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LETTER FROM THE EDITORS

JOURNAL OF FOODSERVICE
MANAGEMENT & EDUCATION

Again, welcome to the Journal of Foodservice Management and Education. We appreciate you taking the time to review the manuscripts in this issue of the journal. This issue supports food service operators, educators, and researchers; advancing knowledge from the classroom to the kitchen.

The topic of food safety education and research crosses all disciplines of food service management. Educators play an integral role in developing the food safety knowledge and competence of tomorrow's food service managers. Roberts and colleagues provide specific recommendations for enhancing food service educators' food safety teaching methods, including guidelines for teaching employee motivation. York and researchers also provide best practices for conducting employee food safety observations and related methodologies. Anciado and colleagues elaborate on the long-term care environment and factors that impact Nutrition Managers' decisions to purchase commercial pureed foods. Finally, Schaffer and Miller discuss the relevance of cooking ability and knowledge among dietetics students.

Thank you again to all the reviewers who have taken the time to review the manuscripts that have been submitted. Without your dedication to our profession this Journal would simply not be possible.

Over the last year, the Journal has continued to increase the number of manuscripts received. The Journal will release a second issue later this year, the first time the journal has been able to publish two issues in a year. With that in mind, please continue to keep the *Journal of Foodservice Management and Education* in mind as you consider Journals in which to publish your work.

Warmest Regards,

Kevin R. Roberts, PhD
Co-Editor

Kevin L. Sauer, PhD, RD
Co-Editor

ABSTRACTS

Research Manuscripts

Educating future managers to motivate employees to follow food safety practices

Current and future foodservice managers' perceptions about motivating employees to practice safe food handling were examined as a basis for developing recommendations to improve dietetics and hospitality educators' pedagogy related to employee motivation. Perceptions about teaching and delivery methods also were explored. Four focus groups were conducted in Iowa and Kansas; two with future managers (students) and two with current managers. Five major themes emerged from the qualitative data analysis: communication, customization, operations, training methods/materials, and human resources. Each motivator is discussed and suggestions are provided for enhancing teaching and learning in foodservice management programs.

Purchasing commercially prepared pureed foods: Nutrition managers' perspectives

The objective of this research was to determine factors contributing to the decision of a Long-Term Care Home's (LTCH) Nutrition Manager (NM) to purchase commercial pureed foods. Interview data were collected using a structured questionnaire for face-to-face or telephone interviews with a convenience sample of 25 NMs from Southwestern Ontario. Summative content analysis identified the most common themes. Thirteen LTCHs purchased commercial products to supplement in-house pureed foods. Facility environment, insufficient food funding and the requirement to match the regular menu were barriers to purchasing. Perceived food quality, philosophy about food production, number of residents on pureed diet, and staffing environments contributed to purchasing decisions. Further research is recommended focusing on effectiveness of commercial pureed foods for pureed diets in LTCHs.

Effects of observing employees for food safety compliance

Research investigating foodservice employees' compliance with food safety guidelines often utilizes observational methodology where an observer is present and recording employees' behaviors as they work. Research must determine if the observer's presence influences employees who are trained in food safety and those who are not. A group who had received a four-hour ServSafe® food safety training course and a control group were included in the study (N=252). Both groups' compliance rates were higher during the first hour of the observation compared to the last two hours of the observation. Implications for foodservice managers, researchers, and health inspectors are discussed.

Applied Solutions Contributions

Should future dietetic graduates know how to cook?

Dietetic educators have students in their classrooms who lack cooking knowledge. The many causes of cooking illiteracy are discussed. Challenges facing educators include how to address this problem efficiently, effectively, and in a manner that is not cost prohibitive to the student or the university. This article looks at the importance of cooking skills in a Registered Dietitian's career and the Academy of Nutrition and Dietetic's emphasis on these skills regardless of practice area. Various solutions are presented for the dietetic educator.

Research Contribution

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EDUCATING FUTURE MANAGERS TO MOTIVATE EMPLOYEES TO FOLLOW FOOD SAFETY PRACTICES

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ABSTRACT

Current and future foodservice managers' perceptions about motivating employees to practice safe food handling were examined as a basis for developing recommendations to improve dietetics and hospitality educators' pedagogy related to employee motivation. Perceptions about teaching and delivery methods also were explored. Four focus groups were conducted in Iowa and Kansas; two with future managers (students) and two with current managers. Five major themes emerged from the qualitative data analysis: communication, customization, operations, training methods/ materials, and human resources. Each motivator is discussed and suggestions are provided for enhancing teaching and learning in foodservice management programs.

Keywords: food safety, foodservice, education, managers, motivation, teaching and training methods

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INTRODUCTION

Despite the challenging economic climate in the United States (U.S.), the foodservice industry has remained stable. The National Restaurant Association (NRA) (2010) predicted foodservice industry sales to top $604.2 billion in more than 960,000 locations across the U.S. in 2011. An estimated 49% of every dollar spent on food by Americans is for food prepared away from home; approximately 130 million people dine in foodservice operations on a typical day (NRA, 2010; U.S. Department of Agriculture, 2010).

The safety of food prepared and served away from home has received much attention from consumers and operators. In 1995, 50% of consumers believed in the ability of the restaurant industry to protect the well-being of consumers (Allen, 2000). In 2007 that number declined to 43% (Food Marketing Institute Research, 2007). Although many states require the person in charge and others to demonstrate knowledge of food safety, 59% of known or reported foodborne illnesses can be traced back to mistakes made in the kitchen of a commercial foodservice operation (Centers for Disease Control and Prevention, 2006). It is estimated that foodborne disease in the U.S. sickens one out of every six Americans and causes 3,000 deaths each year (Scallan, Griffin, Angulo, Tauxe, & Hoekstra, 2011; Scallan, Hoekstra et al., 2011).

The societal costs of foodborne illness in the U.S. are estimated to be $1.4 trillion annually (Roberts, 2007). For the foodservice operator, one outbreak in the foodservice operation could result in costly legal fees, medical fees, hospitalization, medication, and increased insurance premiums (Cochran-Yantis et al., 1996). The combination of these direct costs and loss of sales from negative publicity and decline in reputation often force the foodservice to cease operations.

The impact of a foodborne illness is well recognized by industry professionals; foodservice personnel can use well-documented preventative measures to mitigate foodborne illnesses. Food safety is a complex issue. Managers should have expertise in both hard (science-based knowledge such as food safety and sanitation) and soft skills (those less quantifiable) such as leadership and human resources management. Educators of current and future foodservice managers and leaders are challenged with the teaching of these hard and soft skills to students.

The purpose of this qualitative study was to improve pedagogy relating to employee motivation in the foodservice industry by developing recommendations for hospitality and dietetic educators to utilize in the classroom. Recommendations were based on three specific objectives: 1) determine challenges managers have in motivating employees to follow and utilize basic food safety practices, 2) determine what would make managers more effective in their roles, and 3) gauge reactions of managers to various teaching and delivery methods such as DVD, podcast/vodcast, webinars, and other non-lecture methods.

LITERATURE REVIEW

In 1998, the Food and Drug Administration (Food and Drug Administration [FDA], 2000) conducted an observational study to explore foodborne illness risk factors in a multitude of settings, including hospitals, nursing homes, elementary schools, retail operations, and full- and quick-service restaurants. The restaurant industry had the lowest overall compliance scores compared to identified standards, with the full-service industry scoring 13% lower than any other segment of the foodservice industry. In 2003 and 2008, the FDA (2004, 2009) conducted follow-up studies and still, the restaurant industry continued to score lower than almost all other segments of the foodservice industry. Both reports identified risk factors for foodborne illness that needed priority attention in both quick- and full-service restaurants. These included improper holding time and temperature, poor personal hygiene, chemical control, protecting equipment from contamination, and inadequate cooking. Previous research (Bean & Griffin, 1990) identified improper holding temperatures, poor personal hygiene, and cross contamination as the top three factors contributing to foodborne illnesses. More recent research continued to show these as the top three factors (Olsen, MacKinon, Goulding, Bean, & Slutsker, 2000) while other research

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indicated these practices are still of concern within the foodservice environment (FDA, 2000, 2004, 2009; Pilling et al., 2008; Roberts et al, 2008). These factors are all preventable if employees have the knowledge and motivation to practice food safety behaviors. Because the manager's role has been identified as important in influencing the food safety culture (Arendt & Sneed, 2008), it is important to consider the views of current and future managers when planning internvention and reduction strategies

Food Safety Education and Learning

The benefits of employee food safety training have been explored in several studies, although results have been inconsistent. Several studies have found that training helps improve overall employee knowledge of food safety (Costello, Gaddis, Tamplin, & Morris, 1997; Finch & Daniel, 2005; Howes, McEwen, Griffiths, & Harris, 1996; Lynch, Elledge, Griffith, & Boatright, 2005; Roberts et al., 2008) while other studies have found that training is not consistently associated with improved knowledge (Luby, Jones, & Horan, 1993; Pilling et al., 2008; Wright & Feun, 1986).

Studies have found that food safety training is positively associated with improved microbiological food quality (Cohen, Reichel, & Schwartz, 2001), increased food safety inspection scores (Cotterchio, Gunn, Coffill, Tormey, & Barry, 1998; Kneller & Bierma, 1990), and self -reported changes in food safety practices (Clayton, Griffith, Price, & Peters, 2002; McElroy & Cutter, 2004). Brannon, York, Roberts, Shanklin, and Howells (2009) also found that a formal food safety training course helped employees develop an appreciation for the importance of food safety practices and increased awareness of the proper practices that should be followed on the job.

Researchers have begun to investigate the link between knowledge and behavior. Roberts et al. (2008) explored food safety knowledge and behaviors of foodservice employees after employees completed a four-hour training class based on the ServSafe® employee level course. The focus was on the top three factors that contribute to foodborne illness: improper holding temperatures, poor personal hygiene, and cross contamination. Even though overall employee knowledge had improved for the 160 employees sampled, behavioral compliance remained low after the knowledge training, with little significant improvement.

York et al. (2009) expanded this work by using the Theory of Planned Behavior to identify four different treatment groups and their effects on specific food safety behaviors (improper holding temperatures, poor personal hygiene, and cross contamination) in the restaurant setting. The first group received ServSafe® training alone; the second group received a Theory of Planned Behavior intervention that targeted the subjects' perceived control; a third group received both ServSafe® training and the Theory of Planned Behavior intervention; and the fourth group was a control and received no intervention. Results indicated that the training only group and the Theory of Planned Behavior intervention only group were similar in compliance with identified food safety standards. However, those receiving both training and the intervention had the greatest compliance rates of all groups.

Chapman, Eversley, Fillion, MacLaurin, and Powell (2010) observed the influence of a food safety information sheet (labeled as an infosheet) on practices within the foodservice environment. Each infosheet posted was designed to be applicable for the study group and focused on a particular food safety practice. A new sheet was posted each week for seven weeks total. Results showed that the infosheets had a positive impact on the behaviors of the food handlers in the study. While the infosheets had a positive impact on behaviors, the impact was lessened during busy periods of production and service. The study did not take into account if the employees had any prior food safety training.

Supervisors/Managers

Arendt and Sneed (2008) approached food safety practice compliance as a supervisory function. The researchers posited that because traditional training had been shown ineffective at motivating employees to change behavior, approaching training at a supervisory level through employee motivation may be more effective. The researchers indicated that supervisors are vitally important in assuring that employees are following recommended food safety practices. From a practical standpoint, when one considers that 12.7 million employees are employed in the restaurant industry (NRA, 2009), and only a fraction of those employees have received food safety training, supervisors are key to encouraging and motivating employees to follow proper practices.

A recent trend in food safety research has focused on the connection between knowledge and behavior (Brannon et al., 2009; Pilling et al., 2008; Roberts et al., 2008; York et al., 2009). However, there is a paucity of data relating to how managers can strengthen the connection between knowledge and behavior and motivate their employees to more closely follow recommended food safety practices.

Using Motivation Theory

Expectancy theory was first discussed by Vroom (1964) as a motivation theory to explain the behaviors or choices an individual makes. The theory states that individuals will behave in a manner that maximizes positive outcomes, such as rewards, and minimizes negative outcomes, such as punishments. The theory proposes that employees within the work context will be motivated when they believe that increased effort on their part will yield improved job performance; that improved job performance will lead to rewards for the employee within the organization; and that the employee values these expected rewards. Lawler and Porter (1967) would later build upon this work and posited that employee performance and motivation should also consider such factors as knowledge, experience, and abilities. Arendt and Sneed (2008) used this motivation theory as a theoretical underpinning to better understand employees' safe food handling behavioral intentions. They recognized that the manager has direct control over many aspects of motivation. Managers and future managers were the target of study in their research (Arendt & Sneed, 2008).

METHOD

This study used focus group discussions to gather in-depth qualitative data about the research objectives. Focus group methodology should be considered when investigating complex behaviors and motivations (Morgan, 1998). Prior to focus group commencement, individual questionnaires were completed by participants to gather gender, age, length of time worked in foodservice operations, time worked in current operation, if respondents had a computer at home, reasons for using the computer, preferred training method, and learning style preference. To determine preferred training method and learning style preference, respondents were asked to rank their preferences for 12 different methods and which learning style was most useful for them. Focus group questions were developed and evaluated by the research team consisting of six members. As is noted by Krueger (1998a), "The true pilot test is the first focus group with participants"(pg. 57). The research team held a meeting after the first focus group to evaluate acceptability of the questions and based on that discussion, no changes were made.

Participant Recruitment

Current and future foodservice managers were recruited in two Midwestern college towns in different states. Current managers were recruited via signs in foodservice establishments and phone calls made by the researchers. Future managers, defined as those who would be entering the foodservice industry within one year of the focus group, were recruited in hospitality and dietetic related classes at the two participating universities. One current manager focus group and one future manager focus group were conducted in each participating state, for a total of two current manager focus groups and two future manager focus groups. Participants were informed of the time and location of the focus group discussions during the recruitment process. Both groups were told the researchers were conducting a food safety study and were interested in their opinions. Those who responded to recruitment efforts were reminded the day prior to the focus group via email or phone call. A nominal cash "thank you" gift was offered to compensate for time required to participate in the study.

Data Collection

Each participant attended one of the four focus group discussions intended for either current or future managers. Each focus group ranged from 5–12 participants. Focus group discussions lasted from 40 to 70 minutes. All focus group discussions were recorded using a digital voice recorder. The Institutional Review Board at both participating universities approved the research protocol prior to any contact with participants.

