

Health Inspectors' Perceptions of the Words Used to Describe Violations

JINKYUNG CHOI* and BARBARA ALMANZA

Dept. of Hospitality and Tourism Management, Purdue University, West Lafayette, IN 47907, USA

ABSTRACT

Restaurant inspection reports are widely accessible to the public who may use them to gauge the food safety practices of restaurants. Words used in inspection reports are important, as they must accurately and precisely describe the violation, but in addition, word choices may also influence the perception of food safety risk associated with specific violations. This is important not only for consumers, whose interpretations might vary, but also for restaurant managers, who consider issues of restaurant reputation. This study investigated 25 health inspectors' perceptions of the words used to describe violations. Health inspectors were asked about their perceptions of selected words in five categories at a quarterly meeting of a food protection committee from the Indiana Environmental Health Association. Results indicate that health inspectors had different perceptions of the words and were influenced by a number of factors. The use of the word "filthy," for example, was associated with the highest perceived risk (between 5.88 and 6.08 on a scale of one to seven) in five types of violations and was most often considered inappropriate (between 14 and 18 inspectors considered a statement containing the word "filthy" inappropriate in five violations). In contrast, the word "soiled" was preferred as being appropriate, correct, and commonly used. A significant difference was found in the perceptions of high-risk words between more experienced and less experienced inspectors. Inspectors with less experience thought that the word *unsanitary* was perceived as a higher risk word by consumers ($M = 5.07, SD = 0.84$) than did those with 15 or more years of experience ($M = 3.92, SD = 1.23$); $t(21) = (2.61), P < 0.05$. Five themes emerged there are clear differences in the perception of the weight of word choices, inspectors may be influenced by other factors when writing violations, training can affect how health inspectors describe violations, there are limitations in writing violations, and health inspectors are aware of the effect of health reports on consumers.

A peer-reviewed article

*Author for correspondence: Phone: +1 765.494.9847; Fax +1 765.494.0327
Email: choi108@purdue.edu

INTRODUCTION

Health inspection reports were originally designed to communicate between health inspectors and restaurant managers. Because the Freedom of Information Act allows the public to have access to health inspection reports, however, health inspectors also communicate indirectly with consumers. Consumers' interest and use of cleanliness/food safety information is demonstrated by research reporting that the hygiene condition of a food service is one of the top three considerations when consumers select a place to dine out (4).

Today's health inspector has multiple roles as inspector, communicator with restaurant managers and consumers, and educator. As a communicator, it is essential that health inspectors provide accurate and reliable inspection results to restaurant managers and to the public. For consumer use of information, it is also important to consider the impact of the individual's reading ability in understanding restaurant health inspection reports. Reading ability is likely to vary depending on the reader's personal interest in the subject (13) and knowledge (15).

Words used to describe violations in health inspections are important in that the violations reflect food safety issues at the restaurant. Issues of food safety are also critical for restaurant managers and owners; perceptions of poor sanitation might lead to consumers choosing a different restaurant, resulting in loss of revenue. To avoid consumers' misinterpretation of food safety practices at the restaurant, the choice of accurate, clearly understood, and standardized words describing inspection results is important. Variations in inspection results by individual inspectors have been suggested to be attributable to several factors (10, 14).

However, a study examining health inspectors' perceptions of word choices in terms of frequency, accuracy, and inappropriateness is lacking. Therefore, this study was conducted to investigate whether health inspectors have different perceptions about the words they use to describe violations. This study provides a starting point for discussion of these words and may be helpful in exploring issues of standardization of violation descriptions.

Health inspector's role as communicator

Consumers are interested in food safety issues at restaurants and use food safety information when purchasing food. Research has found that 70 percent of respondents would no longer buy food from a food service establishment about which they had concerns about hygiene (5). In addition, a study found that people who perceived that a restaurant was "not at all" committed to food safety were less likely to choose that restaurant when eating out (9). In fact, cleanliness was the most important determinant for consumers' perceptions of restaurant food safety (7).

Restaurant inspection reports provide useful information for those who are curious about the safety of food they consume away from home and are often made available from local health departments to meet the public's demand for food safety information, as well as to provide information as stated in the Freedom of Information Act (FOIA) (16). The local health department's Web sites that feature health inspection reports have clearly attracted consumer interest. For example, New York City's health department Web site averaged 23,000 hits an hour its first day online (11). In England, the Bournemouth council Web site had 20,000 hits in two weeks and Liverpool had more than 100,000 hits in the two days following the launch of its Web site for health inspection reporting (1). Because of the great consumer interest in food safety information, the health inspector's role in providing accurate inspection results has received renewed attention and is essential in helping to avoid misinterpretation of inspection results by this expanded audience.

