to them.
- He/she did not notice any of the links on the left hand side of the pages within the site.
- He/she entered the "press release" page and said, "Is that it?" They felt that there should be more information there. They said that the issue papers looked "boring" and "busy." He/she said they would never go looking for them.
- While trying to look through the site, the user got lost and confused on where they where and how to get back to something they had seen previously.

*Internet Analysis*

When the search terms "Florida agriculture" and "Florida Agriculture Institute" were entered into the top three search engines Google, MSN, and Yahoo!, it was discovered that the site was not visible on all search engines. On Google and Yahoo! the Agriculture Institute site was not in the top 50 sites under "Florida agriculture," it was listed 33 on MSN. However, when searching "Florida Agriculture Institute" it was number one on Yahoo!, number three on Google, and number one on MSN.

## Conclusions

This study of the Florida Agriculture Institute Web site shed light on its usability as well as the possible effectiveness of a joint venture between industry and academia. While findings showed that the site was effective in some cases, a few points were discovered in which the site could be improved to increase usability.

Based on the data collected by users through the online survey, it could be the case that the majority of current users are members of the institute, and are fairly happy with the site. The responding users felt the site needs to be updated more frequently, and they did have concerns on whom the true audience of the site was. It was found that the users felt the quantity and usefulness of the information presented could be improved, a finding echoed through the usability testing. It is important to note that the response rate was very low for the online survey, so findings from the survey can not be taken alone as a conclusion in the site analysis. Further survey testing is warranted.

The usability testing showed that information about the various agriculture groups presented was useful, as was some of the other information presented. However, there may be clearer, more visually attractive ways to present the information effectively. Some of the navigation, while clear to those close to the organization, may be confusing to outside, or new, users of the site. Overall, a list of over 21 specific recommendations for improvement to the Web site was given to the organization based on the research literature and the findings of the study.

It is interesting to note that all three participants of the usability testing stated the site they visit most is Google or another search engine. This is important in that if they are looking for Florida agriculture information and use one a search engine, the Agriculture Institute needs to register high on those search engines. It was found by the researcher that they do not always show up high on those lists, which can easily be changed, as the Florida Ag Calendar (a site also supported by the organization) does register high on these same engines.

## Recommendations

With all new research ventures like this one, lessons can be learned. The number of respondents to the Web survey was quite low for any true generalization to be noted. Due to this it is recommended that more action be taken to engage the variety of users of the site and encourage their input into the survey. Since this was not the main methodology used, only current members of the organization and users of the site were solicited. Future solicitation should include media members. The researchers and the association found it very beneficial that all of the organization's defined audiences were represented in the usability testing however. While more participants could have been recruited, researchers were satisfied with the fact that by the last testing many of the same comments were given.

This paper outlined the usage of a laboratory method to testing Web site usability. While this is not the only method described in the research, it was seen as one of the most frequently used method. By utilizing this system the researchers were able to discover the many nuances of the site in a recorded environment. Some researchers note that participants should be instructed to visit the site prior to coming to testing. This was not followed in this case because it was a small site with only a few pages, and researchers

wanted to get initial reactions to the site if participants had never visited. Further research should continue to explore the effectiveness of various site testing methodologies.

It is highly recommended to videotape the usability testing; as it is hard for the tester to write down all that the participant is doing and saying. By being able to review the tapes, a deeper analysis can be done by the researcher. However, it is recommended to provide the individual testing the participants with not only a script, but also print outs of each Webpage so they can more efficiently take notes on what button was clicked, and what elements were commented on to ensure no comments are missed.

It was noted by the participants and in the literature the benefits of having a tester who was not directly tied to or familiar with the site. This allowed for freer dialog from the participants. The individuals were not afraid to be candid and honestly critique the site. It is recommended that individuals doing similar studies follow this practice.

When delving into such a partnership it is imperative that clear expectations are set between what both parties will be offering. For this study a small stipend was provided for the research in return for an executive summary and presentation to the board of the organization describing the findings.

This study offered a unique opportunity for researchers to partner with professional agricultural communicators to ensure the message of the agriculture industry was being communicated effectively. This partnership was successful on both ends. It allowed the researchers to use a new methodology to study an emerging area of communications, while giving the industry partners a usable product. Marketing and usability research is imperative in ensuring that organizations like the Agriculture Institute are engaging their visitors online effectively, and this partnership allowed them to access this information in a way that was manageable and financially suitable to their minimal budget. This study resulted in not only building on a strong relationship between agricultural communicators in the state and the University of Florida, but it also allowed the organization to take action to produce a newly designed Web site based on the recommendations made.