Upon arrival, participants were thanked for coming, informed of their rights as research subjects, and asked to sign an informed consent form. Participants then completed the demographic questionnaire that also included the questions relating to preferred teaching and delivery methods as well as preferred learning style. Participants were offered a light snack and encouraged to mingle so as to get comfortable speaking around one another. After all participants had arrived, an experienced focus group moderator began the session by welcoming the participants, reviewing the goals of the focus group discussions, and describing the process that would be utilized. Each moderator had experience conducting focus groups and a moderator guide was used to assure that each group received the same instructions and questions. To assure anonymity, each participant was asked to develop an alias to which they would be referred to during the focus group. Each participant wore a name tag identifying his/her alias to all other members of the focus group.

The moderator began asking the discussion questions, which were used to build the foundation of the discussions (Table 1). Because qualitative research is intended to be of an emergent nature, participant responses determined the overall direction of the focus groups. The moderator allowed ample time for participants' responses. During the focus group, an experienced assistant moderator took field notes utilizing a moderator form adapted from Krueger (1998b). At the conclusion of the focus group, participants were provided $40 as a "thank you" gift. The moderator and assistant moderator debriefed within 48 hours of each focus group.

Table 1. Key Focus Group Questions

- Tell me what roles you play related to food safety.
- Could you talk a little about how you feel you do in these roles?
- What would make you more effective in these roles?
- To help you be a better leader and supervisor (related to food safety) what content areas would you like to know more about?
- How would you like to receive this information?
- What are your reactions to non-traditional methods of receiving information and/or training?
  - DVD
  - Computer simulation
  - Podcast/vodcast
  - Webinars
  - Others (i.e., texting, email)

Data Analysis

Recordings of all focus group discussions were transcribed by an experienced transcriptionist. Four researchers experienced in qualitative data analysis coded and themed the transcribed focus group data; three researchers were assigned to each focus group transcript to assure accuracy in hand coding without overburdening any one researcher. Themes were developed independently and then discussed until a consensus between the four researchers was reached. All focus group data were pooled together for analysis.

The demographic questionnaires were entered into SPSS (Version 17.0) for data analysis and descriptive statistics (means and standard deviations) were computed. For training preferences, respondents were asked to rank order twelve different methods; data were analyzed to determine the frequency with which respondents ranked each method within their top three preferred methods. Also, a mean ranking was determined for each method by summing ranking scores and dividing by the number of respondents.

RESULTS AND DISCUSSION

The show rate for the focus groups was 97% (there were 37 confirmed recruits, yet 36 participants actually attended the sessions). Participants in the study included 15 current managers and 21 future managers. Twenty-six of the 36 participants were male (72%). The majority of participants (69%) ranged in age from 18 to 25 years old with 17% age 40 and older. Almost all (94%) reported presence of a computer at home with a variety of uses such as communication (97%); classes (81%) and bill paying (64%) indicated. Sixty-seven percent had worked in foodservice operations for five years or less and 43% had worked in their current operations for less than one year. Table 2 presents the demographic information of the participants.

Motivation Effectiveness

Data coding identified five issues that managers deal with when motivating and training employees to follow food safety practices: customization, human resources, training methods/materials, communication, and operations. Students entering the industry will be expected to motivate employees to ensure compliance with identified food safety standards. Therefore, these issues should be addressed in hospitality and dietetics curricula. A model depicting the challenges of food safety motivation identified in the study is presented in Figure 1.

Customization

Customization is related to the inadequacies of the current one-size-fits-all approach to food safety training, which does little to actually motivate employees to practice proper behaviors. One participant passionately stated that trainers or managers have to consider the generational preferences of employees and others' comments centered on this as well. One of the participants stated:

> *"In our operation we have such a wide range of ages so that's an issue because the 18- to 25-year-olds would prefer this method where those that are in the 60- to 65-age bracket would have a different comfort zone for learning, so you've got to address those kinds of things. And are they, you know, a visual learner? Do they learn by the video or do they need to have hands-on? So,*

Table 2. Focus Groups Participant Demographics (N=36)

Category	Frequency (n)	Percent (%)
Gender		
Male	26	72
Feale	10	28
Age		
18-21 years	13	36
22-25 years	12	33
26-30 years	4	11
31-50 years	5	14
51-65 years	2	6
Time Worked in Foodservice Operations		
Less than 1 year	6	17
1-<2 years	4	11
2-< 3 years	5	14
3-5 years	9	25
6 years	0	0
7-10 years	7	19
Over 10 years	5	14
Time Worked in Current Operation		
Less than 1 year	16	43
1-<2 years	6	17
2-<3 years	6	17
3-5 years	4	11
6-9 years	2	6
Over 9 years	2	6
Computer at Home[a]	34	94
Reasons for Using Computer Away from Work[b]		
Communication	35	97
Information source	33	92
Banking	30	83
Classes	29	81
Travel Arrangements	28	78
Bill Paying	23	64

[a] Yes Responses
[b] Percent total is more than 100% as multiple responses could be selected

you know, it's finding many different methods so that you can address all the different learning styles and hit with some people. It's gotta be something that means something to 'em."

One theme that emerged was the idea that multiple delivery methods are needed for younger generations to accommodate their varied learning styles. One female participant stated:

"I could see some real problems with that [computer simulation based training] *again because of the age variation of your work crew. You guys* [referring to the younger managers in the focus group] *would all be very comfortable with that. A lot of the employees in my age bracket would be extremely uncomfortable"*

Moreover, the idea surfaced that motivation to follow proper food safety practices might be best done at the operational level, particularly with managers taking the lead. Managers could lead, not only by the training they conduct with employees, but also in modeling proper behavior and tailoring messages to best meet needs of individual employees.

Human Resources

This area referenced the challenges associated with human resources management relative to food safety practices. Participants identified staff turnover, lack of motivation among employees, employees' attitudes toward the job, and lack of employees understanding the relationship between knowledge and practice as challenges they commonly face.

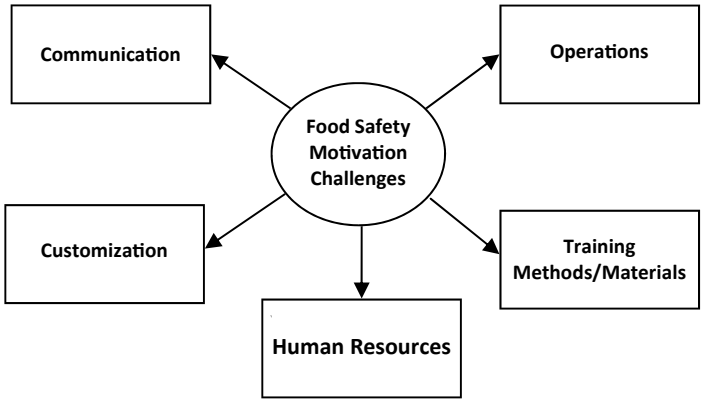

Figure 1. Themes identified from focus group discussions

One participant discussed how difficult it is for managers to track who has, or who has not, been trained given a large staff size and continual turnover. Organizations with structured training periods often faced the dilemma of proper orientation for new employees. One participant stated:

"The other issue is the turnover of staff that we have and constantly keeping abreast of who has been trained. We have orientation programs where we talk about food safety, but honestly, 2 years ago I hired 50% of my staff again after our orientation took place in the fall."

Many participants agreed. One participant indicated that employee food safety training needs to be simplified and streamlined to accommodate their high turnover rate. He stated:

"Turnover is a big issue for us, and so…I mean, we have high turnover just with student employees. And so I think it needs to happen, you know, efficient training needs to happen earlier."

Another participant stated:

"…to do it [food safety training] *in like a timely fashion because they don't have 6 months to take a class. I don't have 8 extra hours to pay them to be off the floor. It needs to be short, a 10-minute* [training]*"*

Another commented that the operation's management usually does a good job at initial training of employees, but in their environment it's "sink or swim" after the initial training due to the high turnover rate.

Training Content

Training content centered on the food safety training itself. Participants indicated that food safety training, such as ServSafe®, can be effective, but it does not give managers and employees a good practical application or knowledge of the actual Food Code requirements. Frustration with how requirements are written was also heard by participants who wanted easily accessible and understandable information.

A participant stated:

"And it is hard to understand those codes. I don't know why they can't be written in a user-friendly[way]*, you know, they'll be like, in Section A, Paragraph 3, but they don't actually reiterate what Section A, Paragraph 3 says…you think you've learned because you've learned through ServSafe, but ServSafe doesn't necessarily match with state code at all."*

Participants intuitively understood effective teaching by indicating it was important to educate the employees not only on what they are

to do, but why they were required to perform the task in a particular way. Participants identified this as effective teaching because once employees understand why they are supposed to do something; they will be motivated to follow the recommendations while on the job.

Communication

On-going conversations about food safety practices and methods used to communicate these practices to employees were also identified in the focus groups as issues. Participants indicated more training was needed within the work environment. Most agreed that it would be better to have shorter, focused training sessions than the complete ServSafe® style class. One participant commented how difficult it was to not only keep up with the Food Code herself, but also to ensure that employees were aware of food code changes and updates within the operations' jurisdiction. Managers cannot motivate employees, and employees cannot follow recommended practices, when they are unaware of what those proper practices are, particularly when updates are made every two years, or as noted earlier, when information is not clearly written for lay operators. Communication with staff within the organization and communication between the organization representatives and regulatory agencies were identified as key issues.

Operations

Many issues were identified that related to the foodservice operation itself. No risk/reward systems were in place to motivate employees to follow food safety practices. One participant indicated that employees want to see *"…immediate gratification…immensely. Be it a slap monetary or a slap on the back…just something that gets them involved*."

Other issues discussed within the operations category included: managers who indicated that they lacked support from upper-level management; lack of consistency of enforcing food safety policy in the operation; and the need to develop priorities within the work environment. One of the participants concluded that:

> *"..being on the same page where we work I kinda feel like the upper management doesn't always like enforce everything and so, me going in and saying, "Don't drink that pop when you're cooking food," that's like nothing because the upper management walks by and gives 'em pop or whatever, you know. To me, I kinda like feel like I'm, it's not really effective because it's not consistent across the board"*

Teaching and Delivery Method Preferences

Data related to the preferred training methods of focus group participants are presented in Table 3. Participants rank-ordered twelve listed methods of training. The top three preferred methods were activity-based training (61%), observation (39%), and question/ answer sessions with an expert (36%). Most participants (83%) also identified experiential as their preferred learning style, followed by visual (58%), and audio (39%).

When discussing training preferences, many identified DVD as boring, difficult to focus on, and difficult to take seriously. Other participants indicated that training information should be communicated via email. Computer simulation was identified as a potential training medium as long as it is consistently updated. Other interactive forms of training also were preferred, such as the GloGerm™ Exercise or an interactive game. Participants of different age categories had different training preferences (Table 4). Participants older than 30 years of age had greater preference for face-to-face training (mean rankings 5.4-5.5) than participants in the age categories less than 30 years (mean ranking 6.2-6.5). Likewise, participants ranked activity-based training differently by age category; those in the 22-30 year old

Table 3. Training Method and Learning Style Preferences (N=36)

Category	Frequency (n)[a]	Percent (%)[a]	Mean Ranking[b]
Training Method			
Activity based	22	61	3.2
Observation of activities	14	39	4.9
Question and answers with an expert	13	36	5.5
Group discussions	12	33	4.9
Face to face lecture	11	31	6.1
Videotaped demonstrations	8	22	7.3
Interactive videos or computer games	7	19	6.5
Role plays or skits	5	14	7.2
Video or ICN lecture	4	11	8.2
Dialog with another person	3	8	5.1
Manuals or brochures with information	3	8	8.2
Vodcasts/podcasts	1	3	9.5
Learning Style[c]			
Experiential	30	83	
Visual	21	58	
Audio	14	39	

[a] Respondents were asked to rank order training methods from 1-12 (1=most preferred and 12 = least preferred). Frequency and percent indicates the number and percent of participants who ranked the training method as either 1,2 or 3.

[b] Mean ranking was calculated by summing all rankings (1-12) for an individual training method and dividing the sum by number of participants responding.

[c] Percent total is more than 100% as multiple responses could be selected.

Table 4. Training Preferences of Current and Future Managers by Age Category (N=36)

	Mean Ranking[a]				
Training Method	18-21 years	22-25 years	26-30 years	31-50 years	51-65 years
Vodcasts/Podcasts	9.4	9.8	9.8	8.0	11.5
Video or ICN Lecture	8.0	8.9	9.8	6.0	8.0
Manuals or Brochures	7.6	9.0	8.3	7.6	8.5
Role Plays or Skits	7.0	6.5	8.5	7.2	10.0
Interactive Videos or Computer Games	6.9	5.8	8.3	6.2	5.5
Videotaped Demonstrations	6.8	7.8	10.0	6.4	5.0
Face to Face	6.2	6.5	6.3	5.4	5.5
Question and Answers with an Expert	5.9	5.3	4.3	6.8	3.5
Observation of Activities	5.5	4.9	4.0	4.2	5.5
Dialog with Another Person	5.4	6.2	2.5	4.0	4.0
Group Discussions	5.3	4.9	4.5	5.0	2.5
Activity Based	4.2	2.5	2.0	1.4	8.5

[a] Mean ranking was calculated by summing all rankings (1-12) for an individual training method and dividing the sum by number of participants responding.

age category had higher rankings (mean rankings 2.0-2.5) compared to the youngest and oldest group (with mean rankings of 4.2 and 8.5, respectively). Those in the age category 31-50 years ranked the activity-based method the highest with a mean ranking of 1.4.

This study has implications across the hospitality and dietetics curricula, not only in the realm of food safety, but also in human resources management, foodservice systems management, and hotel operations management. Most of the participants in the study indicated that some type of activity-based training was the most preferred method. The majority of participants (83%) preferred experiential learning to visual and audio learning alone. Participants indicated that the current one-size-fits-all lecture-style approach is ineffective in motivating current and future employees to follow proper food safety practices. Although food safety information can be taught efficiently in this manner, it is not clear if knowledge will equate to practice. In addition, the soft skills needed to become a successful manager in the foodservice industry likely cannot be effectively taught in a lecture-style approach. Deale, O'Halloran, Jacques, & Garger (2010) explored teaching methods in hospitality and tourism and found that most faculty continue to use the lecture method of teaching. They note that with dwindling resources, this is an efficient method, but may not be best for student learning.

The foodservice industry is a labor-intensive industry. The top issues of managers from a variety of fields, not solely hospitality, included dealing with conflict, communicating with employees and motivating employees (Brotheridge & Long, 2007). Roberts et al. (2008) reported that employees had the knowledge necessary to perform certain food safety tasks, yet they failed to utilize this knowledge on the job. This study reinforces past work on the need to improve the connection between knowledge and behavior. Hospitality and dietetic educators need to not only train future managers on the theory and knowledge of the profession, but also on how to train their employees using methods that encourage them to apply knowledge on-the-job. Table 5 presents suggested learning activities for each of the motivation and training issues identified in this study. Educators and managers alike need to forgo the traditional training that only teaches what to do; rather, training should focus on communicating why it must be done this way and how to communicate this message effectively to various audiences using multiple media. The fundamental knowledge needed to develop and implement these types of training programs must originate in hospitality and dietetic programs.

