



Consumer Food Safety Perceptions of Ready-to-Eat Deli Foods in Northwest Arkansas

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ABSTRACT

Ready-to-eat (RTE) foods are convenient and have increased in popularity over the past 20 years. Questions about the safety of RTE foods arose after numerous outbreaks of *Listeria monocytogenes* were linked to the consumption of RTE foods, mostly deli meats. To assess current consumers' food safety perceptions as well as shopping preferences in Northwest Arkansas, 213 consumers were surveyed. Consumers responded that the primary reasons for purchasing deli foods were convenience (37%), taste (32%) and nutritional value (11%). Most of the respondents (68%) believed that deli foods are more nutritious than restaurant foods. A majority responded that deli foods are "as safe as" (66%) or "safer than" (32%) restaurant foods. The food safety perception depended on shopping frequency at delis as well as formal education level. With an increasing frequency of shopping at stand-alone delis, consumers were more likely to perceive deli foods as "safer than" restaurant foods. Consumers with a post-secondary degree were more likely to categorize deli foods as "as safe as" restaurant foods. In conclusion, it appears that Northwest Arkansas deli customers generally are not highly concerned about deli food safety and are only marginally aware of risks associated with these products.

INTRODUCTION

Ready-to-eat (RTE) foods are food products that may be safely consumed without any further preparation (such as cooking or reheating) by the consumer (34). They are convenient and quick; therefore, they have increased in popularity in the last 20 years (10, 22). Deli meats are RTE meat or poultry products that are usually sliced, either in the processing facility or after distribution, and typically assembled in a sandwich for consumption (14). Deli meats can be bought at the grocery store deli counter or at a stand-alone deli, with stand-alone delis defined as commercial establishments that are not part of a larger store.

Questions about the safety of RTE foods arose after the occurrence of numerous outbreaks of disease linked to *Listeria monocytogenes* (4, 6, 7, 8, 31), often linked to the consumption of RTE foods, mostly RTE deli meats (18, 23, 28, 32, 37). According to the Centers for Disease Control and Prevention, every year approximately 2,500 people in the United States get listeriosis, resulting in approximately 2,300 hospitalizations and 500 deaths (5, 13, 26). The high rates of hospitalization and death from listeriosis show that when cases do occur, the illness is severe compared with that caused by most other foodborne pathogens. Primarily, the elderly, pregnant women, newborns and immunocompro-

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TABLE 2. Socio-demographic characteristics of the sample, sample size (N) = 213

Socio-demographic characteristic	% of total
Gender	
Male	42.3
Female	57.7
Age group	
18–25	8.5
26–35	16.9
36–45	23.9
46–55	23.0
56–65	13.6
>65	14.1
Educational level	
Fewer than 12 years of schooling	4.7
High school graduate or GED	30.5
Associate's or technical degree	17.8
Bachelor's degree	28.2
Master's degree	8.0
Professional degree or Ph.D.	10.8
Ethnicity	
Caucasian	89.2
Hispanic/Latino	5.6
African-Americans	3.3
Asian	0.5
Other	1.4

is due to post-processing contamination (5, 15). Even after adequate heat treatment, food products can be contaminated by biofilms present on the surfaces of various equipment, by environmental contamination, or by cross-contamination (15). Multiple reports have suggested that *L. monocytogenes* contamination is most likely due to recontamination or cross-contamination in the retail environment during handling steps such as peeling, slicing and repacking (23, 30, 38).

Food handlers, customers, and the environment are potential sources of *L. monocytogenes* (23). Safe food-handling behavior is very important to reduce the risk and incidence of foodborne disease (29). A recent survey revealed that most food handlers (95%) were aware of food safety behaviors; however, a majority of the respondents (63%) admitted that they do not always carry them out (9). Less is known about the food safety knowledge

of customers who frequent deli establishments. Therefore, the overall focus of this study was to assess customers' awareness of food safety issues associated with delis. Current food safety perceptions of deli foods among customers at commercial grocery establishments with in-store deli operations were assessed by use of a survey instrument that also included inquiries on shopping habits, such as frequency of shopping at a deli and type of products bought (including organic and natural products) as well as the motives for purchasing deli foods. In addition, the perception of the nutritional value of deli foods was estimated.

