Food Safety Perceptions and Behaviors of Participants in Congregate–Meal and Home–Delivered–Meal Programs

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Abstract

The study reported here examined the food safety perceptions, food safety behaviors, and emergency food preparedness of elderly people participating in congregate-meal and home-delivered-meal (HDM) programs as influenced by demographic and socioeconomic variables. Interviewers surveyed elderly people participating in a congregate-meal and HDM program in nine counties in central Kentucky in April 2004 and May 2005. Participants' perceptions of food safety issues showed statistically significant differences by meal site location, age, marital status, and household composition. Participants' self-reported food safety behaviors showed statistically significant differences by marital status, meal site location, age, gender, household composition, race/ethnicity, and level of education. In addition, significant differences were found in seniors' self-reported emergency food preparedness by race and level of education. The study found that some elderly people participating in the Elderly Nutrition Program (ENP) have disconcerting food safety perceptions, engage in risky food-handling behaviors, and lack emergency food and water preparation. Since many elderly people participating in the ENP program are vulnerable, these findings indicate that support and assistance by providers is warranted to protect elderly people from unsafe situations.

The Elderly Nutrition Program

According to the U.S. Census, the population of individuals 65 years of age and older grew by 74 percent between 1970 and 1999 (U.S. Department of Health and Human Services [DHHS], 2000). Today, 44 million individuals 60 years of age or older live in the United States (DHHS, n.d.a). By 2030, the number of adults 65 years of age or older is expected to double, to more than 70 million (DHHS, 2001). The fast growth of this age group has increased demand for social services to serve this population. The Elderly Nutrition Program (ENP), implemented under the Older Americans Act (Title III), provides congregate meals in various group settings, such as senior centers, faith-based settings, and school locales, as well as in the homes of homebound elderly people (DHHS, n.d.b).

Under Title III, a person must be at least 60 years of age to be eligible for ENP (DHHS, n.d.b). The program targets older people who are most vulnerable, such as members of ethnic-minority groups and people living alone. It also provides services to individuals with lower incomes, individuals with lower levels of education, individuals living in rural areas, and individuals in fair or poor health (DHHS, n.d.a; Millen, Ohls, Ponza, & McCool, 2002). ENP has been instrumental in allowing older people to maintain independence and avoid premature nursing home placement (DHHS, n.d.a).

In Kentucky, in fiscal year 2003–2004, nearly 3.3 million elderly people received home-delivered meals (HDMs) or participated in congregate meals (National Aging Program Information System, 2003). In fiscal year 2005, over 1.8 million meals were served to homebound elderly people in Kentucky (Kentucky Department for Aging and Independent Living, 2005). Nationally, in fiscal year 2002, 250 million congregate meals and HDMs were provided to the elderly (Congressional Research Service, 2004). A 2003 study by the Administration on Aging found that 62 percent of HDM recipients received one half of their daily food intake from an HDM and that 58 percent of congregate-meal recipients received one half of their daily food intake from a congregate meal (DHHS, n.d.b). A study conducted in Lake County, Indiana, found 39 percent of elderly people participating in the HDM program to be at moderate nutritional risk and 33 percent to be at high nutritional risk (Herndon, 1994).

Food Safety and Foodborne Illness

Food safety is a serious issue in America. Infants, young children, elderly people, and immune-compromised individuals are most at risk of incurring a foodborne illness (CDC, 2001; Kendall, Medeiros, Hillers, Chen, & DiMascola, 2003; McCabe-Seller & Beattle, 2004). As people age, immune system functions decrease and antibiotic treatment is less effective because of a decrease in physiological function (Smith, 1998).