Table 5. Teaching Strategies to Motivate About Food Safety

Motivation Strategies	Facilitated Learning Activities
Customization	Interviews with individuals of different age categories to understand differences Preparation of food safety materials targeting unique learning preferences
Human Resources	Role play whereby students "act out" human resources management challenges and reach a solution Case study analysis of unmotivated employees who do not adhere to safe food practices
Training Methods	Student-developed non-traditional food safety training (e.g. Podcasts) Paired student teaching activities where one student teaches another
Communication	Development of formal communication documents such as food safety standard operating procedures specific to the work organization and employee handbooks Preparation and delivery of 5-7 minute food safety content messages
Operations	Student persuasive speeches to garner support from others Structured debates between groups of students on a food safety concern (e.g. glove use)

CONCLUSIONS AND APPLICATIONS

This paper has addressed the challenges identified by current and future managers when trying to motivate employees to follow proper food safety practices on the job. Specifically, challenges relating to customization, human resources, training content, communication, and operations were identified in four focus group settings with 36 participants. Participants voiced interest in customized training materials that would be specific to their age or learning style and also voiced frustration with some of the human resource challenges in operations. Training content and teaching emerged as a predominant theme whereby practicality was paramount; participants wanted training that was applicable to their work situation. Communication by supervisors and managers could also serve as a motivator to encourage employees' safe food handling behaviors. What emerged from these focus group discussions was that managers can help motivate employees to follow safe food handling practices. Multiple strategies were identified that can help hospitality and dietetic educators better prepare students, future managers in the industry, to do so. For example, shorter, focused food safety training was preferred when compared to the traditional ServSafe® course. Such training could be customized to the age of the employee and the operation itself and be taught in the actual work environment to make the training more meaningful to the employee.

The reaction of participants to various teaching and delivery methods was also explored. Most participants indicated that activity-based training was preferred, followed by observation. By implementing these strategies in the dietetic and hospitality classroom, faculty can educate students on how to motive employees. More importantly, educating future managers to motivate employees will have a profound impact once these future managers are able to motivate their own staff to follow proper food safety practices and this will ultimately help to improve the connection between knowledge and behavior.

Limitations and Future Research

One major limitation of this study was that due to budgetary constraints, the sample was only drawn from two Midwestern states. Thus, the feelings and thoughts of managers who could be dealing with different populations and cultures in other U.S. locations are not reflected.

Future research should quantitatively explore motivation and pedagogy techniques related to proper food safety practices. Other research also should investigate motivation from the employee's perspective to develop a framework of what motivates them to practice safe food handling behaviors. This information then can be implemented into hospitality and dietetic curricula to ensure future students are able to effectively motivate hourly employees within the industry. Research exploring pedagogy and andragogy related to food safety and motivation is also needed, including preferred methods of learning for all age groups of learners who are currently working in the industry.

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Research Contribution

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PURCHASING COMMERCIALLY PREPARED PUREED FOODS: NUTRITION MANAGERS' PERSPECTIVES

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ABSTRACT

The objective of this research was to determine factors contributing to the decision of a Long-Term Care Home's (LTCH) Nutrition Manager (NM) to purchase commercial pureed foods. Interview data were collected using a structured questionnaire for face-to-face or telephone interviews with a convenience sample of 25 NMs from Southwestern Ontario. Summative content analysis identified the most common themes. Thirteen LTCHs purchased commercial products to supplement in-house pureed foods. Facility environment, insufficient food funding and the requirement to match the regular menu were barriers to purchasing. Perceived food quality, philosophy about food production, number of residents on pureed diet, and staffing environments contributed to purchasing decisions. Further research is recommended focusing on effectiveness of commercial pureed foods for pureed diets in LTCHs.

Keywords: purchasing, commercial pureed food, dysphagia, nutrition manager, long-term care

INTRODUCTION

Dysphagia, or difficulty swallowing, is an indication of a loss of neural control, muscle strength and/or structural damage in the upper digestive tract that results in inefficient and dysfunctional swallowing (Lotong, Chun, Chambers, & Garcia, 2003). Dysphagia often occurs in neurological conditions including stroke, Multiple Sclerosis, Parkinson's disease, Alzheimer's disease, and other forms of dementia (Defabrizio & Rajappa, 2009), but can also be due to the natural, physiological processes of aging (Achem & Devault 2005). Symptoms of dysphagia include gurgling voice, coughing and choking while drinking or eating (Defabrizio & Rajappa, 2009); some individuals with dysphagia do not exhibit these symptoms and silently aspirate. Oral and oropharyngeal phases of dysphagia often require modified texture foods such as pureed or minced solids (Keller, Chambers, Niezgoda & Duizer, 2011; Wieseke, Bantz, Siktberg, & Dillard, 2008).

It is estimated that about 16% of Canadians, or 400,000 individuals living in the community and up to 60% of residents living in Long-Term Care Homes (LTCH), are affected with dysphagia (Houjaji, Dufresne, Lachance, & Ramaswamy, 2009). Older adults with dysphagia may be hesitant to eat if they are fearful of choking. Therefore, dysphagia can exacerbate weight loss and cause malnutrition (Foley, Martin, Salter, & Teasell, 2009; Keller et al., 2011; Smith-Hammond, & Goldstein, 2006). Due to the high prevalence and increased risk for malnutrition that often coincides with dysphagia, food quality is especially important. The focus of this work will be on pureed foods, as this texture is challenging to produce at a high quality that is also safe for swallowing.

To address the needs of older adults with dysphagia, pureed foods are often used to promote safe swallowing (Vivanti, Campbell, Suter, Hannan-Jones, & Hulcombe, 2009). The American National Dysphagia Diet (NDD) describes the dysphagia pureed diet as food with a soft mashed potato or pudding-like consistency (National Dysphagia Diet: Standardization for Optimal Care, 2002). However, there are several limitations associated with an entirely pureed diet. Nutritional inadequacy both with micro and macronutrients has been shown (Adolphe, Whiting, & Dahl, 2009; Dunne & Dahl, 2007). Some pureed foods may be lacking in flavor due to dilution with various liquids during the manufacture (Hotaling, 1992; Kader, 2008). Often, the appearance is unappealing and presentation of pureed foods in LTCHs is poor (Wright, Cotter, Hickson, & Frost, 2005). Furthermore, older adults view transitioning to an exclusively pureed diet as loss of their dignity, and they regard pureed foods as comparable with baby food (Chadwick, Jolliffe, Goldbart, & Burton, 2006; Garcia & Chambers, 2010). This can contribute to loss of appetite, potentially further worsening nutritional status (Brownie, 2006; Houjaji et al., 2009; Sloane, Ivey, Helton, Barrick & Cerna, 2008).

Only a few studies have focused on evaluating pureed foods for dysphagia. Cassens, Johnson and Keelan (1996) found that using three -dimensional food molds to shape pureed foods resulted in increased appetite and intake for residents with dysphagia living in a skilled nursing facility. Dahl, Whiting, and Tyler (2007) investigated the nutritional value of in-house pureed foods and protein content was found to be variable and inadequate across LTCHs and across Canadian provinces. Another study found that fortifying pureed meals with a commercial iron-rich infant cereal improved iron intake in individuals and improved the texture and cohesion of the pureed foods (Kennewell & Kokkinakos, 2007).

It is likely that the use of pureed food will increase in the future. As the Baby Boomers hit the age of retirement, it can be expected that the number of new admissions in LTCHs will increase but also that these individuals will be of higher acuity with several co-morbidities, including dysphagia (Laurence & Kash, 2010). Therefore, more individuals may require diets with texture modified foods in the future. Despite this likely increased need, there has been little research on commercial pureed foods and their contribution to dysphagia management.

Long-Term Care Homes may process their own pureed foods in-house. However, nutritional and textural quality of in-house pureed foods may vary depending on the staff members involved in preparing them (Dahl et al., 2007). If in-house pureed foods are not prepared to the pudding-like consistency that is safe for swallowing, residents may be at risk for choking. In addition, nutritionally inferior products can lead to malnutrition. Commercial pureed foods are widely available from several companies. Commercial pureed foods may be preferred for dysphagia management because of their standardized consistency, improved appearance, and in some cases enhanced nutritional profile. In addition, depending on the brand, they may not

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require further cooking, preparation, or plating, and require only thawing prior to serving, thus reducing labor costs.

Purpose of the Study

The purpose of this qualitative study was to investigate the factors that contribute to purchasing commercial pureed foods from the perspective of the Nutrition Manager (NM). A NM's responsibilities vary in each LTCH but can include managing food service workers, planning menus and sourcing food ingredients for all diets, including the pureed diet (Canadian Society of Nutrition Management, n.d.). It is ultimately up to the NM to decide whether or not the LTCH will use commercial foods to cater to the needs of their residents. To our knowledge, this is the first research study that has attempted to explore this topic.

METHODS

Study Design

This analysis focused on selected questions from interviews with NMs. It was part of a study that focused on issues associated with preparing and serving pureed foods in LTCHs. Cooks were also interviewed, however, their data were not presented here. Interviews were conducted to understand the processes, limitations and challenges when preparing pureed foods in-house. A qualitative approach allowed us to capture the thought processes and decision factors, which are currently unknown and difficult to quantify. Since this work was exploratory and the first of its kind, open-ended questions were preferred as they provided flexibility in addressing research questions, conducting data collection and completing analysis (Braun & Clarke, 2006).

Recruitment Method and Participants

The researchers partnered with the Ontario Society of Nutrition Managers (OSNM), Ontario Long-Term Care Association (OLTCA) and Agri-Food for Healthy Aging (A-HA) to recruit LTCHs in Southwestern Ontario. This area of the province was chosen because it was within an easy driving distance from the university where researchers were located. Starting in January 2011, OSNM, OLTCA and A-HA dispersed details of the study by posting information on their websites and distributing mass e-mails. Interested LTCHs contacted researchers to take part in the interviews. NMs who wished to participate but were located in LTCHs that required more than a two-hour drive from the university were interviewed over the phone.

Data collection occurred between January and May 2011. Recruitment was stopped after 25 interviews for two reasons. In addition to having a range of LTCHs and NMs participating, there was consistency in their responses on the key issues that influenced their purchase of commercial products.

Data Collection

Structured interviews for NMs focused on menu planning and the requisition of pureed foods for the LTCHs. For the purpose of this study, only a section of the NMs' interview questionnaire was used in the analysis (See Appendix). Other questions were asked, however, these were not used for the purpose of this study. Two interviewers were involved in collecting data. Interviewer # 1 completed 22 face-to-face interviews with NMs while Interviewer #2 was present. Interviewer # 2, by herself, completed three interviews on the phone. Interviews took on average of 45 to 60 minutes to complete.

At the beginning of each interview, participants were informed that the conversation would be digitally audio-recorded. NMs signed consent forms before commencing. Phone interviews were digitally recorded as well and verbal consents were provided. All interviews were treated confidentially. Participants had the opportunity to refuse to answer questions or withdraw at any time. The researchers had no contact with the residents of the LTCHs. The University of Guelph Research Ethics Board provided their ethical approval.

Data Analysis

All interviews were transcribed prior to data analysis. Two researchers independently coded the transcripts line by line to identify recurring codes or themes. Each transcript was reviewed three times by each reviewer to identify segments of the conversations that were relevant to the research question. After reviewing all transcripts, these researchers met to agree on initial codes and reviewed the codebook with the rest of the research team. Reliability of coding was checked by randomly selecting 10% of the transcribed pages and cross-comparing codes (Lombard, Snyder-Duch, & Bracken, 2002). A summative content analysis was used to discover underlying main themes (Morgan, 1993). With this approach, the codes were quantified by counting their occurrence in each transcript. The frequency of a code was a means of determining its importance or relevance in answering the research question (Hsieh & Shannon, 2005; Sandelowski, 2000). A summative content analysis was appropriate to answer the research question, as minimal interpretation was required to identify reasons for use or non-use of commercial pureed foods (Hsieh & Shannon, 2005).

RESULTS AND DISCUSSION

Profile of the LTCHs and Nutrition Managers

As shown in Table 1, a total of 25 NMs participated. In Ontario, Canada, LTCHs are publicly funded and not-for-profit, or privately owned and for-profit (McGrail, McGregor, Cohen, Tate, & Ronald, 2007). Sixteen participants were from for-profit LTCHs and nine from non-profit LTCHs. In this study, it was found that ownership status did not influence the decision to purchase pureed foods as none of the participants mentioned that they took the ownership status of their respective LTCHs into consideration when deciding to purchase or not to purchase commercial pureed foods.

Eleven NMs worked in larger LTCHs serving 130 residents and more and 14 in LTCHs with less than 130 residents. Ontario's Ministry of Health and Long-Term Care (MOHLTC) does not provide a classification of LTCHs based on the number of beds. In another study conducted in Ontario, a stratified sample of LTCHs was categorized into two sizes, namely fewer than 150 beds or 150 beds or more (Ducak & Keller, 2011). In this study, 130 was used as a cut-point for classifying LTCHs, as participants self-reported their facility as a 'small LTCH' when it was less than this number.

The percentage of total residents on pureed diets at the time of data collection varied. No LTCHs purchased pureed foods exclusively for pureed diets. Out of the 25 LTCHs, 13 occasionally or regularly purchased commercial pureed foods to supplement those made in-house. Table 2 shows most common products purchased and NMs' reasons for using these to substitute for pureed foods made in-house.

Policy Constraints

The most common issue that prevented NMs from purchasing commercial pureed foods was the cost as alluded to by 20 out of the 25 NMs interviewed. It was mentioned that the budget allotted by the MOHLTC during the time of the study, which was CAN$7.33 per resident per day, was not enough to cover the costs of raw food ingredients, supplements and commercial pureed foods. NM # 9 commented, "It [the budget] is cost prohibitive, for sure. That seems to be one of our biggest draw backs." NMs noted that purchasing other items such as supplements, tube feeds and specialty food items such as expensive gluten free foods, took precedence over commercial pureed foods.