MATERIALS AND METHODS

Survey instrument

A 15-question survey (Table 1) and the protocol to be used were approved by the Human Subjects Committee of the

Institutional Review Board of the University of Arkansas (Fayetteville, AR). Initially, respondents were asked about their shopping habits: the frequency of shopping at a deli, stand-alone delis and grocery store deli counters (Questions 1, 2, 6), the types of products bought at those delis (Questions 3 and 4) and reasons for purchasing deli foods (Question 8). The second component focused on the customers' opinions about the food quality at the deli counter, such as the foods' safety (Question 5 and 9) and nutritional value (Question 7). In the final section, questions about organic and all natural deli items (Questions 10 and 11) were asked, such as questions regarding food safety and willingness to pay more for organic or all-natural deli items than for conventional deli items. In addition, demographic information (Questions 12 – 15) was collected, such as the respondent's age group, gender, ethnicity and educational level.

FIGURE 1. Food safety perception of deli foods compared with restaurant foods (deli food is “less safe than”/“as safe as” / “more safe than” restaurant food) of 213 retail grocery shoppers

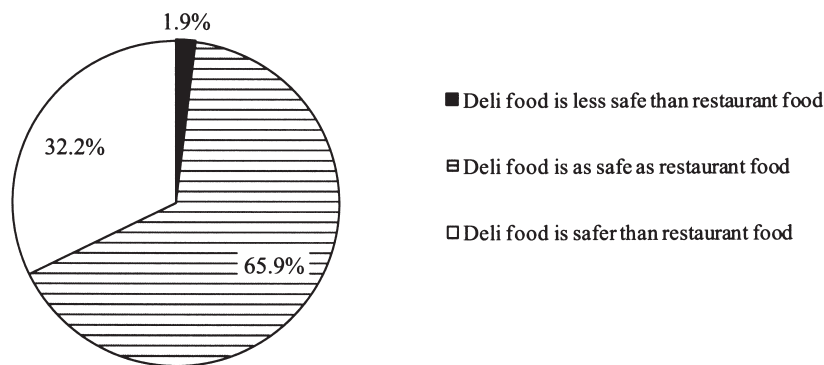
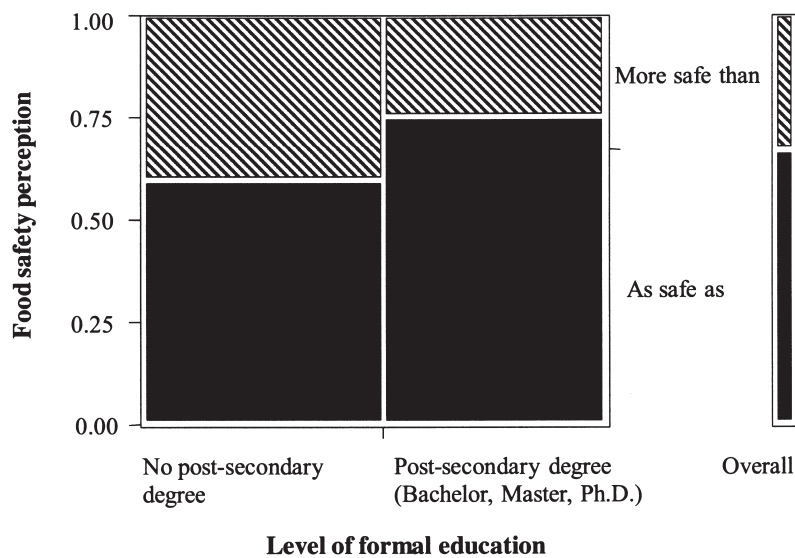


FIGURE 2. Contingency Analysis comparing food safety perception of deli foods compared with restaurant foods (deli food is “as safe as” / “more safe than” restaurant food) versus level of formal education in a Mosaic plot of 213 retail grocery shoppers (Chi²-test: $P = 0.019$, significant at level 0.05)



Survey procedures

Questions for the questionnaire were developed on the basis of the specific needs of the study. The questionnaire was field-tested with a small group of individuals. Each question was evaluated for clarity and examined to determine whether it provided the desired information. The length of the survey was evaluated as well. Discussion among group participants about the questionnaire

further improved it. The surveys were conducted during February and March 2009 in three different retail grocery store locations in Northwest Arkansas, one in Fayetteville and two in Springdale. At each location, the surveys were carried out for 3 hours on two different days corresponding to one weekday (Mon/Tues/Wed/Thurs) and one day in the weekend (Saturday), during the high-traffic time as defined by the respective store manager. To motivate the custom-

ers to participate in the study, University of Arkansas mascot cups were provided as gifts of appreciation for completing the survey form. In order to increase the diversity of respondents, one of the surveys was conducted at a store in a neighborhood with a higher proportion of Hispanic residents. A Spanish translation of the survey was provided for any customers for whom communication in Spanish might be preferable.