Although health inspectors visit restaurants and write inspection reports using manuals based on the FDA Food Code, the food code can be greatly impacted by their visual assessments, which might result in selection of various words to describe these violations. Anecdotally, health inspectors will say that although certain words may appear to have similar meanings, some words are more or less appro-

priate (or even inappropriate). Words such as dirt, filth, soil, and food debris, for example, although similar in meaning, are thought to have very different connotations.

Variations in health inspection reports have been cited in several studies. For example, health inspectors showed variation in regard to their opinions of cleanliness and the resulting inspection reports (10). It was hypothesized that the variation in the results of restaurant inspections might be caused by individual inspectors, timing of inspections, types of operation, size of the establishment, and limited time for the inspection (14). Other researchers have also suggested that inspectors show variations in writing violations during an inspection (3, 8, 10).

Health inspector's role as educator

The National Restaurant Association (NRA) has been promoting managers' certification in food safety to educate managers regarding the most current food safety information and practices. In addition, to improve sanitary conditions in the restaurant, restaurant managers are expected to implement a food safety training program for their employees. Health inspectors provide restaurant managers and food handlers with food safety information while they are inspecting the restaurants. At least one study has reported that health inspectors educate restaurant workers about food safety during the inspection process and that this was one of their most important activities (6). It was also noted, however, that some inspectors did not conduct inspections thoroughly and rarely explained violations (6). This variation in health inspections might lead to inconsistency in restaurants implementing food safety practices, with subsequent differences in inspection results. Increased standardization of inspection methods might improve restaurant managers' understanding of changes that need to be made in their restaurants' food safety practices.

Words used in inspection reports are therefore important, since the words used to describe violations are related to accuracy, precision, and identification of risk in terms of food safety

of the foodservice establishments. These are important not only for consumers, whose interpretations might vary, but also for restaurant managers who consider issues of restaurant reputation. In addition, they provide careful and considered legal documentation of health inspectors' actions. Furthermore, an individual's ability to interpret the restaurant health inspection reports might vary on the basis of the terminology or vocabulary used to describe the violations. Vocabulary, for example, has been found to play an important role in predicting reading comprehension in young adults (2).

An exploratory study was therefore conducted to open a dialogue regarding health inspectors' perceptions of the words used to describe violations. The objectives of this study were to examine health inspectors' perceptions of the accuracy, correctness, common usage, and appropriateness of words used to describe violations. The study also obtained health inspectors' feedback on the core elements of ideal violation descriptions. Finally, this study explored health inspectors' opinions of the risk perception of consumers eating in a restaurant that had violations described with specific words.

MATERIALS AND METHODS

The convenience sample for this cross-sectional quantitative and qualitative study consisted of members of the food protection committee of the Indiana Environmental Health Association. Members were almost all Indiana health inspectors; additional members included staff from the Indiana State Health Department, one member from academia, and an industry representative who is responsible for the food safety program for a large food retail operation. The Purdue University Institutional Review Board reviewed and approved the protocol before the study. Phase 1 utilized a quantitative approach using questionnaires. Phase 2 utilized a qualitative approach facilitating discussion among inspectors at the meeting. The questionnaire focused on the choice of words used to describe health inspection violations. The words were selected from the FDA Food Code, Retail Food Establishment

Sanitation Requirements (Indiana State Department of Health) and extensive search of health inspection violations nationwide on the web pages of local health departments. The words selected for the study were commonly used words with similar meanings in five categories. For example, the five words used to describe a violation related to lack of cleaning or cleanliness included unsanitary, unclean, soiled, dirty, and filthy; three words that might be used to describe a pest control problem included mice, rodents, and vermin. Similarly, clusters of words were selected to represent bare hand contact of foods, employee illness, and unsafe food temperatures. Because of the varied use of the words that might be used to describe lack of cleaning or cleanliness, this cluster of words was evaluated in five situational contexts: a walk-in refrigerator, a restroom, food handler appearance, a kitchen sink, and a dish machine. The questionnaire therefore included 39 violation statements using five sets of descriptive words in nine situational contexts.