TABLE 1

Descriptive Characteristics of Congregate-Meal and Home-Delivered-Meal Respondents

Characteristic	Home-Delivered Meals		Congregate Meals		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Gender						
Male	13	14.1%	23	18.0%	36	16.4%
Female	79	85.9%	105	82.0%	184	83.6%
Total	92	41.8%	128	58.2%	220	100.0%
Age						
60–70	14	15.2%	38	29.5%	52	23.5%
71–80	38	29.5%	48	37.2%	79	35.7%
81–90	42	45.7%	37	28.7%	79	35.7%
91 and above	5	5.4%	6	4.7%	11	5.0%
Total	92	41.6%	129	58.4%	221	100.0%
Race						
White	86	93.5%	99	78.6%	185	84.9%
Other	6	6.5%	27	21.4%	33	15.1%
Total	92	42.2%	126	57.8%	218	100.0%
Education						
<High school	46	50.0%	68	53.1%	114	51.8%
High school/GED	29	31.5%	34	26.6%	63	28.6%
Some college/college degree	17	18.5%	26	20.3%	43	19.5%
Total	92	41.8%	128	58.2%	220	100.0%
Marital status						
Single	6	6.6%	14	10.8%	20	9.0%
Married or living as married	17	18.7%	23	17.7%	40	18.1%
Divorced, separated, or widowed	68	74.7%	93	71.5%	161	72.9%
Total	91	41.2%	130	58.8%	221	100.0%
Status of home						
Live alone	61	66.3%	91	70.0%	152	68.5%
Live with someone	31	33.7%	39	30.0%	70	31.5%
Total	92	41.4%	130	58.6%	222	100.0%

The elderly have a higher incidence of major surgeries that affect the body's ability to fight infections and are more likely to experience more severe consequences from an infection (Klontz, Adler, & Potter, 1997). In addition, changes in the gastrointestinal tract, malnutrition, lack of exercise, and excessive use of antibiotics may all increase morbidity and mortality from foodborne illness (Smith).

Purpose of Study

Given seniors' increased susceptibility to foodborne illness, special attention needs to be paid to the food safety perceptions and behaviors of HMD clients. Optimization of home-delivered nutrition services requires a better understanding of the food-related risks and practices of HMD program participants. Seniors have been found to use a wider array of inappropriate practices to cook, cool, and thaw food than does the general population (Gettings & Kiernan, 2001). Several factors can affect the food safety of elderly people participating in congregate-meal and HDM programs, including 1) perceptions about foodborne illness and food safety that can lead to unsafe practices, 2) delayed consumption and improper storage of HDMs or congregate meals, and 3) lack of food safety preparedness in cases of emergency. The purpose of our study was to expand current understanding of food safety perceptions, food safety behaviors, and emergency food preparedness among elderly people participating in congregate-meal and HDM programs. This exploratory study attempted, in particular, to provide additional knowledge about the handling of HDMs once the food arrives at the client's home.

Methods

Study Population

A food safety survey was conducted at senior center sites providing congregate meals

and HDMs in nine counties in central Kentucky. On the basis of the criteria for participating in ENP, subjects were at least 60 years of age. The counties recruited for this study were primarily rural, except for one county containing a major city with a population of approximately 260,000 people. The survey was conducted in April 2004 in five counties and in May 2005 in the other four counties. It received prior approval and cooperation from the management team of the senior centers.

Survey Instrument

A 21-question survey was developed based on questions from the U.S. Food and Drug Administration Survey of Consumer Food Handling Practices and Awareness of Microbiological Hazards (FDA, 1993). The researcher added additional questions specific to home-delivered-meal practices and emergency food preparation, and these questions were reviewed by ENP administrators. The majority of the questions were Likert-type and closed-ended. Demographic information, on race, gender, level of education, marital status, age, and number of individuals living in the household, was also solicited. The University of Kentucky's Institutional Review Board (IRB) approved the survey questions and research protocol.

Data Collection

Registered dietitians from the district Dietetic Association and dietetic interns from the university's Nutrition and Food Science Department administered the survey orally to the congregate-meal and home-delivered-meal recipients in a personal interview. Before conducting the survey, the researchers were trained in conducting interviews and were required to complete the Human Subjects Protection Training offered through the university's IRB. In addition to the training, a detailed instruction guide was provided to ensure uniformity among the interviewers in administration of the survey. All participants in the study gave written, informed consent.