Statistical analysis

The survey data were entered and analyzed in JMP (release 7.0.2: SAS Institute, Inc.). Each respondent was given a corresponding number and his/her answers to each question were entered in JMP with a specific code. It was cross checked twice for accuracy. Once all the data were entered into JMP, relationships between two variables were identified by use of a bivariate analysis of frequencies with the contingency analysis in JMP. To test the independence of cross tabular data, a chi-square test was performed in JMP. In all statistical tests, a significance level of 0.05 was used to identify significant differences.

RESULTS

A total of 213 respondents completed the survey in three different retail grocery stores. The overall demographic analysis revealed the gender split of the respondents to be 42% male and 58% female. An overview of the socio-demographic characteristics of our sample is shown in Table 2 and illustrates that each age group of interest was represented. For most respondents, the highest level of education selected was high school or GED (30.5%), associates or technical degree (17.8%) or bachelor's degree (28.2%). Most participants (89%) identified themselves as Caucasian, with slightly over 10% of the respondents identifying with other ethnicities.

Food safety perception

A majority of the respondents perceived deli foods as being “as safe as” (66%) or “safer than” (32%) restaurant foods and only 2% perceived deli foods as being “less safe than” restaurant food (Fig. 1). Whether consumers answered

FIGURE 3. Contingency Analysis comparing food safety perception of deli foods compared with restaurant foods (deli food is “as safe as” / “more safe than” restaurant food) versus stand-alone deli shopping frequency of 213 surveyed grocery-store shoppers in a Mosaic Plot (Chi²-test: $P = 0.001$, significant at level 0.05)

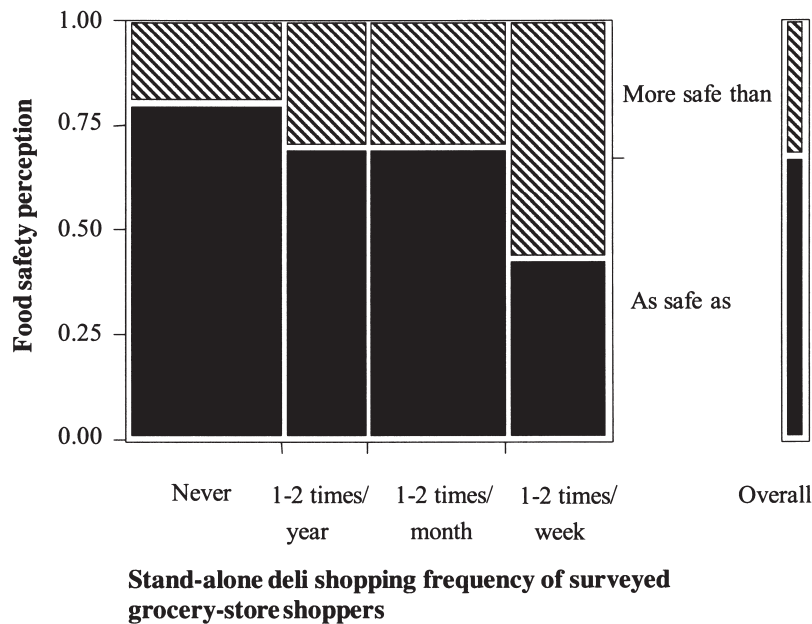
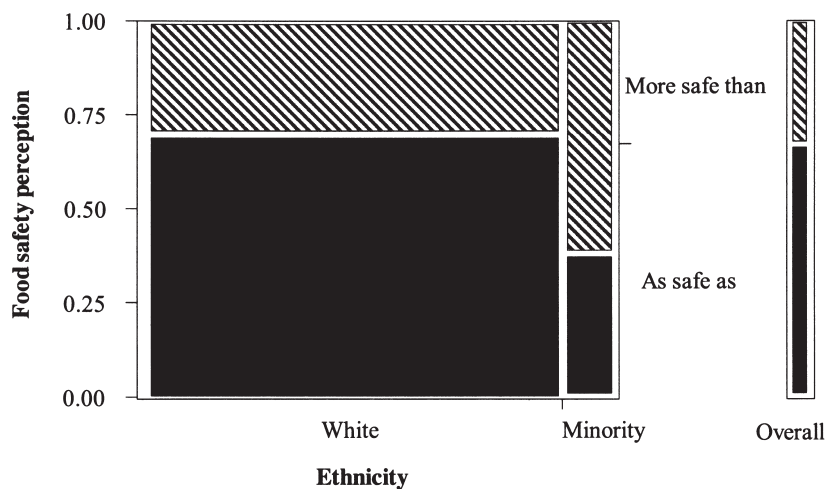