Table 1. Profiles of LTCHs Where Participants Worked	
Variable	**Frequency**
Ownership Status	
For Profit	16
Non Profit	9
Size of the LTCH based on the number of beds	
Small (<130 beds)	14
Large (≥ 130 beds)	11
Percentage of Residents on Pureed Diet	
≤ 5%	3
6 - 10%	4
11-15%	9
16 - 20%	7
> 20%	2
Methods of Pureed Food Service	
Puree all foods in house	12
Puree some foods in-house and purchase some commercial	13

Table 2. Common Commercial Pureed Foods Purchased by Nutrition Managers

Commercial Pureed Foods	Specific Reasons
Pureed vegetables such as corn, peas and snow peas, eggplants, beans, string beans	• Difficult to puree in-house because of tough shells or husks as they do not break down in the food processor. • Watery vegetables need additional thickeners; amounts added become difficult to standardize during preparation
Pureed fruits such as peaches and prunes	• Juicy and watery vegetables need additional thickeners; amounts added become difficult to standardize during preparation.
Pureed starches such as pasta and rice	• Starch sides become too glutinous, lumpy, and get stuck in a 'ball' when pureeing in-house. • Commercial pureed products have a better texture and give residents other starch options aside from mashed potatoes
Pureed meats such as ham, pork, turkey, beef and chicken	• Use as a base for sauces to be added on to - be comparable to regular texture entrée options
Pureed entrees such as roast beef 'pucks'	• Use as ready-to-thaw second entrée options
Individual pureed meals with strips of pureed starch, pureed meat and pureed vegetable	• Use for when residents did not like the two in-house pureed options
Pureed Egg	• For convenience purposes especially during breakfast
Pureed products molded to look like regular texture counterpart	• For special occasions only such as Easter and Christmas

Of all NMs who mentioned cost as a hindrance, nine out of 20 NMs purchased commercial pureed foods occasionally, three of the 20 which specifically noted that they were only able to purchase some commercial pureed products when their budget allowed for it. The rest who purchased commercial pureed foods ordered them on a regular basis, as often as they ordered other foods and raw ingredients.

In the same way that NMs thought that cost was the most significant influence that hindered their ability to purchase commercial pureed foods, Ducak and Keller (2011) also identified the inadequacy of the MOHLTC funding to cover all food costs in 40 nursing homes. It was found that when NMs and Registered Dietitians planned menus for LTCHs, the lack of resources prevented them from accommodating the diverse needs of their residents (Ducak & Keller, 2011).

The need to match modified texture foods to the regular menu was another reason for not purchasing commercial foods; this reason was provided by 16 out of 25 NMs and six of these only purchased commercial pureed foods to supplement those made in house. These NMs discussed the lack of variety of commercial pureed products available in the market as a hindrance to comply with the MOHLTC requirement. For example, NM # 19 who worked in a LTCH with a significant Chinese population could not find pureed bok choy as a commercial pureed product. This vegetable was commonly served throughout the menu and is a staple in the Chinese diet. The other NMs pointed out that there were currently no halal or gluten free commercial pureed foods available when they last searched for options.

The interpretation of this requirement varied by NM. For example, NM # 25 explained that the regular texture menu called for a slice of black forest cake. She did not purchase a comparable commercial product because it was not formulated to include the cherry sauce, unlike the black forest cake that would be served to residents without dysphagia in the LTCH. On the other hand, other NMs believed that they were able to make substitutions with commercial purees with a few additional steps. For example, barbecue chicken wings could not be pureed directly into a food processor because of the bones. NM # 11 purchased commercial pureed chicken and substituted these for chicken entrees by adding similar toppings that would mimic the regular texture foods, and in this case, barbecue sauce.

Out of the 25 participants, six NMs mentioned that they took suggestions of MOHLTC compliance officers (inspectors) into consideration when deciding to purchase commercial or make in-house pureed foods. NM #12 shared that a MOHLTC compliance officer suggested commercial pureed foods as the better option over in-house. Three of these six participants indicated that they purchased pureed foods to be in-line with the recommendations of their compliance officers; they used commercial pureed foods to substitute for food items that were difficult to puree in-house. However, more recently NM # 12 was cited for not following the regular texture menu more closely because of the use of commercial pureed foods. She noted that transitioning the menu from purchasing commercial pureed foods to majority of those made in-house was not easy. The remaining three NMs decided not to purchase commercial pureed foods altogether because of their frustrations with inconsistent suggestions from MOHLTC compliance officers. NM # 3 mentioned that MOHLTC compliance officers directly told them to not purchase commercial pureed foods.

One of the MOHLTC menu planning regulations, Section (71)(1)(b) states, "Every licensee of a long-term care home shall ensure that the home's menu cycle includes menus for regular, therapeutic, and texture modified diets for both meals and snacks" (Ministry of Health and Long-Term Care, 2010). Furthermore, Section (72)(2)(e) states, "The food production system must, at a minimum, provide for: menu substitutions that are comparable to the planned menu" (Ministry of Health and Long-Term Care, 2010). It was apparent that NMs strived to abide with these regulations and that these influenced their decisions when planning the menu. However, not all NMs understood and interpreted these regulations in the same way, nor, as reported by NMs, do the compliance officers who inspect LTCHs.

Staff Environment

Out of the 25 participants, seven NMs identified that consistency in product and the risk for choking due to human error was a reason for purchasing some pureed foods. They reported that staff did not consistently know when a product was the right texture. If NMs felt that cooks or dietary aids lacked training, they ensured the safety of residents with dysphagia by purchasing some commercial pureed foods. On the other hand, when NMs were confident in the abilities of their staff, the decision to not purchase commercial was easier. Developing pride in making a quality product was key. NM # 9 stated,

> *Once the cooks get the job pride on doing their purees then you're laughing, I mean you've got no worries, because they are going to take pride in doing them and make sure that they* [pureed foods] *taste as good as the regular* [texture].

In addition to quality control, two of the 25 NMs mentioned that they purchased commercial pureed foods to lighten the workload of the staff.

One of NMs' many responsibilities is to be involved in management of the dietary staff and to identify their skills or the need for training (Canadian Society of Nutrition Managers, n.d.). One of the implications of under-trained staff is the risk of producing in-house pureed foods, which may not be safe for swallowing for residents with dysphagia. It was apparent that NMs took the skills of staff, or lack thereof, under consideration when deciding to purchase commercial pureed foods.

Facility Environment

Out of the 25 participants, eight NMs discussed freezer space, a structural aspect of the facility that influenced their purchasing. Since commercial pureed foods were typically delivered to the LTCHs frozen and packed in boxes, plenty of storage space in a walk-in freezer was necessary. Out of these eight NMs, four purchased commercial pureed foods to supplement those made in-house, because they had sufficient freezer space to store them. One explained that the LTCH she worked in was built with the intention of outsourcing the majority of their foods. However, the lack of storage space was an issue that other NMs dealt with daily. Four NMs thought that small freezer space was problematic even to store other frozen foods and ingredients:

> *As much as I'd like to perhaps buy pureed vegetables and to just take it out, heat it up and serve it, I don't have the luxury. I only have that one small freezer, that's it. I have to be careful about what I buy…And in spite of that, I get groceries delivered twice a week. It's just not an option* (NM #18).

During interviews conducted in their respective facilities, NMs provided a tour of the kitchen when they were able to. The physical layout and structure of LTCH buildings were highly variable. Kitchen sizes and areas allotted for walk-in refrigerators and freezers varied. Expanding the size of a walk-in freezer would require significant resourcing that was unreasonable and not a priority.

The equipment that a LTCH had for pureeing foods in-house was reported to influence a NM's decision to purchase commercial pureed foods. All 25 LTCHs carried a food processor in their respective kitchens. The most commonly used food processor was the Blixer, whose capacity ranged from 2V (2.5 Qt. or 2.37 L) to 5V (7 Qt or 6.62 L). Thirteen of the 25 NMs stated that they took their equipment into account when considering to purchase or not to purchase commercial pureed foods. Of these 13 NMs, seven purchased commercial pureed foods. One explained that not only are Blixers expensive to purchase, they are also expensive to maintain; blades need regular replacing or sharpening, which could cost up to CAN$200-$250 every time. The issue of breakdown of equipment was a key influencer in the choice of two NMs to purchase, even if only to have foods available in the event of an emergency.

On the other hand, six of these 13 NMs did not purchase commercial pureed foods because of their fully functioning food processors. One stated, "I don't think there is any menu item that we cannot puree in our new Blixer... Since we got the Blixer, it's a miracle…it's a God-send." Thus, equipment is an important consideration in not only preparing safe and appropriate pureed food, but also in determining whether or not to purchase commercially.

Food Quality

Another reason for purchasing was the preference for taste and appearance of commercial pureed foods. Out of the 25 participants, 12 NMs noted that the taste of pureed foods was a factor when deciding to purchase commercially. Of these participants, two purchased commercial pureed foods, because they believed that these products had a better flavor profile. The majority who gave taste as a reason thought that pureeing foods in-house gave them the ability to flavor foods accordingly, thus improving taste. It has been identified that the process of pureeing, on top of traditional cooking methods, can alter the flavor intensity of foods, specifically in vegetables and fruits (Kader, 2008). The addition of liquids, such as milk or broths, during the pureeing of mainly solid foods, can alter true flavors (Hotaling, 1992). Some commercial lines flavor enhance their products with seasonings, or natural and artificial flavors during manufacturing. However, some of these products may have high amounts of sodium, which might not be appropriate for residents with some health conditions. Taste was a key influencer on the purchasing decision in this study; preparing in-house gave greater control over the flavor profile and lead to the decision to forego commercial.

Out of the 25 participants, two NMs explained that the decision to purchase commercial pureed foods was influenced by how much they thought the residents liked them. Throughout all the interviews, NMs noted that most residents on a pureed diet required feeding assistance and were unable to speak; they looked to the direct care staff for preferences of these residents. One of these NMs decided to prepare pureed foods in-house as she believed this was their preference, and it would taste similar to other textures they had in the past. She stated, "That way when a person has been on a regular ground then they're given a pureed texture it still tastes the same. It's not changing what they're used to having." The other NM who provided consumer preference as an influencer decided to purchase some commercial pureed foods. Specifically, she noted that a commercial pureed bread product was well received. Because of its

sweet taste, they were more likely to consume it compared to bread that was pureed in-house.

Out of the 25 participants, three NMs decided to purchase commercial pureed foods to address malnutrition of residents on an exclusively pureed diet; an influence in this decision was that some commercial products were fortified with protein and they knew exactly how much of this macronutrient was being provided in a serving. One explained, "They're [in-house] just not as nutritionally sound as a pre-prepared pureed item. There's no guarantee that you're getting six grams of protein for your lunch today."

There are some studies that looked at fortifying in-house pureed foods and its effect on the nutritional status of older adults (Adolphe, et al., 2009; Kennewell & Kokkinakos, 2007). These studies, although of short duration, demonstrated the efficacy of food enhancement. There are several ways to increase nutrient density and especially calories of pureed foods prepared in-house, for example using cream instead of water and broth, or the addition of butter and other oils when pureeing vegetables (Dunne & Dahl, 2007). However, these additional steps may be cumbersome for staff, and are costly due to lack of inexpensive fortificants for protein and micronutrients. In addition, excess calories may not be indicated for all residents with dysphagia.

NMs' Philosophy on Food

The philosophy of food and food production was a key influencer in decisions around purchasing or foregoing commercial pureed. Out of the 25 participants, six NMs felt that in-house pureed foods were superior to commercial pureed foods. In-house pureed foods were seen as 'home-made' and these NMs described commercial pureed foods as 'processed foods' and 'fast foods', produced in large masses in industrial facilities. Coincidentally, two of these NMs also sourced raw ingredients locally. One stated, "We as a company, our philosophy is that we do home-style cooking. That's been our company's philosophy for 30 years since we've been in the business." Interestingly, the same NM compared pureed foods to apple pie. The dessert is widely available pre-made, but home-made is still preferred because it is more palatable and 'made with love'. Two of these six NMs thought that commercial pureed foods contained fillers that contributed to their thickness. These additives were thought to help add to the shape, but had no nutritional value, and thus these commercial products were seen as undesirable.

On the other hand, four out of the 25 NMs, all of whom supplemented in-house pureed foods with commercial pureed products, thought that it was a more logical choice to purchase because of the products' convenience. NM # 13 summed all her thoughts to describe her preference for commercial pureed foods as she stated,

> *It seems silly for us to take our time, two to three hours a day running processors to run purees and minced products. What a waste of labor, expensive equipment and we can't even ensure that it's smooth. The food processor, there's nothing for them to pass through to make sure that you didn't miss a lump.*

The NMs' decision to purchase commercial pureed foods is influenced by the values of the LTCHs where they worked, which then translate into their own principles that they take into consideration when purchasing commercial pureed foods.

Other Factors that Influence the Purchase of Commercial Pureed Products

Out of the 25 participants, three NMs mentioned that the number of residents on a pureed diet influenced their decision to purchase commercial pureed foods. Because of the number of residents, pureeing food in-house would require the cook to process several batches of dishes using the equipment they had available. A fluctuating percentage of residents on a pureed diet was also reported to influence the purchase commercial pureed foods. It was described that the number of residents on pureed diets was likely to change often because of turnover or transfer of residents to the hospital. As some commercial pureed products were available in individual frozen 'pucks', they could conveniently be rethermed to address fluctuating numbers at mealtimes.

Ontario's MOHLTC provides guidelines for LTCHs to ensure that residents' nutrition needs are met and their dignity and choices are respected. LTCHs are to offer two choices for main entrees and two choices for desserts during lunch and dinner (Ministry of Health and Long-Term Care, 2010). Each main entrée is composed of a protein, a side of grains, and a side of vegetables. Pureeing foods in-house add to the workload of cooks, as each component of the main entree has to be processed separately. In addition, main entrees and desserts vary across therapeutic diets. Purchased commercial pureed foods lessened the number of food items that would have to be produced and can lighten the workload of the cooks.

Out of the 25 participants, two NMs mentioned that they purchased commercial pureed foods, specifically molded products, because of their appearance. Despite their high cost, they purchased these only during special occasions, such as Christmas and Easter, as residents and family appreciated these. The use of molded pureed foods and their influence on intake of residents has been studied (Cassens, et al., 1996; Stahlman, Garcia & Hakel, & Chambers, 2001). However, only one study has shown benefits in the form of weight gain from these foods (Germain, Dufresne & Gray-Donald, 2006).

Out of the 25 participants, four NMs mentioned that they purchased commercial pureed foods as back up for when the kitchen staff was short on time. Three NMs reported providing residents with commercial purees when residents did not wish to have the two in-house pureed entree options. Six NMs purchased commercial pureed foods to substitute for items that they believed were hard to puree in-house. Certain fruits, such as berries and cherries were also hard to puree in-house, as the pits and seeds would have to be removed. These NMs claimed that purchasing commercial pureed fruits, such as pureed fruit cocktail and peaches, eliminated the step of adding thickeners to reach the pudding-like consistency when pureeing in-house. The others purchased commercial pureed starches such as pastas, rice and pancakes as the process of pureeing these in-house made them too glutinous causing them to lump into a ball.

Table 3 tallies the frequency of NMs who took all factors discussed into consideration when deciding to or not to purchase commercial pureed foods.

