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RESEARCH CONTRIBUTIONS:

PEDAGOGY CONTRIBUTIONS:

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LETTER FROM THE EDITORS

JOURNAL OF FOODSERVICE
MANAGEMENT & EDUCATION

Welcome to the Journal of Foodservice Management & Education. We are pleased to highlight some significant changes for the online Journal including a fresh look and outlay to support the needs of diverse constituents. The Editors applaud the backing of the Journal by the Foodservice Systems Management Education Council (FSMEC) and National Association of College and University Food Services (NACUFS) who jointly seek to support educators, researchers, operators, and students with current research and effective teaching strategies in foodservice systems management and education. Current topics span healthcare food and nutrition services, college and university dining and strategies in the classroom.

The subject of job satisfaction shares a long and rich history in organizational behavior research. Job satisfaction is also an integral element to the service industry, emphasizing research that examines employee satisfaction in foodservice operations. Using both qualitative and quantitative techniques, Chmel and Colleagues have extended this field of research by examining relationships between job satisfaction and respect among food and nutrition service employees in an academic medical center.

Additional research contributions elaborate on the college and university dining environment. Ying and Barrett used the Theory of Planned Behavior to describe director's beliefs and attitudes about solid waste management programming in their operations. Rajagopal and Strohbehn report the views of college and university foodservice directors about food allergen policies.

The objective of the *Pedagogy Contributions* section is to improve and advance foodservice education. As such, we are pleased to introduce two unique manuscripts in this section of the Journal. Haynes outlines the justification and process of creating a commercial foodservice laboratory at Eastern Kentucky University. Rajagopal and Strohbehn provide guidelines to the innovative approach of using podcasting to enhance food safety education for college students.

Publishing the Journal requires the work and dedication of many professionals who take the time to write, review, comment, and edit the many submissions received. Thank you to the authors who strive to give back to the profession in many ways. In addition, thank you to the many reviewers to take the time to provide of their expertise to assure the soundness of the manuscripts accepted for publication. Finally, we would like to thank Dr. Bonnie Gerald, previous editor of the Journal, who laid the foundation and provided the many hours required to facilitate all the processes necessary to publish this work.

It has been a wonderful pleasure getting the Journal to this point in the past year and we look forward to a productive journey ahead. Thank you all.

Cordially,

Kevin R. Roberts, PhD
Co-Editor

Kevin L. Sauer, PhD, RD
Co-Editor

ABSTRACTS

Research Manuscripts

Academic medical center food and nutrition services employees' perceptions of respect influence their job satisfaction

A cross-sectional research design consisting of three focus groups and completion of a 52-item questionnaire (n = 148, 59% response) captured participants' perceptions of respect and compared it to their job satisfaction. Research participants reported perceiving the greatest level of respect from their coworkers, as compared to their supervisors and customers. Mean satisfaction responses indicated some level of job satisfaction. Respect and job satisfaction measures were significantly correlated ($p < .01$). The strongest relationship existed between employees' perceived respect from coworkers and current job satisfaction ($r = .61$). Respect from coworkers and supervisors helped to predict employee's job satisfaction ($r^2 = .47$).

Beliefs underlying intention to implement sustainable waste management programs in college and university foodservice operations

The purpose of this study was to use the Theory of Planned Behavior to determine NACUFS members' beliefs about the implementation of solid waste management programs in their operation. An e-mail instrument was developed through reviewing the literature, conducting focus groups, and administering a pilot study. The population was members of NACUFS who had e-mail addresses listed in the 2009 Membership Directory; the response number was 212 (13.5%). A majority of respondents had positive attitudes about implementation and important others included superiors, university administration and students. Barriers to implementation were time, money, and resources.

Views of college and university dining directors on food allergen policies and practices in higher education settings

Ninety-five college and university (CU) dining directors provided information through a web-based survey about present policies towards handling food allergens, incidences of food allergy reactions on their campuses, and their views towards developing policies and training for handling food allergies in CU dining settings. The survey indicated an absence of uniform food allergy policies across CU dining services in the United States. CU dining directors acknowledged the need for development of standard policies for handling food allergies and training programs specific to handling food allergens in CU dining settings.

Pedagogy Contributions

An academic justification for creating a commercial foodservice laboratory kitchen in the Department of Family and Consumer Sciences

A state of the art commercial foodservice laboratory kitchen was constructed in the Department of Family and Consumer Sciences at Eastern Kentucky University in summer 2010. Originally proposed in 2003, this project could not have been realized without the concerted effort of faculty of the department, the Chair of the Department, the Dean of the College of Health Sciences, the Provost of the university, the Associate Vice President for Capital Planning, the Director of Facilities Services, and others.

The intellectual justification for the project is based upon a review of related literature that supports the use of scarce resources to develop an up to date commercial foodservice teaching laboratory. The completed project features equipment, technology, and designs that are efficient, mobile, versatile, modular, and environmentally sustainable. Equipment that is EPA Energy Star approved was purchased. The ventilation hood system is automatic, increasing air flow in stages as heat production is detected, and saves energy by reducing fan speeds during idle periods. Some pictures of the completed project are included.

Student attitudes toward podcasting for food safety education: An example-based approach

Podcasting has recently emerged as a major technological invention and has been immensely popular with applications in entertainment and education. This study aimed at determining the attitudes of hospitality management students toward the use of podcasting as an instructional tool in a food safety course. Student attitudes toward using podcasting as an instruction tool were positive. Colleges and universities can use podcasting as a tool for instruction in their on-campus and distance education courses. However, faculty should clearly delineate educational objectives and familiarize themselves with technology operational procedures before podcasting can be successfully incorporated in the classroom.

Research Contribution

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ACADEMIC MEDICAL CENTER FOOD AND NUTRITION SERVICES EMPLOYEES' PERCEPTIONS OF RESPECT INFLUENCE THEIR JOB SATISFACTION

Elizabeth A. Chmel, MS, RD[1]; Mary B. Gregoire, PhD, RD, FADA[2]*;
Linda Lafferty, PhD, RD, FADA[3]; Marcelle Stone, MEd, RD[4]

[1]Consulting Dietitian, Loyola University Health Center, Maywood, IL 60153, USA
[2]Professor and Director of Food & Nutrition Services, Rush University Medical Center, Chicago, IL 60612, USA
[3]Associate Professor and Dietetic Internship Director, Rush University Medical Center, Chicago, IL 60612, USA
[4]Instructor and Assistant Director, Foodservice Operations, Rush University Medical Center, Chicago, IL 60612, USA

ABSTRACT

A cross-sectional research design consisting of three focus groups and completion of a 52-item questionnaire (n = 148, 59% response) captured participants' perceptions of respect and compared it to their job satisfaction. Research participants reported perceiving the greatest level of respect from their coworkers, as compared to their supervisors and customers. Mean satisfaction responses indicated some level of job satisfaction. Respect and job satisfaction measures were significantly correlated ($p < .01$). The strongest relationship existed between employees' perceived respect from coworkers and current job satisfaction ($r = .61$). Respect from coworkers and supervisors helped to predict employee's job satisfaction ($r^2 = .47$).

Keywords: Respect, Job Satisfaction, Satisfaction, Hospital Foodservice

INTRODUCTION

Employee job satisfaction literature, dating back to works by Karl Marx (1848), remains an important topic today due to its impact on employee commitment, customer satisfaction, service quality, job knowledge, and quality of life (Andersen, Lodish, & Weitz, 1987; Gilmore & Bierman, 1999; Weiss, Dawis, England, & Lofquist, 1967). Harter, Schmidt, and Hayes (2002), in their meta analysis of 42 studies on job satisfaction, suggested that improved employee satisfaction resulted in greater customer satisfaction and service quality. Specifically, utilizing university foodservice employees as a study sample, Gilmore and Bierman's (1999) research found that as respondents' level of satisfaction increased, service quality perceptions also increased.

A variety of factors may contribute to or predict an employees' job satisfaction. Saari and Judge's (2004) article explored the causes of employee attitudes, results of positive and negative job satisfaction, and the different ways to influence employee attitudes, acknowledging that an organization can indirectly influence employee perceptions of their environment and attitude. A variety of factors, such as employee job characteristics, work environment, disposition, culture, and home environment, contribute to an employees' job satisfaction (Cortina, Magley, Williams, & Langhout, 2001; Duke & Sneed, 1989; Graham & Unruh, 1990; Gray, Niehoff, & Miller, 2000; Kickul & Liao-Troth, 2003; Nelson, 2006; Roustang, 1977; Weiss, Dawis, England, Lofquist, 1967; Scarpello & Campbell, 1983). Sneed and Herman (1990) and Chong, Unklesbay and Dowdy (2000) are the only authors who have published research exploring job satisfaction of hospital foodservice employees. Their results suggested that characteristics of the job and the nature of the work performed influenced employee's satisfaction.

*Corresponding Author: Phone: (312) 942-5297; E-mail: Mary_Gregoire@rush.edu

The concept of respect, cited within the literature as workplace fairness, appreciation, interactional justice, and civility, has begun to be examined as a potential contributor to job satisfaction. Although many authors have cited the importance of providing respect to others and encouraging subordinates to respect one another, few authors have been able to provide a uniform definition for respect (Bettencourt & Brown, 1997; Dillon, 2007; Darwall, 1977). Bettencourt and Brown (1997) reported a positive relationship between workplace fairness and bank teller's job satisfaction. McGuire, Houser, Jarrar, Moy, and Wall (2003) investigated retention of allied health (physical therapy, radiology, and medical technology) employees and concluded that respect was one of the attributes that impacted employee satisfaction and retention. Laschinger and Finnegan's (2005) research with nurses found respect to have a direct effect on organizational trust, which in turn, affected job satisfaction.

Research on respect and the relationship between respect and job satisfaction has not been reported with foodservice employees. The purpose of this research was to begin an exploration of these concepts with hospital foodservice employees. The objectives were to: determine hospital food and nutrition employees' definition of respect, quantify food and nutrition employees' perceived level of respect, and examine the relationship among employees' current perceived respect and job satisfaction.

METHODS

A cross-sectional research design study, consisting of three focus group discussions and completion of a 52-item questionnaire, ensued following review and approval by the academic medical center's Institutional Review Board. Participants included food and nutrition services employees at one large, Midwest, urban academic medical center. The 676-bed, non-for-profit, academic medical center's food and nutrition department includes more than three hundred employees ranging from clinicians (dietitians, diet technicians), faculty, and employees in three separate foodservice operations (patient meal service, retail foodservice, and club/conference).

Three separate one-hour focus group sessions with eight, six, and four employees, respectively, were conducted to gain a better understanding of foodservice employee's definitions and beliefs about the construct of respect to help assure that the questionnaire used in this study represented employee perceptions about respect. Three focus groups, a number typical for focus group exploration (Borra, Goldberg, & Tuttle, 2008), resulted in consistent, similar statements that were later coded into 16 areas of exploration. Had the three focus groups not resulted in similar, consistent responses, additional focus group sessions would have been held. Focus group members were representative of a variety of demographic characteristics of food and nutrition services employees at the medical center (gender, job responsibilities, and length of

employment). Employees, who might be willing to express opinions in a group setting, were suggested by supervisors and approached by the researcher to ask their willingness to participate. All employees who indicated an interest and willingness to participate in a focus group session over their lunch period were included. Prior to focus group participation, focus group members were provided with a description of their responsibilities for the session, notified they would receive a free lunch, entered in a raffle, and asked to give written consent.

Several steps were taken to assure employee confidentiality. Employees were referred to by a name of their choosing that was not their own, sessions were moderated by two trained human resource managers, and each session was tape recorded and transcribed by a research assistant. Focus group discussion areas of inquiry defined respect unique to the food and nutrition services employees and further depicted examples of respect (or lack of respect) within the workplace.

The questionnaire contained 38 respect items, six job satisfaction items, and eight demographic items. Themes from focus group discussions were used to assist in respect questionnaire item development and inclusion; respect constructs were divided into perceived respect from supervisors, coworkers, and customers. Questionnaire respect items included statements from the previously validated forms including the Workplace Incivility Scale (Bettencourt & Brown, 1997) and Perceptions of Fair Interpersonal Treatment Scale (Donovan, Drasgow, & Munson, 1998). Questionnaire items were developed by the researchers for focus group discussion themes not found within previously developed questionnaires. Job satisfaction with supervisors, coworkers, work, pay and benefits, and opportunity for promotions was assessed using statements developed and validated within Sneed's (1988) foodservice research.

Demographic information such as age, gender, current job title, length of employment at the medical center, job history, and previous job satisfaction constituted the final section of the questionnaire. The final questionnaire was reviewed and validated by a team of three foodservice researchers, three foodservice managers and a pilot study with 21 food and nutrition services employees

Based on pilot test feedback, the original interrogative rating scale (yes, no, and unsure) for rating the respect and satisfaction items was changed to a seven-point Likert scale; respect responses ranged from 1, strongly disagree to 7, strongly agree and satisfaction responses ranged from 1, extremely dissatisfied to 7, extremely satisfied. Questionnaire incentives were adjusted from inclusion in a raffle to each respondent receiving a free cafeteria dessert coupon award for their participation.

Questionnaires were color coded and distributed separately to each food and nutrition services unit (patient foodservice, retail foodservice, club operations, clinical nutrition (clinical dietitians, diet technicians), and administrators/faculty) to facilitate result comparison among units. Result comparison between units was relevant due to the potential differences between different work environments and managers. Distribution methods included: distribution with paychecks with an envelope for return of questionnaire to researcher (retail), administration at a team meeting (club and clinical nutrition), research assistant administration to groups of employees (patient foodservice), and placed in mailbox with envelope for return (faculty). Confidentiality was assured to each employee as no individual identifying information was included on the questionnaire, managers did not see the individual questionnaires, and questionnaires were returned in sealed envelopes to the research assistant.

Data were analyzed using SPSS (Windows Version 17.0, 2008). Descriptive statistics, including means, frequencies, and standard deviations, were computed for all variables. Ratings for respect items were collapsed into three scores (respect perceived by supervisor (s), coworker (s), and customers) by averaging the ratings for each. A combined job satisfaction score was created by averaging ratings for the five job items (satisfaction with supervisors, coworkers, work, pay and benefits, and opportunity for promotions). Cronbach's alpha values were calculated to determine internal consistency of the respect and satisfaction scores. Pearson's correlation and stepwise linear regression were used to explore possible relationships among the job satisfaction and employee respect scores. Analysis of variance examined respect and job satisfaction scores based on demographic information.

RESULTS

A total of 148 questionnaires (59%) were completed and returned by food and nutrition services personnel. Respondents ranged in age from less than 25 years old to older than 65; the majority of respondents were female (73%). Foodservice support employees were the most predominant group of study participants (62%), many of the participants had worked at the medical center for more than five years (55%), and a majority held less than five jobs prior to their current position (86.9%).

Respect

Throughout the focus group sessions, displaying reciprocal amounts of respect, understanding and valuing differences, equal work distribution, and expressions of appreciation reappeared as themes in the discussion. Following are examples of two focus group responses, utilized in questionnaire development:

> "Not letting color, the way you dress, things of that nature affect or influence how I respect or why should I respect you."