Questions about these violation statements included which was the most nearly correct statement, the most commonly used, and the most accurate to use, as well as whether it might be inappropriate to use. Questions asking for the respondent's perception of the accuracy and their opinion of the consumers' perception of risk were measured on a bipolar seven-point Likert Scale, from one (low) to seven (high): "Please rate the following descriptions of violations according to your perception of their accuracy" and "In your opinion, what would be the consumers' perception of risk of contracting foodborne illness if they ate in a restaurant with violations described in the following ways?" Items assessing the most correct and the most commonly used statement to describe the violation were allowed only one response. Items asking about the inappropriate use of words allowed for multiple responses. Demographic information of respondents was also obtained. Questionnaires were distributed to health inspectors at a meeting of the food protection committee of the Indiana Environmental Health Association on November 13, 2009.

For the statistical analysis, the Statistical Program for the Social Sciences (version 16.0, 2008, SPSS Inc, Chicago, IL) was used. Descriptive statistics and independent sample *t*-tests were performed to analyze the data. For the qualitative approach, the authors of this study facilitated discussion among food protection committee members and recorded the discussion. Participants were able to discuss their responses freely, and sufficient time was allowed for participants to respond. The discussion lasted 20 to 30 minutes and was audio-recorded by using a microcassette tape-recorder (Panasonic VAS Recorder; Matsushita Electric Industrial Co., Ltd., Osaka, Japan). The recordings were transcribed by the researchers who had facilitated the discussion at the conference. The results of this study were presented to the food protection committee during their meeting on March 12, 2010 for comments and discussion.

RESULTS

A total of 25 questionnaires were distributed and collected at the Food Protection Committee meeting. Of the 25 collected questionnaires, 24 were completed by a respondent. Approximately 8 of the 24 respondents were between 35 and 44 years old. The majority of the respondents were female ($n = 19$) and had a bachelor's degree or higher ($n = 21$). Half of the respondents had 15 or more years of health inspection experience.

Perceptions of the words used to describe violations (as assessed by the questionnaire)

Descriptive analyses were run to assess perceptions of the words used to describe violations. Most of the words that health inspectors perceived to be high-risk to consumers were also the words that health inspectors perceived as inappropriate to use. The word *filthy* was considered inappropriate, incorrect, and not very commonly used by health inspectors. The word *soiled* was considered the most appropriate, correct, and commonly used by health inspectors and had a median amount of risk associated with it. All of the words perceived to be accurate to

TABLE 1. Health inspectors' perceptions of the words used to describe violations

Violation descriptions	Perceived risk ^{ad}	Accuracy ^{ae}	Correct statement ^{bf}	Commonly used ^{bg}	Inappropriate to use ^{ch}
	mean ± standard deviation		Frequency		
The shelves in the walk-in refrigerator were unsanitary with food.	4.04 ± 1.16	3.17 ± 1.61	0	2	7
The shelves in the walk-in refrigerator were unclean with food.	3.63 ± 1.28	3.79 ± 1.65	0	0	6
The shelves in the walk-in refrigerator were soiled with food.	4.42 ± 1.21	6.25 ± 1.19*	24*	18*	0
The shelves in the walk-in refrigerator were dirty with food.	4.96 ± 1.20	3.91 ± 1.56	0	2	7
The shelves in the walk-in refrigerator were filthy with food.	6.04 ± 1.33	3.65 ± 1.58	0	2	18*
The restroom was unsanitary.	4.83 ± 1.27	3.96 ± 1.71	2	1	9
The restroom was not clean.	4.04 ± 1.12	4.63 ± 1.61	4	10*	3
The restroom was soiled.	4.29 ± 1.37	5.58 ± 1.59	15*	10*	2
The condition of the restroom was dirty.	5.21 ± 1.10	4.57 ± 1.67	1	3	6
The condition of the restroom was filthy.	6.08 ± 1.25	3.96 ± 1.92	2	0	16*
The appearance of the food handler was unsanitary.	4.58 ± 1.48	3.67 ± 1.88	0	0	9
The appearance of the food handler was unclean.	4.17 ± 1.35	3.75 ± 1.70	1	0	3
The uniform that the employee was wearing was soiled.	4.78 ± 1.10	6.13 ± 1.03	18*	18*	0
The food handler was wearing a dirty apron.	4.96 ± 1.18	5.04 ± 1.66	3	5	7
The uniform the employee was wearing was filthy.	6.00 ± 1.57	4.04 ± 2.03	1	0	14*
The sink in the kitchen was unsanitary.	4.22 ± 1.47	3.71 ± 1.69	0	0	7
The sink in the kitchen was unclean.	4.08 ± 1.23	3.96 ± 1.64	0	1	4
The sink in the kitchen was soiled.	4.63 ± 1.06	6.04 ± 1.28	22*	16*	1
The sink in the kitchen was dirty.	4.92 ± 1.17	4.61 ± 1.69	1	6	7
The sink in the kitchen was filthy.	5.88 ± 1.20	4.04 ± 1.94	1	1	15*
The dish machine was unsanitary with food debris.	4.58 ± 1.64	3.74 ± 1.66	0	0	7
The dish machine was unclean with food debris.	4.17 ± 1.37	4.36 ± 1.56	2	0	4
The dish machine was soiled with food debris.	4.78 ± 1.13	6.04 ± 1.16	19*	18*	0
The dish machine was dirty with food debris.	4.96 ± 1.20	4.65 ± 1.56	2	5	8
The dish machine was filthy with food debris.	6.00 ± 1.25	3.78 ± 1.83	1	0	16*

