

Fitting Farm Safety into Risk Communications Teaching, Research and Practice

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Abstract

New safety challenges are emerging as agriculture evolves within the complexity of serving a growing world population. The nation's most hazardous industry is struggling to provide safe working environments in the face of demographic changes in the agricultural work force, new technologies, new kinds of enterprises, pushback against regulation, and other forces. Such changes introduce new forms of occupational risk and create greater need for appropriate safety communications. This study examined potentials for improving engagement of the agricultural media, which serve as primary information channels for farmers. Those who teach agricultural communications are key gatekeepers in preparing skilled professional agricultural journalists and other agricultural communicators. Therefore, the study focused on potentials for strengthening skills in farm safety communications through teaching programs in agricultural journalism and communications. The second and related purpose involved advancing understanding of conceptual linkages between farm safety communications and risk communications, using a safety-oriented framework of risk communications. A mixed methods research design involved quantitative and qualitative approaches using an online survey among faculty representatives in 23 agricultural communications programs at universities throughout the nation. Responses identified encouraging potentials and useful direction for integrating farm safety into agricultural communications courses. Findings also shed helpful light on conceptual linkages between risk communications and a seemingly "lost cousin" — farm safety communications. They pointed to new potentials for agricultural communications teaching and scholarship in strengthening connections between theory and practice in risk communications (including farm safety communications) related to agriculture.

Key Words

Farm safety, risk communications, agricultural communications, communications education, courses

Introduction

Safety in farming faces serious and growing challenges in human and financial terms. Agriculture has the highest rate of occupational death across all U.S. industries — 22.2 fatalities per 100,000 workers — ranking it ahead of transportation, mining, and construction (U.S. Department of Labor,

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2014). The annual cost of occupational injuries in agriculture is \$8.3 billion in medical costs and lost productivity, with a typical cost of \$1 million for one tractor overturn (Agricultural Safety & Health Council of America, 2014). About every three days, a child dies in an agriculture-related incident (National Children's Center, 2013).

Furthermore, new safety challenges are emerging as agriculture evolves dramatically. For example, demographics of the agricultural workforce are changing rapidly, along with scales of operation, types of farming enterprises (such as agritourism, organic farming, biomass production, and other niche enterprises), and specialized equipment and technologies (as with precision farming and unpiloted aerial vehicles). Each change introduces new safety challenges and new communications challenges. Also, proposals and changes in safety regulations generate a need for improved communications among and with farmers (Heiberger, 2012). Such changes call for greater diversity of safety information and new ways to deliver it (Murphy & Lee, 2009). This need for improved communicating about safety serves as the foundation for two companion purposes of research reported here.

Purpose 1. Assess the potential for using teaching programs in agricultural journalism and agricultural communications to improve practices for effectively communicating about farm safety through agricultural media.

Several factors prompt interest in assessing the status and potential of teaching farm safety communications within agricultural communications programs at U.S. colleges and universities.

Agricultural media offer exceptional potential for helping improve the safety of practices and conditions on farm and ranches. Farmers use a wide range of sources and channels for gathering agricultural information. Readex Research in 2012 analyzed use of 15 channels by a national sample of U.S. farmers and ranchers. Eighty-two percent reported reading agricultural magazines and newspapers at least weekly. Fifty-two percent reported using digital agricultural media at least weekly, with websites and e-newsletters most common (Agri Council of American Business Media, 2012). Farm broadcasters provide current market information, weather, and agricultural news on more than 1,300 stations nationwide. A 2014 survey by Ipsos Research among U.S. farmers and ranchers revealed 84% reported finding their local farm broadcaster and farm news information important in their daily operation decisions (National Association of Farm Broadcasting, 2015).

Within all those media, professional agricultural journalists select, gather, and process the editorial content. Other communicators, who specialize in agricultural public relations and marketing communications, plan and prepare advertisements and other information about products and services available to producers.

Universities serve as major education providers for such agricultural journalists and communicators. During 2011 nearly 1,500 undergraduate students were enrolled in agricultural journalism/communications degree programs at U.S. land-grant universities. More than 130 students were enrolled in master's and doctoral programs (U.S. Department of Agriculture, 2011). Those who teach agricultural communications courses are key gatekeepers (Shoemaker, 1996) for grooming professional agricultural journalists and communicators. They also are important in teaching communications skills and insights to students who are not preparing to be professional journalists or communicators but who will communicate in all sectors of agriculture.

