Public Relations Journal Vol. 5, No. 2, Spring 2011
ISSN 1942-4604

Food Warnings and Recalls: Remembering Readability in Crisis Communication

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Objective: We examined readability literacy levels for the crisis communication, food-related warnings and recalls, distributed by the FDA and USDA.

Methods: Readability measures were calculated for the food-related press releases disseminated on the agencies' Web sites for the six month period of January through June 2008.

Results: The food-related warnings and recalls were written at reading levels above nearly half of the U.S. population.

Conclusions: The high readability levels of the FDA and USDA written alerts about foodborne illnesses and outbreaks negatively influence message effectiveness. Although time constraints inherently affect crisis communication, readability measures can and should be remembered and used.

LITERATURE REVIEW

Charged with protecting the public's health, the U.S. Food and Drug Administration (FDA) and the U.S. Department of Agriculture (USDA) regulate much of the nation's food supply and system. Although the U.S. food system is among the world's safest, contaminated foods and foodborne illness outbreaks cause an estimated 76 million illnesses and 5,000 deaths each year (Mead et al., 1999). The threats number many and range from *Salmonella* in peppers to *E. coli* in spinach to *Listerium* in milk. Sources of such threats are varied and occur during production, harvesting, and processing activities; through distribution systems; and at retail and consumer sites. Moreover, the sources of the threats may be unintentional or intentional, while the consequences may be limited or catastrophic.

When a foodborne illness outbreak occurs and the contaminated food(s) is identified, the FDA or the USDA as a public health agency alerts the public that a specific product or commodity is considered unsafe and consequently advises individuals to take a particular action (Curatolo, 2005; Rudd, Comings, & Hyde, 2003). Although food recalls may be recommended by the regulatory agency, recalls are actions "taken voluntarily by food manufacturers or distributors after they determine independently or are informed by a government agency of the possibility of negative health concerns by consumers from eating their products" (Teratanavat & Hooker, 2004, p. 359).

Typically, the regulatory agencies issue warnings and, when voluntarily initiated by the linked food organization, announce recalls. During the first six months of 2008, the FDA and the USDA posted 176 such communications to their respective Web site, the primary channel for this food-related crisis communication. The postings typical include the federal alerts and the official press release of the food company. The media and the public rely on these postings as the primary source of information for public dissemination.

Hoping to limit the incidence and severity of a foodborne illness, the FDA or the USDA expects individuals to access, understand, and apply the instructions within the posted warning and/or recall. This reliance on written releases via the Internet for food-related warnings and recalls underscores the importance health literacy. Without adequate health literacy, the public cannot be expected to comprehend and understand the warnings and take action.

Readability, one aspect of health literacy, is a critical aspect when source information is primarily available in written format as in food warnings and recalls issued by governmental agencies and food organizations (Bernhardt & Cameron, 2003). Therefore, this study examined readability in the crisis communications associated with food-related warnings and recalls distributed by the FDA and USDA during the first half of 2008.

Risk and Crisis Communication

Most simply, the purpose of risk communication is to avoid crises, while the purpose of crisis communication is to respond to an actual crisis (Sellnow, Ulmer, Seeger, & Littlefield, 2009). Risk communication messages typically center on the potential of future harm and persuasively promote specific behaviors for risk reduction and harm avoidance. Conversely, crisis communication messages take place within a context of immediacy, threat, and uncertainty and attempt to warn and inform the public about an unfolding event and emergency actions (Reynolds & Seeger, 2004). Fearn-Banks (2002) suggests that “crisis communication is verbal, visual, and/or written interaction between the organization and its stakeholders prior to, during and after a negative occurrence” (p. 480).

As public health agencies, the FDA and the USDA focus on protecting the public’s health by “enhancing food safety” and “taking steps to reduce the prevalence of foodborne hazards from farm to table (FDA, n.d.)” and by “assuring the safety, efficacy, and security of … our nation’s food supply” (USDA, n.d.). During routine operations, the agencies provide consumer education and health promotion by engaging in health campaigns and risk communication. The messages center on projections of risk and the probabilities of negative consequences for individual consumers if they do not adhere to the recommended behaviors.