^aItems were asked using a 7-point Likert scale.

^bItems were answered with a single response.

^cItems were answered with multiple responses.

^dHighest mean value.

^ePerceived risk: The hazard level a consumer believes to be associated with consuming a food, whether or not that belief is factually correct.

^eAccuracy: The degree to which an evaluation based on an inspection represents the true value of the attribute that is being evaluated.

^fCorrect statement: Conforming to fact or truth in accordance with an accepted standard.

^gCommonly used words: Words used by inspectors frequently or habitually.

^hInappropriate to use: Words that would improperly describe the situation or condition.

use were also the adjectives most commonly used and perceived to correctly describe violations (Table 1).

For words used to describe pest control violations, *mice* and *rodents* were perceived to be accurate and were commonly used to describe violations. *Vermin* was perceived as inappropriate to use (Table 2). When asked about words used to describe bare hand contact violations, the term *bare*

hands was considered accurate (M = 6.30), correct (n = 18) and commonly used (n = 12) however, the term *without wearing gloves* was also commonly used (n = 11) even though it was considered inappropriate to use (n = 10).

The health inspectors' perceptions of the description of the violations was tested by running an independent sample t-test to see if there was any significant difference in responses based on

characteristics of the health inspectors. A significant difference was found in the perceptions of high-risk words for consumers between more experienced and less experienced inspectors (those with 15 or more years of experience and those with less than 15 years of experience as a health inspector). Inspectors with less experience thought that the word *unsanitary* was perceived as a higher-risk word by consumers (M

TABLE 2. Health inspectors' perceptions of the words used to describe the violations

Violation descriptions	Perceived risk ^a	Accuracy ^{ae}	Correct statement ^b	Commonly used ^b	Inappropriate to use ^c
	mean ± standard deviation			Frequency	
Shell eggs were registering at 46°F in the walk-in refrigerator.	3.79 ± 1.98	6.17 ± 1.46	16*	13*	1
Shell eggs were stored at 5°F above what they should be stored at.	4.33 ± 1.79	4.04 ± 1.82	0	0	15*
Shell eggs were stored at an improper temperature.	4.50 ± 1.56	4.30 ± 2.16	6	11	11
Shell eggs were stored at an unsafe temperature.	5.75 ± 1.57	3.96 ± 1.99	3	0	9
There were droppings from mice in the kitchen.	5.88 ± 1.45	5.67 ± 1.63	7	8*	3
There were droppings from rodents in the kitchen.	5.79 ± 1.32	5.67 ± 1.37	8*	6	3
There were droppings from vermin in the kitchen.	5.04 ± 1.73	4.67 ± 1.61	1	2	8*
There was evidence of mice in the kitchen.	5.42 ± 1.10	4.67 ± 1.63	2	4	6
There was evidence of rodents in the kitchen.	5.63 ± 0.97	4.38 ± 1.53	6*	5*	4
There was evidence of vermin in the kitchen.	4.92 ± 1.53	4.21 ± 1.86	1	0	12*
Employee was observed using bare hands to plate lettuce for salads.	5.78 ± 1.70	6.30 ± 1.18	18*	12*	4
Employee was observed handling lettuce for salads without wearing gloves.	6.00 ± 1.25	5.48 ± 1.86	5	11	10*
An employee with an infection was handling food.	5.71 ± 1.42	4.21 ± 1.84	5	7	11*
An employee diagnosed with <i>Salmonella</i> was handling food.	6.75 ± 0.70	6.29 ± 1.68	18*	17*	9

^aItems were asked using a 7-point Likert scale.