> "respect (is) everybody to work together and feel the love… everyone work together."

Participants, responding to the questionnaire rated their perceived respect on a seven-point Likert scale (1, strongly disagree to 7, strongly agree). Respondents perceived the highest respect from coworker behaviors, such as: (1) coworkers greeting each other (m = 5.55), (2) treating each other with respect (m = 5.37), and (3) talking politely to each other (m = 5.36). The highest rated supervisor behaviors included: (1) my supervisor talks politely to me (m = 5.04), (2) is courteous (m = 5.03), and (3) appreciates my efforts by saying thank you or offering another reward (m = 4.87). In general, ratings related to respectful behaviors among coworkers were higher than respect ratings for supervisor behaviors. Items rated less than a 4, suggesting disagreement, were often negative behaviors such as: (1) my supervisor(s) ignore(s) me (m = 2.54), (2) talk(s) down to me (m = 2.94), and (3) talk(s) in a negative tone of voice, loudly, or yells (m = 2.98).

Ratings for individual items were averaged to create three respect scores: FNS supervisors, FNS coworkers, and customers. Cronbach's alpha values confirmed the internal consistency and reliability for each of the three respect scores (FNS supervisor = .96, FNS coworkers = .91, customers = .71). Mean scores for each construct ranged from 4.82-5.25, with respect perceived from customers scoring the highest.

Analysis of Variance was used to explore whether respect construct

scores differed based on demographic information (age, gender, unit, job title, and length of employment). Differences were found most notably by unit and job title (see Table 1). Patient foodservice employees and employees in foodservice support positions rated all three respect constructs significantly lower whereas clinical nutrition and professional employees provided the highest ratings. Ratings for the supervisor respect score also differed by age and gender with older employees perceiving more respect from supervisors than younger employees and females perceiving more supervisor respect than males.

Job Satisfaction

Respondents rated five job satisfaction items and their overall job satisfaction on a seven-point Likert scale (1, extremely dissatisfied to 7, extremely satisfied). Mean satisfaction ratings all were greater than 4 (m = 4.58 – 5.49) suggesting some level of job satisfaction for all items. Employees responded that they were most satisfied with their work (m = 5.49) and least satisfied with their opportunities for promotion (m = 4.58) and supervisors (m = 4.72).

Ratings for the five satisfaction items (satisfaction with supervisor, coworker, work, pay, benefits) were averaged to create a combined satisfaction score. Cronbach's alpha value (.89) confirmed a strong internal consistency and reliability for the score. Both the single item (overall job satisfaction) and the combined satisfaction score (averaging of five job component ratings) were used to evaluate job satisfaction because research results are inconclusive on which is a better measure of overall job satisfaction (Saane, Sluiter, Verbeek, & Frings-Dresen, 2003; Scarpello & Campbell, 1983). In this study, the mean employee rating for the statement, overall satisfaction (m=5.30) was similar to the combined job satisfaction score (m=5.11)

Few differences were found when exploring the overall job satisfaction rating and the combined job satisfaction score based on respondent demographics (age, gender, unit, job title, and length of employment at the academic medical center) with analysis of variance (Table 1). Differences existed in length of employment for both satisfaction scores; those who had been employed at the medical center five to 10 years had significantly lower satisfaction (m = 4.44) ratings than others. A significant difference existed between employee age for only the combined satisfaction score; those greater than 55 appeared most satisfied with their jobs (m = 5.84).

Relationship between Respect and Job Satisfaction

A Pearson's correlation and stepwise linear regression analysis confirmed ($p < .01$) a relationship between the three respect construct scores (respect perceived by supervisors, employees, and customers) and the two satisfaction measures (combined satisfaction score and overall satisfaction item) (Table 2). The degree of relationship for many of the correlations was moderate. The strongest relationships (r = .711 - .850) existed between the job satisfaction items (supervisors, co-workers, work, pay and benefits,

Table 1. Comparison of Food and Nutrition Services Participant Satisfaction Ratings by Demographic

			FNS Supervisors[f]		FNS Coworkers[f]		Customers[f]		Overall Satisfaction[f]		Combined Satisfaction[f]	
	Respondents		Mean[abc]	SD[bc]	Mean[abc]	SD[bc]	Mean[abc]	SD[bc]	Mean[ae]	SD[e]	Mean[ade]	SD[de]
Age												
< 25	10	7.3%	3.66^{y}	1.37	4.82	1.04	5.40	1.74	5.90	.74	5.28^{x}	1.02
25-34	38	27.7%	4.05^{z}	1.36	4.93	.96	5.29	1.49	5.35	1.60	5.14^{x}	1.04
35-44	27	19.7%	4.12^{y}	1.56	5.03	1.05	5.44	1.58	5.81	1.08	5.10^{x}	1.40
45-54	39	28.5%	4.81^{x}	1.20	4.34	1.33	4.71	2.03	5.00	1.86	4.68^{z}	1.60
≥ 55	23	16.8%	5.39^{x}	.83	5.09	.86	5.74	.99	5.65	1.7	5.84^{y}	.69
Gender												
Male	38	27.3%	4.03^{x}	1.33	4.58	1.17	5.21	1.70	5.42	1.59	4.72	1.55
Female	101	72.7%	4.98^{y}	1.38	4.90	1.08	5.23	1.62	5.33	1.66	5.20	1.25
Unit												
Patient Foodservice	83	55.7%	4.09^{z}	1.33	4.49^{y}	1.16	4.78^{x}	1.76	5.00	1.83	4.69	1.38
Clinical Nutrition	21	14.1%	6.22^{x}	.52	5.61^{x}	.51	6.24^{z}	.76	6.00	.78	5.90	.79
Club	20	13.4%	5.01^{y}	1.03	5.17^{y}	.56	5.93^{x}	.69	5.95	.85	5.58	.85
Retail	18	12.1%	4.87^{y}	.96	4.62^{z}	1.33	4.92^{x}	1.86	5.17	1.95	5.18	1.32
Faculty	7	4.7%	5.94^{x}	.65	5.30^{y}	.77	6.00^{y}	.64	5.71	1.38	5.43	1.43
Job Title												
Foodservice Support	86	61.9%	4.21^{x}	1.28	4.90^{y}	.13	4.90^{x}	1.78	5.46	1.61	4.94	1.41
Professional	19	13.7%	6.08^{y}	1.07	6.24^{z}	.13	6.24^{y}	.61	5.74	1.00	5.61	1.03
Patient Support	15	10.8%	5.23^{z}	1.26	5.59^{x}	.81	5.59^{z}	1.26	5.00	2.43	5.44	1.33
Management	12	8.6%	5.76^{y}	1.11	5.71^{y}	.32	5.71^{y}	1.42	4.58	1.56	4.53	1.33
Clerical Support	7	5.0%	4.57^{x}	1.20	5.00^{x}	.19	5.00^{x}	1.50	5.00	1.16	5.03	.85
Length of Employment												
0-4 years	53	42.4%	4.68	1.51	4.75	1.05	5.50	1.35	5.67^{x}	1.22	5.20^{y}	1.18
5-10 years	35	30.3%	4.56	1.49	4.54	1.33	4.81	1.83	4.83^{y}	2.10	4.44^{z}	1.67
> 11 years	29	24.8%	5.29	1.20	5.16	.90	5.25	1.91	5.83^{z}	1.00	5.68^{y}	.77

[a] Different superscripts (^{x,y,z}) in rows indicate differences between means ($p < .05$) using analysis of variance to test pairwise differences.

[b] Respect construct scores calculated by averaging respect items

[c] Respect scale: 1, strongly disagree, 2, disagree 3, somewhat disagree, 4, neither disagree nor agree, 5, somewhat agree, 6, agree, 7, strongly agree

[d] Combined satisfaction calculated by averaging satisfaction items: Satisfaction with... Supervisors, Coworkers, Pay and Benefits, Workers, and Opportunities for Promotion

[e] Satisfaction scale: 1, extremely dissatisfied 2, dissatisfied 3, somewhat dissatisfied, 4, neither satisfied nor dissatified, 5, somewhat satisfied, 6, satisfied, 7, extremely satisfied

[f] Respondents: Total n = 149; n varies = mean +/- SD

Table 2. Correlations among Job Satisfaction and Respect

	Perceived Respect from…			*Satisfaction with…*					
	FNS Supervisors	FNS Coworkers	Customers	Supervisors	Coworkers	Work	Pay and Benefits	Opportunities for Promotion	Overall Satisfaction
Perceived Respect from…									
FNS Supervisors									
FNS Coworkers	.418**								
Customers	.550**	.589**							
Satisfaction with…									
Supervisors	.694**	.397**	.422**						
Coworkers	.311**	.686**	.389**	.417**					
Work	.405**	.523**	.410**	.417**	.586**				
Pay & Benefits	.317**	.438**	.341**	.359**	.502**	.758**			
Opportunities for Promotion	.366**	.451**	.357**	.482**	.463**	.671**	.680**		
Overall Satisfaction Rating	.343**	.418**	.314**	.548**	.438**	.652**	.641**	.666**.	
Combined Satisfaction Score	.544**	.613**	.489**	.711**	.713**	.843**	.827**	.850**	.738**

**p < .01

opportunities for promotion) and combined job satisfaction score, which was not unexpected as the combined score was an average of those five job satisfaction items. Significant, moderate (r = .31 – .694) correlations existed among the respect construct scores and job satisfaction item ratings and score; the strongest relationships were found between the FNS supervisor respect score and satisfaction with supervisor rating (r = .694), FNS coworker respect score and satisfaction with coworkers rating (r = .686), and the combined job satisfaction score and the FNS co-worker respect score (m = .613).

A regression analysis was conducted to examine the impact of respect on job satisfaction. Respect scores for coworkers and supervisors were significant but the model explained little of the variation in overall employee job satisfaction (r^2 = .20) (Table 3). The regression model was much stronger for the combined satisfaction score, with supervisor respect and coworker respect better predicting the combined job satisfaction score (r^2 = .47) (Table 3).

DISCUSSION

Very few authors have attempted to define respect as it relates to a particular study sample. As focus group discussions revealed, varying opinions regarding the exact actions/behaviors that constitute respect existed among food and nutrition services employees. Such findings are consistent with previous research the lack of uniformity in perceptions about respect (Ellingsen & Johannesson, 2008; Graham & Unruh, 1990; Roustang, 1977; Saari & Judge, 2004; Scarpello & Campbell, 1983; Cortina, Magley, Langhout, & Williams, 2001; Duke & Sneed, 1989; Kickul & Liao-Troth, 2003; Gray, Niehoff, & Miller, 2000; Weiss, Dawis, England, & Lofquist, 1967; Spector, 1997; Crede, Chernyshenko, Stark, Dalal, & Bashshur, 2007).

Table 3. Regression Analysis of Respect Constructs Predicting Overall Job Satisfaction Rating and Combined Job Satisfaction Score

Step	Variable	Model R^2	Entry F
Predicting Overall Job Satisfaction rating[b]			
1	FNS Coworker Respect[c]	.166	27.899***
2	FNS Supervisor Respect[c]	.201	17.524***
Predicting Combined Job Satisfaction score[a]			
1	FNS Coworker Respect[b,c]	.366	82.519***
2	FNS Supervisor Respect[b,c]	.467	62.229***

[a] Responses to the satisfaction ranged from: 1, extremely dissatisfied, 2, dissatisfied, 3, somewhat dissatisfied, 4, neither satisfied nor dissatisfied, 5, somewhat satisfied, 6, satisfied, 7, extremely satisfied

[b] Combined satisfaction includes an average of satisfaction ratings for: Supervisor, Coworker, Work, Pay & Benefits, and Opportunities for Promotion

[c] Responses to respect items ranged from: 1, strongly disagree, 2, disagree, 3, somewhat disagree, 4, neither agree nor disagree, 5, somewhat agree, 6, agree, 7, strongly agree

Focus group discussions provided valuable feedback regarding food and nutrition services employees' perceptions of respectful behaviors within the workplace. Common themes included employees' appreciating when supervisors: are sensitive to their needs and concerns, treat all workers fairly and equally, talk politely, and provide timely feedback. Theses definitions are consistent with published definitions (Dillon, 2007; Darwall, 1977; Hudson, 1980; Bettencourt & Brown, 1997), stating that courtesy and civility, fair communication, interpersonal treatment, and a "no surprises" approach enhance an employees' emotional attachment to their organization (Bettencourt & Brown, 1997). The focus on Dillon's (2007) sub-category of respect, recognition respect, within this research, as compared to appraisal, directive, and evaluative respect, was supported by participant responses. Negative behaviors mentioned throughout focus group sessions, 'scolding an employee in front of everyone' and 'talking negatively to someone', confirmed Dillon's (2007) classification of similar behaviors, such as humiliating, degrading, debasing, denigrating, or demeaning a person, as disrespectful and potentially destructive behaviors.

Sixty-four percent of participants in this research agreed that their supervisor appreciated their efforts by saying thank you or offering another reward' (m = 4.87). This differs from a recent Gallup Poll report (Nelson, 2006), revealing that 65% of employees attested that they did not receive a word of praise or recognition and also, a U.S. Department of Labor statistic (Nelson, 2006), revealing that lack of appreciation is the number-one reason employees leave their jobs.

Similar to Sneed's (1988) research examining the relationship between school foodservice supervisor and employee perceptions of job characteristics and job satisfaction, employees in this study revealed being satisfied with their work and coworkers and least satisfied with their opportunities for promotion. However, differing from Sneed's (1988) research, where participants rated satisfaction with supervision highest, participants within this research rated satisfaction with their supervisors lower than their satisfaction with work, coworkers, and pay.

The significant moderate correlation found in this study between employees' respect perceptions and their current job satisfaction

supports prior research in other, nonfoodservice types of work (Nelson, 2006; Saari & Judge, 2004, Bettencourt & Brown, 1997; Cortina, Magley, Langhout, & Williams, 2001; Kickul & Liao-Troth, 2003; Laschinger & Finegan, 2005; Pearson & Porath, 2004; Cropanzano, Prehar, & Chen, 2002; Graydon, Kasta, & Kahn, 1994; Wiley, 1997). Bettencourt and Brown (1997) reported a positive relationship between respect, workplace fairness, and bank teller job satisfaction (Bettencourt & Brown, 1997). Additionally, Laschinger and Finegan (2005) concluded that greater nursing job satisfaction was associated with structurally empowering conditions, where employees felt that their managers were more likely to treat them with concern for their well-being. Lastly, Graham and Unruh (1990) reported a positive relationship between appreciation and job satisfaction of medical technologists.

Mean satisfaction responses regarding employees' previous jobs were somewhat lower (m = 4.72) than their current job satisfaction, suggesting that employees may be more satisfied with their position at their current academic medical center as compared to prior employment. However, overall job satisfaction was significantly ($p < .05$), but only minimally related to satisfaction with previous employment ($r = .203$). This differs from Saari and Judge's (2004) opinion, that job satisfaction, largely a dispositional factor, can only be minimally manipulated within the workplace.