Variables

To address the objectives of the study, four questions from the survey were categorized as perception questions, 12 questions were identified as behavior questions, and five questions were categorized as emergency preparedness questions. Perception questions consisted of the following: 1) How common is it for people in the United States to get foodborne illness? 2) Where are food safety problems most likely to occur? 3) What amount of foodborne illness has there been in the United States in the last five years? and 4) How likely are elderly people to become sick because of a foodborne illness? The questions about food safety behaviors pertained to the practices elderly people employ when they receive an HDM or bring home a congregate meal. These questions addressed issues such as when people eat their HDM (upon delivery or later in the day), how often they save part or all of their HDM to eat later, how they handle their HDM upon delivery if they eat some or part of it later in the day, how long they leave food on a counter before throwing it away, what they do with food left out on the counter overnight, and whether they wash their hands before eating. Questions on emergency preparedness included whether people had available in their home a three-day supply of nonperishable food, a gallon of water for each family member, a cooler and frozen gel pack, a portable refrigerator/freezer thermometer, and a handheld can opener.

Data Analyses

All analyses were conducted with SPSS 13.0 for Microsoft Windows. Descriptive statistics were computed for demographic characteristics. Cross-tabulation and Fisher's exact Chi-square tests were used to investigate associations between demographic variables and respondents' food safety perceptions, food-handling behaviors, and emergency food preparedness. A statistical significance of $p \leq .05$ was used for all tests.

Results

Description of the Sample

At the time of the study, 633 seniors participated in the congregate-meal and HDM program in the nine targeted counties in central Kentucky (400 received congregate meals; 233 received HDMs). A total of 246 subjects agreed to participate in the food safety survey, and of these responses, 220 were usable (a 35 percent response rate). Out of the usable responses, 92 were from HDM recipients (41 percent) and 130 were from congregate-meal recipients (59 percent). Unbeknownst to the participant, the interviewer discreetly deemed 26 interviewees incapable of participating in the study because of concerns about the participant's limited cognitive abilities.

The demographic characteristics of the respondents are presented in Table 1. Eighty-four percent of the sample was female and 16 percent was male. The largest age groups were 71–80 and 81–90 years of age (each group had 35.7 percent). Eighty-five percent of the sample was white. The preponderance of the sample (52 percent) had not completed high school or obtained a high school equivalency degree. Slightly less than 20 percent of the respondents had some college or a college degree. Seventy-three percent were divorced, separated, or widowed, while an additional 9 percent were single, and 18 percent were married. Nearly 69 percent of the sample lived alone.

Food Safety Perceptions

Table 2 provides the results of the cross-tabulation and Fisher's exact Chi-square test used to identify differences in respondents' perceptions of food safety issues on the basis of demographic and socioeconomic characteristics. Statistically significant differences were found in seniors' perceptions of food safety issues for meal site location, age, marital status, and household composition. When responses of seniors at congregate-meal sites and seniors receiving HDMs were compared, it was found that significantly more seniors at congregate-meal sites believed foodborne illness was very common. Older respondents (81 years of age and older) were more likely to believe that food safety problems were more likely to occur at places other than the home than were younger respondents (60–80 years of age). Twenty-one percent of all age groups believed food safety problems were more likely to occur outside the home. Significantly more married respondents believed that foodborne illness had increased in the past five years than did elderly people who were single or divorced, separated, or widowed. In addition, seniors who lived alone or were male were more likely to believe that older people were more likely to get foodborne illness.

Food Safety Behaviors

Analysis was conducted to determine differences in seniors' food safety behaviors in relation to demographic and socioeconomic variables. Table 3 shows that significant differences were found for marital status, meal site location, age, gender, household composition, race/ethnicity, and education level. Thirty-three percent of elderly respondents stated that at least half the time they saved

TABLE 2

Respondent Perceptions of Food Safety Issues as Influenced by Demographic Variables