^bItems were answered with a single response.

^cItems were answered with multiple response.

*Highest mean value.

^dPerceived risk: The hazard level a consumer believes exists after consuming a food, whether or not that belief is factually correct.

^eAccuracy: The degree to which an evaluation based on an inspection, represents the true value of the attribute that is being inspected.

^fCorrect statement: Conforming to fact or truth in accordance with an accepted standard.

^gCommonly used words: Words used by inspectors frequently or habitually.

^hInappropriate to use: Words that would improperly describe the situation or condition.

= 5.07, SD = 0.84), compared with the group with 15 or more years of experience (M = 3.92, SD = 1.23); t (21) = (2.61), P < 0.05. Both groups believed that the word *filthy* is perceived as high risk by consumers (Table 3).

Reasons for perception and word choices (focus group discussion)

The next part of the study utilized a focus group to better understand participants' selection of words and to explore qualitatively their perceptions of the words used to describe violations. To ensure appropriate contextual exploration in this phase, focus-group

questions were based on the survey that the respondents had completed prior to the discussion. For example, the survey asked about specific words the participants might use to describe violations and what their perceptions of those words were. During the focus group discussion, the participants were asked whether they use any other words to describe these violations and the reasons why they choose to use/not use certain words. In addition, the discussion investigated factors influencing health inspectors when writing violations. The authors of the study facilitated the discussion for food protection committee members and tape recorded it. During the discussion, five

themes were identified. The first was that there were clear differences in the perception of the weight of word choices among health inspectors and that skilled judgment is required when decisions on the severity of the violation are being considered. For example, comments included that what is "unsanitary to one health inspector is not unsanitary to another," there is a "different definitive level of what is dirty, it is extremely subjective," and "...how much is too much?" These comments parallel a previous research study that stated that "'Cleanliness' is a relative concept – what is acceptable as being 'clean' is one situation may be unacceptable in another" (12).

TABLE 3. The results of independent sample t-tests of the health inspectors' perceived risk of the violations

Violation descriptions	Perceived risk ^c	
	EXPI ^a	EXP2 ^b
The shelves in the walk-in refrigerator were unsanitary with food.	4.42	3.67
The shelves in the walk-in refrigerator were unclean with food.	4.08	3.20
The shelves in the walk-in refrigerator were soiled with food.	4.50	4.30
The shelves in the walk-in refrigerator were dirty with food.	4.66	5.25
The shelves in the walk-in refrigerator were filthy with food.	5.42*	6.67**
The restroom was unsanitary.	5.16	4.50
The restroom was not clean.	4.25	3.83
The restroom was soiled.	4.50	4.08
The condition of the restroom was dirty.	5.08	5.33
The condition of the restroom was filthy.	5.75	6.42
The appearance of the food handler was unsanitary.	5.25	3.92
The appearance of the food handler was unclean.	4.67	3.67
The uniform that the employee was wearing was soiled.	4.90	4.67
The food handler was wearing a dirty apron.	5.08	4.83
The uniform the employee was wearing was filthy.	5.92	6.08
The sink in the kitchen was unsanitary.	5.00	3.50
The sink in the kitchen was unclean.	4.42	3.75
The sink in the kitchen was soiled.	4.25	5.00
The sink in the kitchen was dirty.	4.58*	5.25*
The sink in the kitchen was filthy.	5.30**	6.42**
The dish machine was unsanitary with food debris.	5.08	4.00
The dish machine was unclean with food debris.	4.50	3.75
The dish machine was soiled with food debris.	4.58	4.50
The dish machine was dirty with food debris.	5.25	5.08
The dish machine was filthy with food debris.	6.00	6.33

*Significantly different at $P < .05$ **significantly different at $P < .01$.

EXP^a: experience less than 15 years. EXP^b: experience equal to and more than 15 years.