It would, therefore, seem such programs represent a promising response to the question "Where is the education and training to come from?" posed by two leaders of the Agricultural Safety and Health Council of America (ASHCA) in a 2009 issue of the Journal of Agricultural Safety and

Health. Murphy and Lee highlighted nine critical issues that undergird support, motivation, and effort for safety in the nation's dynamic agriculture sector. They cited weak and dwindling support for farm safety and health in Cooperative Extension programs, farm legislation, state agencies, and commodity groups. They emphasized critical need for better connections between agricultural cooperatives, insurance companies, farm and ranch suppliers, and support services to professional safety and health organizations and societies (p. 205).

Communicating through media about safety is not easy (Ozegovic & Voaklander, 2011; Pedler, 2006). However, research reveals strong potentials for effective teaching and learning about agricultural safety and health through efforts that involve media and other means (Covitt, Gomez-Schmidt, & Zint, 2005; Miller, Schwab, & Peterson, 1994; Teran, Strohlic, Bush, Baker, & Meyers, 2008).

Purpose 2: Examine conceptual linkages between farm safety communications and risk communications, with an eye on identifying ways to strengthen theory and practice in both areas.

Simon, Robertson, and Doerfert (2003) called attention to the need for strengthening linkages in their report, "The inclusion of risk communications in the agricultural communications curriculum." They cited evidence of a gap between the theory and practice of risk communications and the practices of agricultural communications professionals in dealing with a growing menu of issues that involve communicating about risks.

Similar evidence of need emerged from an ad hoc committee of agricultural communications faculty members at eight universities in the southern region of the United States. Risk communications strategies ranked second among the five priority research themes identified. The committee emphasized need for greater understanding of factors that influence risk perceptions and effects of risk communications methods with respect to agricultural products, processes, and technologies (Agricultural communications research priorities, 2003). Indeed, risk communications is, "an extremely important aspect of communication practice" (Telg, 2010, p. 1).

It is noteworthy that interest in risk communications involving agriculture has focused on consumer and public safety more than farm safety. An analysis in the Agricultural Communications Documentation Center at the University of Illinois revealed nearly 1,900 documents about risk communications related to food, farming, natural resources, renewable energy, and other dimensions of agriculture. Those reports trace back more than a century, exploring hundreds of issues that have emerged and changed over time. Examples include the relationship between advertising and pure food legislation (Pierce, 1911); health effects of tobacco and smoking (Cigarette smoker study, 1961); healthfulness of dairy products (Role of diet in heart disease, 1965); use of pesticides (Celebrity pesticide spots, 1968; Harmer, 1971; Salcedo, Evans, & Read, 1971; Whelan & Stare, 1975); safety of meat (Unfounded claims against meat, 1974); routine feeding of antibiotics to livestock (The antibiotics controversy, 1985); irradiation of food (Food is split over irradiation, 1985); artificial sweeteners (Lawler, 1986); use of nanotechnology in food and agriculture (Pense & Cutcliffe, 2007); the portrayal of lean, finely textured beef as "pink slime" (Sellnow & Sellnow, 2014); and dozens of others.

Relatively little reference to risk communications involves occupational risks and safety of farmers/ranchers and their families, farm workers, and others in production agriculture. Farm safety communications has a long tradition, predating much of the current emphasis on risk communications. In fact, the advent of World War II led to the emergence and evolution of a nationwide farm safety movement in the United States. The movement engaged government agencies at all levels as well as universities, agribusinesses, youth organizations, rural groups, and other partners. Oden's research

about this movement from 1940 to 1975 tracked a revolution of technologies and practices on farms and ranches. He observed the blessings of technology sometimes have been mixed, as each advance has also brought a new potential for injury (Oden, 2005, p. 421).

Whereas the traditions of farm safety communications and risk communications have developed quite separately, they would seem to share conceptual roots worthy of attention. The study reported here seeks to add understanding and meaning to the shared elements. It does so by using a safety-oriented conceptual framework identified by Lundgren & McMakin (1998). In their book, *Risk Communication*, they organized risk communications along three functional lines.

