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Consumer Response to Food Contamination and Recalls: Findings from a National Survey

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Abstract

Food tampering is a great concern to many in the food safety industry. Deliberate contamination of food in the United States has occurred and could happen again. Upon discovery, the company may voluntarily recall the unsafe product or it may be recalled by the government. Food recalls are announced on television and radio, in newspapers, and on the internet at www.foodsafety.gov among others. Indeed thousands of recalls occur each year, often resulting in millions of dollars in cost to the food industry. Since 9/11, the U.S. government has worked with the food industry to anticipate and prevent threats to the food supply. Consumers, however, also have a part to keep food safe before, during, and after possible acts of foodborne bioterrorism. We conducted a national survey of 1,011 adults, which asked respondents how likely they would be to follow specific government recommendations regarding foodborne illness, recalls, and intentional acts of contamination. Forty-two percent of respondents reported they thought it was very likely or likely that there would be a possible terrorist attack on the U.S. food supply in the next 10 years, and 62% reported they would not be very prepared or not at all prepared for one. In the event of a possible terrorist attack, 28% of respondents stated they would stock more food and water in their homes. Additionally, in our study, most (86%) of the respondents reported they would be very likely or likely to contact their local health department or law enforcement agency if they suspected a food product had been intentionally tampered with, and 96% reported they would be very likely or likely to return a recalled food product to the place of purchase or discard it. It is important for consumers to do their part to be prepared in the event of an intentional attack on the U.S. food supply, and to be aware of possible deliberate contamination and food recalls should they occur.

Keywords: food recalls, food tampering, consumer response to recalls

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Introduction

Since 9/11 and the subsequent anthrax incidents, concerns about intentional acts of food contamination, or foodborne bioterrorism, in the United States have been heightened. Although most foodborne disease outbreaks are unintentional, deliberate contamination of food in the United States has occurred and could happen again (Ryan et al., 1987; Totok et al., 1997). For example, an intentional contamination of pasteurized liquid ice cream in tanker trucks caused an estimated 244,000 people to become infected with *Salmonella enteritidis* in 1994 (Hennessy et al., 1996). A deliberate contamination of a commercial food product could cause a widespread outbreak of foodborne illness geographically dispersed across the United States (Sobel, Khan, & Swerdlow, 2002). The Centers for Disease Control and Prevention (CDC) therefore produced a list of possible biological agents that could be used to contaminate food and water sources (Khan, Morse, & Lillibridge, 2000). Although these biological agents, namely foodborne pathogens, rarely result in death with proper treatment, a sudden large increase in the number of foodborne illness cases could overwhelm medical resources, and appropriate treatment might not be available to all victims (Sobel et al., 2002). Since 9/11, the U.S. government has worked with U.S. food processors and food producers to anticipate, prevent, and deter threats to the food supply (Cliché, 2006). In addition to food intentional food contamination or bioterrorism, the frequency of food recalls has increased in recent years (Zootecnica, 2011) due to a variety of factors including improved methods for detecting microbial or chemical contaminants in foods and changes in government inspection and surveillance methods. The majority of food recalls are the result of operational mistakes or the inadvertent but undisclosed contamination of a food product by a known allergen.

Food producers and processors and government agencies have roles to play in ensuring the safety of the food supply. Consumers, however, also have a part in the farm-to-fork continuum to keep food safe including before, during, and after emergencies and possible acts of foodborne bioterrorism. Several government agencies, such as the U.S. Department of Agriculture (USDA), Food and Drug Administration (FDA) and the U.S. Department of Homeland Security, and other organizations, such as the American Red Cross, have developed various Web sites and print materials to educate consumers about recommended food safety practices to respond to food recalls and prepare for emergency situations, including food tampering and bioterrorism. In focus groups conducted by Godwin, Coppings, Kosa, Cates, & Speller-Henderson (2010), it was found that consumers trust these agencies for information on handling food-related emergencies. However, limited research, especially at the national level, has been conducted to measure consumers' knowledge and use of these recommended food safety practices.