As opposed to prior research denying a correlation between a single-item assessment of satisfaction and combined satisfaction (mean of the five individual satisfaction item ratings), the combined job satisfaction score by employees in this study was significantly correlated with overall satisfaction rating for employees in all units: (retail foodservice employees $p < .01$, $r = .928$; patient foodservice employees $p < .01$, $r=.650$), club/conference employee $p < .01$, $r = .835$; clinical nutrition employees $p < .01$, $r = .827$; and faculty $p < .01$; $r = .971$).

Several limitations to this study should be considered while examining results. The study included employees at only one facility, which limits generalizability of findings. Variation in response rate among units may be attributed to the various questionnaire distribution methods. Response rates were greatest when employees assembled together for a meeting to complete the questionnaire and lowest when distributed with paychecks.

Despite the limitations found within this study, constructive information regarding food and nutrition services employees' definition of respect, current perceived respect, and their current job satisfaction was obtained. Food and nutrition services employees' satisfaction responses were greater than four on a seven-point scale, suggesting some level of job satisfaction. Employees' response suggested respectful behaviors among coworkers and between employees and supervisors do occur but the frequency of occurrence could be improved. A relationship, as hypothesized, between employee perceptions of respect by supervisors and coworkers and their level of job satisfaction was confirmed by correlation and regression analysis results. Encouraging respect behaviors identified in this study should help to improve FNS employee satisfaction within this academic medical center.

CONCLUSIONS AND APPLICATIONS

Several opportunities for further research exist. Repeating this study in medical centers of different geographic regions, size, or management style would strengthen generalizability of study results. Further analysis of employees in different hospital departments may be needed to confirm the relationship found between employee perceptions of respect and job satisfaction. Additional separation and analysis of the relationship between job satisfaction and each category of respect (fairness, appreciation, interactional justice, and civility) would help to determine which entity of respect contributes most to employee satisfaction. Inclusion of additional demographic (cultural and upbringing) items may allow for further analysis and insight regarding the impact of cultural values on employee perceptions of respect. Lastly, further research examining the effectiveness of different in-service training techniques may be needed to help implement the results of the study, increasing respect behaviors within the workplace.

Concern with an employees' perceived level of respect in the workplace is an increasing problem within today's work environment (Kowalski, 2003; Farkas, Johnson, Duffett, & Collins, 2002; Nelson, 2006). Researchers in the department of food and nutrition services at one large, Midwest, urban academic medical center sought to define respect in the workplace and assess the relationship between an employee's perceived levels of respect and current job satisfaction. Other foodservice managers concerned with employees' perceived respect or job satisfaction may benefit from implementing a similar study to assess areas for improvement in their operations.

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Research Contribution

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BELIEFS UNDERLYING INTENTION TO IMPLEMENT SUSTAINABLE WASTE MANAGEMENT PROGRAMS IN COLLEGE AND UNIVERSITY FOODSERVICE OPERATIONS

Ying Zhou, MS[1]; Betsy Barrett, PhD, RD[2*]

[1]Catering and Conference Services Assistant Manager, The Ritz-Carlton, Guangzhou, Pearl River New City, Tianhe District 510623, China
[2]Associate Professor, Department of Hospitality Management & Dietetics, Kansas State University, Manhattan, KS 66506, USA

ABSTRACT

The purpose of this study was to use the Theory of Planned Behavior to determine NACUFS members' beliefs about the implementation of solid waste management programs in their operation. An e-mail instrument was developed through reviewing the literature, conducting focus groups, and administering a pilot study. The population was members of NACUFS who had e-mail addresses listed in the 2009 Membership Directory; the response number was 212 (13.5%). A majority of respondents had positive attitudes about implementation and important others included superiors, university administration and students. Barriers to implementation were time, money, and resources.

Keywords: Solid waste management, Theory of Planned Behavior, NACUFS

INTRODUCTION

Today, the rapid development of modern science and technology has allowed humans to use many of these technological conveniences to improve daily life. At the same time because of these improvements and population growth, humans are facing serious challenges of global warming, overrun of solid waste materials and environmental pollutants, natural resource depletion, biodiversity loss, decreased air quality, increase in acid rain, ozone depletion and many other critical environmental issues which need solutions to avoid long-term and irreversible damages to our climate (Goodland, 1995; Hedin & Likens, 1996; Last, 1993).

Along with the increasing number of environmental challenges and large quantities of energy demands, many have begun to be concerned about the environment and relate to it as the "Going Green" movement (Pyle, 2008). As a result, the concepts of sustainability have begun to gain momentum in various functions and activities in the hospitality and tourism industries (Micheal, 1999), and strategies for sustainable development are being adopted by governments, institutions, operations, and individual households (Citizens United for Renewable Energy and Sustainability [CURES], 2006; Eng & Siguaw, 1999; Morgan, 2007).

In general, sustainability is defined as maintaining a process over time to meet the needs of the present without jeopardizing the ability to meet the needs of the future (Tagtow & Harmon, 2008), and deals with quality of life in the social, economical, and ecological environments (Sumberg, 2008; Sustainable Measures, 2006). Many foodservice and hospitality operations have implemented sustainability programs that: (1) protect the environment, (2) provide better ways to meet customers' needs through "green" operations, (3) cut down waste and costs, (4) increase environmental related governmental policies and regulations, (5) gain more competition power for "green" markets, (6) boost employee morale, (7) limit risks, and (8) build a strong reputation and public relations (Enz & Siguaw, 1999; Morgan, 2007).

As hospitality operations, colleges and university foodservices have a unique opportunity to manage waste by using resources efficiently and effectively, collecting materials for recycling and reusing, and composting food wastes (Wie & Shanklin, 2001). These actions can assist them in enhancing their reputation while reducing costs and contributing to a better community. Most National Association of College and University Foodservice (NACUFS) members have realized their role in sustainability by conserving water and energy through waste management to include: (1) recycling, (2) grab-n-go packaging, and (3) food waste composting.

Kelly (2003) stated that the first step in starting a green program is to understand what sustainability is and is not because sustainability is a broad and complex term (Aber, Kelly, & Mallory, 2009). To date, few studies have been published that measure how NACUFS members are responding to sustainable waste management practices and the newly released Sustainability Guide published by NACUFS in September 2009. This guide offers assistance with sustainable implementation, sustainability best practices, the critical sustainability areas, questions to consider before making decisions or taking actions about sustainability programs, and important measures for assessing the effectiveness of sustainability programs (Boss, 2009).

College and university foodservice directors, assistant directors, managers, and others are playing an important role in environmental stewardship, yet they may not apply their knowledge to developing practical outcomes and solutions or are using the sustainability guide. Research to determine NACUFS members' current attitudes, subjective norms, barriers, and intention to implement sustainable waste management programs would be valuable to NACUFS members (Aber at al., 2009).

The primary purposes of this study were to ascertain what SWM programs have been implemented in college and university foodservice operations, and determine how NACUFS members' attitudes, subjective norms, and barriers affect the implementation of additional SWM programs based on the Theory of Planned Behavior (TPB). A secondary purpose was to identify the differences in intention to implement additional sustainable waste management programs based on characteristics of the respondents' age, size of facility, region of the country and if the facility had a sustainable waste management committee.

Hypothesis Development

Cotter (2007) stated that significant relationships were found between pro-environment behaviors and several factors, such as sense of responsibility, perceived control and knowledge about sustainability. Attitude and subjective norms about sustainability,

*Corresponding Author: Phone: (785) 532-2208; E-mail: ebb@ksu.edu

therefore, would influence "green movement" intentions based on Ajzen's (1991) Theory of Planned Behavior (TPB). It is believed that when NACUFS members have a positive attitude about implementing a sustainable waste management program, they will more likely "behave" by implementing a "sustainable waste management program." Also, if NACUFS members feel social pressure from others around them about sustainable development, they will more likely "behave" by implementing a "sustainable waste management program" (Chen, 2008).

Several authors have reported that college and university foodservices directors, assistant directors, managers, and others are facing specific barriers to implementing a sustainable waste management program due to lack of funding, lack of training, inability to purchase local products, lack of support, lack of interest of employees to change, lack of staff, tools, and time (Shanklin et al, 2003; University of Vermont, 2007). If NACUFS members perceive fewer barriers about sustainable development, then the intention to implement a sustainable waste management program could be higher. By contrast, if NACUFS members perceive more barriers, their intentions to implement a SWM program may be lower (Chen, 2008; Shanklin et al, 2003; University of Vermont, 2007). The following hypotheses, therefore, were constructed for the present study:

Hypothesis 1: NACUFS members' attitudes toward implementing a sustainable waste management program positively affect their intentions to implement a sustainable waste management program.

Hypothesis 2: Subjective norms of NACUFS members positively affect their intentions to implement a sustainable waste management program.

Hypothesis 3: The barriers of implementing a sustainable waste management program negatively affect NACUFS members' intentions to implement a sustainable waste management program.

METHODOLOGY

Sample Population

The population (N = 2,184), which excluded pilot study participants, for this study were members of NACUFS who have e-mail addresses listed in the 2009 NACUFS Membership Directory (NACUFS Membership Directory). Members in the directory were sorted by membership regions: Continental (n = 206), Northeast (n = 448), Mid-Atlantic (n = 235), Midwest (n = 523), Pacific (n = 370), and Southern (n = 402). A response rate of 15% (n = 328) was desired to conduct statistical analysis. The research protocol was reviewed and approved by Kansas State University Institutional Review Board for Research on Human Subjects.

Focus groups

Kansas State University foodservice management employees (n = 25) were asked to participate in five focus groups. Participants responded to open-ended questions based on the TPB which included: (1) can you please describe some good things that can come from implementing sustainable waste management practices in your facility; (2) what are some bad things that can come from implementing sustainable waste management practices in your facility; (3) list all the people you think either approve or disapprove whether or not you implement sustainable waste management practices in your facility; (4) what makes, or would make, it easier for you or other managers to implement sustainable waste management practices in your facility, and (5) what makes it difficult for you or other managers to implement waste management practices in your facility. The pilot instrument was developed from their responses, through a review of literature, and the NACUFS Sustainability Guide (Boss, 2009).

Questionnaire Development

The survey instrument included six sections: (1) foodservice operations' current sustainable waste management practices; (2) NACUFS members' attitudes about implementing a sustainable waste management program; (3) NACUFS members' subjective norms to implementing a sustainable waste management program; (4) barriers toward implementing a sustainable waste management program; (5) NACUFS members' intentions to implementing a sustainable waste management program; and (6) demographic and operational characteristics of NACUFS members and foodservice facilities.

Measurements

Current Sustainable Waste Management Practices. This section included two parts: (1) items recycled in the foodservice facility; (2) past sustainable waste management programs in the foodservice facility. The measures required respondents to mark *Yes* or *No* to ascertain their current sustainable waste management practices.

Attitudes. Eight items measured NACUFS members' attitude toward the behavior (AB) about implementing a SWM program. NACUFS members' attitudes were measured in two parts - behavioral beliefs (BB) and outcome evaluation (OE). The behavioral beliefs measures asked the respondents to rate their level of agreement about implementing a sustainable waste management program in their facility, from 1 strongly disagree to 5 strongly agree. The outcome evaluation measured the importance level for implementing a sustainable waste management program on a 5-point scale from 1 not important to 5 very important. According to Chen (2007), the total attitude score was obtained by the following formula:

$$AB = (BB_1 \times OE_1 + BB_2 \times OE_2 + BB_3 \times OE_3 + BB_4 \times OE_4 + BB_5 \times OE_5 + BB_6 \times OE_6 + BB_7 \times OE_7 + BB_8 \times OE_8) / 8$$

Subjective Norms. Eight subjective norms (SN) were identified through the literature review, newly released NACUFS sustainability guide, and the results of the focus group study. Subjective norms were measured in two parts – normative beliefs (NI) and motivation to comply (MI). The normative beliefs measures asked each respondent to rate how likely those eight referent groups or individuals would support the implementation of a sustainable waste management program in their operation, from 1 extremely unlikely to 5 extremely likely. The number 6 was used if an item didn't relate to the operation. The motivation to comply measures rated how likely their implementation of a sustainable waste management decision would be influenced by those eight groups or individuals on a 5-point scale from 1 extremely unlikely to 5 extremely likely. The number 6 was used if an item didn't relate to the operation. According to Chen (2007), the total subjective norms score was obtained by the following formula:

$$SN = (NI_1 \times MI_1 + NI_2 \times MI_2 + NI_3 \times MI_3 + NI_4 \times MI_4 + NI_5 \times MI_5 + NI_6 \times MI_6 + NI_7 \times MI_7 + NI_8 \times MI_8) / 8$$

Barriers. Sixteen barriers (B) were identified by the literature review, newly released NACUFS sustainability guide, and the focus group study. Barriers were measured by asking the respondents to rate the level of agreement for barriers to implementing sustainable a waste management program on a 5-point scale from 1 strongly disagree to 5 strongly agree. The total barriers score was obtained by the following formula:

$$B = \Sigma Bi / 16$$

Behavioral Intention. Three behavioral intentions (BI) items were measured by asking the respondents to rate how likely they were to

implement sustainable waste management practices in their foodservice facility using the scale 1 being extremely unlikely to 5 being extremely likely. The total barriers score was obtained by the following formula:

$$BI = (BI_1 + BI_2 + BI_3) / 3$$

Demographic Variables. Thirteen questions requested demographic information about the status of the college or university (private vs. public); size of the school based on the foodservice budget; management type of the foodservice dining facility; the number of meals served per lunch or dinner meal; size of the community where the university was located; budget of the foodservice facility; if the foodservice was self-operated or contract managed; if the foodservice facility had a campus wide or foodservice sustainability committee; and geographic location of the operation. Questions asked of the individual respondents included current position, gender, age, educational level, and work experience.

Questionnaire Pilot Test

Two hundred and thirty (*n* = 230) randomly selected NACUFS members were contacted and asked to participate in the pilot study. They were sent an e-mail requesting participation and were instructed to click on a URL to access the survey that included a section asking for feedback about the instrument itself. These directors, assistant directors, managers, and others were not included in the final sample. Reminder e-mails were sent one week after the initial e-mailing to encourage completion by non-responders. Of the 230 e-mails, 55 e-mails were undeliverable and were returned to the sender. The total number of responses was 17 participants for a 10% response rate. The results indicated that the pilot study was reliable: *attitudes* (*behavioral beliefs* Cronbach's alpha = .86; *outcome evaluations* Cronbach's alpha =.83), *subjective norms* (*normative beliefs* Cronbach's alpha =.81; *motivation to comply* Cronbach's alpha =.80), *barriers* (Cronbach's alpha =.82), and *behavior intentions* (Cronbach's alpha =.96).