Variable		Questionnaire Item			
		How common is it to get foodborne illness in the United States?			
		Very Common	Somewhat Common	Not Common at All	Total
Meal site	Home	33.3%	30.0%	36.7%	(90) 100%
	Center	48.4%	31.3%	20.3%	(128) 100%
	Total	42.2%	30.7%	27.1%	(218) 100%
				$p = .018$	
		Where are food safety problems most likely to occur?			
		Home		Other Places	Total
Age	60–70	92.2%		7.8%	(51) 100%
	71–80	78.9%		21.1%	(76) 100%
	81–90	71.6%		28.4%	(74) 100%
	91+	60.0%		40.0%	(10) 100%
	Total	78.7%		21.3%	(211) 100%
				$p < .012$	
		What amount of foodborne illness has there been in the past 5 years?			
		More	Less	The Same	Total
Marital status	Single	21.1%	15.8%	63.2%	(19) 100%
	Married or living as married	53.8%	15.4%	30.8%	(39) 100%
	Divorced, separated, or widowed	30.5%	19.5%	50.0%	(154) 100%
	Total	34.0%	18.4%	47.6%	(212) 100%
				$p = .051$	
		As people get older, are they more likely to get foodborne illness?			
		Yes	No	Not Sure	Total
Household composition	Live alone	60.9%	17.2%	21.9%	(151) 100%
	Live with someone	54.3%	31.4%	14.3%	(70) 100%
	Total	58.8%	21.7%	19.5%	(221) 100%
				$p = .052$	
Gender	Male	77.1%	14.3%	8.6%	(35) 100%
	Female	55.4%	22.8%	21.7%	(184) 100%
	Total	58.9%	21.5%	19.6%	(219) 100%
				$p = .054$	

their congregate meal or HDM to eat later in the day instead of at the time they received it. The practice of saving some of the meal to eat later occurred significantly more often among seniors participating in congregate meals than among seniors receiving HDMs. Single and divorced, separated, or widowed seniors were significantly more likely to eat their meal right away, while married seniors were more likely to eat some of it within one to two hours of receiving it. Among all marital groups, 18 to 22 percent of the sample ate their meal more than two hours after it was delivered. Fifty percent of the oldest group (91 years of age or older) kept all or a part of their unconsumed meal on the counter instead of in a refrigerator or warm oven. In addition, a significant number (36 percent) who were 60 to 70 years of age practiced this behavior.

Males, along with those who lived with someone, were also significantly more likely to leave leftovers on the counter for two hours or more before throwing them away. With respect to leaving a casserole or similar food out over night, seniors who were 80 years of age or less, who were white, and who had a high school education or less than a high school education were significantly more likely to throw the food away than were those who were older than 80 years of age, were nonwhite, and had more than a high school education. Last, seniors participating in the congregate-meal program were significantly more likely to wash their hands before eating than were seniors who participated in the HDM program.

Emergency Food Preparedness

Additional analysis was conducted to determine difference in seniors' self-reported food preparedness for emergencies such as floods, hurricanes and ice storms (Table 4). Whites

TABLE 3

Respondent Food-Handling Behaviors as Influenced by Demographic Variables

Variable		Questionnaire Item			
		When do you eat the meal?			
		Right Away	1–2 Hours	>2 Hours	Total
Marital status	Single	73.3%	6.7%	20.0%	(15) 100%
	Married or living as married	37.5%	40.6%	21.9%	(32) 100%
	Divorced, separated, or widowed	62.5%	20.0%	17.5%	(120) 100%
	Total	58.7%	22.8%	18.6%	(167) 100%
				$p = .036$	
		How often do you save some of the meal to eat later?			
		Always	About Half the Time	Rarely/Never	Total
Meal site	Home	4.4%	29.7%	65.9%	(91) 100%
	Center	18.4%	35.7%	45.9%	(98) 100%
	Total	11.6%	32.8%	55.6%	(189) 100%
				$p = .002$	
		What do you do with your meal if you do not eat all or part of it right away?			
		Put on Counter	Put in Refrigerator/Oven		Total
Age	60–70	36.1%	63.9%		(36) 100%
	71–80	15.7%	84.3%		(51) 100%
	81–90	24.2%	75.8%		(62) 100%
	91+	50.0%	50.0%		(10) 100%
	Total	25.8%	74.2%		(159) 100%
			$p = .044$		
		How long do you leave casserole or similar food on counter before throwing it away?			
		<2 Hours	2 Hours/>2 Hours		Total
Gender	Male	58.8%	41.2%		(34) 100%
	Female	82.0%	18.0%		(178) 100%
	Total	78.3%	21.7%		(212) 100%
			$p = .004$		
Household composition	Live alone	82.1%	17.9%		(145) 100%
	Live with someone	69.6%	30.4%		(69) 100%
	Total	78.0%	22.0%		(214) 100%
			$p = .031$		
		What would you do if you left a casserole or similar food on counter overnight?			
		Eat It	Throw It Away		Total
Age	60–70	3.9%	96.1%		(51) 100%
	71–80	5.4%	94.6%		(74) 100%
	81–90	16.7%	83.3%		(78) 100%
	91+	18.2%	81.8%		(11) 100%
	Total	9.8%	90.2%		(214) 100%
			$p = .030$		
Race/Ethnicity	White	7.2%	92.8%		(180) 100%
	All other races	22.6%	77.4%		(31) 100%
	Total	9.5%	90.5%		(211) 100%
			$p = .015$		
Level of Education	<High school	7.3%	92.7%		(109) 100%
	High school	4.8%	95.2%		(62) 100%
	Some college or B.S. degree	23.3%	76.7%		(43) 100%
	Total	9.8%	90.2%		(214) 100%
			$p = .007$		
		Wash hands before eating meal?			
		Very Likely	Somewhat or Not Likely		Total
Meal Site	Home	75.0%	25.0%		(92) 100%
	Center	89.8%	10.2%		(128) 100%
	Total	83.6%	16.4%		(220) 100%
			$p = .005$		