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**Evaluation of the Professional Development Status of the Agricultural Media Summit-Sponsoring Organizations' Active Members**

Research Paper Submission for the
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**Abstract**

This study evaluates the status of professional development within the agricultural media industry as perceived by the active members of Livestock Publications Council, American Agricultural Editors' Association, and the American Business Media's AgriCouncil. Through descriptive and correlational research, professional development attendance characteristics, professional development attitudes, and relationships between professional development attendance and skill confidence of members of the three organizations who sponsor the Agricultural Media Summit were examined. Respondents overwhelmingly favored professional development and were overall satisfied with their professional development opportunities. Respondents indicated schedule conflicts, location, and the expense of attendance as the main reasons for being unable to attend professional development events. Significant relationships were identified between LPC members' conference attendance and their skill confidence in graphic design, and between LPC members' participation in professional development at work and their skill confidence in photo editing. Agricultural media practitioners should be aware of the professional development status that exists among its professionals when organizing future conferences and meetings. Researchers should further explore relationships between professional organization membership and professional development attitudes, agricultural media company size and skill competencies, and how individuals are funded for professional development conferences and their attendance to those conferences.

**Keywords**: Professional development, Agricultural Media Summit, Livestock Publications Council, American Agricultural Editors' Association, ABM AgriCouncil, professional organizations, skills, conference attendance, and agricultural media.

# Evaluation of the Professional Development Status of the Agricultural Media Summit-Sponsoring Organizations' Active Members

## Introduction

As technological advances continue to change the face of the agricultural media industry, a stronger need arises for qualified and skilled personnel. Professional development allows agricultural media professionals to learn new techniques and update their existing knowledge to keep pace with rapid technological changes within their careers.

Many agricultural communicators join professional organizations in an effort to improve their career-related skills and knowledge, while protecting the interest of their profession. Professional organizations allow individuals to become connected to the profession on a broader spectrum through a network of colleagues, and provide members with a powerful influence on professional development (Guskey, 2000). There are approximately 10 professional organizations in agricultural communications that provide opportunities for members to fine tune their skills and update their knowledge of agricultural communications issues and tools (Boone, Meisenbach, & Tucker, 2000).

Professional organizations often provide professional development through workshops and seminars held at conferences and annual meetings. The Agricultural Media Summit (AMS) is the combined meeting of three sponsoring agricultural media professional organizations: Livestock Publications Council (LPC), American Agricultural Editors' Association (AAEA), and the American Business Media's AgriCouncil. AMS is the largest gathering of agricultural media professionals in the United States and brings together professionals in the industry to aid in developing their professional skills (Jenks, 2003). The three organizations have hosted AMS annually in different locations around the United States since 1999. The primary goal of AMS is to provide professional development and networking opportunities to agricultural media professionals by addressing many different skills and issues that affect the profession (Agricultural Media Summit, 2005). Workshops and seminars held at AMS provide professional development in areas such as writing, photography, and design, while allowing attendees to share ideas with their colleagues (Newham, Davis, & Roybal, 2005).

## Purpose and Objectives

The purpose of this study is to evaluate the professional development status among active members of the three AMS-sponsoring organizations.

The following objectives were designed to satisfy the purpose of this study:

1. Identify the professional development attendance characteristics of members of LPC, AAEA, and ABM AgriCouncil.
2. Identify the relationship between total AMS attendance and skill confidence among members of LPC, AAEA, and ABM AgriCouncil.
3. Identify the relationship between workplace professional development participation and skill confidence among LPC, AAEA, and ABM AgriCouncil members.
4. Identify the attitudes of LPC, AAEA, and ABM AgriCouncil members toward their professional development opportunities in general and at AMS.

## Theoretical Framework

Prior studies have been conducted on professional development evaluation of agricultural educators and extension personnel; however, little research has focused on the professional development evaluation of agricultural communicators. Literature in agricultural fields, journalism, and communication professions were reviewed to gain a better understanding of the professional development and training evaluations previously conducted in order to accurately contribute to the agricultural communications professional development literature. The theories of adult learning and organizational behavior and participation guided this professional development evaluation in order to understand why adults seek new information.

### *Adult Learning*

Knowles, Holton, and Swanson (2005) suggest the need for learning engagement resides within the learner. Adults' personal goals influence their drive for more control over their learning, and as a result, learning will increase. While external factors, such as better jobs, higher salaries, and promotions often influence why adults seek learning opportunities, internal forces within the learner are more potent. Knowles, Holton, and Swanson (2005) describe motivation and the readiness to learn as two adult education internal forces that influence one's desire for increased job satisfaction, self-esteem, and quality of life.