CONCLUSION AND APPLICATIONS

There have been very few studies focusing on pureed foods and their use in dysphagia management. This is the first study that specifically looked at the perception of the Nutrition Manager and their decision to purchase commercial pureed foods. This study has several strengths but also some limitations. Interviews were conducted with for-profit and non-profit LTCHs, which were diverse in size and purchasing experiences with pureed foods. However, all participants

Table 3. Factors Contributing to the Decision to Purchase Commercial Pureed Foods			
Factors Contributing to the Decision to Purchase	**Number of NMs who mentioned this factor**	**Of those who mentioned this factor, number of NMs who purchased**	**Of those who mentioned this factor, number of NMs who DID NOT purchase**
Policy Constraints			
Cost	20	9	11
MOHLTC requirement to match regular texture menu	16	6	10
As suggested by MOHLTC compliance officer	6	3	3
Staff Environment			
Eliminate the room for human error	7	7	0
Lighten the workload of staff	2	2	0
High level of confidence in the skills of staff	1	0	1
Facility Environment			
Freezer space	8	4	4
Quality of equipment used for pureeing foods	13	7	6
Food Quality			
Taste as perceived by NMs	12	2	10
Taste as perceived by residents, according to opinions of staff	2	1	1
Protein fortification	3	3	0
NMs' Philosophy on Food			
In-house pureed foods are superior to commercial products	6	0	6
Purchase commercial products for their convenience	4	4	0
Other factors mentioned which contribute to purchasing commercial pureed products			
Appearance	2		
Back up when staff is short on time	4		
Back up when residents did not prefer two menu options	3		
Substitute for food items that are hard to puree	6		

self-identified and all LTCHs were in one province and did not cover all of the 14 Local Health Integration Networks (regions) in this province. It is unclear how generalizable these findings are to other LTCHs, especially outside of Ontario, Canada. Audio recording assured accurate notation of key concepts and themes expressed by participants, however, it is possible that some restrained their opinions and provided selective thoughts that did not provide a full picture of their decision making process. There were two researchers who analyzed the collected data separately and then both came together to check for reliability of coding. However, there was a disproportionate number of participants interviewed by these researchers, and there is the potential for inconsistency in interviewing. Using a structured questionnaire promoted consistency and no new themes were identified after about 20 interviews; as such, interviews were stopped at 25 participants.

The decision to use commercial foods is complex and there are many contributing and interacting factors. It was apparent that the NMs had the best interest of residents when deciding whether or not to purchase commercial and which products to purchase. Overall, participating NMs in this study aimed to ensure that pureed meals were palatable, preserved the dignity of residents and promoted safe swallowing. Ultimately, the underlying deciding factor was the safe consistency of products for swallowing by residents with dysphagia and the availability of quality equipment that could produce this safe texture. Through this study, NMs may be more informed about factors considered by others, should they decide to switch from making all pureed foods in-house to buying commercially prepared items, or vice versa. From the perspective of the NM, there were variations in the levels of training of the staff involved in pureeing foods in-house. To ensure proper consistency that is safe for swallowing, training must be provided for staff involved in preparing in-house pureed foods and so that standardized recipes would promote quality. Similarly, it is apparent that NMs require critical thinking skills when making decisions that affect the delivery of pureed foods, as there are many factors which can be taken into consideration. NMs must be educated and trained to keep an open mind and consider all factors when arriving at any decision as a part of his/her role in the LTCH.

For food producers, this study demonstrates the complexity of this decision and results may assist them with considering products to focus on, so that costs can be reduced. It is apparent that there is a need for further research to determine the effectiveness of commercial and in-house pureed foods for dysphagia management. Also, studies should be conducted comparing their characteristics, such as sensory appeal and nutritional quality. If it is proven that commercial foods are superior in appeal and nutrient profile, leading to improved nutritional status of residents on pureed diets, this may justify changes to policy on food funding for LTCHs.

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APPENDIX

Questions for the Nutrition Manager analyzed in the study:

If pureed foods are ordered commercially:

- Do you order any pureed or texturally modified foods commercially?
- Do you order commercial thickeners or any other products to make pureed? If yes, what and where do you order from?
- What puree products (do/would) you chose to purchase pre- prepared? Why?
- What do you think (are/would be) some problems and limitations of having pre-prepared pureed foods? What are some benefits of using commercial pureed foods?
- What changes would you like to see in commercially prepared MTF? (If applies)

If pureed foods are made in-house:

- Can you list some food products appropriate for purees that are routinely prepared from scratch on-site?
- Why are these products prepared in-house rather than purchased?
- What enhancements do you do to purees at this facility?
- Are there any products in the regular menu that you have to substitute on the regular menu that don't puree well?
- How do cooks know the food is at the right texture and consistency for safe swallowing?
- What, in your opinion, are some problems and limitations of the pureed foods prepared in-house in this facility?

Research Contribution

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EFFECTS OF OBSERVING EMPLOYEES FOR FOOD SAFETY COMPLIANCE

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ABSTRACT

Research investigating foodservice employees' compliance with food safety guidelines often utilizes observational methodology where an observer is present and recording employees' behaviors as they work. Research must determine if the observer's presence influences employees who are trained in food safety and those who are not. A group who had received a four-hour ServSafe® food safety training course and a control group were included in the study (N=252). Both groups' compliance rates were higher during the first hour of the observation compared to the last two hours of the observation. Implications for foodservice managers, researchers, and health inspectors are discussed.

Keywords: food safety, restaurant employees, ServSafe® training, observation methodology, social desirability, habituation

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INTRODUCTION

Inadequate levels of compliance with proper food safety practices in foodservice operations remain a challenge of operators and researchers alike. Research studies employing the most ambitious methodologies have involved observing foodservice employees' behaviors during food production. However, there is potential for an observer's presence to influence employees' behaviors, which may compromise the validity of the data. This study investigated whether employees adjust their compliance with food safety guidelines when aware they are being observed for those behaviors, identified if there is a point in time when employees become habituated to an observer's presence, and assessed whether food safety training influences the adjustment of compliance rates while being observed. This was accomplished by analyzing trends for compliance over the course of a three-hour observation session for a group of employees who had received ServSafe® food safety training and a group of employees who had not.

LITERATURE REVIEW

Foodborne illnesses are the cause of 48 million illnesses, 128,000 hospitalizations, and 3,000 deaths annually in the United States (Centers for Disease Control and Prevention, 2011). Accordingly, assuring the safety of foods consumed is a public health priority (Castellanos, Myers, & Shanklin, 2004; Food and Drug Administration [FDA], 2004, 2009; United States Department of Health and Human Services, n.d.). The current research focuses on food safety in restaurants due to the significant number of meals consumed in restaurants as well as the high percentage of foodborne illness outbreaks attributed to restaurants. In 2011, foodservice industry sales will top $600 billion for the first time in history, reaching an unprecedented $604.2 billion. Of this, $550.8 billion will come from commercial operations. Additionally, 43% of Americans indicated that restaurants are an essential component of their daily lifestyle (National Restaurant Association, 2010).

Further contributing to the importance of restaurant food safety research is the fact that a majority of reported foodborne illness outbreaks (59%) are traced to food consumed in restaurants (Centers for Disease Control and Prevention, 2006). Restaurants are often out-of-compliance with guidelines more than nursing homes, elementary schools, and hospitals (FDA, 2004, 2009).

Research in restaurants also is important because it provides information about the compliance rates with food safety guidelines, and can help determine whether providing food safety training influences compliance levels among employees. Such research can allow researchers to look at trends that may result from training or regulatory changes, and provide perspective for researchers desiring to develop and initiate interventions to improve compliance levels. The accuracy of the data collected and reported is essential because it forms the basis of important decisions and policies designed to improve food safety compliance rates. As such, research must investigate the accuracy of data collected through various methodologies.

Research Relying on Employees' Self-Reports

Researchers have investigated food safety compliance rates in restaurants using employees' self-reports (Clayton, Griffith, Price, & Peters, 2002; McElroy & Cutter, 2004). However, there is no way to determine the reliability or validity of self-reported data. Self-reported data, especially for socially sensitive topics, can be biased toward a socially desirable response (Crowne & Marlowe, 1960; Eagly & Chaiken, 1993). To be perceived positively, individuals are likely to provide responses consistent with perceived norms (Leary, 1996). Researchers have reported the effects of social desirability bias on self-reports of attitudes (Fisher, 1993), values (Fisher & Katz, 2000), personality characteristics (Mick, 1996), and behaviors (Mensch & Kandel, 1988). Therefore, foodservice employees may be likely to self-report complying with guidelines more often than they actually perform the behaviors.

Research Relying on Health Inspectors' Reports

Research has relied on health department inspection scores as evidence of restaurant employees' compliance with food safety guidelines (Casey & Cook, 1979; Cotterchio, Gunn, Coffill, Tormey, & Barry, 1998; Kneller & Bierma, 1990; Kwon, Roberts, Shanklin, Liu, &

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Yen, 2010; Mathias et al., 1994; Mathias, Sizio, Hazelwood, & Cocksedge, 1995; Roberts, Kwon, Shanklin, Liu, & Yen, 2011; Wright & Feun, 1986). Use of such secondary data has limitations in terms of reliability and validity. Researchers are unable to determine whether health inspectors have conducted thorough, quality inspections. Bryan (1990) indicated that inspections are based on the individual judgment of inspectors, and inspectors often rate an operation differently than their peers. Further, Kassa, Harrington, Bisesi, and Khuder (2001) noted that inspectors' reports are not consistent with microbiological tests of food surfaces in restaurants. Other studies found that scores on restaurant health inspectors' reports are not predictive of foodborne illness outbreaks (Cruz, Katz, & Suarez, 2001; Jones, Pavlin, LaFleur, Ingram, & Schaffner, 2004; Penman, Webb, Woernle, & Currier, 1996).

Research Utilizing Observational Methodology

Many of the most ambitious studies have utilized behavioral observation to assess foodservice employees' compliance with food safety guidelines in restaurants (Clayton & Griffith, 2004; FDA, 2000, 2004, 2009; Green et al., 2006; Howes, McEwen, Griffith, & Harris, 1996; Manning & Snider, 1993; Paez, Strohbehn, & Sneed, 2007; Pilling et al., 2008; Pilling et al., 2009; Roberts et al., 2008; Strohbehn, Sneed, Paez, & Meyer, 2008). These researchers observed employees' compliance with food safety practices during food production activities. Roberts et al. (2008) observed foodservice employees who participated in a four-hour ServSafe® food safety training session and a control group to evaluate the effects of training on employees' compliance with selected food safety guidelines (using thermometers, handwashing, and surface control). The researchers recorded when employees performed individual behaviors properly or improperly, and then calculated compliance rates. A significant increase in overall food safety behaviors from pre- to post-training was found. When exploring individual practices, only handwashing behavioral compliance increased significantly. Manning and Snider (1993) observed temporary foodservice operations at a fair for compliance with food safety guidelines. They used an observational checklist that included practices related to hygiene, storage and hot/cold holding equipment, food surfaces, and handwashing. The researchers found no relationship between the behavior of employees and their knowledge and attitudes relating to personal hygiene and cross contamination. Specific behaviors that needed improvement included handwashing and bare-hand contact with ready-to-eat foods.

Although many restaurant food safety studies utilized observational methodology, the researchers did not find any studies that investigated the effects of this methodology (i.e., effects of the observer's presence) on compliance rates during the observation period. When interpreting results of observational studies, there are some important issues to consider: How does the presence of the observer and the employees' knowledge that their food safety practices are being observed influence their compliance with food safety guidelines? Is the behavior observed an accurate depiction of how employees would behave if they were not being observed, or is it an adjusted, more socially desirable response? In essence, do such behavioral observations have construct validity? The current study seeks to investigate these questions.

Theoretical Support for the Research Focus

There is research to suggest that observation influences the observed individuals' behaviors. According to the social desirability theory, individuals present themselves in socially desirable ways, especially related to socially sensitive topics (Crowne & Marlowe, 1960; Helmes & Holden, 2003). When individuals know they are being observed, they will behave in ways they believe are socially desirable or acceptable. Given that noncompliance with food safety guidelines can contribute to severe consequences (e.g., serious illness, death), social desirability theory would suggest that employees will attempt to increase their compliance with guidelines when they are aware of being observed for those practices.

Other research has shown that employees increase productivity when they are aware that they are the focus of a research study. This is referred to as the Hawthorne effect and was first discussed by Mayo (1933). In this situation, again, the person is giving a socially desirable response.

Research on social facilitation (Zajonc, 1965; see also Aiello & Douthitt, 2001) suggests that having an audience improves an individual's performance on well-learned tasks. However, observation can actually decrease one's performance on tasks that are not well-learned (due to anxiety of being watched).

Although the process of being observed influences individuals' behaviors, research indicates that those who are being observed become habituated at a point in time, and being observed after this no longer influences their behaviors. Hagen, Craighead, and Paul (1975) observed habituation when watching interactions between mental health technicians and their patients. Zebiob, Forehand, and Resick (1979) observed habituation when watching mothers interacting with their young children.

Purposes of the Current Study

The goal of this study was to address a gap in the literature by investigating the effects of observation on restaurant food production employees' compliance rates with three selected food safety practices, when the employees are aware of the observation and its purpose. The researchers sought to identify whether the employees exhibit a habituation effect during the course of the observation and the point at which employees become habituated to the researcher's presence. This is important knowledge for researchers because employees' compliance rates after this time will be a more accurate indication of their typical behaviors.

The second purpose of the study was to investigate whether employees who are trained in food safety and those who are not trained are influenced by the observation in a similar fashion. While the Hawthorne effect suggests that participants increase productivity when they know they are being observed, the phenomenon of social facilitation suggests that untrained employees may not have higher compliance rates when being observed because performance does not improve during tasks that are not well-learned. Identifying the effects of observation on food safety trained and untrained employees would determine whether researchers need to approach observations of these groups in different fashions (due to different abilities for adjusting compliance levels). An initial social facilitation effect was predicted: the trained group was expected to exhibit higher compliance rates in the presence of an observer at the beginning of the observation. However, the untrained control group was not expected to exhibit higher compliance rates at the beginning of the session due to lack of knowledge and the anxiety of being watched during tasks that had not been learned. Although the control group may know many aspects of food safety, they probably are aware they have not received formal training and are uncertain of more sophisticated aspects of food safety.

Thus, the research questions for this study included: 1) Do employees exhibit a habituation effect during the course of an observation and at what point do employees become habituated to the researcher's presence?; and 2) Are employees who are trained in food safety

influenced by the observation in a similar fashion as those who have no training?

Food Safety Behaviors Targeted

This study involved observing foodservice production employees for specific behaviors related to handwashing, use of thermometers, and handling of work surfaces. These behaviors were targeted because the improper performance of these behaviors is known to contribute most significantly to foodborne illnesses (FDA, 2004). Behaviors were limited because it was not feasible to observe compliance with all food safety guidelines.