Public health practitioners and researchers regularly employ risk communication research in public health campaigns. Models and theories including Fear Appeals,

Health Belief Model, Social Marketing, the Theory of Reasoned Action, and many others provide the theoretical framework for designing campaigns and crafting messages intended to persuade consumers to adopt the recommended behaviors for risk reduction and crisis prevention. Campaign messages are grounded in both current scientific and technical understanding of specific risk factors as well as cultural or social beliefs regarding the risk (Reynolds & Seeger, 2004). Time is available and taken to identify and analyze the target audience, carefully craft a campaign and its messages, pilot the messages and appeals to target audience members, and disseminate the messages through targeted media channels (Reynolds & Seeger, 2004; Rudd, Comings, & Hyde, 2003).

In contrast, when the FDA or the USDA posts warnings and recalls about foodborne illness outbreaks and food contamination, they engage in crisis communication. The communication is event-centered and must attend to what is happening and what must be done to resolve or contain the crisis. The officials respond swiftly in spite of having incomplete information. As mentioned, these agencies almost exclusively utilize written communication on their Web sites.

In these times of crisis, the public health community experiences pressure to communicate effectively with the public within a context of immediacy, threat, and high uncertainty. Crisis messages are essentially non-routine, bound to a specific event, and crafted with urgency. Therefore, the messages are frequently more spontaneous and less controlled than those in risk communication; they are more like news releases and less like polished campaigns (Reynolds & Seeger, 2004). Time constraints during crises prohibit the design and development stages associated with risk communication. Additionally, crises by definition entail much more uncertainty than scientifically studied risks.

Rudd, Comings, and Hyde (2003) examined two mailings by the federal government, the 1988 Understanding AIDS and the 2001 postcard A Message to Americans, that serve as contrasting examples of risk and crisis communication. The first mailing consisted of a seven-page brochure, which underwent formative, pilot, and summative testing and cost more than $25 million; the second mailing was a simple post card, which was developed, printed, and disseminated within 4 weeks. The mailings show stark differences in the design and development process, the content and format, and the influence of time as a limiting factor. Crisis communication rarely has the benefit of any significant formative research for design, testing, and implementation of messages (Rudd, Comings, & Hyde, 2003).

Literacy

There is general consensus that written communication must be tailed to the literacy skills of the target audience. According to the U.S. Department of Health and Human Services (2000), health literacy involves “the capacity to obtain, interpret, and understand basic health information and services and the competence to use such information and services to enhance health” (p. 11). Therefore, health literacy requires a

mix of cognitive abilities and social skills and includes reading literacy, numeracy literacy, media literacy, and computer literacy (Bernhardt & Cameron, 2003).

Reading literacy levels in the U.S. document a range of functional skills and ongoing disparities (U.S. Department of Education, 2005). In 2005, the U.S. Department of Education conducted the National Assessment of Adult Literacy (NAAL), the most comprehensive measure of adult literacy. The survey measured three dimensions of literacy: prose literacy (understanding written narrative), document literacy (understanding written outline or bulleted text), and quantitative literacy (numeracy). The results revealed that 47 percent of respondents were at "basic" or "below basic" for prose literacy, 34 percent were at "basic" or "below basic" for document literacy, and 55 percent were at "basic" or "below basic" for quantitative literacy.

"Basis" indicates skills necessary to perform simple and everyday literacy activities such as finding information in a pamphlet, using a television guide, or comparing ticket prices for two events. "Below Basic" indicates no more than the most simple and concrete literacy skills such as the ability to search a short, simple text to find a piece of information, sign a form, or add dollar amounts. Alarmingly, almost half of the U.S. population scores at the basic or below basic literacy level (U.S. Department of Education, 2005).

Based on the NAAL results and the association of readability literacy and communication effectiveness, high readability skills cannot be assumed for any communication, including food safety messages, which tend to be complex. Nevertheless, well over 250 studies in public health and medical journals indicate that health-related print materials score at reading grade levels far exceeding the reading ability of the average adult (Rudd, Moeykens, & Colton, 2000).