Mackeracher (2004) suggests once new knowledge has been obtained, it has a half-life, meaning an adult's professional knowledge and skills require updating. More specifically, the skill-related knowledge of professionals that deal with computers and information have a short half-life of six months or less to keep up with evolving technology, resulting in a need for professional development.

### *Organizational Behavior and Participation*

Organizational participation is one outlet for adults to obtain professional learning. Organizations provide environments that build up the benefits of a professional life (Leicht & Fennell, 1997), while allowing professionals to have some influence over their work (Heller, Pusic, Strauss, & Wilpert, 1998). Heller et al. (1998) state participation and behavior within an organization can be linked with the motivation and participatory competence of the adult learner, as well as the social prerequisites of the organization, such as its culture, structure, and technology usage. Knowles, Holton, and Swanson (2005) suggest organizations conducive to learning implement philosophies and attitudes focused on personal development, the sharing of information, and participation by all those affected. Therefore, motivated individuals will seek favorable learning environments that will help them develop professionally.

### *Professional Development*

Advancements in technology have led to a greater need for possession of certain skills, knowledge, and abilities in communications, providing a greater need for professional development (Berge,de Verneil, Berge, Davis, & Smith, 2002). According to Guskey (2000), the purpose for professional development stems from an ever-increasing knowledge base, which requires new types of expertise to continually refine one's skills. Along with the recognition of the importance for professional development are many concerns for its effectiveness when in

practice, thus providing a need for its evaluation (Guskey, 2000). Improving job-related knowledge, skills, and attitudes of employees has placed a widespread emphasis on professional development since the induction of the concept in the early 1970s (Sparks & Loucks-Horsley, 1989).

Professional development has been extensively explored within the educational realm. In regards to academia, Beal (2003) suggests professional development is a continuing form of adult education that encompasses the background knowledge, skills, and experience of adult learners in a performance-centered learning process. Principals such as self-motivation and professional responsibility help determine an adult's guiding philosophy to obtain professional development (Beal, 2003).

How professional development is delivered and obtained influences its effectiveness among adults. Quality professional development (a) embodies principals of effective learning, (b) has substance, credibility, and worth, and (c) is adequately supported by organizational influences (Beal, 2003). Specifically to agricultural education, Washburn, King, Garton, and Harbstriet (2001) state professional development programs should be established to reflect current trends in education and new developments in agricultural industries.

Beal (2003) suggests that adults prefer professional development programs that involve providing practical ideas, workshops with colleagues, and speakers from specific subject fields. This type of professional development may come in the form of annual conferences or meetings, which include workshops focusing on a specific topic relevant to current needs of professionals, as well as networking opportunities that allow the sharing ideas and techniques (Bascia, 2001). Doerfert, Akers, Davis, Compton, Irani, and Rutherford (2004) support such reasons for participation in professional development, suggesting agricultural communications professionals specifically seek professional development to gain knowledge and skills, and to network with other professionals. In addition, at-work training seminars have also been indicated as preferred career building activities (Doerfert et al., 2004). Often the only restraint preventing employees from attending professional development events is the availability of resources, such as time and money (Agarwal, Prasad, & Zanino, 1996). Skill areas addressed at professional development events cover writing, Web design, and presentation and computer software, which rank near the top of professional development priorities (Conklin, Hook, Kelbaugh, & Nieto, 2002). Sgobbi (2002) states employees with greater competencies in technical and organizational skills have access to professional growth within their company. Participation in professional organizations is a means of fulfilling these professional needs (White, 2005).

*Professional Organization Membership and Annual Meetings*

Holding membership within a professional organization may influence an individual's attendance to professional development conferences. White (2005) suggests an individual's organizational participation can reflect their interests in improving professionally, as well as their cognitive, evaluative, and behavioral dimensions. Furthermore, attitudes of individuals can impact their participation within an organization and how much they benefit from organizational membership (Rakow, Helgeson, Arneson, and Fontaine, 2003). Donnellan and Snowden (2000) state agricultural communicators belong to professional organizations, such as the Association for Communications Excellence in Agriculture, Natural Resources, and Life and Human Sciences (ACE), mainly for professional development and networking with peers. Professionals seek organizations such as ACE for creative skill-building opportunities that will benefit their careers (Donnellan & Snowden, 2000).