- Care communication. This form is preventive in nature and purpose. It seeks to inform and advise the audience about safety and health risks in the workplace.
- Consensus communication. This form of risk communication involves safety planning. It seeks to inform and encourage groups to work together to reach a decision about how the risk will be managed (prevented or mitigated). It also is a subset of stakeholder participation, which encourages all those with an interest (stake) in how the risk is managed to be involved in building consensus.
- Crisis communication is risk communication in the face of extreme, sudden danger. It can include communication before, during, and after a major emergency.

These three dimensions serve as touch points for using the study reported here to examine conceptual linkages between farm safety communications and risk communications.

Goals of the study reported here are consistent with the National Occupational Research Agenda (NORA) for Occupational Safety and Health Research and Practice in the U.S. Agriculture, Forestry, and Fishing Sector (NORA, 2008). NORA Strategic Goal 3, in particular, addresses “Outreach, Communications and Partnerships.” This study also fits within Priority 5 of the National Research Agenda for Agricultural Education and Communication Programs, 2011-2015. Priority 5 involves efficient and effective agricultural education and communications programs. In terms of this study, it emphasizes research focus on seeking and demonstrating effective integration of communications and the safety dimensions of agricultural sciences (Doerfert, 2011).

Research Questions

This research focused on those key gatekeepers — faculty members — who teach agricultural journalism/communications courses and advise future professionals at universities throughout the nation. In support of the identified purposes, it involved five research questions:

- RQ1. What are faculty members’ perceptions about (A) the relative importance of farm safety, (B) the effectiveness of communications with farmers, farm families and farm workers about occupational safety, and (C) the extent to which coverage of farm safety requires special reporting skills?
- RQ2. How extensively is farm safety addressed in existing agricultural communications courses?
- RQ3. To what extent are those who teach agricultural communications courses interested in using educational resources about farm safety communications?
- RQ4. In what topics are they most interested, and in what form(s) might they welcome and use educational resources about farm safety communications?
- RQ5. What conceptual linkages, if any, do their responses reveal between farm safety com-

Methods

A mixed methods survey research design was used with a combination of quantitative and qualitative approaches. Specifically, an online survey methodology was chosen with an explanatory design that used qualitative responses to explain quantitative results in selected parts of the survey instrument. This design was chosen to provide a better understanding of the research problem than through either the quantitative or qualitative approach alone (Creswell & Plano-Clark, 2007).

Participants in the survey represented U.S. universities that offer identified majors, options, or concentrations in agricultural journalism or agricultural communications. Investigators chose to seek information through a census or near-census of all of such programs in the nation. Thirty-five programs were identified through organizational directories, university and other websites, research reports, correspondence, and other means. One faculty member from each university was selected to participate. In cases of universities with multiple agricultural communications faculty members, the person identified for contact was selected on the basis of identified program leadership and teaching experience.

The survey was developed collaboratively by project team members in the National Farm Medicine Center and the Agricultural Communications Documentation Center, University of Illinois. Institutional review boards of the University of Illinois and Marshfield Clinic Research Foundation granted approval. Research Electronic Data Capture (REDCap), a secure web application for building online surveys for research studies, was used for this survey.

Respondents were invited to complete an eight-item, two-page survey. The National Farm Medicine Center was identified in the survey introduction. Topics addressed for the instrument were developed through a review of literature about farm safety communications. The questionnaire was pretested through discussions with eight agricultural communications faculty members at a professional conference. The survey was sent by e-mail to the 35 identified faculty members on November 5, 2013. Two reminders were sent by e-mail during the 2-week response period, and non-respondents were not sampled. No incentives were provided.

This effort resulted in 23 completed questionnaires, a response rate of 66%. Responses were not identified by respondent or institution, and enrollment data for individual programs were not available. However, the favorable response rate helped assure that findings represent a substantial majority of total enrollment in agricultural journalism/communications courses and degree programs at universities throughout the nation. Data analyses are descriptive. Standard summary statistics are presented.

Results

Research Question 1

Part A

Results reported in Table 1 reveal respondents place high priority on safety in farming and agriculture, with 87% identifying safety as extremely important. One respondent noted the special importance of this topic for farm audiences. This finding is consistent with results of research among high school teachers of agriculture in Texas. Researchers found teachers exhibited strong personal beliefs consistent with proper safety preparedness and practices in agricultural settings (Hubert et al, 2001, p. 151).