Final instrument

Based on the results of the pilot study, changes in the questionnaire design and wording were made. The final version of the instrument included 89 questions that measured current sustainable waste management practices, attitudes, subjective norms, barriers and intentions to implement a sustainable waste management program and respondent and operational demographic characteristics. A final Axio survey invitation e-mail with a cover letter e-mail explaining the objectives of the research and introducing the instrument was sent to the remaining members of NACUFS (*n* = 2,184). The cover letter e-mail explained the objectives of the research. A follow up e-mail was sent after one week to encourage response.

DATA ANALYSIS

All of the data were analyzed using SPSS (Version 17.0, 2007, SPSS Inc, Chicago, IL). Descriptive statistics were computed and included frequencies, means, and standard deviations. Cronbach's alpha (1951) was used to determine construct reliability. A threshold of .70 was used to demonstrate consistency (Nunnally, 1978). Multiple linear regression analysis was used to test the hypotheses: to examine the relationships between the dependent variable (behavioral intention) and the independent variables (attitude, subjective norms, and barriers) (Bobko, 2001). Statistical significance was set at $p \leq 0.05$. T-tests and ANOVA were used to test the differences in factor means and item scores by NACUFS members' gender, age, geographical location, facility sustainability committee status, and the size of foodservice facility budget with intention to implement a SWM program.

RESULTS

Of the 2,184 NACUFS emails sent (which excluded pilot study participants), 402 (18.4%) were undeliverable and were returned to the sender, 212 (9.7%) were undeliverable due to retirement or change of jobs, so the final sample size was 1,570. The total number of responses was 212 resulting in a 13.5% response rate. The response rate for this study was lower than in other e-mail studies conducted with this population. The instrument showed high reliability scores (Cronbach's alpha >.70) for all scales.

Respondents Characteristics

The majority of participants (63%) was over 45 years of age and had been employed in foodservice from 16 to more than 21 years (83%), and more than half of the participants (59.9%) were male. Approximately 59% of participants were foodservice directors, assistant directors, and 32.1% were managers. Almost three-fourths of the respondents (72.2%) had a college degree.

Operational Characteristics

More than half (62.3%) of the foodservice facilities in this study were public schools located in varying population areas. School size by budget was represented by 32.1% small (less than $1M to $8M), 27.8% medium (greater than $8M to $18M), and 37.7% large (greater than $18M). More than half of the operations (55.7%) had a facility wide sustainability committee, and 84.4% of respondents had a campus wide sustainability committee (Table 1).

Sustainable Waste Management Program Implementation

Table 2 shows the items most frequently recycled: cardboard (97.2%), office paper (94.8%), fats, oil and grease (92%), toner cartridges (85.8%), tin cans (79.7%), newspaper (77.8%), aluminum (77.4%), plastic products (76.9%), and glass (71.2%). Items least likely to be recycled were paper products 45.3% (e.g. napkins) and others (e.g. computers, clothing, and equipment). These findings agree with the results of Chen (2008) who reported that cardboard, fats and oils, and aluminum were the most frequently recycled items in college and university foodservices.

Waste management practices (Table 3) most frequently implemented were: providing waste receptacles for recyclables (82.1%); using reusable service ware (80.7%); ensuring all drains are routed through a grease trap (74.1%); training of sustainable waste management practices (72.2%); using biodegradable disposable products (71.2%); and using refillable containers for drinks (71.2%). The least implemented sustainable waste management practices were: partnering with others to reuse composted food waste (37.7%); using a pulper (35.8%); and performing a cost/benefit analysis for recycling programs (33%). Similarly, Chen (2008) reported sustainable waste management practices least likely to occur in foodservice facilities were: composting and using a pulper.

For behavioral beliefs (Table 4), most NACUFS members believed that implementing a SWM program will be better for the environment (4.61 ± .70); improves reputation (4.39 ± .69); is better for the local community (4.21 ± .80); and decreases food waste (3.97 ± .92). The respondents showed less agreement that a SWM program would increase competitive power (3.55 ± .98) and decrease costs (3.15 ± 1.13).

Respondents believed that implementing a SWM program was important because it could protect the environment (4.42 ± .77); maintain customer satisfaction (4.31 ± .68); reduce food waste (4.12 ± .72); and improve their reputation on campus (4.08 ± .66). Least important included increasing competitive power (3.63 ± 1.09) and

Table 1. Respondents & Operational Characteristics *(n=212)*

Respondent Characteristics	n	%[a]
Age		
25 or less	3	1.4
26-35	16	7.5
36-45	59	27.8
46-55	86	40.6
56 or older	48	22.6
Gender		
Male	127	59.9
Female	85	40.1
Geographic Location		
Continental	21	9.9
Northeast	45	21.2
Mid-Atlantic	23	10.8
Midwest	66	31.1
Pacific	29	13.7
Southern	28	13.2
Years employed in foodservice		
5 or less	8	3.8
6-10	9	4.2
11-15	19	9.0
16-20	31	14.6
21 or more	145	68.4
Education		
High School/GED	3	1.4
Some College	30	14.2
Associate Degree	26	12.3
Bachelors	104	49.1
Advanced Degree	49	23.1
Position		
Director	85	40.1
Assistant Director	40	18.9
Manager	68	32.1
Other	19	9.0

Operational Characteristics	n	%[a]
Status of school		
Private	80	37.7
Public	132	62.3
Size of school by budget[b]		
Small (< $8 Million)	68	32.1
Medium ($8 -$18 Million)	59	27.8
Large (> $18 Million)	80	37.7
Management Type		
Self-operated	167	78.8
Contract managed	40	18.9
Campus sustainability Committee		
Yes	179	84.4
No	28	13.2
Facility sustainability committee		
Yes	118	55.7
No	91	42.9
Community Size		
Less than 50,000 people	73	34.4
Between 50,000-100,000 people	63	29.7
Greater than 100,000 people	71	33.5
Operation-scale[c]		
Small-scale (0-99 servings)	1	.5
Medium-scale (100-499 servings)	25	11.8
Large-scale (500-999 servings)	49	23.1
Very large-scale (1000 or over)	137	64.6

[a]Frequency of responses percentages may not add to 100% due to rounding
[b]Size of school determined based on the budget listed on NACUFS membership directory
[c]By # of meals served (lunch/dinner)

employee job satisfaction (3.60 ± 1.12).

Perceived NACUFS members' normative beliefs and motivation to comply about implementing a sustainable waste management program are presented in Table 4. Results are similar to those conducted with other TPB studies which reported administrators and customers influenced their implementation decisions (Chen, 2008; Roberts & Barrett, 2008). For normative beliefs, participants reported that they believe those around them who would support implementation of a SWM included their superiors (4.53 ± .77), college and university administration (4.43 ± .75), and other university foodservice operations (4.14 ± .90). Least likely were employees (3.85 ± .84) and vendors or suppliers (3.76 ± .86).

For motivation to comply, participants reported that their sustainable waste management decisions were most likely influenced by their superiors (4.47 ± .81), college and university administration (4.37 ± .76), and students (4.22 ± .84). They were least likely influenced by their employees (3.44 ± 1.02) and vendors or suppliers (3.25 ± .97).

Barriers (Table 4) were not as important in the decision to implement a SWM as NACUFS members' attitudes and subjective norms. Most of participants agreed that the following items were barriers to implementing a SWM program: lack of financial resources (3.92 ± 1.202); lack of campus coordination (3.83 ± 1.108); lack of recycling facilities and storage areas (3.83 ± 1.154); cost of recyclable, reusable products (3.77 ± 1.060); and lack tools and resources (3.52 ± .995). Most of the respondents agreed that they had support from university administration and management training time. In a similar study, Chen (2008) found that resources (e.g., financial & facility resources), time, and money also were barriers to implementing sustainable practices in college and university foodservice operations.

NACUFS members had favorable intentions to implement a SWM program as shown in (Table 4). These included continuing to develop SWM programs to reduce waste (4.56 ± .669) and increasing SWM practices in their operation (4.49 ± .770). The results of this study were comparable to the study conducted by Chen (2008) about sustainable waste management practices in college and university foodservices.

Regression analysis

Multiple linear regression explained over 21% (R^2 = .21) of the variance and indicated that NACUFS members' attitudes had the most influence on NACUFS members' intentions to adopt a sustainable waste management program (β = .356), followed by their subjective norms (β = .185) (Table 5). Barriers did not have a significant influence on intention in this study, suggesting its influence on sustainable decisions might not be as important as attitudes and subjective norms for NACUFS members.

Demographic Differences

In the present study there were no significant differences among NACUFS members' intentions to adopt a sustainable waste management program based on their age, geographic location, and

Table 2. Items recycled *(N=212)*

		Frequency			
		Yes		No	
	Measures	n	(%)[a]	n	(%)[a]
1	Cardboard	206	97.2	6	2.8
2	Office Paper	201	94.8	11	5.2
3	Fats, oil and grease	195	92.0	17	8.0
4	Toner Cartridges	182	85.8	30	14.2
5	Tin Cans	169	79.7	43	20.3
6	Newspaper	165	77.8	47	22.2
7	Aluminum (e.g. cans, foil)	164	77.4	48	22.6
8	Plastic Products	163	76.9	49	23.1
9	Glass	151	71.2	61	28.8
10	Paper Products (e.g. napkins)	96	45.3	116	54.7
11	Other:	26	12.3	186	87.7

Frequency of responses percentages may not add to 100% due to rounding

Table 3. Waste Management Practices Implemented *(N=212)*

		Frequency			
		Yes		No	
	Measures	n	(%)[a]	n	(%)[a]
1	Provided waste receptacles are marked to segregate recyclables.	174	82.1	38	17.9
2	Use reusable service ware (e.g. cups and glassware).	171	80.7	41	19.3
3	Ensure all drains are routed through a grease trap.	157	74.1	55	25.9
4	Sustainable waste management practices training.	153	72.2	59	27.8
5	Use biodegradable disposable products.	151	71.2	61	28.8
6	Use refillable containers for drinks.	151	71.2	61	28.8
7	Monitor customer food waste to develop polices.	116	54.7	96	45.3
8	Compost food waste.	115	54.2	97	45.8
9	Operate a tray-less dining service.	106	50.0	106	50.0
10	Donate reusable (e.g. leftover food, old uniforms, and linens).	95	44.8	117	55.2
11	Track usage of energy, gas, and water.	95	44.8	117	55.2
12	Purchase products with less packaging.	91	42.7	121	57.1
13	Develop solid waste reduction strategies.	89	42.0	123	58.0
14	Partner with others to use composted waste.	80	37.7	132	62.3
15	Use a pulper.	76	35.8	136	64.2
16	Performing a cost/benefit analysis for recycling programs.	70	33.0	142	67.0
17	Other:	5	2.40	207	97.6

Frequency of responses percentages may not add to 100% due to rounding

the size of the foodservice facility. The only demographic that significantly (p<.001) impacted NACUFS members' intentions to implement a sustainable waste management program was whether or not the college and university foodservice operation had a sustainability committee (Table 6).

DISCUSSION

The findings of the present study indicate that NACUFS members have implemented many SWM practices in their foodservice operations. This supports the report about sustainability efforts on college campuses, where among nine categories college foodservices received the highest scores for recycling (SEI, 2008). SWM practices, however, most frequently implemented were less costly and required fewer resources, such as, providing waste receptacles for recyclables, using reusable service ware, ensuring all drains are routed through a grease trap, and training in sustainable waste management practices. The least implemented sustainable waste management practices required more time, money, and training, such as, partnering with others to reuse composted food waste, using a pulper, and performing a cost/benefit analysis for recycling programs.

The results indicated that NACUFS members have positive attitudes about implementing sustainable waste management programs and important significant others included superiors, university administration and students, but not employees, suppliers, or vendors. Barriers to implementing a SWM program included lack of financial resources, campus coordination, and recycling facilities. However, the respondents indicated that it was important to continue implementing sustainable waste management programs.

When testing the TPB model, attitudes and subjective norms significantly impacted their intentions to implement a SWM program. Therefore, if their attitudes are positive and those around them who are important support the implementation, then it is more likely that a SWM program will be implemented.

In the current study, barriers were not significant to implementing a SWM program. These results are similar to those of Chen (2008) who used the TPB and found that barriers were insignificant in implementing sustainable waste management programs. NACUFS members, therefore, appear to want to implement additional SWM practices and those around them support the implementation. The resources to do so, however, are not available, yet they don't appear to be concerned about these barriers. This may indicate that NACUFS members have the skills and knowledge to implement a SWM program and realize that in these times of cost savings, using resources for SWM programs is not the most efficient use of resources. Findings in the present study suggested that the differences in size of the foodservice facilities, geographic locations, and age of NACUFS members' did not have any significant effect on NACUFS members' decisions to adopt a sustainable waste management program. The results of the present study are different from other reported findings, which have found that those who are younger are more likely to be concerned about sustainability (Gelissen, 2007; Heeswijk, 2008; Klineberg, McKeever, & Rothenbach, 1998). The discrepancy between the current study and previous studies may be due to the lower percentage of younger respondents than other studies conducted with sustainability.

The results indicated that NACUFS members who had a facilities-wide sustainability committee (t = 4.56, p<.001) had a greater intention to implement a sustainable waste management program in their operations. NACUFS members, thus, might find it beneficial to create a foodservice sustainability committee to assist with implementing a SWM program.

CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE STUDY

The NACUFS organization in their 2009-2014 Strategic Plan has identified that they would implement a plan for maintaining sustainable resources (NACUFS, 2010). The results of this study found that NACUFS members have begun to be concerned about the environment (Pyle, 2008). As a result, the concepts of sustainability are gaining momentum in their implementation of SWM programs and are on track to meet the goals of the NACUFS strategic plan (NACUFS, 2010). The majority of respondents have implemented some form of a SWM program and results showed they had positive attitudes about implementation and subjective norms who were important included superiors, university administration and students. To assist in implementation of SWM practices, members may want to refer to the NACUFS's Sustainability Guide that provides information about sustainability best practices, the critical sustainability areas for college and university foodservices, questions to consider before making decisions or taking actions in sustainability areas, and important measures for assessing the sustainability initiatives' effectiveness (Boss, 2009).

Because NACUFS members who have positive attitudes and important subjective norms will be more likely to implement a SWM program, during training and continuing education, the NACUFS organization could emphasize the importance of implementing these programs in the operation and that members should listen to those around them when considering implementing a SWM program. Another suggestion would be for member schools to develop a sustainability committee within their operations.