TABLE 4

Respondent Behaviors with Respect to Emergency Preparation, as Influenced by Demographic Variables

Variable		Questionnaire Item		
		Three-day supply of nonperishable food?		
		Yes	No	Total
Race/ethnicity	White	83.3%	16.7%	(180) 100%
	All other races	62.5%	37.6%	(32) 100%
	Total	80.2%	19.8%	(212) 100%
		$p = .014$		
		Cooler and frozen gel packs?		
		Yes	No	Total
Level of education	<High school	30.9%	69.1%	(110) 100%
	High school	44.4%	55.6%	(63) 100%
	Some college or B.S. degree	57.1%	42.9%	(42) 100%
	Total	40.0%	60.0%	(215) 100%
		$p = .009$		
		Refrigerator/freezer thermometer?		
		Yes	No	Total
Level of education	<High school	9.3%	90.7%	(107) 100%
	High school	11.3%	88.7%	(62) 100%
	Some college or B.S. degree	31.0%	69.0%	(42) 100%
	Total	14.2%	85.8%	(211) 100%
		$p = .005$		

were significantly more likely than other racial/ethnic groups to have a three-day supply of nonperishable foods in their home. Elderly people who had attended some college or had a college degree were more likely to have a cooler, frozen gel packs, and refrigerator and freezer thermometers in their homes than were elderly people with less formal education.

Discussion

Our study of elderly people participating in the congregate-meal and HDM program used three distinct categories of food safety questions: questions about food safety perceptions, questions about food safety behaviors, and questions about emergency food preparedness. Significant correlations between these food safety areas and seniors' demographic characteristics were found. ENP participants are often part of the vulnerable population that has compromised immune systems. By better understanding the perceptions and practices of ENP participants, agencies can establish food safety policies and procedures that protect the elderly.

Some food safety perceptions of elderly people can be problematic. Our study of central Kentucky elderly people participating in ENP revealed that 27 percent thought foodborne illness was uncommon. When combined with the finding that over 20 percent of the sample thought food safety problems were more likely to occur in places other than their homes, this finding indicates that a considerable number of elderly people who participated in the study may be at risk of foodborne illness. In addition, the study found that respondents in the oldest age group were more likely to believe that food safety problems occur in places other than the home. While fewer foodborne illnesses are reported from the home (Bruhn, 1997), home kitchens are, in reality, more likely than restaurants to introduce foodborne pathogens when personal hygiene and proper food-handling procedures are not practiced (Medeiros et al., 2004). About one-fifth of the study population appeared to believe that food safety problems could not occur in their homes and to be more suspicious of "outside influences" on the safety of food.

Two other perceptions that were found in the study and that could prompt elderly people to make erroneous food-handling decisions were the belief that foodborne illness had declined in the last five years (18 percent of the sample) and the belief that older people are not more susceptible to foodborne illness (22 percent of sample). An interesting finding of the study, not reported in previous research, is that seniors who lived alone were significantly more likely to believe that older people were more susceptible to foodborne illness than were seniors who lived with someone.The findings indicate that 20 to 25 percent of ENP participants have risky food safety perceptions. Mathieu (2002) has reminded readers that "agencies must take precautions depending on what kind of client they are dealing with" (p. 1746).