Table 1

Importance of Safety in Comparison With Other Aspects of Farming and Agriculture

Importance	Number	Percent
Extremely	20	87
Somewhat	2	9
Not very	0	0
Not	0	0
No opinion	1	4
Total	23	100

Part B

More than one-half (52%) of respondents replied positively to this question, but marginally so (see Table 2). None said they believe safety is being communicated very effectively. Thirty-one percent said they hold no opinion about the effectiveness of efforts to communicate about safety with farmers, farm workers, and others in agriculture.

Table 2

How Effectively Safety Is Being Communicated With Farmers, Farm Workers, and Others in Agriculture

How Effectively	Number	Percent
Very	0	0
Somewhat	12	52
Not very	3	13
Not	1	4
No opinion	7	31
Total	23	100

"I'm really not sure," one respondent explained. "I would think there could be farm advertising influences on editorial content related to safety. Yet, you do see some safety stories. Honestly, I'm not sure 'how effectively' the topic is covered."

Another respondent observed food safety is not being communicated well, "but I do believe risk-to-life safety is."

A third respondent observed, "It can be effectively communicated through the communication channels of commodity groups and farm organizations. I do not see the coverage addressed in mainstream media because the writers fail to show the newsworthiness of the situation."

"I think the key question is how effectively is it being taken up by producers," said another respondent, emphasizing the gap across media coverage, awareness of safety among farmers and the practices they actually follow.

Part C

Findings in Table 3 show more than one-half (52%) of respondents recognize some special communications skills are needed to cover farm and agricultural safety.

Table 3

Extent to Which Special Communications Skills are Involved in Reporting Farm and Agricultural Safety

Extent	Number	Percent
Many special skills involved	0	0
Some special skills involved	12	52
Few Special skills involved	5	22
No special skills involved	1	4
No opinion	5	22
Total	23	100

Some of the special skills they identified included

- Knowledge of farming operations, tools, and technologies
- Understanding the nature of farming and the agricultural industry
- Knowledge of the inherent risks involved in farming and in agriculture
- Awareness of and familiarity with terminology involving farming and equipment
- Knowledge of national statistics related to farm safety
- Knowledge of science and agriculture
- Understanding of farmer attitudes and practices related to safety
- Special familiarity with media, media skills and media relations involved in communicating about farm safety

Research Question 2

Responses suggested relatively few courses in these programs involve communicating about farm and agricultural safety. Of the 23 respondents, 74% indicated course work in their programs does not involve this subject area. Only two respondents (9%) reported having courses that do so. An additional 17% said they do not know whether courses in their programs involve such coverage.

One respondent at a university offering such courses replied, “We provide opportunities for students to cover many issues in agriculture through practical communications assignments. Occasionally, students choose, or are assigned, topics related to farm safety.” These opportunities take place in courses such as Agricultural Communications, Graphic Design in AFLS, Electronic Communications in Agriculture, Agricultural Reporting and Feature Writing, and Agricultural Campaigns.”

Another faculty respondent identified three courses that include units on communicating safety: Agricultural Communications, Risk and Crisis Communications, and Organizational Power and Advocacy. “Most relevant is the Risk and Crisis class,” the respondent explained.

In terms of teaching resources used, a respondent reported, “All classes use case studies and resources from Extension services. As you know, safety and communications are not often specifically addressed in traditional ag comm textbooks, so we’ve supplemented this void with our own materials.”

Research Question 3

Findings in Table 4 show 78% of respondents indicated they and their associates would have some interest in gaining access to teaching resources that involve covering — or communicating about — farm safety. Of those, 22% expressed keen interest, while 56% percent said they would be somewhat interested.

Table 4

Level of Interest in Teaching Resources that Involve Covering — or Communicating about — Farm and Agricultural Safety

Interest Level	Number	Percent
Very interested	5	22
Somewhat interested	13	56
Little interest	2	9
No interest	1	4
No opinion	2	9
Total	23	100

Research Question 4

Part A

Findings reported in Table 5 reveal two-thirds or more of the respondents expressed interest in three of the identified four topics: communicating about risk assessment and management, issue management, and ethics and journalistic guidelines in describing/portraying farm and agricultural safety. Ethics and journalistic guidelines commanded greatest interest, with 83% indicating that the topic would be useful in their agricultural communications courses. Responses suggest respondents place about equal priority on prevention-oriented coverage and incident/follow-up coverage of farm and agricultural safety.