METHODS

Development and Validation of the Observation Instrument

An observation form (Figure 1) was developed to assist in manually recording foodservice employees' compliance with food safety guidelines. Although the three behaviors of interest were handwashing, use of thermometers, and handling of work surfaces, it was necessary to identify more specific behaviors to record for each behavioral category. A panel of food safety experts made a list of specific behaviors for each behavioral category (e.g., handwashing), and included behaviors related to performing the behavior at appropriate times (e.g., after sneezing, using the bathroom) and with the proper technique (e.g., using soap and hot water). On the observation form, each specific behavior was listed on the left side grouped under the broader behavioral category. On the right side of the form were two columns where observers could indicate when the employee performed the specific behavior at the correct time (or with proper technique), or when they performed it incorrectly. The researchers modeled the observation form after previous research that had utilized observational methodology (Johnson, 1995; Toro, 2005).

The observation form was pilot tested with all researchers (ServSafe® certified graduate research assistants) who would be collecting data. During testing, pairs of researchers observed up to four foodservice employees in restaurants that were not included in the final data collection. Researchers observed employees for 20 minutes, and then took a 10-minute break to compare their coding, discuss discrepancies in their coding, and reach agreement for the appropriate codes to use. This procedure was repeated five times; the observation session lasted three hours. Modifications were made to the observation form as necessary. The pilot testing served to train all observers and allowed them to become familiar with the observation form. The average inter-rater reliability estimate for two researchers observing the same employees over a three-hour session was established at .71 for their initial coding, although discussion improved reliability to 100% agreement.

ServSafe® certification of observers and extensive pilot testing with the observation form contributed to maximizing the objectivity of all behaviors observed. Pilot testing allowed all observers to agree about how best to code behaviors that may be more vague or subjective than others. Pilot testing was completed by all possible pair combinations of observers, so each person was allowed the opportunity to discuss discrepancies with all other observers. Following pilot testing, all observers met as a group to further discuss the coding protocol for the more subjective behaviors. In this way, the researchers removed as much subjectivity as possible from the coding.

Recruitment

The population of interest was restaurant food production staff. Due to budget limitations, only restaurants within a 300-mile radius of the research university were considered. Lists of foodservice establishments and their contact information were obtained from the

Figure 1. Food Safety Observation Form

Food Safety Restaurant Observation Form

Restaurant code: _____ **Date**: _____

Time period: _____ **Number of employees observed**: _____

Employee code A:_____ **B**:_____ **C**:_____ **D**:_____

Observation Activity	Observed		Note
	Yes	No	
I. Hand Washing			
Employees wash their hands after the following activities:			
1. When shift begins			
2. Returning to the work area (after smoking, eating, chewing gum or tobacco, bussing dirty dishes, or using the restroom)			
3. Before putting on clean gloves			
4. Handling raw food (before and after)			
Handling chemicals that might contaminate food			
5. Touching body parts (hair, face, or body) ***(Note: Cap at 5 observations and ending time)***			Ending Time:
6. Touching clothing or aprons ***(Note: Cap at 5 observations and ending time)***			Ending Time:
8. Touching anything else that may contaminate hands, such as unsanitized equipment, work surfaces, cleaning cloths, and drinking straw.			
9. When food preparation tasks are interrupted or changed			
10. Sneezing, coughing, or using a handkerchief or tissue			
Hand Washing Procedure			
14. Vigorously scrub hands for at least 20 seconds			
15. Vigorously scrub arms above wrists for at least 20 seconds			
16. Clean between fingers			
17. Clean under fingernails			
18. Rinse thoroughly under running water			
19. Dry hands and arms with a single-use paper towel or warm-air hand dryer			
II. Using Thermometers			
1. Wash, rinse, sanitize, and air-dry before and after use			
2. Check internal temperature of food by inserting the thermometer stem or probe into the thickest part of the product			
3. Check temperature of food at the completion of cooking			
4. Check temperature of food at the completion of reheating			
5. Food stored on the hot line is at least 135°F			
6. Food stored on the cold line is 41° F or less			
III. Food Handling and Cleaning and Sanitizing Work Surfaces			
1. Food is covered when transported			
2. Food is covered and labeled properly before holding or storing			
3. Food contact surfaces are free of dust, dirt, and food particles			
4. *Leftovers labeled & dated (check anything over 7 days old)			
5. Separate raw products from cooked and ready-to-eat products			
6. Wiping cloths are stored in a sanitizing solution			
7. Separate wiping cloths are used for food and nonfood surfaces			
All food-contact surfaces (hands/gloves, countertops, cutting surfaces, equipment, dishes & utensils) must be washed, rinsed, and sanitized following:			
8. Anytime begin working with another type of food or ingredients			
9. After touching anything that might contaminate the food-contact surfaces			

Note:

Missouri telephone directory and from foodservice licensing agencies in Kansas and Iowa. All restaurants, including casual, fine dining, and quick-service, regardless of ownership structure (corporate or independent) were included in the sample. A systematic random sample was obtained by calling every fifth restaurant.

Recruitment was conducted between May 2005 and July 2006. Student assistants made unsolicited "cold calls" to restaurant managers, during which they followed a script that described the study requirements and timeline, and offered the managers free food safety training for all food production staff in exchange for participation. If the manager wished to learn more about the study, a packet of informational materials was mailed to them, and if necessary, a principal investigator travelled to the establishment to speak directly with the manager. Thirty-one of 1,298 restaurant managers who were contacted agreed to participate in the study. Because the manager made the decision to participate or not, there is no reason to believe that employees who participated are different from employees whose managers declined participation. While managers originally consented for their employees to participate in

the research study, consent also was obtained from each employee who participated.

Procedure

This study utilized an observational methodology in a cross-sectional design, with participating employees assigned to one of two groups. One group received ServSafe® food safety training prior to being observed for food safety compliance during food production; the observation occurred one to two weeks after training was complete. The other group served as a control and was observed prior to receiving the training. This manipulation allowed the researchers to test whether employees who are trained in food safety and those who are not will be influenced similarly by the observer's presence. It is important to note that all employees received training by the end of the study, and all were observed for their compliance with behaviors related to the three specific food safety practices. Both groups were aware they were being observed for food safety behaviors; however, they were not aware that the observation was specifically for handwashing, thermometer usage, and handling of work surfaces.

Training. ServSafe® training was chosen because ServSafe® is the national standard in the restaurant industry. Four-hour training sessions were offered because this length is generally targeted at employees, while longer (i.e., eight or 16-hour) sessions are typically targeted at managers. Using the ServSafe® Employee Training Guide and supporting materials, the ServSafe®-certified instructors covered topics such as defining foodborne illnesses, using proper personal hygiene, preventing cross-contamination, avoiding time and temperature abuse, and cleaning and sanitizing. The behaviors targeted for observation in the study were not emphasized more than usual in the training. The training was free of charge for all food production employees at participating restaurants, and employees were compensated for their training time at their hourly rate. The training sessions were offered in locations convenient to restaurant staff (e.g., in the restaurant itself, or at local meeting sites). Multiple training sessions and English-to-Spanish translators were available to maximize employee participation.

Observations. As in the pilot testing, the food safety observations were conducted over three-hour sessions in restaurant kitchens during a lunch or dinner shift. One researcher was able to observe a maximum of four employees simultaneously. If more than four employees were available for observations, an appropriate number of researchers were present to conduct the observations. The three-hour observation sessions were separated into six 20-minute periods with 10-minute rest periods between. The rest periods served to reduce observer fatigue, thus enhance the accuracy of researchers' recordings of employees' behaviors. A separate observation form was used for each 20-minute session, which allowed the researchers to compare the influence of the observer's presence on the employees' behaviors through the course of the observation.

Employees were observed for their compliance with food safety guidelines related to handwashing, thermometer usage, and handling of work surfaces. Food safety behaviors were considered to be performed correctly if they were completed at the correct time or using the correct technique. Food safety behaviors were considered to be performed incorrectly if they were not completed at the time they should be or if they were not completed using the appropriate technique. If a behavior was observed to be performed correctly, a tick mark was placed in the appropriate column, and if a behavior was performed incorrectly a tick mark was made in a different column.

Statistical Analysis

On each of the six observation forms, the tick marks for behaviors within each of the three behavioral categories were added together, separately, in the two columns (i.e., indicating the number of times each behavior was performed correctly and the number of times each behavior was performed incorrectly). Additionally, column totals were calculated, which combined the data for all three behavioral categories into one composite score.

Next, compliance rates were calculated as percentages of food safety behaviors performed correctly by taking the number of times the behavior was performed correctly during that period, divided by the total number of times the behavior should have been performed correctly (i.e., the sum of the "correct" and the "incorrect" columns), multiplied by 100. This was done separately for all three behavioral categories and for a behavioral composite, for each of the six periods during the three-hour observation. Therefore, there were a total of 24 compliance percentages calculated for each participant: six for each of the three behavioral categories and six for the overall behavioral composite, with the six percentages representing compliance during each of the six 20-minute periods within the three -hour observation session.

A series of four mixed factors Analyses of Variance (ANOVAs) were performed on the data. One ANOVA was performed for each of the three behavioral categories, and one for the behavioral composite. In each analysis, the between-subjects factor was employee group, with two levels: trained group and control group; the within-subjects factor was behavioral compliance rates, with six levels: employees' compliance rates during the six 20-minute periods composing the three-hour observation session (Sessions 1 to 6). This factor let the researchers determine whether the employees' compliance rates varied over the six sessions (i.e., to evaluate potential habituation effects to the observer's presence). Helmert contrasts were employed to determine whether employees' compliance rates in the first or second sessions were different from the remaining sessions, which would be expected if habituation effects exist. The interaction effect allowed the researchers to test whether the observer's presence influences trained and untrained employees similarly.

RESULTS

Sample Characteristics

Two-hundred fifty-two employees from 31 restaurants participated. Participants were predominantly male (69.6%). The average age was 28.3 years (*SD* = 10.4), and the average length of industry experience was 7.8 years (*SD* = 8.1). Establishments included quick- and full-service, chain and independently owned, and American and ethnic cuisine restaurants. Participants were either assigned to the control group (n = 158) or the trained group (n = 94). Some managers originally in the trained group discontinued participation after their employees received the free training, so behavioral observations could not be completed, which led to unequal group sizes.

Effects of Observation

The test of the differences between the compliance rates for the six 20-minute observation sessions was significant for employees' overall behavioral compliance [F (5, 770) = 5.72, p < .001], handwashing [F (5, 670) = 5.57, p < .001], and handling of work surfaces [F (5, 145) = 2.87, p < .05]. Refer to Table 1 for mean compliance percentages and standard errors for the analyses. Helmert contrasts revealed that employees' compliance rates during the first 20-minute session were significantly higher than in later sessions (Sessions 2 through 6) for overall compliance [F (1, 154) = 19.26, p < .001)], handwashing [F (1, 134) = 11.23, p < .001)], and handling of work surfaces [F (1, 29) = 17.14, p < .001)]. Employees' compliance rates in Session 2 continued to be significantly higher than in later sessions (Sessions 3 through 6) for overall behavioral

Table 1. Behavioral Compliance Percentages of Trained and Untrained (Control) Foodservice Employees

	Mean Compliance Percentage ± SE								
	Overall Behavior			Handwashing			Handling of Work Surfaces		
Time Period (20 minutes each)	Control Group (n = 92)	Trained Group (n = 64)	Total	Control Group (n = 81)	Trained Group (n = 55)	Total	Control Group (n = 19)	Trained Group (n = 12)	Total
1	37.50 ± 2.85	51.22 ± 3.42	44.36[a] ± 2.23	32.13 ± 3.19	42.19 ± 3.87	37.16[a] ± 2.51	77.28 ± 6.71	88.00 ± 8.44	82.64[a] ± 5.39
2	33.67 ± 3.05	46.66 ± 3.66	40.17[b] ± 2.38	29.50 ± 3.46	42.68 ± 4.20	36.09[b] ± 2.72	61.05 ± 8.58	55.28 ± 10.80	58.17 ± 6.90
3	30.10 ± 2.96	42.68 ± 3.55	36.39 ± 2.31	23.02 ± 3.14	37.07 ± 3.81	30.05 ± 2.47	53.60 ± 9.57	71.67 ± 12.05	62.63 ± 7.69
4	26.99 ± 2.91	39.20 ± 3.49	33.10 ± 2.28	20.92 ± 3.15	35.56 ± 3.83	28.24 ± 2.48	60.18 ± 10.07	65.28 ± 12.67	62.73 ± 8.09
5	35.91 ± 3.06	37.57 ± 3.67	36.74 ± 2.39	28.87 ± 3.35	29.67 ± 4.07	29.27 ± 2.63	51.40 ± 8.25	79.29 ± 10.38	65.35 ± 6.63
6	30.32 ± 3.28	37.17 ± 3.93	33.74 ± 2.56	22.69 ± 3.21	29.69 ± 3.89	26.19 ± 2.52	60.78 ± 9.33	69.58 ± 11.74	65.18 ± 7.50
Mean Compliance	32.42 ± 2.20	42.42 ± 2.64		26.19 ± 2.41	36.14 ± 2.93		60.71 ± 6.73	71.52 ± 8.47	
Test Statistic [c]			*F* (5, 770) = 5.72***			*F* (5, 670) = 5.57***			*F* (5, 145) = 2.87*

Note. Compliance percentages were calculated by dividing the number of food safety related behaviors performed correctly by the number of times the behaviors should have been performed correctly, and multiplying by 100.
There were too few observations on use of thermometers to perform that individual analysis; however, data related to thermometer usage is included in the calculations for overall behavioral compliance.
* p < .05, ** p < .01, *** p < .001
[a] Compliance in the first session was significantly higher than all later sessions, for the group of employees as a whole (p < .001).
[b] Compliance in the second session was significantly higher than all later sessions, for the group of employees as a whole (p < .01).
[c] Test statistics below the Total column represent within subjects (six observation sessions) analyses.

compliance [F (1, 154) = 6.54, p < .01] and handwashing [F (1, 134) = 13.12, p < .001]. These results support that the observer's presence does influence employees' behavior and that they become habituated (their compliance levels decrease and level off) after approximately one hour. In each analysis, the interaction effect between group and compliance rates over the six sessions was not significant, indicating the observer's presence influences the groups similarly.

There was an expected main effect of training. The trained group had significantly higher overall behavioral compliance [F (1, 154) = 8.46, p < .01] and handwashing compliance [F (1, 134) = 6.89, p < .01] than the control group. The groups had similar compliance rates for handling of work surfaces [F (1, 29) = 1.00, *ns*].

Data analysis for the use of thermometers could not be conducted because there were a limited number of observations for use of thermometers. Thermometer use data were included in the overall compliance calculations and is reflected in the trends for the overall compliance percentage.