Our study found that some demographic and socioeconomic characteristics had a significant relationship to elderly people's food safety behaviors. One of the most resonant concerns revealed by the study was the handling of unconsumed HDMs. Seniors who were married were significantly more likely to delay eating their HDMs than were seniors who were not married. Overall, 44 percent of ENP participants (both congregate-meal and HDM recipients) saved some of their meal to eat later.

Several senior citizens gather for a midday meal at the Franklin County Senior Citizens Center in Frankfort, Kentucky. *Photo by Cathy Cardwell, director of activities.*

Recipients of home-delivered meals in Franklin County, Kentucky, are treated to a friendly visit as well as a hot, nutritious meal. *Photo by Willa Thomas, nutritionist for the Division of Aging and Independent Living.*

Participants in a home-delivered-meal program. *Photo by Knoxville/Knox County CAC Mobile Meals.*

This finding is comparable to those of previous studies, which reported that about one-half of HDM recipients saved food to eat later (Asp & Darling, 1988; Fey-Yensan, English, Ash, Wallace, & Museler, 2001; Roberson, Binkley, Almanza, Ismail, & Nelson, 2005). This study found that significantly more congregate-meal than HDM recipients saved some of their meal to eat later. Since this generation is known for saving leftover food, this finding suggests the possibility that portion sizes may be too large in the congregate-meal settings where this study took place. Of those who ate all or part of their meal later, individuals 60 to 70 years of age and over 90 years of age were significantly more likely to leave the meal sitting on the counter. Alarmingly, 50 percent of elderly people over 90 years of age left an unconsumed meal on the kitchen counter.

Previous research has also found delayed consumption of HDMs after improper storage in the home (Fey-Yensan et al., 2001). In that study, younger HDM participants (65–74 years of age) and males were more likely to eat their entire meal upon receiving it. The majority stored part of the meal for later; of that group, 38 percent stored it in the refrigerator and 30 percent on the counter. As in our findings, leaving the meal on the counter was more likely among those in the oldest age group. In contrast to our study, which found that 81 percent of seniors ate their meal within two hours, another study found that 77 percent of the clients who received HDMs ate their meal within one hour of delivery. Of those who did not eat the meal immediately, 41 percent left the meal on the counter, 44 percent refrigerated it, and 12 percent stored it in a hot oven (Roberson et al., 2005). A focus group of seniors 65 years of age and older found prompt refrigeration of food to be lacking (Boone et al., 2005). These findings suggest that ENP agencies should combat unsafe practices of the elderly by having delivery drivers encourage clients to eat their meal right away or make sure it is refrigerated upon delivery. In addition, agencies could implement strategies to encourage safe food-handling practices in the home by changing food container types, providing storage information on containers, and so forth.

Another major concern revealed in the study was seniors' handling of leftover food. Twenty-two percent of the sample stated they would leave a casserole or similar food on the counter for over two hours before they would throw it away. This unsafe practice was significantly more prevalent among males and married ENP participants than it was among females and seniors who were single or divorced, separated, or widowed. In addition, the study found that almost 10 percent of the sample would eat a casserole or similar food that had been left on the counter overnight. This practice of eating food left out overnight was significantly more prevalent among respondents 81 years of age or older, among respondents of a race/ethnicity other than white, and among respondents with the highest level of education. Similarly, Redmond and Griffith (2004) reported that men had riskier hygiene and cooking practices than did women.

An annual survey of supermarket shoppers conducted in 2000 indicated that 60 percent of respondents thought that washing their hands and food preparation surfaces were the two most important methods they used to keep food safe from bacteria (ERS/USDA Briefing Room, 2004). In our study, considerably more seniors (nearly 84 percent) washed their hands before eating. One could postulate that eating meals in a group setting increases handwashing since we also found that respondents who participated in congregate meals were significantly more likely to wash their hands than were HDM participants.

The last section of the survey investigated how prepared ENP participants were with regard to emergency food and water. This inquiry was prompted by recent cata-

strophic events in the United States such as hurricanes, floods, ice storms, and tornadoes. The study found that certain demographic variables (race and education level) were significant. Our findings also suggest that more attention should be given to preparing elderly people for emergencies, especially members of the ethnic/racial groups that showed less preparedness for emergencies and less knowledge of safe-food-handling principles.