^cPerceived risk: The hazard level a consumer believes to be associated with consuming a food, whether or not that belief is factually correct.

The second theme was that health inspectors could be influenced by other factors when writing violations. Comments included that there were “other factors that are associated with the entire operation” and a “level of differences exist...” Findings of previous studies also support this theme that inspectors are influenced by types or sizes of operations (10) and that some restaurants, such as fast food chain restaurants, usually received better grades than full-service restaurants (14). It was found that inspectors did not write down all violations if too many critical violations were identified or if the violations were corrected immediately (6).

The third theme was that training can affect how health inspectors describe violations. One respondent specifically commented that “different training affects how violations are written up...” The impact of different training methods is not unexpected, because training is generally handled at the local level. New health inspectors may be trained by shadowing experienced health inspectors for a specified training period, so that most of their skills are shaped by their experiences during this on-the-job training. Since experiences will vary during the training period, so will the new health inspector’s ability to describe the violations and the variability found among

descriptions of violations. One respondent with more than 15 years of experience commented that “all inspectors should be forced to use words from the Food Code and write down violations as it will be used in court since it is a legal documents...state code requires you to write what you observe”.

The fourth theme was that there are limitations to being able to write down violations. One is a physical limitation; if inspection reports are hand-written, there may be perceived space limitations within the inspection report form. In addition, more detailed descriptions take longer to write down, so that some health inspectors may focus on essential

issues if they are under time pressure constraints.

The fifth theme that emerged was that health inspectors were aware of the effect of inspection reports on consumers. Since the public can easily access inspection reports (on health department Web sites, for example), the focus group commented that some health inspectors may be trying to write more generally so that others (such as the public) can understand the report. One inspector, for example, commented that “the general public does not understand the temperature danger zone”.

DISCUSSION

The public is more conscious of food safety as frequency of eating out increases. In addition, the availability of health inspection results through the Internet or other media supports consumers’ demand for food safety information. Hence, it has become even more critical to provide the public with accurate and understandable information about health inspection results. Descriptions of violations in the current health inspection reporting system provide detailed and useful information to the restaurant manager and are important to the public; however, the words used to describe violations vary among health inspectors.

This study found that individual health inspectors have different perceptions of the words used to describe violations. Different perceptions of the meanings associated with specific word choices, the influence of other factors (such as whether the violation is corrected immediately), inspector training, time and space constraints in writing inspection reports, and an awareness of the public’s use of inspection reports may affect inspectors’ decisions about how to report violations. This study provides a starting point for further discussion on the use of words and perhaps standardization of violation descriptions. Although one word or one set of words may be not adequate to describe the skilled assessment of a violation, some standardization of terms would be helpful in assisting with training of new health inspectors, pro-

viding more consistency among health inspectors, or making it easier for restaurant managers and perhaps even consumers to understand.

Further, it is possible that consumers may benefit from additional explanations of technical terms so that they can better understand the implications of the inspection reports with regard to restaurant cleanliness. Providing food safety information along with health inspection reports may have the additional benefit of helping to educate the public. Finally, routine rotation of inspectors’ responsibilities among restaurants (commonly done in many jurisdictions) would also help reduce differences in inspection results among health inspectors.

The data were collected from a regional quarterly meeting of a food protection committee by means of self-completed questionnaires, which resulted in data that may have been skewed to perceptions of a regional group of health inspectors. Although this study found useful information on future research recommendations, the study used common word choices related to only nine areas in the health code. Therefore, future studies may want to use other areas of the health code to investigate ‘health inspectors’ perceptions of the words used to describe violations.

Despite the limitations, results of this study clearly suggest that variations exist among health inspectors writing down violations. The results also suggest that some words may be more appropriate, or accurate, or may carry a greater connotation of risk, than others. When health inspectors write down inspection reports, word choices would be expected to vary, as health inspectors use their skilled judgment to assess which words best describe their observations in that food-service establishment. Health departments should recognize, however, that variations in health inspection reports may also occur when standardization or adequate training is lacking. Results of this research suggest the need for added discussion regarding words used in inspection reports and how these are interpreted by an expanding group of interested users.