## Methodology

Descriptive and correlational research was used to satisfy the evaluative purposes of this study. Descriptive research involves detailed portrayal of one or more cases, while correlational research seeks to discover the direction and magnitude of the relationship among variables through the use of correlational statistics (Gall, Borg, & Gall, 1996). Because surveys are the most widely used procedure in evaluations, and are commonly used to collect facts, attitudes, and opinions at one point in time (Witkin, 1984), an online survey was developed to achieve the objectives of this study. The survey instrument was developed using Zoomerang.com, an online survey administrator. The survey was divided into four sections: (a) professional development attendance, (b) attitudes toward professional development, (c) skill area confidence, and (d) demographic information. The instrument used Likert-type scale questions to identify attitudes and skill confidences: 1=strongly disagree, 2=disagree, 3=agree, 4=strongly agree. The skill areas examined were (a) writing, (b) photography, (c) photo editing, (d) graphic design, (e) page layout, (f) Adobe software, (g) Web design, and (h) presentation.

A pilot test of the online survey was conducted to measure reliability. Initially, members from the professional development committee of the Association for Communications Excellence in Agricultural, Natural Resources, and Life and Human Sciences were pilot tested because they are involved in an agricultural communications professional organization that is not included in the sample. However, due to a low response rate, agricultural communications and education graduate students at Texas Tech University were administered the survey. Cronbach's Alpha of .87 was recorded for the Likert-type scale questions on skill confidence, and Cronbach's Alpha was .60 for the attitudinal questions. Changes were made to increase clarity of questions. Nunnally (1967) suggests .5 could be considered adequate during early research stages or with new instrument development. Before the instrument was sent to the sample, the Executive Director of LPC, Diane Johnson, reviewed the survey for face validity.

The studied population consisted of active members of the three sponsoring organizations that attend AMS: LPC, AAEA, and ABM AgriCouncil. Only active members from the organizations were used, so only individuals actively participating in agricultural media careers were represented. The accessible population size was N = 320. A stratified random sample of LPC publication members ($n$ = 86), AAEA active members ($n$ = 127), and ABM AgriCouncil members ($n$ = 22) was selected using Krejcie and Morgan's (1970) table for determining sample size according to the active membership of each organization. The total sample size consisted of 235 individuals.

A modified version of Dillman's (2000) Tailored Design Method was used for data collection, employing a five contact schedule. Contacts included a prenotice letter, follow-up reminders, and thank you letters. Data collection ran from May 8, 2006 until June 15, 2006. A total of 110 surveys were completed for a response rate of 49.4%. To reduce nonresponse error, 25 randomly selected nonrespondents were contacted by the researcher and surveyed over the phone. The data collected from the 25 late respondents was compared with the data from early respondents (Linder, Murphy, & Briers, 2001). No significant differences were found between the two groups. All responses were combined for a total response rate of 60% with 135 completed surveys.

## Findings

*Objective 1 – Professional Development Attendance Characteristics*

Objective one identified the professional development attendance characteristics of members from LPC, AAEA, and ABM AgriCouncil (Table 1). The majority of the sample regularly attends AMS, while 14.8% do not attend any annual meetings or conferences. Respondents indicated four other professional development events they regularly attend other than AMS.

Table 1

*Professional Development Events Annually Attended By Members of AMS-Sponsoring Organizations* (*N* = 135)

| Conference | Frequency (*f*) | Percentage (%) |
|---|---|---|
| Agricultural Media Summit (AMS) | 74 | 54.8 |
| National AgriMarketing Association (NAMA) | 22 | 16.3 |
| Livestock Publications Council (LPC) Regional Workshops | 8 | 5.9 |
| North American Agricultural Journalist (NAAJ) | 6 | 4.4 |
| American Horse Publications (AHP) | 5 | 3.7 |
| Do not attend any annual meetings | 20 | 14.8 |

*Note*. Some members attended more than one conference annually.

The three most recent conferences had the highest attendance of all the AMS conferences, while 34.1% (*n* = 46) had never attended AMS (Table 2).

Table 2

*AMS Attendance By LPC, AAEA, and ABM AgriCouncil Members* (*N* = 135)

| Year – AMS Location | Frequency (*f*) | Percentage (%) |
|---|---|---|
| 2005 – Milwaukee, Wisconsin | 52 | 38.5 |
| 2004 – Tampa, Florida | 43 | 31.9 |
| 2003 – Cleveland, Ohio | 46 | 34.1 |
| 2002 – Reno, Nevada | 40 | 29.6 |
| 2001 – Grand Rapids, Michigan | 37 | 27.4 |
| 2000 – San Antonio, Texas | 36 | 26.7 |
| 1999 – Denver, Colorado | 42 | 31.1 |
| Have not attended any AMS | 46 | 34.1 |

*Note.* Some respondents have attended more than one AMS.