One limitation of the study is that it was conducted in only nine counties in Central Kentucky; therefore, the results can be generalized only to Kentucky's ENP participants. Nevertheless, because of the thoroughness of the research design according to which personal interviews were conducted, findings from this study should provide useful information on the food safety perceptions and behaviors of elderly people enrolled in ENP programs nationwide.

Conclusions

The findings of our study are a reminder of how important it is for elderly people, especially those in high-risk populations, to adhere to safe food practices. They also indicate that sometimes elderly people participating in ENP have precarious food safety perceptions and partake in risky food-handling behaviors. As elderly people age, these behaviors may escalate because of physical and mental impairments.

The study found that elderly people have misconceptions that are of significant importance to their overall health. Some respondents believed that foodborne illness was not likely to happen to them or that foodborne illness occurred elsewhere other than the home. These misconceptions, along with a lack of proper food safety education, can put elderly people at risk. Our study found that along with these misconceptions, ENP participants in central Kentucky displayed several unsafe food practices, such as frequently not eating their meals upon delivery, coupled with unsafe disposition of the meals. In addition, over 20 percent of respondents ate food that had been left out in unsafe conditions for over two hours and nearly 10 percent stated that they would eat a casserole that had been left out overnight. In national data from 1993 through 1997, the food preparation practice most commonly reported as contributing to foodborne disease was improper holding temperature (Olsen, MacKinon, Goulding, Bean, & Slutsker, 2000). Since many elderly people experienced the Great Depression and are on fixed incomes, they may feel uneasy discarding food that has been held at an improper temperature for too long. They need consistent reminders and encouragement to throw out food that is potentially unsafe. In addition, since many elderly people participating in the ENP program are vulnerable, the findings of the study indicate that encouragement and assistance are warranted with respect to proper storage of prepared foods and the stocking of adequate food, water, and supplies in the home for emergency situations.

More research is needed to understand the food safety perceptions and behaviors of ENP participants. As this population grows, the risk of foodborne illness will increase. Better understanding of misconceptions and inappropriate behaviors can be applied in ENP strategies. Continued independence of seniors in their home can be achieved if congregate-meal and HDM recipients practice safe food-handling procedures at home.

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President's Message

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- www.rivcoeh.org/opencms/rivcoeh/ProgServices/Food_Program/Program_Awards.html—click on the movie ad link to see a career promotion video and search the site for attractive job announcements.

After presenting these items, I asked the audience what more could be done to improve visibility. Here are bulleted selections from their suggestions:

- a Capitol Hill Day in which NEHA members meet their representatives and senators,
- Senate aides could be invited to NEHA headquarters to learn more about current environmental health issues,
- mentor legislators and invite them to conferences,
- podcasts on various environmental health concerns,
- title-on-reverse T-shirt (photo opportunities during emergency events),
- pictures!—environmental health lends itself to visual displays,
- could we be ready with press releases and experts for the next *E. coli* outbreaks?
- invite high school students from a 50-mile radius to our annual educational conferences (both national and state affiliate conferences),
- get a marketing firm to assist NEHA on marketing directions,
- have a marketing strategy that state level agencies could adapt to their local needs,
- title—"sanitarian" and "EHS" are confusing,
- mandate professional registration,
- James Herriott books—do environmental health stories in a similar vein?
- Rebecca Berg to do *Reader's Digest* stories on environmental health,
- DVD encouraging high school students to consider environmental health as a course of study,
- local environmental health practitioners to serve as high school science fair judges,
- environmental health–focused high school Disease Detectives competition, and
- governor proclamations of Environmental Health Days.

The ideas are great, but the energy level in the room to move ahead on some of these ideas was even greater. As I mentioned in my previous column, I have asked several active NEHA members to coordinate the marketing activities that are being undertaken around the country so that we have maximum output and as little tripping over one another as possible. I believe these activities will be most effectively accomplished at the grassroots level and could involve affiliates, individuals, and sister organizations, which are also addressing issues related to the problem of the "invisible profession."

In addition, I'm hopeful that the workgroup can identify corporate partners, granting agencies, foundations, and sponsors who would be willing to fund the hiring of marketing specialists to work and give us guidance on a broader scale.

Robert G. Blake