REFERENCES

1. Archibald, C. 2007. FSA should iron out bugs. *Environ. Health News* 22:6.
2. Braze, D., W. Tabor, D. Shankweiler, and W. E. Mencl. 2007. Speaking up for vocabulary: Reading skill differences in young adults. *J. Learn. Disabil.* 40:226–243.
3. Cotterchio, M., J. Gunn, T. Coffill, P. Tormey, and M. A. Barry. 1998. Effect of a manager training program on sanitary conditions in restaurants. *Public Health Rep.* 113:353–358.
4. Fatimah, U. Z. A. U. H. C. Boo, M. Sambasivan, and R. Salleh. 2011. Foodservice hygiene factors – The consumer perspective. *Int. J. Hosp. Mgmt.* 30: 38–45.
5. Food and Drug Administration. 2004. Introduction and purpose and methodology, of the FDA report on the occurrence of foodborne illness risk factors in selected institutional foodservice, restaurant, and retail food store facility types. Available at: <http://www.fda.gov/Food/FoodSafety/RetailFoodProtection/FoodbornellnessandRiskFactorReduction/RetailFoodRiskFactorStudies/ucm089699.htm>. Accessed 25 August 2009.
6. Green, L., C. Selman. 2005. Environmental health specialists’ practices and belief concerning restaurant inspections. Annual Meeting, *Int. Assoc. Food Prot.* Baltimore, MD, August, 14–17.
7. Henson, S., S. Majowicz, O. Masakure, P. Sockett, A. Jones, R. Hart, D. Carr, and L. Knowles. 2006. Consumer assessment of the safety of restaurants: The role of inspection notices and other information cues. *J. Food Safety* 26:275–301.
8. Jones, T. F., B. Pavlin, B. J. LaFleur, L.A. Ingram, and W. Schaffner. 2004. Restaurant inspection scores and foodborne disease. *Emerging Infect. Dis.* 104:688–692. Available at: www.cdc.gov/eid. Accessed 22 October 2010.
9. Knight, A. J., M. R. Worosz, and E. C. D. Todd. 2007. Serving Food Safety: Consumer perception of food safety at restaurants. *Int. J. Cont. Hosp. Mgmt.* 19:476–484.
10. Lee, J., D. C. Nelson, and B. A. Almanza. 2010. The impact of indiv-

- idual health inspectors on the results of restaurant sanitation inspections: Empirical evidence. *J. Hosp. Mkt. Mgmt.* 19:326–339.
11. Lueck, T. J., and N. MacFarquhar. 2000. Site listing restaurant inspections starts a feeding frenzy on the web. Available at: <http://www.nytimes.com/2000/05/18/nyregion/site-listing-restaurant-inspections-starts-a-feeding-frenzy-on-the-web.html> Accessed 5 September 2010.
 12. Moore, G., and C.A. Griffith. 2002. Comparison of traditional and recently developed methods for monitoring surface hygiene within the food industry: an industry trial. *Int. J. Environ. Health Res.* 12: 317–329.
 13. Schraw, G., S. E. Wade, and C. A. Kardash. 1993. Interactive effects of test-based and task-based importance on learning from text. *J. Educ. Psychol.* 85:652–661.
 14. Seiver, O. H, and T. H. Hatfield. 2000. Grading systems for retail food facilities: a risk-based analysis. *J. Environ. Health* 62:30.
 15. Van den Broek, P., D. N. Rapp, and P. Kendeou. 2005. Integrating memory-based and constructionist processes in accounts of reading comprehension. *Discourse Process* 39:299–316.
 16. Worsfold, D. 2006. Eating out: consumer perceptions of food safety. *Int. J. Environ. Health* 16:219–229.



ILSI North America Technical Committee on Food Microbiology Announces:

2012 Request for Pre-Proposals for Research Support in Three Specific Areas:

- ◆ Prevalence
- ◆ Dry Sanitation – Technology and Processes to Control *Salmonella* in Low-Moisture Environments
- ◆ Identification and Use of Appropriate Surrogates Across Food Products and for a Variety of Process and Commodities

Pre-Proposal submission deadline is January 13, 2012.

For more information, please visit the ILSI North America Web site at:
<http://www.ilsa.org/NorthAmerica/Pages/ILSI-NA-FoodMicro-Grants-2012.aspx>.
Please contact Alison Kretser at atakretser@ilsa.org with questions.

The ILSI North America Technical Committee on Food Microbiology is committed to taking a proactive role in providing scientific findings to improve understanding and control of microbial food safety hazards which will enable scientifically-informed decision making. This is achieved through sponsoring research and education in collaboration with academia, government, and industry.