Table 4. Attitude, Subjective Norms, Barriers for Implementing SWM Programs			
		Mean[1]	SD[2]
Attitude - Behavioral beliefs (BB)[a, 3] (Reliability: *Cronbach's alpha* .80)			
1	Implementing a SWM program will be better for the environment.	4.61	.70
2	Implementing a SWM program will give us a better reputation.	4.39	.69
3	Implementing a SWM program will be good for the local community.	4.12	.80
4	Implementing a SWM program will decrease food waste.	4.08	.92
5	Implementing a SWM program will improve customer satisfaction.	4.08	.82
6	Implementing a SWM program will be supported by our employees.	3.69	.77
7	Implementing a SWM program will give increase competition power.	3.61	.98
8	Implementing a SWM program will decrease costs.	3.59	1.13
Attitude - Outcome evaluation (OE)[a, 4] (Reliability: *Cronbach's alpha* .86)			
1	Protecting the environment		
2	Maintain customer satisfaction	4.36	.75
3	Reducing food waste	4.26	.81
4	Improving reputation on campus	4.23	.96
5	Decreasing costs	4.08	.89
6	Benefiting the local community	3.94	1.02
7	Giving us a competitive advantages over our competition	3.63	1.09
8	Increasing employee job satisfaction	3.60	1.12
Subjective norms - Normative beliefs (NI)[b, 5] (Reliability: *Cronbach's alpha* .80)			
1	Your superiors	4.53	.77
2	College and university administration	4.43	.75
3	Other university foodservice operations	4.14	.90
4	University faculty and staff	4.09	.80
5	The students who dine in your facility	4.06	.79
6	The citizens of the local community	3.95	.88
7	Your employees	3.85	.84
8	Vendor(s) / Supplier(s)	3.76	.86
Subjective norms - Motivation to comply (MI)[b, 5] (Reliability: Cronbach's alpha .75)			
1	Your superiors	4.47	.81
2	College and university administration	4.37	.76
3	The students who dine in your facility	4.22	.84
4	University faculty and staff	3.82	.87
5	Other university foodservice operations	3.67	1.01
6	The citizens of the local community	3.52	1.04
7	Your employees	3.44	1.02
8	Vendor(s) / Supplier(s)	3.25	.77
Barriers to implement SWM programs[6] (Reliability: Cronbach's alpha .86)			
1	Lack of financial resources	3.92	1.20
2	Lack of campus coordination	3.83	1.11
3	Lack of recycling facility and storage areas	3.83	1.15
4	Cost of recyclable, reusable products	3.77	1.06
5	Lack of tools and resources	3.52	1.00
6	Lack of training/education about how to implement	3.46	1.15
7	Overall cost of recycling	3.45	1.09
8	Lack of support by customers due to additional costs	3.34	1.10
9	Supervision required for employees to follow the tasks	3.29	.92
10	Lack of quality recyclable products available for purchase	3.27	1.14
11	Lack of ability to create lasting changes	3.17	1.14
12	Time for managers to implement	3.17	1.08
13	Lack of interest/willingness of employees to change	3.08	1.10
14	Required training time for employees	3.06	.97
15	Lack of support from university administration	2.95	1.21
16	Manager training time	2.95	1.10

Table 4. Attitude, Subjective Norms, Barriers for Implementing SWM Programs (Continued)			
Behavior intention to implement a SWM program[7] (Reliability: Cronbach's alpha .87)			
1	Continue developing SWM to reduce waste.	4.56	.67
2	Increase SWM practices.	4.49	.77

Note. [1] M = mean
[2] SD = standard deviation
[a] AB = Attitude toward the behavior; BB = Behavioral beliefs; OE = Outcomes evaluation; $AB = (BB_1 \times OE_1 + BB_2 \times OE_2 + BB_3 \times OE_3 + BB_4 \times OE_4 + BB_5 \times OE_5 + BB_6 \times OE_6 + BB_7 \times OE_7 + BB_8 \times OE_8) / 8$
[3] Behavioral beliefs scale: 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree
[b] SN = Subjective norms; NI = Normative beliefs; MI = Motivation to comply; $SN = (NI_1 \times MI_1 + NI_2 \times MI_2 + NI_3 \times MI_3 + NI_4 \times MI_4 + NI_5 \times MI_5 + NI_6 \times MI_6 + NI_7 \times MI_7 + NI_8 \times MI_8) / 8$
[4] Outcomes evaluation scale: 1 = not important to 5 = very important
[5] Normative beliefs and motivation to comply scales: 1 = extremely unlikely to 5 = extremely likely
[6] Barriers scale: 1 = strongly disagree to 5 = strongly agree

Table 5. Regression Analysis of Intention to Implement a SWM Program *(N=212)*

Measures[a]	B	SE	β	*t*	
Constant	3.397	.302		11.253	
Attitude	.007	.001	.365	5.261	***
Subjective Norms	.004	.002	.185	2.730	***
Barriers	-.113	.066	-.105	-1.713	

[a] $R^2 = .21$
*** $p<.001$

Table 6. Demographic factors influence on behavior intentions to implement a SWM program

Behavior Intention Measures[1]	*n*	M[2]	SD[3]	*t*	
Age of the Directors					
45 or less	78	4.43	.75	-.88	
46 or greater	134	4.52	.61		
Facility Sustainability Committee					
Yes	118	4.67	.47	4.56	***
No	91	4.27	.80		
Size of the Foodservice Facility					
Small (< $1 M-$8M)	68	4.41	.69	1.83	
Medium ($8M-$18M)	59	4.49	.51		
Large (> $18M)	80	4.54	.74		
Geographic Location					
Midwest	66	4.70	.67	.77	
Northeast	45	4.59	.68		
Continental	21	4.52	.45		
Southern	28	4.51	.58		
Mid-Atlantic	23	4.42	.69		
Pacific	29	4.38	.82		

[1] Behavior intention measured on a 5-point scale, from 1 = extremely unlikely to 5 = extremely likely
[2] M = mean
[3] SD = standard deviation
***$p<.001$

Future studies in SWM implementation could explore the effectiveness of sustainability education and training programs or how implementing a sustainable waste management program impacts customer satisfaction, financial performance, and budget planning. Other types of foodservices such as for profit restaurants and healthcare could be studied to determine their attitudes, subjective norms and barriers to implementing a SWM program.

LIMITATIONS

An important limitation of the present study was the low response rate (13.5%). Even though the total population was sampled, it may be difficult to generalize the findings to all NACUFS member schools. Two of the three hypotheses were supported which indicates that the instrument had partial construct validity. Efforts to increase participation would need to be implemented in future studies with this group. Also, surveys that are self-administered have limitations including both low respondent rate and non-response bias (Frickers & Schonlau, 2002), which may be true in this case, because only those NACUFS members who may have been interested in or who had implemented a SWM responded.

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Research Contribution

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VIEWS OF COLLEGE AND UNIVERSITY DINING DIRECTORS ON FOOD ALLERGEN POLICIES AND PRACTICES IN HIGHER EDUCATION SETTINGS

Lakshman Rajagopal, PhD[1*]; Catherine H. Strohbehn, PhD, RD, CP-FS[2]

[1]Assistant Professor, Department of Apparel, Educational Studies and Hospitality Management, Iowa State University, Ames, Iowa 50011, USA
[2]Associate Professor & HRIM Extension Specialist, Department of Apparel, Educational Studies and Hospitality Management, Iowa State University, Ames, Iowa 50011, USA

ABSTRACT

Ninety-five college and university (CU) dining directors provided information through a web-based survey about present policies towards handling food allergens, incidences of food allergy reactions on their campuses, and their views towards developing policies and training for handling food allergies in CU dining settings. The survey indicated an absence of uniform food allergy policies across CU dining services in the United States. CU dining directors acknowledged the need for development of standard policies for handling food allergies and training programs specific to handling food allergens in CU dining settings.

Keywords: Food allergies, college and university dining, college and university dining directors.

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INTRODUCTION

A food allergy is an immune system response to a particular food item (Burks et al, 2001). Food allergies affect about 2 to 4% of adults and 6 to 8% of children in the United States (AAAAI, 2009). Food allergies are responsible for an estimated 30,000 emergency room visits and 150-200 fatalities annually in the United States (Bock, Munoz-Furlong, & Sampson, 2001; Sicherer, Munoz-Furlong, & Sampson, 2003). Symptoms of an allergic reaction include swelling of mouth, rash or hives, stomach cramps, diarrhea, and breathing problems. The eight major food allergens (milk, peanuts, tree nuts, soy, wheat, eggs, fish and shellfish) are estimated to cause 90% of the allergic reactions (Sampson, 2004). Allergic reaction to sesame seeds has also recently emerged as a health burden with an estimated 0.10% of children in the United States affected by this allergen (Sicherer et al, 2010). The prevalence of food allergies in children under the age of 18 has increased by 18% in the past decade (Branum & Lukacs, 2009). Approximately, 2.3% of teenagers suffer from food allergies (Pereira et al, 2005).

A 1994-2004 study conducted by Bock, Munoz-Furlong, and Sampson (2001, 2007) found that 16 out of 63 food allergy-related fatalities occurred in college-aged students with 50% of those fatalities occurring on college campuses. Sampson, Munoz-Furlong, and Sicherer (2006) found that college students were most likely to take risks with their food allergies by eating allergic foods, not carrying self -injectable epinephrine, and failing to inform concerned authorities about their food allergies and necessary emergency treatment. Food allergies can be triggered by a small amount of the allergen and occur every time the food is consumed or when cross-contact with the allergen occurs. Those with food allergies must be constantly vigilant of the food they eat, at and away from home. Therefore, foodservice establishments must ensure that the food served is safe for consumption by patrons with food allergies. It is imperative that retail foodservices provide accurate information about ingredients used in menu items, as incorrect or incomplete information puts allergic patrons at risk (Greenhawt, Singer, & Baptist, 2009).

There is recognition by the foodservice industry of the risks of food allergens (Mandabach et al, 2005) and the Food Code 2009 requires training for foodservice employees about proper protocols for handling food allergens (U.S. Food and Drug Administration, 2009). Abbot, Byrd-Bredbenner and Grasso (2007) found that managers in quick-service, fine dining, and school lunch operations rated knowledge about handling allergen-free orders as very important. One management best practice for retail foodservices to address the increasing prevalence of food allergies and potential risk of patrons experiencing an allergic reaction is to develop an operational plan or policy. Organizational policies provide guidance for employees. Written policies and standard operating procedures provide direction about when and how to perform tasks or respond to specific situations. Existing legislation such as the Rehabilitation Act of 1973 and Individuals with Disabilities Education Act, Americans with Disabilities Act and the ADA Amendments of 2008 can provide foundations for development of organizational policies to address food allergens (US Department of Education, 2009).

K-12 schools, many of which now serve preschool children, have been at the center of discussion on food allergies because of increasing prevalence and severity of allergic reactions (IFIC, 2008). Young children may not understand the risks and consequences of food cross contact and choices they make, thus raising questions regarding notification and accountability. Specific guidance templates for foodservices serving young children have been developed (USDA, 2001). A Centers for Disease Control (CDC) project called SHPPS (School Health Policies and Programs Study), assessed school health policies at state, district, school building, and classroom levels (CDC, 2006). This study found that 90% of districts and 98% of school buildings required information about food allergies to be kept in a student's permanent record, and that over three-fourths of school nutrition programs had a written plan for providing service to students with food allergies. As part of policy, some districts required medical documentation of a food allergy before any accommodations were made.

College and university (CU) dining services are similar to K-12 nutrition programs in that foods served comprise a significant portion of a student's dietary intake. CU and K-12 dining programs are often one of few food vendors, if not the only food vendor available on campus. CU's also provide multiple venues for food consumption: residential dining, catering, convenience stores, snack kiosks, and vending (Gregoire, 2009). It is important for CU dining personnel to recognize the incidence rate of allergic reactions on campuses and understand that young adults with food allergies may be averse to taking necessary precautions. Thus, it could be argued that CU dining personnel should adopt a philosophy of implementing every safeguard to ensure all patrons are served "*safe food*". Organizational

*Corresponding Author: Phone: (515) 294-9740; E-mail: lraj@iastate.edu

policies reflecting the philosophy should be translated to clear standard operating procedures to aid in the accommodation process to guide dining personnel and ensure consistent treatment in meeting needs of students with food allergies.

The ADA act requires higher education institutions to have policies that guide the process for meeting and/or accommodating special educational needs of students, as requested by the student (US Department of Education, 2009). The Equal Employment Opportunity Commission, which enforces compliance with the ADA, defines someone with a disability as "anyone with a physical or mental impairment substantially limiting one or more major life activities; has a record of such impairment; or is regarded as having such impairment" (EEOC, 1991, p. 2). Yet, it is not clear the extent to which those with food allergies or other special dietary needs are limited in one or more major life activities. Some situations may be controlled with attention to diet and through consultation with CU staff while other student's circumstances may require collaborative efforts from multiple higher education staff. Thus, it may be necessary for policies to be in place at both institutional and foodservice department levels. In an effort to guide higher education institutions in meeting needs of students with food allergies, a guidance document was developed by the Food Allergy and Anaphylaxis Network (FAAN) and the National Association of College and University Foodservices (NACUFS), the professional organization for foodservice management, in CU (FAAN, 2009). However, it is unclear as to how many institutions currently follow this guidance document and have implemented policies and procedures at their educational institution, and specifically, at their dining services or foodservice department.

The purpose of this exploratory study was to identify present policies towards handling food allergens, perceived incidences of food allergy reactions on CU campuses, CU dining directors' views towards developing policies and training for handling food allergies in CU dining settings.

By identifying the current methods of handling food allergies and current policies at institutional and foodservice department levels for food allergies, it is possible to determine areas that need attention and further development to reduce the number of allergic reactions among CU students and ensure special needs of students are met.

METHODS

Sample Selection

The sample for this study was obtained from the 2008 NACUFS member directory. Since this study aimed to identify views of CU dining directors on food allergen policies and practices in higher education settings, only CU dining directors were allowed to participate in this study. The research protocol was reviewed and approved by the university's Institutional Review Board for Human Subjects prior to data collection.

Questionnaire

Based on a review of literature on food allergies and counsel with university dining personnel, a questionnaire was developed. The questionnaire consisted of three parts: a) perceptions of incidence of severe food allergies on campus and present/future food allergy policies on campus at different levels, b) twenty-five, positively and negatively phrased items measured on a 5-point Likert-type scale assessing attitudes of CU dining directors towards food allergy policies and procedures (1= Highly Disagree, 5 = Highly Agree), and c) demographic information. In this study, severe food allergy reactions were classified as those reactions where the individual developed symptoms such as severe rashes, sever itching, difficulty breathing, and/or needed immediate medical attention. Content validity was determined by three individuals familiar with CU foodservice operations and knowledgeable about food allergies (two faculty members specializing in food safety and one university dining director). This process was repeated until the questionnaire was considered to be clear and easily understandable. Cronbach's alpha for the 25 items related to attitudes towards food allergies and food allergy policies was 0.733. A Cronbach's alpha of 0.7 or higher is indicative of the reliability of the instrument and that the items were measuring the desired construct (Cronbach, 1951).

Survey Administration

The questionnaire was posted on the web using SurveyGizmo®. Web-based surveys are considered more beneficial than paper-based surveys, because of the ease of distribution, short turnaround time, ease of coding and data analysis (Schmidt, 1997). CU directors (N=625) listed on the NACUFS listserve at the time of data collection received an invitation to participate in this study via email. Participants accessed the online questionnaire after providing informed consent. Reminder emails were sent at weeks 1, 2, and 3.