A national survey was conducted to understand consumers' food safety attitudes, knowledge, and practices with regard to emergency preparedness and response (Kosa, Cates, Godwin, Coppings, & Speller-Henderson, 2011). Study findings could be used by educators to identify gaps in consumers' food safety knowledge and practices, develop new or improve existing educational approaches, and thereby help reduce the risk of foodborne illness.

Methodology

A national survey of U.S. household grocery shoppers aged 18 years and older was conducted using a Web-enabled panel survey approach. The survey administration and analysis procedures are described below and in a paper published on power outages published by Kosa et al (2011).

Sample. The sample was selected from a Web-enabled panel developed and maintained by Knowledge Networks (Menlo Park, CA), a survey research firm. The Web-enabled panel was designed to be representative of the U.S. population (Couper, 2000). The Web-enabled panel was based on a list-assisted, random-digit-dial (RDD) sample drawn from all 10-digit telephone numbers in the United States. Households that do not have telephones (approximately 2.4% of U.S. households) are not covered in the sample (US Census Bureau, 2010). As part of a household's agreement to participate in the panel, they were provided with a free computer and free Internet access. All new panel members were sent an initial survey that collects information on a wide variety of demographic characteristics to create member profiles.

At the time of sample selection, approximately 45,000 panel members were actively participating in the Web-enabled panel. A sample of 1,619 panel members who had primary or shared responsibility for the grocery shopping in their households was randomly selected to receive the survey. **Questionnaire.** The questionnaire collected information on consumers' food safety attitudes, knowledge, and practices regarding emergency preparedness and response. Respondents were asked whether they had read or heard about specific food safety recommendations and how likely they would be to follow the recommendations during a future emergency. Respondents were also asked whether they had read or heard about other specific government recommendations regarding food recalls, and intentional acts of contamination, including a terrorist attack on the U.S. food supply, and how likely they would be to follow these recommendations in the future. Prior to survey administration, the survey instrument was evaluated with 10 adults who had recently experienced extended power outages using cognitive interviewing techniques (Willis, 1994). Subsequently, the survey instrument was refined based on the results from the cognitive interviews.

Survey Procedures and Response. The survey was e mailed to a random sample of panel members aged 18 years old and older who had primary or shared responsibility for the grocery shopping in their household. To maximize response rate, two e-mail reminders were sent and one telephone call was made to nonrespondents. Data were collected over a 14-day field period. Of the 1,619 sampled panelists, 49 individuals were not eligible and 559 individuals did not respond. The total sample size was 1,011, which yielded a 64% completion rate.

Weighting Procedures. The data were weighted to reflect the selection probabilities of sampled units and to compensate for differential nonresponse and undercoverage (Lohr, 1999). The weights were based on the inverses of their overall selection probabilities with adjustments for undersampling of telephone numbers for which an address was not available during panel recruiting; households with multiple telephone lines; oversampling of certain geographic areas, African American and Hispanic households, and households with computer and Internet access; and undersampling of households not covered by MSN TV. Using a raking, or iterative proportional fitting technique, data on age, gender, race/ethnicity, geographic region, education, Internet access, and metropolitan status were used in a poststratification weighting adjustment to make the sample reflect the most current population benchmarks (US Census Bureau, 2007). The

final weights were trimmed and scaled to sum to the total U.S. population aged 18 years and older; hence, the weighted survey results are representative of the U.S. adult population.

Analysis. Weighted frequencies were calculated for each survey question. For selected questions, analyses were conducted to assess whether responses varied by respondent characteristics. The following sociodemographic and other variables were included in this analysis: gender, age (18 to 44 years old versus 45 years old and older), education level (high school or less versus some college or more), marital status (married versus not married), household size (single versus two or more individuals), race/ethnicity (white, non-Hispanic versus other), household income (less than \$35,000 versus \$35,000 or more), U.S. region (Northeast, Midwest, South, and West), and metropolitan status (metropolitan versus nonmetropolitan) based on the metropolitan statistical area (MSA) for the household. A chi-square test was performed for the relationships between the variables of interest and the sociodemographic and other variables. The analysis was conducted with the Stata release 8.2 software package (Stata Corporation, 2005).