Schedule conflicts were identified by 64.5% (*n* = 71) of respondents as the main reason why they have not attended professional development events in the past. Location (44.5%, *n* = 49) and the expense of conferences (40.9%, *n* = 45) have also prevented respondents from attending professional development events.

*Objective 2 - AMS Attendance and Skill Confidence*

Pearson product moment correlations (*r*) were used to identify the relationship between AMS attendance and skill confidence. The sum of AMS conferences attended from each individual was recorded to analyze the relationships between members of each organization individually, and all the organizations as a whole. As seen in Table 3, a significant relationship was identified between LPC members' AMS attendance and their skill confidence in graphic design (- .30). Davis' (1971) conventions for determining correlational magnitude indicated a negative moderate correlation, meaning LPC members less confident in their graphic design skills are attending AMS more frequently. No other significant findings were identified between the other skill areas and AMS attendance.

Table 3

*Relationship Between Professional Development Attendance and LPC Members' Skill Confidence*

| Skill | AMS Attendance ($r$) | PD Participation at Work ($r_{pb}$) |
|---|---|---|
| Photo Editing | | - .25* |
| Graphic Design | - .30* | |

*Note*. Coding: Attends AMS = 1, Does not attend AMS= 0.
Coding for workplace participation: 1 = participates, 0 = does not participate.
*$p \leq .05$

*Objective 3 – Workplace Professional Development and Skill Confidence*

Point biserial correlations ($r_{pb}$) were used to identify the relationship between participation in professional development at the workplace and skill confidence. Again, relationships were analyzed per organization and all organizations together. A significant relationship was found was between LPC member's professional development participation at work and their skill confidence in photo editing (- .25), as shown above in Table 3. The negative low relationship was interpreted as LPC members who do not participate in professional development at work are more confident in their photo editing skills. No significant findings were found between workplace professional development participation and the other skill areas.

*Objective 4 – Professional Development Attitudes*

The perceived attitudes among respondents were overwhelmingly favorable toward their professional development opportunities and experiences. Members from the three organizations agreed they were satisfied with their opportunities to attend professional development events (Table 4), and most of the sample indicated they were self-motivated to seek out professional development. In addition, a majority of members from the three organizations who have attended AMS agreed the conference's professional development activities were informative and useful.

Table 4

*Attitudes Toward Professional Development*

| Organization | Strongly Disagree | Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| | Satisfaction With Opportunities To Attend Professional Development Events | | | |
| LPC | 2 (2.6%) | 19 (24.4%) | 43 (55.1%) | 14 (17.9%) |
| AAEA | 2 (3.0%) | 18 (27.3%) | 40 (60.6%) | 6 (9.1%) |
| ABM AgriCouncil | 1 (7.7%) | 2 (15.4%) | 10 (76.9%) | 0 (0.0%) |
| | Self-Motivated To Seek Out Professional Development Activities | | | |
| LPC | 1 (1.3%) | 11 (14.5%) | 48 (63.2%) | 16 (21.1%) |
| AAEA | 1 (1.5%) | 13 (20.0%) | 43 (66.2%) | 8 (12.2%) |
| ABM AgriCouncil | 0 (0.0%) | 1 (7.7%) | 11 (84.6%) | 1 (7.7%) |
| | AMS Professional Development Activities are Informative & Useful | | | |
| LPC | 1 (1.8%) | 2 (3.6%) | 31 (55.4%) | 22 (39.3%) |
| AAEA | 0 (0.0%) | 1 (2.0%) | 31 (62.0%) | 18 (36.0%) |
| ABM AgriCouncil | 0 (0.0%) | 2 (15.4%) | 5 (38.5%) | 2 (15.4%) |

*Note.* Some respondents were members of more than one organization.
Percentages are reported as valid percentages.

## Conclusions and Recommendations

These findings led to several conclusions and recommendations about the status of professional development as it is perceived by the agricultural media.

Among the professional development events annually attended by respondents, AMS accounted for the majority of LPC, AAEA, and ABM AgriCouncil members' attendance, with four other professional development events within agricultural media being attended by respondents. Yet, 20% of respondents indicated they do not regularly attend professional development conferences. These findings suggest most professionals are attending professional development events on a regular basis, and support the statement made by Doerfert et al. (2004) that a majority of agricultural communications training through professional development is delivered by someone outside of a professional's company.