Table 5

Topics That Would Be Useful in Your Agricultural Communications Courses

Topics	Response	Number	Percent
Communicating about risk assessment and management in the context of farm safety	Yes	15	65
	No	8	35
Communicating about issue management (e.g., child ag labor laws)	Yes	16	70
	No	7	30
Ethics and journalistic guidelines in describing/portraying farm and agricultural safety	Yes	19	83
	No	4	17
Preventive <i>vis a vis</i> incident/follow-up coverage of farm and agricultural safety	Yes	11	48
	No	12	52

Part B

Responses summarized in Table 6 indicate the responding teachers would find use in varied forms of teaching resources about communications aspects of farm and agricultural safety. Printed materials

ranked highest, with 70% of respondents indicating teaching resources in that form would be useful. However, in this regard, one responded explained, “We don’t need copies of the materials — just web access.”

More than one-half of the respondents (56% to 65%) indicated the other three forms would be used in agricultural communications courses.

These preferences are both consistent with, and different from, those expressed by high school agriculture teachers in Texas who were invited to express their preference for teaching materials about farm safety. Those teachers preferred safety videos with study guides, class demonstration/simulation activities, and individual study booklets. They expressed relatively low preference for interactive media as teaching tools (Hubert et al, p. 151).

Table 6

Form of safety-oriented teaching resources most likely to be used in agricultural communications courses

Form	Response	Number	Percent
Visual presentations for projection in classes with scripts and option for localization	Yes	14	61
	No	9	39
Printed resources, comprehensive or by topic	Yes	16	70
	No	7	30
Audiovisual presentation for projection in classes, online access or self-instruction	Yes	13	56
	No	10	44
Multi-media teaching modules	Yes	15	65
	No	8	35

Research Question 5

Recognition of all three elements of Lundgren and McMakin’s (1998) safety-oriented framework for risk communications was apparent. Respondents expressed interest in teaching resources about farm safety communications involving topics represented in all three functional areas of that framework — care, consensus, and crisis/risk. Several respondents referred to risk communications in their comments and evidence suggested aspects of farm safety communications are being taught at some universities in the context of risk communications.

Discussion

This study provides valuable insights, nationally, about the views, efforts, and ideas of those who are in a position to teach risk communications each year to thousands of aspiring agricultural journalists/communicators and others. Findings reveal an encouraging potential for integrating farm safety into agricultural communications courses. Responding teachers offered positive views about the importance of occupational safety in farming, identified special skills needed for communicating about

farm safety, and expressed interest in gaining access to related teaching resources. They expressed concern about how effectively safety is being communicated with farmers, farm families, farm workers, and others in agriculture. All of these responses reflect strong potentials and offer direction for pursuing them. They offer a promising answer to the question asked by Murphy and Lee (2009), “Where is the education and training to come from?”

In a broader sense, the study helps fit a “lost cousin” — occupational safety in farming and agriculture — into a growing family tree of risk communications related to food, natural resources, renewable energy, rural development, sustainability, and other dimensions of agriculture. Review of existing literature identified concerns among agricultural communications scholars about a gap between the theory and practice of risk communications (Simon, Robertson, & Doerfert, 2003). Findings of the study help identify a strategy for strengthening the practice of farm safety communications as an integral part of risk communications in agriculture, a strategy that encompasses occupational safety of producers as well as health and well-being of consumers.

While these two traditions of interest have developed quite separately, results reveal shared conceptual roots, adding understanding and meaning to them. Recognition of all three elements of Lundgren and McMakin’s (1998) safety-oriented framework for risk communications was apparent. Respondents expressed interest in teaching resources about farm safety communications involving topics represented in all three functional areas of risk communications — care, consensus, and crisis/risk. Follow-up within such a framework may help strengthen connections between theory and practice in risk communications (including farm safety communications) related to agriculture.