Readability is an important consideration. Increasingly, best practice conventions include attention to reading skills, including key elements of the message such as vocabulary, sentence construction, format, and other literacy-related factors that may increase or limit access to written information (Rudd, Moeykens, & Colton, 2000). Readability tests, mathematical formulas for determining how easy it is to read and comprehend a document, have also been employed as guideposts. Readability studies have been conducted in many disciplines including science research (Goldbort, 2001) and medical and health care journals (Weeks & Wallace, 2002; White, 2000). In the same manner this study evaluated the effectiveness of the FDA and USDA's food-related warnings and food organization recalls by assessing the readability level of their written releases.

METHOD

This analysis examined the FDA and USDA's written communication as posted on their respective Web site. Press releases were collected from the agencies' Web sites for the six month period of January through June, 2008. Sixteen releases were posted online during this period by the USDA; 160 releases were posted by the FDA. Because FDA

releases also included warnings about pharmaceuticals, beauty products and other non-food related items, those not related to food were eliminated, leaving 72 that concerned food safety.

The releases were then individually run through a readability application accessed on the Web site www.readability.info. This is one of many software-based resources available to the public that automatically calculates readability scores. There are a variety of readability indices, all of which are used to determine the grade level of a sample of written text. All measures evaluate parameters such as the number of words used, words containing multiple syllables, the number of sentences, and the length of the sentences and score the text based on a point scale which translate into a calculated grade level. Indexes used in this study are the Flesch Reading Ease, Gunning-Fog Index, and SMOG Index, three common readability tests.

RESULTS

The average readability levels for the USDA releases were grade level 13.7 as measured by the Gunning-Fog Index and grade level 11.6 as measured by the SMOG Index. The Flesch Reading Ease score was 57.6. The average readability levels for the FDA releases were grade level 13.4 as measured by the Gunning-Fog Index and grade 11.8 as measured by the SMOG Index. The Flesch Reading Ease score was 57.8. Table 1 shows the average readability scores and the ranges for the releases by each agency.

Table 1: Readability Measures for Food Warnings and Recalls

	Readability Measure		
	Flesch Reading Ease (on a scale of 1 to 100)	FOG (grade level)	SMOG (grade level)
USDA Releases	57.6	13.7	11.6
FDA Releases	57.8	13.4	11.8

The Flesch Reading Ease index indicates that the releases distributed by both agencies are of midlevel complexity, or a grade 12+ reading level. The Gunning-FOG and SMOG indices place the releases at grade 13 and grade 11. This is clearly of a higher grade level than the literacy level of “basic” or “below basic,” would warrant. Table 2 (attached) shows the readability information for each press release by agency.

DISCUSSION

The food safety releases distributed by the FDA and the USDA require upper levels of readability literacy. They are written at a higher grade level than that of nearly half the U.S. population, which has been found to read at a “basic” or “below basic” level (U.S. Department of Education, 2005). The public, therefore, would have a difficult time understanding and acting upon the written crisis communication. If the readers do in fact have difficulty interpreting the information, the result may be an escalation of the

condition, which might not only prolong the crisis but could produce a disastrous outcome.

Issues of numeracy literacy, media literacy, and computer literacy only compound the problems of readability literacy. FDA and USDA releases are disseminated on the respective Web sites. Readers without access to releases on the Internet rely exclusively on media interpretations and reports of the information; thereby reducing even more the availability of detailed information. Additionally, most crisis communication about foodborne illnesses includes risk concepts and ratios, these numeracy concepts are likely to be confusing to many readers.

Limitations

Readability measures cannot assess the complexity of ideas and whether or not the content is in a logical order. They cannot indicate whether the vocabulary is appropriate for the audience or whether there is a gender, class, or cultural bias. They fail to reveal whether the design is attractive or helps/hinders the reader. Because the readability formulas are quantitatively based on measuring words and sentences, they do not report on the other important elements inherent in effective communication.

A second major limitation is the fact that readability tests cannot take into account the variety of resources available to different readers. Reader resources are tools such as word recognition skills, interest in the subject, and prior knowledge of the topic. Studies have shown that interest and prior knowledge are equally important factors in comprehension and retention of information.

CONCLUSION

Although the real constraint of time in crisis communication may prohibit the extensive design stages possible in risk communication and public health campaigns, public health practitioners and industry officials must also attend to message development and effectiveness during evolving crises. At a minimum, crisis communicators need to be attentive to readability levels. Readability is a first and necessary consideration when developing and disseminating food crisis communication, as it is in other health communication directed to the public (Rudd, Comings, & Hyde, 2003). Readability indexes offer a simple and quick measure of the grade level at which a written text is written.