Schedule conflicts, location of conferences, and the expense of attendance were indicated by respondents as the main reasons for not attending professional development events in the past.

These reasons agree with the suggestion made by Agarwal et al. (1996) that the availability of resources, such as time and money, were among the main reasons why individuals do not elect to participate in professional development.

Technological advancements have created a greater need for professional development (Berge et al. 2002), with computer software and writing skills ranking near the top of professional development priorities (Conklin et al., 2002). Participation in professional organizations allows members to update such skills (White, 2005).

After analyzing members of all three organizations together and each organization individually, LPC members' attendance to AMS and their skill confidence in graphic design possessed the only significant relationship. The relationship suggests members who are less confident in their graphic design skills attend AMS more frequently to increase their confidence. This finding supports Mackeracher's (2004) description of the half-life of professional learning. Technical skills, such as the ones evaluated in this study, require continually updating due to the past pace of technological advancements.

Sgobbi (2002) states employees with greater competencies in technical and organizational skills have access to professional growth with their company. The influence of organization participation in the context of a workplace setting can impact the way professional roles are carried out (Leicht & Fennell, 1997).

This study examined the relationship between professional development participation in the workplace and skill confidence among each organization's members, as well, members of all three organizations combined, but found only one significant correlation. LPC members professional development participation was negatively correlated with their skill confidence in photo editing, meaning members are more confident in the photo editing skills when they do not participate in professional development at their workplace. Furthermore, this may suggest they seek professional development outside of their workplace.

Overall, the sampled agricultural media professionals in this study indicated they were satisfied with their professional development opportunities and experiences. Respondents' professional development satisfaction reflects previous research that suggests attitudes of individuals can impact their participation within an organization and how much they benefit from organizational membership (Rakow et al., 2003). Such involvement entails a professional's activeness in furthering their knowledge of their profession and skills, which includes their attendance to annual meetings and workshops (Sparks & Louks-Horsley, 1999).

The most obvious recommendation for practitioners is to continue providing agricultural media professionals with professional development opportunities. Professional development program organizers should be aware of potential schedule conflicts when planning dates and times. Avoiding dates when breed shows hosted by cattle breed associations and annual meetings from professional organizations other than LPC, AAEA, and ABM AgriCouncil are occurring could aid in allowing more professionals to attend. In addition, the location of conferences and the expense of getting there prevented respondents from participating in professional development. Therefore, the researcher recommends determining where a majority of potential attendees are located may help establish more central locations for conferences, which, in turn, would decrease the cost of travel for most attendees.

As a result of this study, there are several recommendations for further research in professional development within agricultural communications. The sample of this study consisted only of agricultural communications professionals who were members of professional organizations. Research that would compare the professional development attitudes of individuals who are not members of professional organizations with the attitudes of individuals who are members of professional organizations could provide a better understanding of the role

of professional organizations in influencing the professional development attitudes of its members. Individuals who are members of professional organizations may have varying attitudes toward professional development than those who do not hold membership in a professional organization.

In addition, agricultural communications is a broad profession with many jobs that require different types of skills. Research that evaluates skill confidence of individuals more specifically to their job would provide a greater understanding of skill confidences as they relate to each individual agricultural communications skill (i.e. editing, graphic design, Adobe software, etc.). For example, evaluating the skill confidence of editors would concentrate on the skills of writing, editing, grammar, management, and organization.

In terms of conference attendance, this study identified a few factors that have prevented AMS-sponsoring organizations' members from attending conferences in the past, and the location of conferences and the expense of the conferences were among the top three most frequently noted. Therefore, the researcher recommends further research comparing how an individual's conference attendance is funded with their ability to attend.

More specifically to AMS conference attendance, examining past AMS conferences in terms of their location and their attendance is recommended. Grouping past conferences into regional areas, and then comparing attendance among those areas, could provide AMS organizers with a better idea of where to hold future conferences in locations that will receive the highest attendance.

Further evaluation of professional development attitudes should also include the principal of self-efficacy, or the belief in one's capabilities to organize and execute the courses of action required to produce given attainments (Bandura, 1997). This principal would provide both a motivational process and attribution theory angle to why people attend conferences and participate in professional development. In addition, the inclusion of self-efficacy would provide theoretical support for reasons why individuals make certain career decisions (Bandura, 1995).

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