Recommendations

Results of this survey prompt the following recommendations for research and other potential follow-up efforts:

1. Initiate projects for developing and providing to agricultural communications teachers educational resources that involve the topics and forms identified in this survey. Include research components to assess the use and educational value of those resources.
2. Develop sample course outlines and ideas that identify ways in which to incorporate farm safety communications into existing agricultural communications courses. These resources may include case studies, extension materials, and other references such as those identified through the survey.
3. Develop, pretest, and provide educational resources that identify innovative, non-traditional media strategies for communicating with farm workers, farm families, children, and other special audiences.
4. Identify occupational safety risks associated with new and emerging agricultural technologies such as those identified in this study. Through research, analyze communications aspects of those risks and develop strategic communications options.
5. Guided by feedback from respondents, use research to improve understanding of the special skills and concepts required for covering or otherwise communicating about farm safety. Operationalize these insights for use in planning agricultural communications courses and curricula.
6. Conduct research that addresses dilemmas facing agricultural journalists in decisions about how much “care” and “consulting” to include in their journalistic role of editorial independence, neutrality, and balance.

7. Examine further the linkages between concept and practice in communicating about the risk

and safety aspects of agriculture.

References

- Agri Council of American Business Media. (2012). *2012 Media Channel Study*. Conducted by Readex Research, Stillwater, MN. New York City, NY: American Business Media.
- Agricultural communications research priorities in the Southern Region. (2003). Report of an ad hoc committee of agricultural communications faculty members, based on deliberations at the American Association of Agricultural Educators Southern Regional Conference, Mobile, Alabama, February 1-4, 2003.
- Antibiotic controversy: Public benefit or cause for concern. (January 1985). *Meat Board Reports*, 1, 6. Chicago, IL: National Live Stock and Meat Board.
- Agricultural Safety & Health Council of America. (December 2014). *ASHCA Facts 2015 – Be Safe. Be Profitable*. (Fact sheet) Marshfield, WI: Agricultural Safety & Health Council of America. Retrieved from: <http://www.ashca.org/wp-content/uploads/2014/12/ASHCA-2015-Ag-Safety-Fact-Sheet.pdf>. Accessed: 3 March 2015.
- Celebrity pesticide spots. (1968). Audio public service announcements. Washington, D.C.: U.S. Department of Agriculture.
- Cigarette smoker study offers clues to how people read news about health risks. (1961). *Public Relations Tips for Dairymen*, 1(10), 3-4. Chicago, IL: American Dairy Association.
- Covitt, B. A., Gomez-Schmidt, C. & Zint, M. T. (2005). An evaluation of the risk education model - Exploring environmental issues: Focus on Risk. *Journal of Environmental Education*, 36(2), 3-13.
- Creswell, J. W., & Plano-Clark, V. L. (2007). *Designing and conducting mixed methods research*. Thousand Oaks, CA: Sage Publications.
- Doerfert, D. L. (Ed.) (2011). *National research agenda: American Association for Agricultural Education's research priority areas for 2011-2015*. Lubbock, TX: Texas Tech University, Department of Agricultural Education and Communications.
- Food is split over irradiation. (March 18, 1985). *Industry Week*, 27-28.
- Harmer, R. M. (1971). *Unfit for human consumption*. Englewood Cliffs, NJ: Prentice-Hall, Inc.
- Heiberger, S. (2012). Lessons learned from the child agricultural labor law debate. *Journal of Agro-medicine*, 17(4), 351-353.
- Hubert, D. J., Ullrich, D. R., Murphy, T. H. & Lindner, J. R. (2001). Texas entry-year agriculture teachers' perceptions, practices, and preparation regarding safety and health in agricultural education. *Journal of Agricultural Safety and Health*, 7(3), 143-153.
- Lawler, P. F. (1986). *Sweet talk: Media coverage of artificial sweeteners*. Washington, D.C.: The Media Institute.
- Lundgren, R. E. & McMakin, A. H. (1998). *Risk communication: A handbook for communicating environmental, safety and health risks*. (2nd ed.) Columbus, OH: Battelle Press.
- Miller, L. J., Schwab, C. V., & Peterson, J.W. (1994). The Farm Safety campaign and changes in Iowa farmers' attitudes and behavior. Paper presented at the International Conference of Agricultural Communicators in Education, Moscow, ID/Pullman, WA, July 16-20, 1994.
- Murphy, D. J. & Lee, B. C. (2009). Critical issues facing agricultural safety and health. *Journal of Agricultural Safety and Health*, 15(3), 203-205.
- National Association of Farm Broadcasting. (2015). *Farm radio connects with farmers and ranchers*. News release. Platte City, MO: National Association of Farm Broadcasting.