Readability measures can serve as an early warning system to indicate that the writing is too complicated and dense. These tools should be especially valued by crisis communicators who distribute critical, time-sensitive information and hope to mitigate the incidence and severity of illness due to food contamination. The limited time for information releases and prompt action by the public depends upon the public’s ability to access, understand, and apply the recommendations.

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Table 2: Readability Information on FDA/USDA Recalls and Alerts, January to June 2008

USDA Recalls / Alerts						
Date	**Product**	**Adulturation**	**Flesch**	**FOG**	**SMOG**	
1/5/2008	Ground Beef	Ecoli	63.5	13	10.9	
1/12/2008	Ground Beef	Ecoli	52.3	17.3	12.7	
1/26/2008	Chicken	Undeclared Allergen	54.3	14.8	12.5	
2/1/2008	Beef Tenderloin	Undeclared Allergen	62.2	12.1	11	
2/17/2008	Beef Recall	Improper Inspection	76.9	8.8	8.8	
3/2/2008	Chicken	Listeria	50.7	13.4	12.1	
3/3/2008	Chicken	Listeria	56.2	12.1	11.2	
3/4/2008	Chicken	Listeria	49.9	13.7	12.3	
3/4/2008	Meat/Poultry	Listeria	58.7	12.7	11.5	
3/14/2008	Chicken Giblets	Adulterated	62.6	13.4	11.5	
3/29/2008	Chicken	Mislabel	55.9	13.3	12	
5/3/2008	Meat/Poultry	Listeria	38.9	25.6	15.1	
5/12/2008	Ground Beef	Plastic	69.8	10.9	9.7	
5/21/2008	Pork Sausage	Listeria	48.7	14.1	12.6	
6/8/2008	Ground Beef	Ecoli	69.1	11.4	10.3	
6/9/2008	Chicken	Listeria	52.8	13.9	12.3	
			922.5	220.5	186.5	/16
Average			57.6	13.7	11.6	

FDA Recalls/Alerts						
Date	**Product**	**Adulturation**	**Flesh**	**FOG**	**SMOG**	
1/3/2008	Fruit Chews	Undeclared milk	61.3	12.6	11.5	
1/16/2008	Indian Specialties	Lead	73.8	10.9	9.7	
1/18/2008	Beans	C. Botulinum	50.3	15.6	13.4	
1/21/2008	Bean Salad	C. Botulinum	63.2	11.6	10.6	
1/22/2008	Nuts	Undeclared ingred	67.4	10.6	9.8	
1/22/2008	Ice Cream	Undecl pecans	56.7	14	12.1	
1/23/2008	Croaker	C. Botulinum	65.7	10.7	10.2	
1/23/2008	Tea Beverage	Undecl sulfites	54.7	14.6	13	
1/25/2008	Coconut	Undecl sulfites	60.9	12.4	11.5	
1/26/2008	Sesame Seeds	Salmonella	53.7	13.4	12	
1/30/2008	Cheese	Staphylococcus aureus	60.8	12.6	11.4	
1/31/2008	Cheese Dip	C. Botulinum	59.3	11.9	11.1	
1/31/2008	Crackers	Undecl eggs	57.4	13.8	12.3	
2/1/2008	Basil Pesto	Undecl pine nuts	58.2	13.2	11.9	
2/1/2008	Coconut	Undecl sulfites	50	13.9	12.5	
2/4/2008	Plums	Undecl sulfites	60.1	13.3	12.1	
2/6/2008	Soup	Undecl ingred	55.7	16.4	12.5	
2/7/2008	Milk Soy Wheat	Undecl ingred	67.4	11.3	9.9	
2/7/2008	Vegetables	C. Botulinum	77.4	8.1	8.5	
2/7/2008	Apricots	Undecl sulfites	51.2	14.2	12.7	
2/9/2008	Tuna	Salmonella	53.8	13.8	12.4	
2/11/2008	Vinaigrette	Mislabel/undecl ing	55.4	13.8	12.4	
2/11/2008	Popcorn	Undecl nuts	66	10.5	10	
2/11/2008	Ginger	Undecl sulfites	60.3	12.5	11.5	
2/12/2008	Candy	Undecl milk	59.6	13.5	11.7	
2/14/2008	Crackers	Undecl ingred	51.5	15.4	13.3	
2/15/2008	Sesame Seeds	Salmonella	54.8	14.5	12.6	
2/20/2008	Ice Cream	Undecl peanut butter	58.6	15.7	13.1	
2/21/2008	Ice Cream	Undecl pecans	60.5	11.3	10.5	
2/29/2008	Fish Fillets	Contains pills	54.2	13.3	11.8	
3/4/2008	Pancake Mix	Salmonella	59.6	11.3	10.7	
3/6/2008	Raisins	Undecl sulfites	56.5	13.3	12.1	
3/14/2008	Langostinos	Listeria	42.5	16.5	14	
3/14/2008	Empanadas	Undecl milk	65	9.5	9.4	
3/18/2008	Spelt Bread	Imdec; wheat	70.1	11.3	10.4	
3/18/2008	Fish Batter Mix	Undecl milk	63.3	13.6	10.9	
3/18/2008	Cinnamon Rolls	Undecl milk	44.9	18.1	14.8	
3/27/2008	Cantalope	Salmonella	46.2	16.1	13.9	