Data Analysis

Responses were encrypted and stored on a secure server before they were analyzed. Data were analyzed using *SPSS 18.0*. Descriptive statistics and Cronbach's alpha were calculated. Independent sample *t*-tests, one-way Analysis of Covariance (ANOVA) were used to compare mean responses based on demographic characteristics. The alpha level was set at $p \leq 0.05$.

RESULTS

Profile of Respondents

Of the 625 questionnaires that were sent, 34 (5.4%) were undeliverable and returned to the sender. A total of 96 responses were obtained, resulting in a response rate of 16.2%. Out of 96 questionnaires received, one questionnaire was incomplete, resulting in 95 useable questionnaires. There was nearly equal representation of male (*n* = 50) and female (*n* = 45) respondents. Majority of the respondents belonged to the age groups of 41-50 yrs (*n* = 37) and 51-60 yrs (*n* = 36). The sample represented a wide range of educational levels from high school to doctoral degree, with a majority holding a bachelor's degree (*n* = 47). Most of the respondents (*n* = 53) were from public institutions and 42 respondents represented private institutions. Majority of the respondents were from institutions that had a Fall 2008 student enrollment of 20,000 or less (*n* = 65), while the remaining had Fall 2008 student enrollment of more than 20,000 students (*n* = 30). Number of years working in CU dining services ranged from 0-10 years (*n* = 21) up to > 30 years (*n* = 10). Majority of the CU dining services were self-operated (*n* = 61). Respondents from all NACUFS regions were represented in this study with the majority representing the Midwestern United States (*n* = 49). Demographic information and institutional characteristics of respondents are shown in Table 1.

Food Allergy Incidences

Over half (*n* = 58) of participants mentioned that they were aware of incidences of severe food allergy reactions occurring on campus since beginning employment at their current institution. This finding is supportive of the reports by Bock, Munoz-Furlong and Sampson (2001, 2007) who found that 50% of food allergy-related fatalities occurred among students on college campuses. Hence, food allergy reactions appear to be common among college-age students; and they present challenges and concerns to CU dining service staff. According to recollections of respondents, since Fall 2006, incidences of food allergy reactions on campus ranged from zero occurrences (*n*

Table 1: Demographic Characteristics of CU Dining Directors' (n = 95)

Demographic Characteristic	Frequency
Gender	
Male	50
Female	45
Age	
Less than 40 years	14
41-50 years	37
51-60 years	36
Greater than 60 years	8
Educational Level	
High school/Associates degree/Culinary degree	15
Bachelor's degree	47
Master's degree	28
Doctoral degree	5
Type of Institution	
Public institution	53
Private institution	42
Fall 2008 Student Enrollment	
≤ 20,000 students	65
≥ 20,000 students	30
Total number of years worked in CU dining services	
0-10 years	21
11-20 years	30
21-30 years	34
More than 30 years	10
Type of Foodservice Management	
Contract	34
Self-operated	61
NACUFS Regions Represented	
Northeast	14
Mid-Atlantic	8
Southern	5
Midwest	49
Continental	7
Pacific	12

= 18) to twelve occurrences (*n* = 1). However, about a fourth of respondents (*n* = 27) did not respond to this question; thus it was unclear if incidences of food allergic reactions had occurred or not on those CU campuses. This finding should be considered as the results of this study are reviewed.

Current Food Allergy Policies

Of respondents, about three-fourths (*n* = 72) indicated there were no policies in place addressing food allergens at the institutional level and about half (*n* = 54) reported no policies were in place at the foodservice department level. However, about half of the respondents who indicated that food allergy policies were not in place currently at either level reported that they were in the process of formalizing policies at the institutional level (*n* = 3) and foodservice department level (*n* = 21), respectively. For the respondents that did not respond to the question about the presence of policies at either level (*n* = 44), the most common practice identified for individuals with food allergies was for the student to meet the institution's dining service dietitian to explain his/her dietary requirements and request dietary accommodations. Findings from this study indicate that CU dining service establishments may handle food allergy situations differently within the department because of the absence of clear food allergy handling policies.

In a study of schools in Michigan, it was found that only 16% had written emergency action plans for children with food allergies (Rhim & McMorris, 2001). A recent study conducted jointly by the International Food Information Council (IFIC) and School Nutrition Association (SNA) concluded that there were no consistent nationwide procedures in schools to address food allergies (IFIC, 2008). While the CDC SHPPS study did find that information about food allergies was required for the permanent record in almost all of the districts surveyed, the recent IFIC and SNA study showed accommodation processes directed by policies were not consistent between schools. Thus, there appears to be a lack of best practice recommendations on how to accommodate students with allergies and it is not just limited to CU dining establishments.

The most common practice previously identified in the literature in terms of accommodation requests and procedures in handling students with food allergies was for the student/family to provide documentation and information about acceptable foods for the student and for the school to obtain emergency contact information and treatment guidance (Rhim & McMorris, 2001). Yet, Greenhawt, Singer, and Baptist (2009) found that college students with food allergies failed to provide emergency treatment and contact information to campus health services and dining service staff. Thus, a gap in information surfaces in the student's transition from K-12 to CU, compounded by change in student status from minor to adult, which can potentially place a burden upon the CU in providing adequate protection for the student through avoiding inadvertent consumption or contact of a specific food allergen. One proactive practice CU can take is to ensure awareness by CU personnel, particularly those in campus dining with direct contact with students and implement a policy directing students with food allergies to contact the person in charge of university dining to ensure adequate and accurate information about the students' needs is documented.

Attitudes Towards Food Allergy Policies

The item with the highest level of agreement among CU dining directors was the usefulness of development of a training module specific for food allergies in CU dining services (*M*=4.49±0.63). Attitudes and knowledge of CU dining directors towards food allergies and food allergy policies are shown in Table 2.

CU directors agreed that availability of a policy template for managing food allergies in CU foodservices is needed (*M*4.16±0.79). Respondents also strongly agreed that it would be useful if there was a food allergy training/certification program available for CU dining staff (*M*= 4.23±0.95). Agreement that CU were aware of training CD's and DVD's available through the Food Allergy and Anaphylaxis Network and National Restaurant Association was neutral, with a mean rating of 3.04 on a 5-point scale. This level of agreement may be due to timing, as the release of the FAAN materials was just prior to administration of this survey. CU Director respondents agreed their staff members understood the meaning of "cross contact" (*M*=4.30±0.81), yet reported staff members preparing food might not fully understand the concept of "start fresh" when an order

Table 2: CU Dining Directors' Attitudes towards Food Allergy Policies (n = 95)

Attitudes towards food allergies/food allergen policies	Mean[a]	SD
It would be useful if a training module specific for food allergies in campus dining situations was developed	4.49	0.63
Staff members understand the concept of "cross contact".	4.30	0.81
It would be useful if there was a food allergy training/certification program available for college and dining staff.	4.23	0.95
There is a need for developing a policy template for managing food allergies in university dining services.	4.16	0.79
Food allergies among college students are increasing rapidly.	4.16	0.76
Staff members know how to find out which ingredients are present in food items	393	0.99
There is a need for developing policies at the institutional level for management of food allergies.	3.88	1.01
All food allergies are not medically based; some are intolerances, such as dairy intolerance.	3.83	1.12
My role as the person in charge of dining is to satisfy the dietary needs of every student who has food allergies.	3.74	1.22
Our dining staff is knowledgeable about food allergy risks.	3.57	1.06
Allergens usually are a concern with ethnic foods.	3.54	1.13
Staff members preparing food understand the concept of "start fresh" when an order is placed for a person with food allergies.	3.53	1.33
College age students should be able to figure out how to avoid food allergens without any institutional support.	3.53	1.11
My service staff can answer questions about ingredients in menu items.	3.52	0.86
Dining staff are knowledgeable about how to handle an incident involving an allergic reaction.	3.48	0.98
I am aware of food allergy training CD's and DVD's that are available through the FAAN (The Food Allergy & Anaphylaxis Network) and NRA (National Restaurant Association).	3.04	1.58
Graphics and icons used on our menu boards and signs indicate if a potential allergen is present.	2.92	1.42
Staff members who are involved with catering are trained about handling food allergens.	2.91	1.18
Staff members who are involved with catering are trained about handling incidences of food allergens.	2.71	1.19
The foodservice department does not have the resources to work individually with every student.	2.70	1.36
It is the institution's responsibility to include all ingredients of every menu item on posted signage or labels.	2.61	1.31
All full-time dining staff can identify the 8 common food allergens.	2.46	1.23
Our institutional food buyers read labels on all items purchased and highlight for dining staff if common food allergens are present.	2.38	1.23
There is at least one peanut-free zone operated by dining services on campus.	2.02	1.46
All dining staff are trained on how to inject an Epi-Pen®	1.68	1.02

[a]Scale: 1 (Strongly Disagree) to 5 (Strongly Agree).
Sum score of all 25 attitude items; possible score range 25 – 125.

was placed for a person with a food allergy (*M* =3.53±1.33). Overall, there was a consensus that the number of food allergies among college students was increasing rapidly (*M*=4.16±0.76).

However, despite awareness of the presence of students' food allergies among CU dining directors, respondents rated the statement that all full-time dining staff could identify the eight common food allergens with some disagreement (*M* =2.46±1.23). There was also low agreement to the statement about current use of graphics and icons on menu boards and signage to indicate when a potential allergen was present in the food (*M*=2.92±1.42), even though icons are readily available from the International Association of Food Protection (www.foodprotection.org). CU directors also expressed some disagreement to the statement "all dining staff are trained on how to inject an Epi-Pen®" with a mean rating of 1.68. These findings suggest that CU Directors are aware and indeed understand their responsibilities to meet the dietary needs of students with food allergies (*M* =3.74±1.22), yet there was also recognition of improvement needed among all CU dining staff. There is an need to develop policies and procedures specific to the handling of food

allergy situations in CU dining services, to provide training specific to handling food allergens, and treatment of mild to severe food allergy reactions.

As CU concepts become more retail oriented, frontline worker understanding of what to do when preparing special orders is critical. Wu and Hill (1998) and Vickers, Maynard, and Ewan (1997) showed that structured methods of instruction such as in-services, written plans, and similar educational resources can aid in alleviating anxiety about responding to an allergic reaction and development of policies could lead to a safer environment for individuals with food allergies. Greenhawt, Singer, and Baptist (2009) concluded that CU dining services would benefit from implementation of policies that required clear labeling of allergen information on foods, modifying food preparation areas for allergens, and providing allergen-free meals upon request. Food Code 2009 requires allergen awareness training for all foodservice staff to the extent that the eight common food allergens can be identified (U.S. Food and Drug Administration, 2009). Thus, development of policies and procedures specific to type of operation on campus (i.e. convenience store, catering, onsite preparation) about common foods associated with allergies would ensure compliance with this new requirement.

Independent samples t-tests were used to test if there were any differences in attitude scores towards food allergies and food allergy policies based on gender, type of institution (public or private), type of management (contract or self-operated), and number of students enrolled. One-way ANOVA tests were conducted to determine differences in attitudes towards food allergies and food allergy policies between respondents belonging to different age groups, educational levels and NACUFS regions. Only those questionnaires that fully completed were included in the data analysis. Table 3 summarizes the results obtained for these comparisons.

Statistically significant differences were observed in attitude scores towards food allergies and food allergy policies (p<.05) between males (M = 31.45±14.44) and females (M=39.46 ±18.58). In this study, females rated higher sympathetic attitudes toward allergies and the need for allergy policies than males. Findings in this study could be related to personal knowledge of food allergens or personal responsibilities of respondents (historically, females have purchased food for households and served as gatekeeper of family meals). Gupta et al. (2008) found that mothers of children with food allergies reported that allergens caused a negative impact on quality of life more so than fathers did, and mothers were more cautious about their children being exposed to allergens.

Statistically significant differences were observed between the attitude scores of respondents from private (M=40.35±18.46) and public (M=31.19±14.54) institutions (p<.05), with respondents from private institutions rating attitude statements higher than respondents from public institutions. This difference could be attributed to the fact that students at private institutions pay a higher amount of tuition and thus expect higher quality of services in all arenas of campus life, or that responses from CU Directors at private institutions are reflective of a student culture that expects a safe and nurturing environment with personal attention to specific situations. Although, CU Directors from public institutions indicated high agreement to the statement regarding responsibility to ensure safe food is provided; responsiveness to individual needs becomes challenging, given the typically higher enrollments, increased levels of governance and decision making, and the need for consistent treatment among students. The authors of this study provide these arguments for the difference between private and public institutions but do not suggest that this is indeed the case in private and public institutions. However, mean ratings of respondents from institutions with student enrollment of less than 20,000 students were not statistically significant (p = 0.128) from those respondents from institutions with student enrollment more than 20,000 students, which suggests CU service accommodations in the form of staffing and facilities at more populated institutions are adjusted to provide equity. No statistically significant differences were found between respondents based on type of management (contract or self-operated) (p = 0.835). These findings suggest that all CU dining directors, irrespective of institutional size or type of management, consider it important to develop food allergy policies to improve the student experience on campus and provide a safe environment.

FAAN (2005) recognized this need and developed "The Food Allergy and Training Guide for College and University Foodservices" which provides general guidelines to decision makers in CU dining services for handling food allergies and identifies points to consider when developing food allergy policies. Majority of participants in this study also ranked highly the need for developing a policy template for managing food allergies in CU foodservice (M =4.16± 0.79). This underscores the importance CU dining director's place on uniform policies across all campus food venues and need for consistent treatment in meeting students' needs. However, despite the importance identified by CU directors on policies for handling food allergies, over three-fourths of respondents (75.26%) currently did not have any policies in place at the institutional level and over half (56.25%) of respondents did not have policies in place at the foodservice department level.

Table 3: CU Dining Directors' Attitude Scores towards Food Allergies and Food Allergy Policies by Demographic Characteristics (n = 95)

Characteristic	Mean Attitude Score[a] (SD)	
Gender		
Male	31.45 (14.44)	
Female	39.46 (18.58)	***t*-value =** 2.23*
Age		
21 – 50 years	38.00 (18.62)	
51 years of greater	32.44 (14.92)	***t*-value =** 1.54
Type of Institution		
Public institution	40.35 (18.46)	
Private institution	31.19 (14.54)	***t*-value** = 2.67*
Fall 2008 Student Enrollment		
≤ 20,000 students	37.14 (17.93)	
≥ 20,000 students	31.33 (14.08)	***t*-value** = 1.53
Educational Level		
High school/Associates degree	39.16 (17.02)	
Bachelor's degree	36.34 (18.84)	
Master's degree or higher	32.58 (14.02)	***F*-value =** 0.83
NACUFS Regions Represented		
Northeast	32.35 (18.42)	
Mid-Atlantic	35.37 (10.48)	
Southern	37.80 (20.58)	
Midwest	39.00 (18.46)	
Continental	24.00 (20.49)	
Pacific	30.41 (12.73)	***F*-value** = 1.15

* p<.05

[a]Scale: 1 (Strongly Disagree) to 5 (Strongly Agree).
Mean Sum score of all 25 attitude items; possible score range 25 – 125; items rated on 5-point Likert type scale with 1 (Strongly Disagree) and 5 (Strongly Agree).