DISCUSSION

This study sought to determine whether employees adjust their compliance with food safety guidelines when they know they are being observed for food safety purposes, if there is a point at which employees become habituated to the observer's presence. It also evaluated how being trained in food safety influences the adjustment of food safety compliance rates. Results revealed that employees adjusted their behaviors, but became habituated to the researcher's presence after approximately one hour. Further, both employees who are trained and untrained in food safety appear to exhibit this reaction when aware of being observed.

Implications for Outside Observers

This study showed evidence of habituation among employees when being observed for food safety compliance. This result is consistent with research findings when observing interactions between mothers and their young children (Zebiob et al., 1979) and between mental health technicians and patients (Hagen et al., 1975). Foodservice employees had significantly higher compliance rates in the first hour compared to the remaining sessions. It appears that it took about an hour for the employees to become acclimated to the researcher's presence. Support for this habituation effect is enhanced in that the effect was displayed for multiple behaviors: handwashing, handling of work surfaces, and the overall compliance composite. Insufficient use of thermometers did not allow testing the effect for that behavior.

The finding that habituation occurs after approximately one hour into the observation has potential implications for researchers using an observational methodology while investigating restaurant food safety compliance. These researchers may benefit from disregarding data collected during the first hour to achieve a more accurate indication of employees' typical compliance rates. Collecting accurate data is the key to informing good decision-making and useful policy change.

The finding also has potential implications for restaurant health inspectors. Typically, health inspections are conducted within one hour. The results suggest that inspectors may need to observe restaurant employees in excess of an hour to view more typical behaviors. It is important to note that food safety guidelines that do not involve observing employees behavior directly could be checked immediately (the hotline and coldline are at appropriate temperatures, leftovers have been discarded after seven days); it is behavioral data (handwashing, etc.) that requires time for habituation to occur. Increasing inspection times is an easy recommendation, but it would be difficult to implement. Increasing inspection times to allow for habituation would increase the number of inspectors required in each county as well as the cost of the inspections for the restaurants (i.e., increased licensing fees) and for the public (i.e., taxes used to compensate for inspection costs). Because of low profit margins, economic changes, and increased fees and taxes (Spector, 2003), restaurateurs are unlikely to react favorably to such a recommendation. The public's reaction may be mixed given the increase in taxes, yet it would enhance the ability to gain accurate information about restaurant employees' compliance with guidelines. The more accurate data could be used to train and retrain employees, reinforce positive food safety behaviors, and inform policies to make restaurants safer for consumers.

The results show that food safety trained and untrained employees responded similarly to the observers' presence. Both groups exhibited higher compliance within the first hour of the observation. The results are consistent with social desirability theory (Crowne & Marlowe, 1960; Helmes & Holden, 2003), which suggests that both employee groups would try to improve their behaviors when being observed. The results provide evidence that researchers using observational methodologies do not need to approach observations of trained and untrained employees in a different manner.

Implications within the Foodservice Operation

The results showing higher compliance rates in the first hour of the observation show that, regardless of trained status, foodservice employees may frequently work at levels below their capacity for compliance. This indicates inconsistent motivation among foodservice employees who either forget to perform the behaviors or do not understand the implications of improperly performing food safety practices. Clearly, foodservice employees need more motivation to perform food safety practices consistent with their actual capacity.

Keeping the importance of complying with food safety guidelines salient among foodservice employees is essential. The mere presence of the researcher achieved this, but employees became acclimated to the observer's presence and their motivation for compliance waned after approximately one hour. Foodservice managers must make constant efforts to motivate employees about food safety; based on the results of this study this should be done once per hour, at minimum. As examples: 1) when passing through production areas, reinforce the proper practice of food safety behavior; 2) install a bell that rings every time employees use the handwashing sink to remind employees about safe handwashing practices; 3) post bright signs in high-traffic production areas to remind employees of food safety guidelines (e.g., by the boxes of gloves to remind employees to wash hands before putting on new gloves); 4) communicate to employees that serious consequences could occur if food safety practices are not performed properly (e.g., serious illness for the customers AND employees, death, restaurant closure). Frequent verbal reminders may be even more effective than the mere presence of an outside observer in encouraging the employees to use additional effort to perform at their actual capacity. Ongoing verbal reminders would provide evidence to employees that they are under constant surveillance. While the current study did not test the best source of these reminders, it seems most feasible for the frequent reminders to come from supervisors. Foodservice supervisors and managers are most likely to be present to give such reminders, have authority to give these reminders, and have the most to lose if employees do not follow compliance guidelines. It is ultimately the managers' responsibility to monitor employees' behavior to ensure compliance with food safety guidelines.

Limitations and Future Directions

The major limitation of the study was recruiting restaurant employees. Difficulty existed in gaining consent of managers, which was necessary for the observational portion of the study. Of 1,298 restaurants contacted, only 31 managers participated. Most managers indicated that they did not have time to participate. Many managers were uncomfortable allowing researchers into their operation to observe employees' compliance with food safety guidelines, even though they were assured that all data would remain confidential and that any food safety related concerns would be reported to the manager (not the health department). Failure of the managers to agree to participate decreased the researchers' access to the sample of interest.

The time between the actual training and observations is another limitation. In this study, the observations were conducted within one to two weeks of training. Due to this, the information presented in the training may have been fresh in the employees' minds. Observing employees at a later date may influence the outcome of the study. However, scheduling observations at a later date may result in a loss of subjects due to the high turnover rate in the foodservice industry.

Participants were limited to restaurant employees within a 300-mile radius of the research institution, which included restaurants in Kansas, Missouri, and Iowa. Future research should be conducted in other geographic areas to determine the generalizability of these results.

The current study focused on foodservice employees in restaurants. Future research investigating the effects of observing foodservice employees during food production should target employees in other sectors such as foodservice employees in healthcare, school, childcare, and senior living foodservice environments. Given that observational research is frequently conducted in these environments (Henroid & Sneed, 2004; Sneed & Henroid, 2007; Sneed, Strohbehn, & Gilmore, 2004; Strohbehn et al., 2008), and also given that these employees prepare food for populations at a higher risk of contracting a foodborne illness, it is important to determine if and how these employees' behaviors are influenced by being observed for compliance with food safety guidelines.

Future research should involve testing for the best source of increased salience for the importance of complying with food safety guidelines. As suggested above, supervisors may be the most likely source of reminders; however, this study did not test for that. Future research could compare the effects of an outside observer, reminders from managers, and reminders from coworkers. While it is managers' ultimate responsibility to ensure employees' compliance with food safety guidelines, it may be difficult to get managers to consent to participate in such research. Recruitment of foodservice employees was extremely challenging; recruitment of managers may be equally, or even more challenging.

Other ideas for future research include: 1) investigating whether the results are only applicable to observations of employees' compliance with these selected food safety practices, or whether they are applicable to all food safety practices, and 2) determining the generalizability of the results to observing other types of behaviors besides food safety practices.

CONCLUSION

Both trained and untrained foodservice employees perform below their true capacity for compliance, as evidenced by their initial elevated levels of compliance when being observed. The presence of an observer may influence foodservice employees to exhibit higher compliance with food safety guidelines for approximately an hour. When employees know they are being observed for food safety behaviors, researchers and health inspectors may obtain a more accurate estimation of compliance rates after the first hour. Foodservice managers may be able to increase salience of complying with food safety guidelines by providing verbal reminders to employees emphasizing the importance of this compliance; this may spark additional motivation to properly perform food safety practices.

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SHOULD FUTURE DIETETIC GRADUATES KNOW HOW TO COOK?

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ABSTRACT

Dietetic educators have students in their classrooms who lack cooking knowledge. The many causes of cooking illiteracy are discussed. Challenges facing educators include how to address this problem efficiently, effectively, and in a manner that is not cost prohibitive to the student or the university. This article looks at the importance of cooking skills in a Registered Dietitian's career and the Academy of Nutrition and Dietetic's emphasis on these skills regardless of practice area. Various solutions are presented for the dietetic educator.

Keywords: dietetic student, cooking, college educator, registered dietitian

INTRODUCTION

A report of the 2006 Environmental Scan by the former American Dietetic Association (ADA) identified growing needs and problems in society that currently impact dietetic practice, or will in the near future (Jarratt & Mahaffie, 2007). Jarratt & Mahaffie (2007) identified the lack of cooking knowledge of the younger generation and their reluctance to learn how to cook as a concern for the profession.

Knowledge of food and food preparation plays an important role in all areas of dietetics. Many students no longer come to the classroom having mastered basic food preparation skills which educators previously took for granted (Canter, Moorachian, & Boyce, 2007). Professors are confronted with varying degrees of food knowledge and cooking skills. Challenges in the classroom include students who are unable to conduct food-related experiments, have an inability to prepare meals worthy of consumption, and have an inability to identify foods. Dietetic educators must address cooking illiteracy as a component within dietetics curriculums.

DEFINITION OF COOKING FROM SCRATCH

Research by Stead et al. (2004) found when individuals spoke about "cooking from scratch" or "home cooking" they implied this was the proper method of cooking food. By this, the definition is preparing a dish with raw or fresh ingredients and avoiding convenience items. Cooking illiteracy has been identified as consumers shift towards convenience foods and away from "cooking from scratch" (Begley & Gallegos, 2010).

Convenience foods include those which require no preparation except for cooking or heating before serving. These foods may also be referred to as semi-prepared or "value-added". Examples include frozen dinners, meals in a bag, prepared meat patties and nuggets, frozen pies, desserts, pre-cut vegetables, seasoning packets, bottled spaghetti sauce, and bagged lettuce, etc. (Rozendaal, 2007; Short 2003).

If Registered Dietitians (RDs) would like to impact the trend toward convenience foods, understanding quality scratch food production may be necessary. This includes encouraging how to cook from scratch to improve their food knowledge and cooking skills.

THE IMPACT OF CONVENIENCE FOODS

The proliferation of convenience foods, changing demographics of American households, working mothers, and parents who chose not to cook, results in children who are less likely to learn how to cook, a skill once taught by parents and schools (American Dietetic Association, 2008a; Canter et al., 2007; Levy & Auld, 2004; Michaud, Condrasky & Griffin, 2007). Research conducted by Levy and Auld (2004) found that in 75% of households, mothers were the predominant food preparers and cooking mentors. Fathers also had some participation in cooking and food shopping in households. Research also found that family meals had a positive impact on the cooking skills of the family members (American Dietetic Association, 2008a). College students who had consumed home cooked meals and participated in food preparation had more confidence in their cooking skills than those students without family meals (Gallup, Syracuse, & Oliveri, 2003).

Fast food restaurants have contributed to individuals demanding meals that take 10 minutes or less to microwave instead of the 30 to 60 minutes previously required (American Dietetic Association, 2008a; Ritzer, 1996). Little, Ilbery, and Watts (2009), suggests the increase in television chefs may be helping people get more involved in food preparation, but the demand for quick meal preparation results in utilizing more convenience or semi-prepared foods in meal preparation (Michaud et al., 2007). In an attempt to decrease concerns about the amount of time required for scratch cooking, meal preparation often utilizes pre-prepared, pre-packaged, or pre-cooked foods (Little et al., 2009). Ritzer (1996) further states that consumers realize there is a decrease in food quality when using convenience products, but find it acceptable because they do not evaluate food as critically. The quality standard for food has shifted from a domestic standard to commercially prepared. For example, some children have reported the preference of boxed macaroni and cheese over that made from scratch. (Stead et al., 2004).

Rozendaal (2007) states that preparing a meal from scratch may be less appealing to an individual who lacks cooking skills compared to others. A skilled cook enjoys selecting the ingredients used, determining the length of time to cook the foods, and the physical involvement in food preparation such as cutting, chopping, pinching, and stirring. A person lacking such cooking skills may feel overwhelmed and opt for convenience foods (Little et al., 2009; Rozendaal, 2007; Stead et al., 2004).

Short (2003) states that faculty and specialists internationally share concerns about cooking skills. Some feel that cooking skills have become routine, food preparation no longer requires skill, and the value of cooking has declined as a result of prepared convenience foods. Others suggest domestic cooking practices are now hobbies and daily tasks to be accomplished (Jarratt & Mahaffie, 2007; Short, 2003). The lack of cooking skills is exacerbated by parents and

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guardians using semi-prepared or convenience foods or not teaching children cooking skills (Begley & Gallegos, 2010; Caraher, Baker, & Burns, 2004; Short, 2003). Some children do not experience a traditional home cooked meal or observe the process of preparing them. Busy work schedules and children's extracurricular programs are partly to blame in preventing children from becoming involved in food shopping and preparation (Lichtenstein & Ludwig, 2010).

The commonly held belief that cooking skills are declining and/or being devalued within the population is a result of the demise of home economics in secondary schools internationally (Begley & Gallegos, 2010; Caraher et al., 2004; Kubota & Freedman, 2009; Levy & Auld, 2004; Little et al., 2009; Michaud et al., 2007; Short 2003). Conversely, Peregrin (2010) states that current home economics classes, now often referred to as family and consumer sciences, are rooted in academia and cover the scientific and practical aspects of food and nutrition including basic cooking techniques. The use of convenience foods has been unintentionally supported by the movement away from family and consumer science courses that include cooking skills (Begley & Gallegos, 2010).

Lichtenstein and Ludwig (2010) state one of the long term solutions to battling the pediatric obesity epidemic is to reintroduce cooking education into the schools. The authors explain the "obesity-hunger paradox' arises not only from a lack of nutritious, affordable alternatives to fast food, but also from a lack of knowledge about how to prepare nutritious food at home with inexpensive basic ingredients" (Lictenstein & Ludwig, 2010, pp.1857).

Knol, Robb, and Umstattd (2009) found that US high school students spent 5.8 ± 1.2 minutes in food preparation on school days. Female students spent 7.2 minutes more than male students (Knol, Robb, & Umstattd, 2009). Stead et al. (2004) reported young adults in their early twenties saw cooking as a chore which conflicted with other aspects of their lives. These research findings indicate young adults today may not have the cooking experience required for the dietetics field.

Condrasky and Corr (2007) state college students desire to cook but do not know how, or do not think they have the time. A study by Byrd-Bredbenner (2004) examined young college adults' knowledge of basic food preparation and attitudes toward food preparation. The results indicated low overall food preparation knowledge among young adults. When asked about their level of cooking ability, the majority of young adults overestimated their food preparation knowledge. The young adults had positive attitudes toward food preparation but viewed preparing foods from "scratch" more negatively than cooking using convenience or semi-convenience foods.