FIGURE 4. Contingency Analysis comparing food safety perception of deli foods compared with restaurant foods (deli food is “as safe as” / “more safe than” restaurant food) versus ethnicity in a Mosaic Plot of 213 retail grocery shoppers (Chi²-test: $P = 0.003$, significant at level 0.05)



“as safe as” or “safer than” was independent of their age group ($P = 0.837$) and gender ($P = 0.257$) but did depend on their level of formal education, i.e., whether they had a university degree or not ($P = 0.019$), and on the frequency of their shopping at the stand-alone deli

($P = 0.001$) or grocery store deli counter ($P = 0.007$). Respondents with a post-secondary degree (Bachelor, Master or Ph.D.) tended to perceive deli foods in the “as safe as restaurants foods” category more than did respondents without a post-secondary degree, who perceived

deli foods as more likely to be “safer than restaurant foods” (Fig. 2). Food safety perception also depended on the frequency of shopping at delis; with an increasing frequency of shopping at stand-alone delis, respondents were more likely to perceive deli foods as “safer than” restaurant foods (Fig. 3).

The perception of safety tended to depend on the ethnicity of the respondent (Caucasian or otherwise) ($P = 0.003$) (Fig. 4). Respondents who identified themselves as Caucasian tended to perceive deli foods primarily as “as safe as” restaurant foods, compared with the non-Caucasian respondents, who perceived deli foods as more likely to be “safer than” restaurant foods. However, caution should be exercised when evaluating these data, because all but 23 of the 213 respondents were Caucasian. Future research needs to address the effect of ethnic differences by performing more surveys in areas with greater ethnic diversity and by incorporating additional features into the survey instruments that encourage responses, such as having a language translator present during the survey. This could elicit more responses from respondents who are not comfortable reading or speaking in English.

Shopping habits, motives and perception of nutritional value

The respondents were asked about their deli shopping habits and motives. A large portion of the respondents (81%) answered that they bought most of their deli foods at the grocery deli counter, not at local or chain stand-alone delis. One-third of the respondents (33%) never shopped at stand-alone delis, whereas only 6% never shopped at the grocery store deli counter (Fig. 5). About 85% of the respondents regularly (weekly or monthly) purchased deli items at the grocery deli counter, compared with only 49% of the respondents who regularly shopped at a stand-alone deli (Fig. 5).

We recognize that the types of food purchased at stand-alone and grocery store delis cannot be compared directly, since the items offered differ. However, these data can potentially help identify shopping habits at all places selling foods using deli ingredients. Most customers responding to our survey replied that

FIGURE 5. Shopping frequency at delis of 213 retail grocery shoppers



FIGURE 6. Types of food most often bought at delis by 213 retail grocery shoppers



they shop at stand-alone delis to buy sandwiches (41%) but also purchase other prepared food (20%) and salads (9%). However, when they shop at the grocery store deli counter, deli meats (64%) are the predominant purchase (Fig. 6). The primary reasons for the purchase of deli foods were convenience and taste; the different reasons were (in decreasing order of importance): convenience (37%), taste (32%), nutritional value (11%), selection (9%), safety (3%), quality of the service (3%), cost (2%) and other (5%).

Most of the respondents (68%) also believed that deli foods are more nutritious than restaurant foods. This perception of the greater nutritional value of deli foods compared with restaurant

foods seems to be consistent for the different demographic groups, because it did not depend on age ($P = 0.175$), gender ($P = 0.982$), level of formal education ($P = 0.501$), ethnicity ($P = 0.150$) or the frequency of shopping at a stand-alone ($P = 0.662$) or grocery store deli counter ($P = 0.712$).