These findings are similar to those found among restaurants; Ahuja and Sicherer (2006) found that only 58% of restaurants in their study had a plan in place for handling food allergy reactions. Findings from this study show development of a model policy template for CU foodservices that includes training guidance and which could be tailored to meet individual institutional needs is an important action step in providing food allergy guidance to CU foodservices. For example, the model policy template could include guidelines on providing food allergy training to its employers, the content of such training, suggestions about methods for training, and re-training guidelines. This policy and procedural guidance which could build upon the existing FAAN document could then be incorporated by other CU dining service establishments according to their needs and size of their organizations.

One-way ANOVA was used to determine if differences in attitudes towards food allergies and food allergy policies existed between respondents based on age, educational level, and different NACUFS regions (Northeast, Mid-Atlantic, Southern, Midwest, Continental, and Pacific). No statistically significant relationship was found between attitude scores among respondents representing different NACUFS regions in the United States (p = 0.341). Lack of significant differences among regions of the country indicate that the attitudes towards food allergies and food allergy policies are similar across geographic locations. No significant differences were found in attitudes towards food allergies and food allergy policies among respondents belonging to different age groups (p = 0.773), suggesting that CU dining directors of all age groups were in agreement of the need for development of food allergy handling policies. For the purpose of data analysis, educational level of participants was collapsed into three categories: 1 = High school/Associates degree, 2 = Bachelors degree, 3 = Master's degree or higher. No statistically significant differences between these three different categories of educational levels and attitudes towards food allergies and food allergy policies (p = 0.439) were found. This finding suggests that respondents consider food allergy and food allergy policies important to CU foodservice operations irrespective of educational level. These results suggest that the need for food allergy policies and procedures is universal among CU directors. Post-hoc tests were not conducted because ANOVA comparisons were not statistically significant.

CONCLUSIONS AND APPLICATIONS

The purpose of this exploratory study was to identify present policies towards handling food allergens, incidences of food allergy reactions on campuses, and CU dining director's views towards developing policies and training for handling food allergies in CU dining settings. This study showed that CU dining directors considered food allergies to be a significant issue facing foodservice operations and it is important to develop food allergy handling policies, procedures and training specific to CU dining venues. It was found that the majority of respondents in this study did not have any formal written policies in place for handling food allergies (75.26% at institutional level and 56.25% at the foodservice department level). However, 21.5% of the respondents indicated policy development was occurring. Given the increase in food allergies among children (Branum & Lukacs, 2008), many of whom will enter higher educational settings, the fact that 50% of food allergy-related fatalities occur on college campuses, and that college students are most likely to take risks with their food allergies (Bock, Munoz-Furlong, & Sampson, 2007; Sampson, Munoz-Furlong, & Sicherer, 2006), policy development and procedural guidance and training are clearly needed.

Findings from this study show that CU directors are aware and knowledgeable about specific food allergy controls, yet they are less confident their staff members, including line workers, could identify the eight common food allergens or practice "*fresh start*" when preparing food to order. There was also reported low use of graphics and icons on menu boards and signage to indicate when a potential allergen was present. As CU concepts become more retail oriented, it is critical frontline workers provide accurate information and take appropriate handling precautions when preparing food for food allergy sufferers.

Past research and findings from this study suggest that developing policies are considered essential, but it is also necessary that these policies be implemented in a systematic and logical manner. Providing formal training to foodservice workers on implementation of policies and procedures is necessary for proper application and execution. Developing training specific to handling food allergens is necessary to bring the point across to food handlers and foster proper food allergen handling behaviors. Management support plays a crucial role in encouraging food handlers to practice safe food handling behaviors. Because of the transition in CU dining toward adoption of retail concepts, training specific to CU venues is needed. Policies should also include elements regarding student responsibilities; students should be encouraged to inform CU dining services about their specific food allergies and treatment information. Policies should also include controls to protect confidentiality of the information as much as possible; thus adoption of "need to know" specific protocols, ubiquitous cautions, such as icons on menus, or visual/verbal cues to protect anonymity of person with allergy.

Research is needed for developing food allergy handling policies, applying them in CU dining settings and evaluating the successes and/or challenges faced. Feedback should be obtained from students with food allergies to determine their needs. Development of policies should involve various stakeholders such as students, line-level workers, CU dining managers, CU dining directors, food safety inspectors, and food allergy experts. A team approach towards developing food allergy policies will result in a final product that incorporates multiple perspectives. CU could consider implementation and testing of developed policies, procedures and training at one CU dining facility. The pilot study will help identify further needs and successful strategies for future development of food allergy policies. Training modules specific to food allergies could be developed to address allergen handling in CU dining settings. Training could include a variety of delivery methods (such as lecture, role-play, videos, podcasts, print materials and hands-on activities) to reinforce concepts of food allergies and safe allergen handling practices.

CU foodservice operations should work to develop food allergy policies and procedures, and implement them in their operations to ensure proper handling of food allergies. A policy template incorporating best practice could be made available for CU (and other sectors of commercial and on-site foodservices) with the ability to tailor it specific to institutional needs and local, state, and federal laws. Avoidance of food allergens is the only method of preventing incidences of food allergies. With the influx of the new generation of students in CU venues, CU dining services will need to be ready to face the challenges in ensuring food is safely prepared and served.

There were some limitations in this study. The response rate was relatively low (16.2%) which could be because CU dining directors may not have the time to respond to the high volume of surveys they receive. The low response rate may be attributed to other factors as well: participants were selected from the NACUFS email database which may not be current and/or the institutions or recipients may have email filters. It is not clear the extent that respondents and their

institutions mirrored the NACUFS CU director population; thus, results from this study may not be generalizable to all NACUFS CU dining service operations. A pilot study was not conducted which could have helped reduce the length of the questionnaire and possibly yield higher response rate. However, findings from this exploratory study do provide evidence of interest and need for proactive steps to address food allergens in CU dining operations.

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Pedagogy Contribution

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AN ACADEMIC JUSTIFICATION FOR CREATING A COMMERCIAL FOODSERVICE LABORATORY KITCHEN IN THE DEPARTMENT OF FAMILY AND CONSUMER SCIENCES

Jim R. Haynes, EdD, RD, LD
Associate Professor, Eastern Kentucky University, Richmond, KY, 40475, USA

ABSTRACT
A state of the art commercial foodservice laboratory kitchen was constructed in the Department of Family and Consumer Sciences at Eastern Kentucky University in summer 2010. Originally proposed in 2003, this project could not have been realized without the concerted effort of faculty of the department, the Chair of the Department, the Dean of the College of Health Sciences, the Provost of the university, the Associate Vice President for Capital Planning, the Director of Facilities Services, and others.

The intellectual justification for the project is based upon a review of related literature that supports the use of scarce resources to develop an up to date commercial foodservice teaching laboratory. The completed project features equipment, technology, and designs that are efficient, mobile, versatile, modular, and environmentally sustainable. Equipment that is EPA Energy Star approved was purchased. The ventilation hood system is automatic, increasing air flow in stages as heat production is detected, and saves energy by reducing fan speeds during idle periods. Some pictures of the completed project are included.

Keywords: college/university foodservice education programs, foodservice laboratory kitchens, needs, benefits, strategies, justification

INTRODUCTION
A task force was formed in 2003 within the Department of Family and Consumer Sciences at Eastern Kentucky University to evaluate the status of existing food laboratories. A need was identified to replace one of the existing family style kitchen formats with an up-to-date state of the art commercial foodservice laboratory. The departmental task force functioned to: (1) survey and assess current facilities, (2) evaluate existing facilities in light of a review of the literature on foodservice industry trends and training needs, (3) develop support among stakeholders and administrative decision makers, and (4) identify sources and solicit funding needed to support the project. This strategy could be used by other educational institutions to create a task force to evaluate their own programs and to begin the process of facility upgrades.

A review of the literature provided the intellectual basis for an academic justification and a written plan for the project. The task force adopted a plan that included a request for a commercial foodservice laboratory kitchen, a thirty seat classroom, and the renovation of an adjoining forty seat dining room. The task force worked to develop support for the concept among academic and administrative leaders of the university and to solicit funding. A re-allocation of funding from the university's facilities budget in 2010 permitted final planning and construction of the thirty seat classroom and the commercial laboratory kitchen. To date, funding has not been found for renovation of the adjoining dining room. The completed classroom is located in the same room with the kitchen, and features cutting edge teaching and learning technology. The instructor's station is equipped with an integrated master control panel that coordinates data processing and multi-media including DVD, CD, VHS, Cassette tape, internet, power point, Elmo, writing boards, and a remote control display screen.

REVIEW OF LITERATURE
Baccalaureate Nutrition and Foodservice Administration programs exist as organizational elements of family and consumer sciences departments in colleges and universities (Thaler-Carter, 2000). The roots of Family and Consumer Sciences can be traced to the Smith-Hughes Vocational Education Act of 1917 that appropriated federal funding for the study of home economics, agriculture, and industrial education (Thaler-Carter, 2000). Much of the early emphasis of home economics was upon homemaking and improving family life through a pedagogy focused upon childrearing, cooking, and sewing (Thaler-Carter, 2000).

At its genesis, there was no science of home economics and no set of abiding facts or principles that could be applied to problem solving (Edmond, 1978). Students in traditional home economics received experiential instruction on best practices for food preparation, planning meals for families that sat together for meals, and shopping in the limited food markets of the day (Thaler-Carter, 2000). At the beginning of World War I, a national shortage of food, a deficiency of dietary nutrients, and the poor nutritional status of many soldiers inducted for service in the war convinced legislators of the need for a national research program to study food and nutrition (Edmond, 1978). In 1925, the Purnell Act set aside funds for research in home economics at all of the Morrill land-grant colleges and universities to investigate: (1) foods and human nutrition; 2) clothing, household, and money management; and (3) social relationships among families and the community (Edmond, 1978).

In the three decades following 1945, many demographic, social, and technological changes led home economics to evolve into family and consumer sciences (Thaler-Carter, 2000). As more professional women entered the workforce and the definition and structure of families changed, family and consumer sciences adapted by expanding and redefining its role. Today, family and consumer sciences is not only contemplated upon improving family life and society, but also focuses upon professional and career development (Thaler-Carter, 2000). Food studies mandated by National Standards for Family and Consumer Sciences include food production and services, food science, dietetics, nutrition, and hospitality (Thaler-Carter, 2000).

ACADEMIC-BASED FOOD LABORATORIES AND EQUIPMENT
Food laboratory kitchens, common in Family and Consumer Science facilities built in the 1960's and 1970's, were based upon a family kitchen design that complemented the home economics model. However, today's family and consumer sciences students are also interested in professional and career development in fields such as

*Corresponding Author: Phone: (859) 622-1176; E-mail: jim.haynes@eku.edu

dietetics, nutrition, food science, foodservice administration, food safety, research and development, education, and marketing (Tahmincioglu, 2009).

The establishment of modern foodservice can be traced to the French Revolution in 1793 and the emergence of restaurants in Paris, France (Gisslen, 1999). Early French chefs created the model of the traditional commercial kitchen that consisted of a range, an oven, and pots and pans. This traditional kitchen model was expanded and developed throughout the 20th century (Gisslen, 1999). In the final twenty years of the 20th century, the number and types of foodservice equipment available virtually exploded as innovative new technologies, systems, and designs increased kitchen productivity and energy conservation (Matsumoto, 2001).

EMPLOYMENT IN THE FOODSERVICE INDUSTRY

The demand for more efficient foodservice equipment and systems is rooted in the historically severe labor shortages that existed in foodservices from the mid 20th century and well into the 2000's. The foodservice industry first experienced skilled labor shortages in the 1960's when the large baby boom generation emerged that required foodservice in schools, colleges, healthcare, and commercial dining facilities (Wishna, 2000). Labor shortages reached such critical proportions by 1999 that employee turnover rates in fine dining restaurants were 87% per year, and 123% in fast food services (Wishna, 2000). Managers of fine dining restaurants in 2000 left their jobs at a rate of 50% per year, while fast food managers had a turnover rate of 100% (Wishna, 2000). These disturbing figures illustrate the extent of the human resources crisis that existed in American foodservice in the near full employment economy at the turn of the century (Spears, 1995).

In the time period from the late 1980's through 2007, the high flying economy of the United States reached almost total employment. However, a deep recession beginning in 2007 led to a stalled national economy that still exists in 2010. High unemployment rates of up to 10% in the current era have exacerbated the condition of the economy. More people are now seeking work in foodservices. If and when normal economic conditions return, some employees currently working in foodservices may return to their previously chosen careers.

Graduates of Family and Consumer Science programs today serve in leadership roles in both commercial and onsite segments of the foodservice industry. The onsite foodservice segment provides food in schools, healthcare, retirement facilities, colleges and universities, correctional facilities, the military, and business and industry dining (Food Management, 2010). Graduates with degrees from accredited four year colleges and universities in restaurant and hospitality, institutional foodservice management, food science, and human nutrition often receive the most coveted job and salary opportunities (Tahmincioglu, 2009). In order to receive the very best career preparation, family and consumer sciences students need educational experiences with facilities and conditions that mimic the work situations they will encounter in their careers.

The Restaurant Industry Pocket Fact book (National Restaurant Association, 2010) indicates that the foodservice industry currently employs approximately 12.7 million Americans, and accounts for about 9% of the total workforce. More than 805,360 of these jobs are held by foodservice managers and supervisors (Burton, 2010). The 2009 College Degree Report suggests that foodservice supervisors and managers are relatively well paid at an average mean salary of $46,780, but $55,100 per year at the 75th percentile, and $70,810 in the 90th percentile (Burton, 2010). In the onsite segment, the median 2009 salary for foodservice managers in acute care hospitals is $63,660, while food manufacturing foodservice managers earn a median compensation of $55,460 (Burton, 2010).

FACTORS IMPACTING FOODSERVICE EQUIPMENT DESIGNS

The basic quandary of foodservice is that most foods are at their greatest quality immediately after production, but lose quality rapidly thereafter. At the same time, there is a limit to food preparation capacity and not all tasks can be delayed until service time (Gisslen, 1999). Today's economy does not support the use of an army of kitchen workers to continually keep fresh food on steam tables and buffets (Bendall, 2008). Many foodservices have reacted to this dilemma by purchasing high speed production equipment and/or by purchasing partially prepared value added foods (Bendall, 2008).

The slim profits of the business climate of the present era makes the wise use of innovative high speed foodservice equipment and technology critical in controlling food and labor costs and accomplishing the mission of foodservice. Considerations that impact the selection of foodservice equipment today include the changing demographics of modern patrons, the emergence of technology, the skill levels of employees, escalating quality expectations, concern for healthy food production techniques, and environmental sustainability.

In an effort to make foodservice equipment as simple as possible to use, many commercial and onsite kitchens today rely on user friendly high technology for equipment and systems that are being incorporated into so-called "smart" kitchens (Doty, 1999).