In a similar study, Larson, Perry, Story, and Neumark-Sztainer (2006) reported that out of 790 full-time students, only 20.4% had a high food preparation knowledge score. Cooking skills and time available for food preparation were considered inadequate by approximately 20% to 33% of the study participants. Presently, there is a generation of young people who have been raised in homes where neither the mother nor father cooks (ADA, 2008a; Jarratt & Mahaffie, 2007; Salomon, 2008). Lichtenstein and Ludwig (2010) reported many of today's parents never learned how to cook and instead, rely on restaurants, take-out food, frozen meals, and packaged foods as mealtime choices.

COOKING IMPORTANCE FOR FOODSERVICE MANAGEMENT DIETITIANS

Historically, some dietitians have emphasized the clinical aspect of dietetics and lessened their focus on food preparation and, thus cooking skills (Long & Barrett, 1999). The dietetic professional often focuses on nutrition therapy at the expense of food and culinary skills, which has resulted in cooking illiteracy (Begley & Gallegos, 2010). Some RDs have not emphasized the ease in which foods can be prepared from scratch and in knowing how to use seasonal produce.

Some jobs in the field of dietetics include some involvement in food preparation or foodservice supervision. In the dietetics curriculum, educators attempt to supply students with a solid background in food science and cooking skills; however, students often do not appreciate these efforts (Canter et al., 2007). When these graduates begin their careers, they finally start to appreciate the lessons they learned about food preparation, and cooking skills and realize the importance of attaining and retaining this knowledge (Canter et al., 2007).

In 2005, 48% of all hospitals surveyed had foodservice directors who were RDs (Gregoire & Greathouse, 2010). Gregoire and Greathouse also explored replacement planning for retiring hospital foodservice directors. In regards to demonstrated skills, 15% (n=18) of the stated cooking skills were required and 62.2% (n=74) stated culinary skills were preferred.

Managerial tasks are associated with RDs' job responsibilities (Cluskey, Gerald, & Gregoire, 2007). For example, one foodservice manager taught food preparation and cooking skills to her kitchen staff almost daily (Canter et al., 2007). O'Sullivan Maillet (2002) found that management dietitians and administrators felt cooking skills were essential for employees in foodservice. Five years after graduation, only 3.4% of dietetic students reported they envisioned a management position in their career future. This could impact the anticipated shortage of management dietitians in the future as employment trends show resurgence in management opportunities (Gregoire & Greathouse, 2010; Mitchell & Nyland, 2005).

COOKING IMPORTANCE FOR CLINICAL DIETITIANS

A clinical dietitian is frequently involved in counseling patients. The 2010 Dietary Guidelines suggests reductions in sodium, fat, and calories (Little et al., 2009; United States Department of Agriculture, 2010). The clinical RD needs to recognize appropriate food items and preparation for the patient to learn how to achieve diet compliance (Begley & Gallegos, 2010, Byrd-Brenner, 2004; Canter et al., 2007). Familiarity with foods and food preparation techniques are imperative if RDs are going to have a positive impact on modifying a patient's behavior (Byrd-Brenner, 2004).

Dietitians need to be successful in calculating nutrients from foods and to understand cooking methods and changes during the cooking process. RDs who advise people on what to eat and how to prepare foods should be able to demonstrate these skills (Begley & Gallegos, 2010, Byrd-Brenner, 2004, Condrasky & Griffin, 2007).

There is consumer demand for verification of the healthfulness of food and it is common practice for RDs to provide the nutrient data for recipes in restaurants, as authors of cookbooks, and cooking educators (Powers, Hess, & Kimbrough, 2008). Food and nutrition professionals should understand that accurate nutrient calculations require far more knowledge and skill than simply entering codes for recipe ingredients. Competencies in food science and strong cooking skills increase the accuracy and quality of nutrient calculations for RDs and Dietetic Technicians, Registered who conduct nutrient calculations (Powers et al., 2008).

CONCLUSIONS AND APPLICATIONS

All DIETITIANS SHOULD KNOW HOW TO COOK

There is justification for requiring food preparation and cooking skills in dietetic training (Begley & Gallegos, 2010). The inclusion of food preparation skills and knowledge is stated by by the Accreditation Council for Education in Nutrition and Dietetics (ACEND):

> *KRD 5.1. The food and food systems foundation of the dietetics profession must be evident in the curriculum. Course content must include the principles of food science and food systems, techniques of food preparation and application to the development, modification and evaluation of recipes, menus and food products acceptable to diverse groups (ACEND, 2012, p. 58).*

In a survey designed to identify needed areas of cooking skill development, 94% (n=64) of the RDs indicated they received requests for recipes, techniques, and actual methods of how to modify existing recipes. Also reported, 77% (n= 49) of the RDs felt responsible for educating others about cooking and food preparation but 66% (n=42) felt they knew average to very little about the principles of food preparation comparable to the instruction received in a cooking school (Zwick-Hamilton & Braves-Fuller, 2001). Because RDs report being asked to provide knowledge in these areas, but believe they need more expertise to be of great assistance, this demonstrates the importance of achieving these skills.

For RDs to be effective managers in healthcare foodservice, they should be competent in foodservice systems, food science, food safety, quality of food, nutrition in health and disease, and medical nutrition therapy (Canter et al., 2007, Gregoire, Sames, Dowling, and Lafferty, 2005. Similarly, Registered Dietitians in the Management of Food and Nutrition Systems Dietetic Practice Group follow a standard of professional practice that states management dietitians should utilize the latest methods for food preparation and production (Puckett et al., 2009). Likewise, the Food & Culinary Professionals Dietetic Practice Group established 11 core food competencies to enhance the food knowledge and culinary skills of RDs (Food & Culinary, 2007). Those relating to cooking skill are basic cooking skills, cooking techniques, and recipe development and modification. Culinary skills are more advanced and specialized than basic cooking skills and should not be considered comparable. As mentioned previously, all RDs should attain basic cooking skills, but advanced culinary skills are not required (Deutsch, 2011).

In a 2008 ADA Times article titled *Don't Forget the Food; Kitchen 101 for RDs Who Don't Cook*, Sharon Salomon states RDs are experts in the role of diet in health and wellness, but that does not make all RDs feel it is necessary to be a culinary expert. Having an interest in cooking is natural and a good understanding of kitchen skills can help RDs assist people who are trying to follow good nutrition practices at home. Salomon provides some basic tips such as learning cooking terminology, and studying the proper use of spices to put food back into the RD's area of expertise (Salomon, 2010).

Peregrin (2010) mentions that some dietitians may want to get involved in family and consumer science classes at high schools. The skills needed to teach these topics include; identifying ingredients, understanding the combination of various dishes, temperature requirements, time management skills, and kitchen operations (Silva, 2000). These skills would be needed by the RD to teach basic cooking techniques to students.

Fellers and Weese (2003) designed a project in a rural community where external partners and a leadership team composed of community leaders and RDs planned a micro-enterprise to produce jams, jellies, pickles, and value-added vegetables using locally grown crops. The team leaders, who were RDs, brought unique skills to the project and drew upon their dietetics education and background by utilizing their assessment skills, knowledge of food science, food preservation, food-related laws, food trends. Experience in food systems management, including recipe development, layout and design, food equipment, and sanitation were also observed. This area may further expand with organizations practicing sustainability.

Nutrition education programs often include hands-on food preparation. In a study by Reinhardt and Cason (2006), one group of students prepared a recipe and another group of students prepared a dish by selecting ingredients from the contents in a pantry and then created and prepared a recipe. The instructor for this type of instruction, preferably a RD, would require food preparation and cooking skills (Reinhardt & Cason, 2006). Canter et al. (2007) explains that regardless whether a RD's position is clinical, in the community, in foodservice, or in more nontraditional settings, the RD that is competent in understanding food and food preparation will be more effective in helping consumers to see the connection between food and good nutrition (Long & Barrett, 1999).

IMPLICATIONS FOR DIETETIC EDUCATION

A small personal collection of cooking illiteracy and challenges among dietetics students includes, students who have never used a sharp knife or peeled a potato, students afraid of turning on a mixer, and those unfamiliar with food processors. One student asked if celery was broccoli while another was unaware about putting water in a double boiler. Additional instruction has been required for onion skin removal prior to chopping. Separating eggs has been misinterpreted as putting a shelled egg on one side of the bowl and the second egg on the other side of bowl. A recipe requiring soda has been met with a can of soda pop. Another student informed the instructor the candy thermometer had not reached 300°F when the thermometer was actually reading 500°F.

Some students actually *do* know how to prepare several food items and correctly identify foods. However, in a classroom of students with varied cooking skills, the instructor must decide whether to hold back those that can cook to allow time to teach others, or to require the non-cooking students to learn cooking skills on their own time.

Dietetic educators are continually challenged to incorporate more information about food, nutrition, and management to enhance the competence of entry-level dietitians (Scheule, 2000, Marisco, Borja, Harrison & Loftus, 1998). Adding a beginning cooking class to the curriculum may exceed the maximum number of credit hours. Another recommendation is to include basic cooking skills in a current course and remove other information. However, removing course material related to accrediting standards has to be avoided. Some schools offer a food science courses that develops basic cooking competencies (Begley & Gallegos, 2010). Other programs offer general meal management courses. These classes are appropriate electives, but the impact on cooking illiteracy would depend on students selecting these courses.

Another solution to the cooking illiteracy dilemma is the addition of a cooking competencies for all dietetic students with remedial work for those unable to pass the competency requirements before progressing to upper-level dietetic courses. Such competencies can be determined using different techniques such as videos of cooking techniques with pre and post exams. In my attempt to utilize purchased culinary videos in the classroom, the students felt some of

the skills presented were not applicable to the cooking conducted in class.

Lichtenstein and Ludwig (2010) suggested bringing back home economics; however, it is too late for our current college students. A recommendation for those students without a home economics background is to incorporate it into required food service management classes. Lichtenstein and Ludwig (2010) suggest combining classroom instruction, field trips, and demonstrations to make meal preparation and training manageable instead of being an intimidating and overwhelming task for the students. Young adults, in this case dietetic students, need to be taught to embrace modern conveniences like pre-washed salad greens, while avoiding prepared foods. Students need to learn to prepare meals that are quick, nutritious, and also tasty. Lichtenstein and Ludwig (2010) state in order to increase sales of convenience items, the food industry aggressively promotes the idea that cooking takes too much time and skill, and that food is either nutritious or delicious but not both. This is a difficult misconception to overcome but RDs, if persistent, can promote that cooking from scratch can be quick and nutritious.

As shown, the challenges facing dietetics and food management programs are multi-faceted. Hands-on food preparation classes are expensive to operate and lab space often limits the number of students who can be accommodated. A major challenge facing many university programs is outdated and poorly equipped facilities for teaching food classes (Canter et al., 2007). Due to limited resources, cooking demonstrations may be a reasonable way to reach larger audiences. Another solution is to teach students cooking skills by demonstration from the class instructor; then students demonstrate to the class one of the learned skills. Currently, I am having dietetic students learn a skill and then teach their partner the skill they have learned. The partner will then demonstrate the skill to the instructing partner. These demonstrations are being videotaped and viewed by the entire class. Future classes will utilize these videos to learn the necessary basic cooking and food preparation skills in the beginning of the semester.

Some skills being videotaped are shown in Table 1. The students have been given a pretest and will take a posttest at the end of the semester to determine the effectiveness of the demonstrations and classroom instruction. However, the impact will likely be less effective than hands on cooking classes (Levy & Auld, 2004).

University programs can also consider sponsoring alternative spring break opportunities to increase their knowledge and skills utilizing resources within the state or regions while earning college credit (Canter et al., 2007). Another solution is for dietetic students to learn cooking skills from a chef in a class emphasizing basic cooking skills with students planning and preparing a meal at the end of the week. This class relieves the dietetics professor from the duty, however also control of the course content (Canter et al., 2007, Condrasky & Griffin, 2007).

Cooking with a Chef: A Culinary Nutrition Program with College-Aged Participants (Warmin & Condrasky, 2009) incorporated a chef delivering culinary sections of the class and a RD presenting nutrition information. The results of this program showed an increase in self-efficacy in cooking, cooking techniques, an increase in fruit and vegetable use, and an increase in the knowledge of culinary terms and cooking techniques.

I am currently adjusting class assignments and spending more time on food identification and the combination of foods in Food Systems I. When writing a two week cycle of regular menus for a hospital in my previous classes I found students were unfamiliar with common vegetables and were unable to combine foods into an acceptable meal. Instead of a two week cycle menu this semester, I am assigning a one week cycle menu. After class discussion of food categories and varieties of foods, I will have the students assemble foods as meals that follow the principles of good menu writing. I am also incorporating an illustrated book of foods by category to assist the students in identifying and learning about foods. An assignment will be written to familiarize the students with fresh fruits, vegetables, and meats.

Table 1. Demonstrations of Cooking and Food Preparation Skills

Demonstration/ Return Demonstration	Demonstration/Return Demonstration
Proper knife use Peel potato, onion, carrot/slice, chop, dice	Operation of a steamer Operation of a steam jacketed kettle
Operation of a food processor Operation of a stand mixer 5 qt and 20 qt	Crack and separate eggs Roll out biscuits and pie crust
Sanitizing Procedures Clean up procedures	Operation of the dish machine Setting up 3 compartment sink
Interactive tour of the kitchen and pantry	Selecting proper serving utensils Proper serving techniques on the steam table
Proper glove use Using a can opener Proper use of a food scale Measuring dry and liquid ingredients	Properly setting a table Proper serving techniques in the dining room
AP/EP Calculations	Fruit and vegetable garnishes
Costing recipes	Extending and decreasing a recipe
Proper use of food thermometers Cooking meats	Operation of a steam table Operation of a slicer

I am currently determining the percentage of educators who have changed their methods of instruction for students in regard to student cooking skills and food knowledge. I intend to share the results with educators to explain the methods of instruction that have been implemented by others to adjust to the food knowledge and cooking skill of today's dietetic students.

Current research does not indicate which teaching methodologies are most effective for teaching dietetic students cooking skills. Requiring students to watch cooking videos and to pass a posttest before they begin their upper level dietetic classes would be an effective way of ensuring food knowledge and cooking skills. This methodology will be most efficient, cost effective, and appropriate for dietetic educators to use.

CONCLUSION

The aspiration of the profession is: "The public trusts and chooses Registered Dietitians as food and nutrition experts" (ADA, 2008b). It is the responsibility of the dietetic educator to prepare students for the challenges they will face as an RD regardless of their specialty. Integrating "cooking from scratch" as a mandatory competency and integrated into educational curricula is recommended. Julia Child stated 'it is essential that every dietitian and nutritionist also be a reasonably good cook, and that the culinary arts be a fundamental part of their curriculum' " (Canter et al., 2007, p.315). Once dietetic

students have learned to cook from scratch then they may have the luxury of using appropriate pre-prepared products in their cooking. We need to address the cooking illiteracy that is common today to ensure dietetic students have food knowledge and cooking skills.

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