Organic and all-natural deli foods

When respondents compared the willingness to pay for organic versus all-natural deli products, 35% stated that they would be willing to pay more for all-natural deli foods and 24% would pay more for organic deli foods. However, most respondents (41%) would not

be willing to pay more for either organic or all-natural deli products than for conventional deli products. Nevertheless, stated willingness to pay more for organic and all-natural deli foods may be subject to hypothetical bias. Individuals may respond differently to hypothetical questions than to a situation of real payment; therefore, their stated willingness to pay may be different from their actual willingness to pay in real market situations.

DISCUSSION

Food safety perception

Our study showed that most consumers perceived deli foods as being “as safe as” (66%) or “safer than” (32%) restaurant foods. This result is consistent with a Food Safety Survey from the FDA and FSIS (36) that showed that consumers think that foodborne illness most likely stems from food-handling procedures at food processing plants (43%) and restaurants (20%). Fewer respondents indicated that most food safety problems occur at supermarkets (6%) or at home (15%). A similar study from the Food Marketing Institute (11) revealed that over the past few years, the concern of food safety problems in supermarkets and homes has steadily declined. Only 3% and 4% of consumers think that food safety problems are most likely to occur at supermarkets and homes, respectively. In addition, the International Dairy-Deli-Bakery Association (IDDBA) reported that 96% of consumers believe that food in the supermarket delis is handled safely (20).

The food safety perception that food at the deli counter is relatively safe might be due to the low awareness of *Listeria* and unfamiliarity with the frequency of problems it can cause in deli foods. The FDA/FSIS Food Safety Survey (35, 36), which measured changes in consumer knowledge, safe handling practices and confidence in the safety of poultry and meat, revealed that most consumers are aware of *Salmonella* (86%) and *E. coli* (85%) but not of *Listeria* (30%). Although awareness of *Listeria* has grown from 9% in 1993 to 14% in 1998 and 31% in 2001, it appears that awareness has not increased since 2001, given that in 2006 only 30% of the people had heard of *Listeria* as a problem in food. Similarly, Cates et al. (3) reported that

less than half of consumers are familiar with *Listeria*, compared with 94% for *Salmonella* and *E. coli*. Additionally, care must be taken with regard to self-reported awareness, because this might be lower than actual awareness. Indeed, over two-thirds of consumers who reported being aware of *Listeria* were not able to identify possible food vehicles (3). Respondents without a post-secondary degree were more likely than those with such a degree to perceive deli foods as “safer than” restaurant foods, which might be explained by a lower awareness of *Listeria*. Awareness of *Listeria* has been reported to be generally lower among respondents with relatively low education and incomes (3, 24).

The perception of delis being relatively safe is of concern, given the inconsistent levels of regulatory food safety oversight currently prevalent in delis. Federal inspectors enforce Good Manufacturing Practices (GMPs) and Sanitation Standard Operating Procedures (SSOP; a part of the HACCP) at production plants, but GMPs and SSOP are not mandatory at the retail deli. It is up to the supermarkets and local health department inspectors to ensure that deli departments develop and implement SSOP. Martin et al. (25) reported that the retail and food service industries are being inspected less frequently than production plants and often do not implement HACCP-based food safety principles. According to Lianou and Sofos (23), the combination of limited control interventions and lack of a regulatory framework increases the risk of *L. monocytogenes* contamination of RTE foods in retail and food service environments. Suitable cleaning, sanitation and hygiene as well as temperature control are necessary to prevent or inhibit contamination with and growth of *L. monocytogenes*. Therefore, it is important that there be sufficient and consistent control interventions as well as regulation of delis (23). Temperature control during slicing, packaging and storage, although important, is lacking at most grocery deli counters (19). In federally inspected processing plants producing deli foods, the operations take place at temperatures below 55°F and storage occurs below 40°F. At most grocery store deli counters; however, there is no temperature control: operations such as slicing take place at room temperature, and the temperature at the deli showcase can be above 40°F (19).

Shopping habits

Our study shows that about half of the respondents shop weekly or monthly at the grocery store deli counter. This result is similar to the results reported by the Food Marketing Institute (12), which found that 60% of the respondents purchase fresh cut deli items from supermarkets on a monthly basis. As for the items bought at delis, our results are consistent with those reported by IDDBA (20), which listed the top 12 most consumed deli products for households. Based on this report, sliced-to-order luncheon meat is the deli item most often consumed (on average 2.9 times/week), followed by sandwiches (2.7 times/week). Pre-sliced packaged deli meats have an average weekly household consumption of 1 time/week (20), which is only one-third of the consumption of retail sliced deli meats.