- National Children's Center for Rural and Agricultural Safety and Health (December 2013). 2014 fact sheet: *Childhood agricultural injuries in the U.S.* Marshfield, WI: National Children's Center for Rural and Agricultural Safety and Health. Retrieved from: http://www3.marshfieldclinic.org/proxy/MCRF-Centers-NFMC-NCCRAHS-2014_Child_Ag_Injury_FactSheet.1.pdf. Accessed: 27 Feb 2015.
- Oden, D. (2005). Selling safety: The farm safety movement's emergence and evolution from 1940-1975. *Agricultural History*, 79(4), 412-438.
- Ozegovic, D. & Voaklander, D. C. (2011). What we are not talking about: an evaluation of prevention messaging in print media reporting on agricultural injuries and fatalities. *American Journal of Industrial Medicine*, 54(8), 603-608.
- Pedler, D. (2006). Relationships between the health care sector and the media. *Australian Journal of Rural Health*, 14(6), 243.
- Pense, C. M. & Cutcliffe, S. H. (2007). Risky talk: Framing the analysis of the social implications of nanotechnology. *Bulletin of Science, Technology and Society*, 27(5), 349-366.
- Pierce, P. (1911). Pure food legislation and advertising. *Agricultural Advertising*, 22(12), 40-42.
- Role of diet in heart disease could become a hot issue in year ahead. (1965). *Public Relations Tips for Dairymen*, 5(12), 1-4. Chicago, IL.: American Dairy Association.
- Salcedo, R. N., Read, H., Evans, J. F. & Kong, A. C. (1971). Improving the communication adequacy of pesticide labels: Phase 1 summary report. *Agricultural Communications Research Report 25*, Office of Agricultural Communications, College of Agriculture, University of Illinois, Urbana-Champaign.
- Sellnow, D. L. & Sellnow, T. L. (2014). The challenge of exemplification in crisis communication. *Journal of Applied Communications*, 98(2), 53-64.
- Shoemaker, P. J. (1996). Media gatekeeping. In M. B. Salwen & D. W. Stacks (Eds.), *An integrated approach to communication theory and research* (pp. 79-91). Mahwah, NJ: Lawrence Erlbaum Associates.
- Simon, L. A., Robertson, J. T. & Doerfert, D. L. (2003) *The inclusion of risk communications in the agricultural communications curriculum: A preassessment of need*. Paper presented at the Western Region Agricultural Education Research Conference, Portland, Oregon, April 23-26, 2003.
- Telg R. (2010) Risk and Crisis Communication: *When Things Go Wrong*. Document WC093, p. 1. Agricultural Education and Communication Department, University of Florida/ Institute of Food and Agricultural Sciences. Retrieved from: <http://edistt.ifas.ufl.edu/pdf/WC/WC09300.pdf>. Accessed: 27 Feb 2015.
- Teran, S., Strohlic, R., Bush, G., Baker, R., & Meyers, J. (2008). Reaching teen farm workers with health and safety information: an evaluation of a high school ESL curriculum. *Journal of Agricultural Safety and Health*, 14(2), 147-162.
- Unfounded claims against meat lead to "showdown" time. (1974). *Meat Board Reports*, 7(15). Chicago, IL: National Live Stock and Meat Board.
- U.S. Department of Agriculture. (2011). Food and Agricultural Education Information System, maintained in cooperation with the College of Agriculture and Life Sciences, Virginia Tech University, Blacksburg.
- U.S. Department of Labor. (2014). *National Census of Fatal Occupational Injuries in 2013*. Bureau of Labor Statistics news release (USDOL-14-1674). Retrieved from: <http://www.bls.gov/news.release/pdf/foi.pdf>. Accessed: 27 Feb 2015.

Whelan, E.M. & Stare, F.J. (1975). *Panic in the pantry: food facts, fads and fallacies*. Buffalo, NY: Atheneum.

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