Results

Of the 1,011 respondents, 72% were women; 73% were white, non-Hispanic; and 61% were between the ages of 30 and 59 years old. Approximately 61% of respondents had some college education or a college degree, and 61% of respondents had annual household incomes of \$35,000 or more. Twenty-seven percent of respondents had children living in their households at the time of the survey. Detailed demographic information for the respondents is provided in Table 1. Data regarding the likelihood that respondents would follow USDA recommendations is summarized in Table 2. Nearly ninety-six percent of respondents indicated that they would be very likely (79.4 %) or likely (16.4 %) to follow the USDA recommendation to discard or return a recalled food product (Table 2). A slightly lower proportion, 85.6 %, of respondents were very likely (62.0 %) or likely (23.6 %) to contact their local health department or law enforcement agency if they suspected that a food item had been tampered with as recommended by USDA. Respondents from household that included a high risk person were more likely to follow the recommendation. The percentage of respondents who felt that a terrorist attack on the U.S. food supply is very likely or likely was over twice that of respondents who felt that such a terrorist attack is unlikely or very unlikely (42.1 % vs. 18.6 %, respectively). Thirty nine percent of respondents indicated that a terrorist attack on the food supply was neither likely nor unlikely.

Discussion and Conclusions

Proper handling of food and food products in the home is a vital step in protecting consumers from foodborne illness or injury from foods that have been tampered with or contaminated. A large majority of consumers in our survey indicated that they would properly respond to notification that they possessed a recalled food item by discarding it or returning it to the point of purchase. This high degree of compliance would help to reduce the adverse health impact of recalled foods. While again a large majority of respondents expressed a willingness to comply with the recommendation to contact local law enforcement or health department when confronted with a food product that had apparently been tampered with, the percentage of persons very likely to follow this recommendation was less the proportion that were very likely to follow the recommendation regarding a recalled food (62.0 vs. 79.4 %, respectively). Unfortunately, this may

reflect hesitancy to follow through with the recommendation. Moreover, consumers would need to be aware of the proper authority to contact and have appropriate contact information. It may be that some consumers would lack this information and fail to inform local authorities in a timely manner. While over twice the percentage of survey respondents thought a bioterrorist attack involving the food supply was likely in the near future, this represented less than half the respondents. This result is surprising given the high vulnerability of our food supply to persons with malicious intent (Rasco & Bledsoe, 2005).

Continued efforts are needed to promptly inform consumers of food related problems and instruct them in how to respond to food recalls or food emergencies. Several websites are available, such as www.foodsafety.gov and www.recalls.gov/food, to notify consumers of food safety issues including food product recalls. The Food Safety Modernization Act (FSMA) includes enhanced efforts by the FDA to provide consumers with accurate information on these issues (U.S. Food and Drug Administration [FDA], 2011). We have assembled educational curricula to train county extension agents in how to assist consumers confronted with emergencies that impact food safety (Godwin & Stone, 2011). These and related efforts should enable consumers to be better prepared to properly respond to a variety of food safety issues.

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Tables

Table 1. Demographic characteristics of survey respondents (n=1011).

		%
Region		
	Northeast	17.9
	Midwest	22.7
	South	36.0
	West	23.5
Age		
	18 – 29	15.4
	30 – 44	28.3
	45 – 59	32.3
	60 +	23.9
Race/Ethnicity		
	White non-Hispanic	73.0
	Black non-Hispanic	9.8
	Hispanic	11.2
	Other	6.0
Gender		
	Male	28
	Female	72
Household size		
	Single	33.6
	Two or more	66.4
Children in home		
	Yes	27
	No	73

Table 2. Respondent’s likelihood to follow USDA recommendations (%).

Recommendation	Likelihood to follow recommendation			
	Very likely	Likely	Neither	Unlikely
Very unlikely				
Discard or return recalled food item	79.4	16.4	2.0	1.5
0.4				
Contact local health department or law enforcement regarding tampered food item	62.0	23.6	7.6	5.1
1.6				

n=1011