Our results support the conclusions of IDDBA (20) and Mitchell (27), who reported convenience as the most common reason for purchasing at the in-store deli counter. Many consumers are seeking convenient meals, which likely contributes to increased deli purchases. In addition, Mitchell (2009) suggests that the slowdown in consumer spending due to the economic situation is beneficial to the deli; consumers have become more cost-minded, resulting in a shift from food purchases at a fast-casual restaurant to a cheaper alternative such as a deli. However, in our study, only 2% of the respondents purchased deli foods because of cost considerations.

Limitations of the study

One of the limitations of the study is the sample size. A sample size of 213 is sufficient for a survey study, but caution is necessary when generalizing the results to a larger population. The respondents who participated were not selected randomly, since we approached the shoppers and asked them to participate voluntarily, after we had selected specific grocery stores. This might result in sample selection bias. The stores were all located fairly close together, in neighboring cities. In addition, only shoppers who chose to participate were questioned (volunteer bias). We provided University of Arkansas mascot cups as gifts of appreciation for completing the survey, in an attempt to motivate more shoppers to participate;

however, this is only a small reward. Payment awards with a value high enough to offset the time spent for all shoppers would have resulted in less bias in selection of participants but would greatly affect the cost of the study.

CONCLUSIONS

Most consumers are not aware of the danger of RTE deli meats and *Listeria* contamination, and this lack of awareness may prevent consumers from taking proper precautions when handling RTE foods. Unfortunately, we do not know where most foodborne illness originates, but people’s belief that it is somewhere other than the grocery store or their own home might reduce their concern for food safety at the grocery store or at home. In the future, there is a need not only to continue educating consumers about possible food safety problems and foodborne pathogens such as *Listeria* but also to help them develop more understanding of safe food-handling practices to help prevent foodborne illness (36). From the results of multiple studies (1, 22), we can conclude that consumers often do not know about the recommended refrigerator temperature of 40°F or below. It is necessary to educate consumers about the consequences of unsafe practices so as to motivate them to follow food safety guidelines.

According to Bruhn (2), not only the consumer but also the health community, food industry regulators and the media are responsible for educating consumers so as to ensure that they handle foods correctly. When consumers do not follow the guidelines (insufficient temperature control, poor hygiene), this means that the food safety message has not been delivered effectively, and more or different means of education are necessary. Supermarket delis can provide food safety information. In 2004, 43% of in-store delis provided information about how long the food can be stored; this figure is only marginally higher than it was in 1999 (40%) (20). In addition, because most consumers get information about food safety from the media, it will be important to continue working with the media to get food safety information out to the consumer most effectively. The use of food labels is another efficient mechanism that is used to provide

food safety information to the consumer (33, 36). A possible strategy to increase the consumer's knowledge is obligating pre-sliced as well as in-store sliced deli meats to have product labels containing safe food-handling information as well as warnings for the more susceptible population groups.

Consumers may not be well informed, and food handlers may need to become better educated about food safety principles to adopt appropriate oversight in the deli. Given the inconsistent quality of food safety regulatory control, better food safety training and education of food handlers are needed. The food handlers should not just be told what to do but, to be effective, they should be encouraged to learn about the consequences of their handling. Perhaps handlers might become more willing to change behaviors as a result of better understanding of consequences than as a result of someone directing them to do something without explaining why it is important. We can conclude that a combined effort throughout the entire food chain (that includes not only the processing company and the retailer but the consumer as well) will be necessary for further reduction in the risk of listeriosis.

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REFERENCES

1. American Dietetic Association and the ConAgra Foundation. 2001. Survey reveals Americans need a refrigerator refresher. Available at http://www.homefoodsafety.org/pages/media/releases/apr6_2001.jsp. Accessed 28 October 2009.
2. Bruhn, C. M. 1997. Consumer concerns: motivating to action. *Emerg. Infect. Dis.* 3:511–515.
3. Cates, S., R. A. Morales, S. A. Karns, L. Jaykus, K. M. Kosa, T. Teneyck, C. M. Moore, and P. Cowen. 2006. Consumer knowledge, storage, and handling practices regarding *Listeria* in frankfurters and deli meats: results of a web-based survey. *J. Food Prot.* 69:1630–1639.