Date	Product	Adulturation	Flesh	FOG	SMOG	
3/28/2008	Yogurt	Contains plastic	47.7	15.4	13.4	
3/31/2008	Caesar Dressing	Mislabel/undecl ing	57	15.3	12.2	
4/1/2008	Bread Products	Undecl milk	68.1	11	10.2	
4/1/2008	Croaker	C. Botulinum	59.3	12.2	11.4	
4/3/2008	Cantalope	Salmonella	49.2	15.8	13.8	
4/4/2008	Candy	Uncecl ingred	64.7	11.7	10.6	
4/5/2008	Cereal	Salmonella	49.5	16.7	14	
4/7/2008	Milk	Listeria	48.6	14.7	12.9	
4/7/2008	Ice Cream	Undecl ingred	68.4	11	10.2	
4/8/2008	Chix Dumpling Soup	Undecl ingred	55	15.2	11	
4/8/2008	Ginger	Undecl sulfites	49.7	15.1	13.2	
4/9/2008	Candy	Mislabel/undecl ing	53.1	14.2	12.4	
4/12/2008	Cereal	Salmonella	51.1	15.7	12.7	
4/16/2008	Candy	Undecl ingred	52.2	16.7	14.1	
4/16/2008	Dumplings	Undecl eggs	58.9	12.6	11.1	
4/17/2008	Candy	Lead	58.2	14.6	12.7	
4/18/2008	Cakes	Undecl ingred	52.1	15.7	13.5	
4/23/2008	Soy Sprouts	Listeria	50.8	13.1	13.5	
4/23/2008	Soy Milk	Undecl milk protein	62	12.4	11.3	
5/2/2008	Corn Bread	Undecl soy	61.4	13.1	11.3	
5/6/2008	Italian Ice	Undecl milk protein	59.8	11.4	10.7	
5/6/2008	Clam Chowder	Undecl shrimp	65.4	12	11.2	
5/15/2008	Cheese	Listeria	52.5	14.5	12.5	
5/16/2008	Seafood	Process violation	42.1	17.3	14.5	
5/28/2008	Macaroni Salad	E. coli	60.2	14.1	12.4	
5/30/2008	Cheese	Listeria	52.6	14.4	11.9	
6/5/2008	Cereal	Undecl ingred	57.4	14.9	11.7	
6/7/2008	Tomatoes	Salmonella	45.9	16.8	14.5	
6/17/2008	Chai	C. Botulinum	54.5	13.7	12.3	
6/18/2008	Candy	Contains plastic	62.7	12.6	10.7	
6/23/2008	Cheese	Listeria	60.5	12.3	11	
6/24/2008	Water	Contains cleaner	69.7	10.2	9.2	
6/24/2008	Chix Noodle Soup	Undecl ingred	70.1	11.2	9.6	
6/27/2008	Garlic Bread	Undecl milk	67.1	10.3	9.9	
			4165.5	967	851.8	/72
Average			57.8	13.4	11.8	