4. Centers for Disease Control and Prevention (CDC). 2009. Surveillance for foodborne disease outbreaks – United States, 2006. *Morb. Mortal. Weekly Rep.* 58:609–615.
5. Centers for Disease Control and Prevention (CDC). 2008. Listeriosis – General information. Available at http://www.cdc.gov/nczved/dfbmd/disease_listing/listeriosis_gi.html. Accessed 27 July 2009.
6. Centers for Disease Control and Prevention (CDC). 2002. Outbreak of listeriosis—Northeastern United States, 2002. *Morb. Mortal. Weekly Rep.* 51:950.
7. Centers for Disease Control and Prevention (CDC). 2000. Multistate outbreak of listeriosis—United States, 2000. *Morb. Mortal. Weekly Rep.* 49:1129–1130.
8. Centers for Disease Control and Prevention (CDC). 1999. Multistate outbreak of listeriosis—United States, 1998–1999. *MMWR Morb. Mortal. Wkly. Rep.* 47:1117–1118.
9. Clayton, D. A., C. J. Griffith, P. Price, and A. C. Peters. 2002. Food handlers' beliefs and self-reported practices. *Int. J. Environ. Health Res.* 12:25–39.
10. EPM Communications Inc. 2004. Consumers increasingly seek out convenience in all aspects of their lives. *Res. Alert* 22:6–7.
11. Food Marketing Institute (FMI). 2009. U.S. grocery shopper trends.
12. Food Marketing Institute (FMI). 2005. U.S. grocery shopper trends.
13. Food Safety and Inspection Service (FSIS). 2009. Draft: Comparative risk assessment for *Listeria monocytogenes* in ready-to-eat meat and poultry deli meats.
14. Food Safety and Inspection Service (FSIS). 2003. Ready-to-eat meat and poultry products: Part 430 Requirements for specific classes of product. Available at <http://www.fsis.usda.gov/Frame/FrameRedirect.asp?main=http://www.fsis.usda.gov/oa/haccp/lmworkshop/definitions.htm>. Accessed 29 July 2009.
15. Food Safety and Inspection Service (FSIS). 2003. FSIS Rule designed to reduce *Listeria monocytogenes* in ready-to-eat meat and poultry products. Available at <http://www.fsis.usda.gov/OA/background/lmfinal.htm>. Accessed 29 July 2009.
16. Garrido, V., A. I. Vitas, and I. García-Jalón. 2009. Survey of *Listeria monocytogenes* in ready-to-eat products: Prevalence by brands and retail establishments for exposure assessment of listeriosis in Northern Spain. *Food Control* 20:986–991.
17. Gombas, D. E., Y. Chen, R. S. Clavero, and V. N. Scott. 2003. Survey of *Listeria monocytogenes* in ready-to-eat foods. *J. Food Prot.* 66:559–569.
18. Gottlieb, S. L., E. C. Newbern, P. M. Griffin, L. M. Graves, R. M. Hoekstra, N. L. Baker, S. B. Hunter, K. G. Holt, F. Ramsey, M. Head, P. Levine, G. Johnson, D. Schoonmaker-Bopp, V. Reddy, L. Kornstein, M. Gerwel, J. Nsubuga, L. Edwards, S. Stonecipher, S. Hurd, D. Austin, M. A. Jefferson, S. D. Young, K. Hise, E. D. Chernak, J. Sobel, and listeriosis Outbreak Working Group. 2006. Multistate outbreak of listeriosis linked to turkey deli meat and subsequent changes in US regulatory policy. *Clin. Infect. Dis.* 42:29–36.
19. Gregerson, J. 2009. Advantages of pre-sliced deli meat. *Meatingplace*.
20. International Dairy, Deli, Bakery Association (IDDBA). 2004. Consumers in the deli: Who's in store?
21. Kathariou, S. 2002. *Listeria monocytogenes* virulence and pathogenicity, a food safety perspective. *J. Food Prot.* 65:1811–1829.
22. Kosa, K. M., S. C. Cates, S. Karns, S. L., Godwin, and D. Chambers. 2007. Consumer knowledge and use of open dates: Results of a web-based survey. *J. Food Prot.* 70:1213–1219.
23. Lianou, A., J. N. Sofos. 2007. A review of the incidence and transmission of *Listeria monocytogenes* in ready-to-eat products in retail and food service environments. *J. Food Prot.* 70:2172–2198.
24. Lin, C. J., K. L. Jensen, and S. T. Yen. 2005. Awareness of foodborne pathogens among US consumers. *Food Quality and Preference* 16:401–412.
25. Martin, K. E., S. Knabel, and V. Mendenhall. 1999. A model train — the trainer program for HACCP-based food safety training in the retail/food service industry: an evaluation. *Journal of Extension* 37.
26. Mead, P. S., L. Slutsker, V. Dietz, L. F. McCaig, J. S. Bresee, C. Shapiro,

- P. M. Griffin, and R. V. Tauxe. 1999. Food-related illness and death in the United States. *Emerg. Infect. Dis.* 5:607–625.
27. Mitchell, R. 2009. The future of the deli. *Meat and deli retailer.* May 2009.
28. Olsen, S. J., M. Patrick, S. B. Hunter, V. Reddy, L. Kornstein, W. R. MacKenzie, K. Lane, S. Bidol, G. A. Stoltman, D. M. Frye, I. Lee, S. Hurd, T. F. Jones, T. N. LaPorte, W. Dewitt, L. Graves, M. Wiedmann, D. J. Schoonmaker-Bopp, A. J. Huang, C. Vincent, A. Bugenhagen, J. Corby, E. R. Carloni, M. E. Holcomb, R. F. Woron, S. M. Zansky, G. Dowdle, F. Smith, S. Ahrabi-Fard, A. R. Ong, N. Tucker, N. A. Hynes, and P. Mead. 2005. Multistate outbreak of *Listeria monocytogenes* infection linked to delicatessen turkey meat. *Clin. Infect. Dis.* 40:962–967.
29. Redmond, E. C., and C. J. Griffith. 2003. Consumer food handling in the home: A review of food safety studies. *J. Food Prot.* 66:130–161.
30. Reij, M. W., and E. D. Den Aantrekker. 2004. Recontamination as a source of pathogens in processed foods. *Int. J. Food Microbiol.* 91:1–11.
31. Shank, F. R., E. L. Elliot, I. K. Wachsmuth, and M. E. Losikoff. 1996. US position on *Listeria monocytogenes* in foods. *Food Control* 7:229–234.
32. Sheen, S., and C. A. Hwang. 2008. Modeling transfer of *Listeria monocytogenes* from slicer to deli meat during mechanical slicing. *Foodborne Pathog. Dis.* 5:135–146.
33. Surgeoner, B. V., T. Maclaurin, and D. A. Powell. 2009. Assessing management perspectives of a safe food-handling label for casual dining take-out food. *Food Protection Trends* 29:620–625.
34. U.S. Department of Agriculture, Food Safety and Inspection Service. 2001. Performance standards for the production of processed meat and poultry products: Proposed rule. *Fed. Regist.* 66:12590–12636.
35. U.S. Food and Drug Administration (FDA), Food Safety and Inspection Service (FSIS). 2006. FDA/FSIS Food Safety Survey Topline Frequency Report. Available at <http://www.fda.gov/Food/ScienceResearch/ResearchAreas/ConsumerResearch/ucm080374.htm>. Accessed 28 October 2009.
36. U.S. Food and Drug Administration (FDA), Food Safety and Inspection Service (FSIS). 2002. PR/HACCP rule evaluation report: Changes in consumer knowledge, behavior, and confidence since the 1996 PR/HACCP final rule. Available at <http://www.fsis.usda.gov/oa/research/HACCPImpacts.pdf>. Accessed 28 October 2009.
37. U.S. Food and Drug Administration (FDA), Center for Food Safety and Applied Nutrition, U.S. Department of Agriculture (USDA), Food Safety and Inspection Service (FSIS), and Centers for Disease Control and Prevention (CDC). 2003. Qualitative assessment of relative risk to public health from foodborne *Listeria monocytogenes* among selected categories of ready-to-eat foods.
38. Wang, C., and P. M. Muriana. 1994. Incidence of *Listeria monocytogenes* in packages of retail franks. *J. Food Prot.* 57:382–386.

CONGRATULATIONS...

At IAFP 2010, we offered a drawing for a one-year membership with our Association. We are pleased to announce the following winner of the drawing.

IAFP Membership

Eb Chiarini
University of São Paulo
São Paulo, Brazil