Decentralized cook-freeze systems and other sophisticated refrigeration, freezing, and heating equipment have made large volume advance preparation possible (Doty, 1999). Sophisticated combination oven-steamers and tilt-fry braising pans greatly increase kitchen productivity and are common today in many restaurant and institutional kitchens (Bendall, 2005). Display cooking and ala carte production have been enhanced with the introduction of induction ranges that heat instantly, operate without fumes and flames, and require no ventilation.

Ready prepared kitchens are true food factories that prepare food for later use. Chillers and blast chillers are now available for these systems to bring the temperature of food down from 63°C to below 4° C in 90 minutes or less (Hinson, 1997). When employing the tumble chill method, product is placed still hot into plastic casings that are sealed and tumbled in an icy bath (Hinson, 1997). The shelf life of products processed in a blast chiller can run from 21 to 45 days. Chillers allow large quantities of food to be prepared in advance and then chilled for storage. When service of the food is required, it can quickly be reheated in rethermalizers or combination oven-steamers (Schechter & Doty, 2000).

Features that make equipment more efficient include modular construction, mobility, and versatility. Modular construction allows the same pans, containers, and utensils to be used in various production stages and service without having to change to a different sized or shaped container. Mobility and transportability are very important in centralized commissary kitchens and ready-prepared systems (Sneed, 2001). The inclusion of casters on every piece of equipment possible adds mobility and makes moving equipment for cleaning and kitchen reorganization possible.

Satisfaction of the needs and desires of the target customers of a foodservice are the key factors that determine the establishment's success and continuity. The kind of equipment and the type, form,

and quality of food procured are based upon perceived customer preferences. In recent years, consumer activism has influenced the selection of foods offered for sale, preparation methods utilized, and purchasing. One example is the national movement away from the use of foods containing transfats. Since 2005, New York City, Philadelphia, Pennsylvania, and the State of California have passed laws that banned the use of trans fats in commercial food production (Jones & Helmick, 2006; Ban Trans Fats, 2003-2007).

Parents, educators, and politicians have long been concerned about the growing epidemic of overweight and obesity among school age children. Legislation in 2005 changed the vending products offered in public schools in many states so that more healthy snacks and less sugary drinks are now available to school children (National Conference of State Legislators, 2005). Today, many public schools are taking the unprecedented step of removing fried foods from their menus and by removing and refusing to replace deep fryers in school kitchens (NFSMI, 2000; Phillips, 2010). One option that may be superior to deep frying is the hot air tumble fryer (NFSMI, 2000). Deep fried fries have a 20% fat content, while baked fries contain 14% fat (NFSMI, 2000). Careful selection of foodservice equipment can help enable preparation methods that reduce the use of fats and transfats in food preparation.

Environmental sustainability has emerged as an issue in the systems, equipment, and technology used to provide foodservices. Environmental sustainability, or the green movement, is a world-wide trend that advocates the production and use of "greener food" and less use of fossil fuels in modern life including agriculture and food production (Pirog, 2004). Sustainability is the size of the "carbon footprint" left by the conduct of a business or industry (Pirog, 2004).

The local food movement is a part of environmental sustainability that encourages consumers to purchase more food raised locally (Pirog, 2004). Today's global economy supplies foods that are transported far distances from where they were produced to where they will be consumed. Through fruit and vegetable imports, the conventional global market makes many seasonal foods available nearly year round. As a case in point, in 2001, approximately 39% of fresh fruits in the United States were imported (Pirog, 2004).

Seventy percent of adults say they are more likely to patronize a restaurant that offers locally produced food items (National Restaurant Association, 2010). The local food movement is explained by the notion of a "food mile" (Pirog, 2004). A food mile is a comparative indicator of the amount of fossil fuel required to ship food from the farm where it is grown to a local retail grocer. In a study of Iowa agricultural products, foods grown locally traveled an average of approximately 60 food miles from producer to consumer, but when compared to conventional sources, the shipping distance averaged roughly 1,500 food miles (Pirog, 2004).

The decision to purchase locally produced foods, or to purchase more locally produced foods, is a significant change from the conventional foods market, and may impact a foodservice in unforeseen ways. The service of locally produced food is popular with customers and can be a good way a foodservice can differentiate its products in the marketplace (Sharma, Gregoire, & Strohbehn, 2009). However, extra time may be required for some foodservices to secure local suppliers who have enough capacity to consistently satisfy production needs (Sharma, Gregoire, & Strohbehn, 2009). Although the purchase of locally grown foods was not found to be more expensive than conventional foods (Sharma, Gregoire, & Strohbehn, 2009), the market form of locally acquired food may necessitate additional labor costs for preparation or require special equipment to transform the food into the form required for cooking.

Environmentalists believe that traditional foodservice operations negatively impact the environment by consuming large volumes of water, and creating copious amounts of solid waste material and wastewater (Green Restaurant Association, 2010). Foodservice buildings are estimated to consume roughly 2.5 times more energy per square foot than other comparable commercial structures (Jones, Khan, & Loucks, 2010; Seelve, 2006). Heating, ventilation and air conditioning (HVAC) systems are enormous consumers of energy in kitchens and can use up to 25% of a foodservice's energy expenditures (Seelye, 2006). The amount of energy used in ventilation hood systems can be reduced by 50% with effective controls that reduce fan speeds during idle periods (Seelye, 2006). Water conserving dish machines and the selection of natural gas fueled steam generators can reduce energy consumption. Selecting Environmental Protection Agency (EPA) Energy Star rated refrigerators and heated cabinets can reduce energy use and ensure more consistent temperature control (Seelye, 2006).

In an effort to make foodservices more environmentally friendly, restaurateurs established a Green Restaurant Association to inspect and confirm Certified Green Restaurants® (Green Restaurant Association, 2010). Certified Green Restaurants® are evaluated for water efficiency, waste reduction and recycling, sustainable buildings and furnishings, sustainable food, energy efficiency, and chemical and pollution reduction.

Onsite foodservice has been drastically impacted by the changing realities of the foodservice marketplace in every sector. The managed care environment of healthcare has shortened patient stays and the demand for more of a commercial focus has forced hospitals to drastically change the way they provide meals (King, 2001). Many hospital cafeterias are beginning to resemble mall food courts as operators respond to client demands for more selections and satisfaction (King, 2001). The pressures in hospital foodservice have forced the segment to become one of the most innovative in foodservice today through new experimentation, re-engineering, more efficient equipment, and new practices (Lamar, 2001).

The new wave of equipment innovation seems to be gaining momentum as all sorts of new equipment products make their way into the foodservice marketplace (Matsumoto, 2001 September). The modern global economy is making new equipment designs from all over the world rapidly available in the American market place (Food Management, 2000).

School foodservice, an onsite segment, is undergoing rapid change. A record 53.1 million students enrolled in elementary and secondary schools in 2000 for the sixth consecutive year (NSFMI, 2000; Stockham, 2000). School foodservice directors are faced with the challenge of serving all these students, often in 25 minutes or less. Providing foodservice for these large numbers of students is adding severe stress on older school foodservice facilities that often have equipment badly in need of repair (Matsumoto, 2001, October).

The introduction of the High School Student Satisfaction Survey (NFSMI, 1997) concludes, "Child nutrition programs today are much different from those of 1946…students today are more sophisticated and are exposed at an earlier age to a variety of types of food." Students of today have higher expectations as a result of their commercial dining-out experiences. High school students responding to the survey expressed preferences for more variety in food selections, improved quality, more service options, and an updated dining environment (NSFMI, 2000). Specific food requests in the

survey were for healthier foods, more "ethnic" menu items, and more commercial appeal (NFSMI, 2000).

Since the early 1990's, the US Food and Drug Administration and the US Department of Agriculture have been promoting national implementation of the HACCP food safety system. HAACP changes the food safety system from periodic inspections by an environmental safety officer to a prevention program that becomes the responsibility of each facility. The HAACP program's impact has been felt in new equipment and systems such as computer tracking of food temperature throughout all food systems from receiving to production and service. Computer tracking of food temperatures during the various stages of handling provides a vital trail of data in the food safety effort (NFSMI, 2000). With HACCP becoming an increasing part of foodservice practice, storing perishable food in refrigerators that maintain 41°F temperature and using serving equipment that keeps cooked food above 135° F is critical. Some of the older refrigeration, and hot food counters and holding equipment, may not be capable of keeping food at temperatures prescribed in the new HACCP standards.

No foodservice facilities, buildings, or equipment will last forever. Maintenance costs are relatively low when buildings and equipment are new. As facilities age, maintenance costs become more extensive. Some facilities have under-funded budgets that consider maintenance an operating expense rather than a capital outlay, and may ignore or defer maintenance. Foodservice equipment in onsite operations is typically depreciated over a ten year period (Kotschevar & Terrell, 1977). However, preventative maintenance can extend the useful life of equipment up to 15 or 20 years (Kotschevar & Terrell, 1977).

The commercial sector is encouraged through federal tax breaks to depreciate capital facilities over a 20 to 50 year time frame (Pagano, 1984). But tax-exempt organizations and institutions are not affected by taxes, and administrators may not consider the value of an existing capital asset. Depreciation of capital assets can be a tool to measure the duration of an asset. As assets decrease in value over time, equipment and capital depreciation can give administrators empirical evidence of the need to raise capital, create a capital budget, and renovate or replace the depreciated equipment or facilities (Brief, 2004).

APPLICATIONS IN HIGHER EDUCATION

The rapid pace of change in foodservice production and delivery systems over the past thirty years has created a need for students of foodservice in higher education to experience foodservice equipment and systems in their laboratory experiences that mirror the actual conditions these students must cope with in their careers.

The goals of a new commercial kitchen are:

- To acquire efficient, rapid production, and labor saving foodservice equipment and systems that are modular and mobile.
- To purchase new productive foodservice equipment and technology common to much of the industry in the 21st Century marketplace such as tilt-fry braisers, combination oven-steamers, and steam jacketed kettles.
- To obtain refrigerated foodservice equipment that will maintain perishable food at the HACCP standard of 41° F or less.
- To provide hot holding and service equipment that will maintain cooked prepared food at the HACCP standard of a minimum 135° F.
- To obtain foodservice equipment designed to satisfy contemporary health and environmental concerns such as the use of less fat, environmental sustainability, and the local food movement.

Table 1: Equipment List: Burrier Commercial Kitchen, Eastern Kentucky University

Item 1
Quantity: ***1 each*** **CONVERTIBLE BANQUET CART,** Carter-Hoffman
Item 2
Quantity: ***1 each*** **ICE MAKER WITH BIN, FLAKE-STYLE** Scotsman
Item 3
Quantity: ***1 each*** **SERVING COUNTER, HOT FOOD, ELECTRIC,** Vollrath
Item 4
Quantity: ***1 each***, **CHARBROILER, GAS** Vulcan Hart
Item 5
Quantity: **2 each, 36" RESTAURANT RANGES, GAS W SALAMANDER BROILERS** Vulcan
Item 6
Quantity: ***1 each*** **SPLIT POT FRYER W/BASKET LIFTS** Frymaster
Item 7
Quantity: ***1 each*** **CONVECTION OVEN, GAS,** Vulcan Hart
Item 8
Quantity: ***1 each*** **TILTING SKILLET/BRAISING PAN, GAS** Vulcan Hart
Item 9
Quantity: ***2 each*** **KETTLE, ELECTRIC, TABLE TOP** Vulcan Hart
Item 10:
Quantity: ***2 each*** **EQUIPMENT STAND, FOR STEAM KETTLES**
Item 11
Quantity: ***1 each*** **TOASTER, 4 SLICE POP-UP** Toastmaster
Item 12
Quantity: ***1 each*** **FOOD SLICER** Hobart
Item 13
Quantity: ***1 each*** **COOK/HOLD OVEN CABINET, ELECTRIC ,** CresCor
Item 14
Quantity***: 2 each***, **REFRIGERATOR, REACH-IN STYLE,** McCall
Item 15
Quantity: ***2 each*** **WORK TABLE, CABINET BASE SLIDING DOORS,** John Boos
Item 16
Quantity: ***2 each*** **DISHWASHER, UNDERCOUNTER,** Hobart
Item 17
Quantity: ***2 each*** **QUEEN MARY CART**
Item 18
Quantity: ***1 each*** **BOOSTER HEATER, ELECTRIC,** Hatco
Item 19
Quantity: ***1 each*** **POT RACK, WALL-MOUNTED,** AERO
Item 20
Quantity: ***1 each*** **FOOD MIXER, BENCH STYLE** Hobart

- To acquire new equipment and methods of preparation that enhance display cooking, ala carte, and just in time production.
- To encourage foodservice professionals to analyze the performance, capabilities and duration of existing foodservice equipment and to plan for facility and equipment depreciation so that the replacement of obsolete or worn out items may be recognized and planned for in an orderly manner.

CONCLUSION

The utilization of the commercial foodservice laboratory is expected to expand the quality of the curriculum within the Department of Family and Consumer Sciences and to provide an opportunity for other academic programs, such as Environmental Health Sciences, to utilize the facilities as part of their pedagogy. Nutrition and Foods classes utilizing the Commercial Foods Laboratory include Quantity Foods, Meal Management, Onsite Foodservice Management, Institutional Purchasing, Foodservice Organization and Management,

Figure 1: Kitchen Viewed From Classroom

Figure 2: Front Line Kitchen Equipment Battery

Figure 3: Back Line Kitchen Equipment Battery

Figure 4: Tilt Braising Pan

Figure 5: Self-Generating Steam Jacketed Kettles

Figure 6: Classroom Viewed from Kitchen

Figure 7: Charbroil Grill

Figure 8: Ranges with Salamander Broilers

and Experimental Foods. The Food Hygiene class, from the Department of Environmental Health Sciences of the College of Health Sciences, will be using the facility for part of their course. The Madison County Environmental Health and Safety Department has been invited to use the facility for training purposes. The commercial foods laboratory kitchen will be available for research projects assigned in Experimental Foods, Quantity Foods, and the Food Hygiene classes.

The commercial foods laboratory kitchen will also be used to produce food for a forty seat table service restaurant beginning September 2011. The restaurant is housed in a dining room adjoining the kitchen. Both the commercial foods laboratory and the restaurant will be operated and led by baccalaureate students in the Quantity Foods class. Student operation of the restaurant is expected to provide a superior hands-on leadership experience that would not otherwise be possible. Funds generated by the restaurant will be earmarked to pay for food, supplies, utilities, and maintenance expenses incurred in the ongoing operation of the facility. Budgeting for the restaurant is within the Department of Family and Consumer Sciences, an academic unit of the College of Health Sciences at Eastern Kentucky University.

Success of the program will be measured by its impact upon the

recruitment and retention of students, and the accomplishment of student learning outcomes established by the Department of Family and Consumer Sciences. Student perceptions of the impact of the program will be measured by their own self reported opinions of academic and career preparation. The success of the program will be measured with instruments including the IDEA evaluation system, written senior surveys, and written graduate surveys. Written evaluation of the performance of graduates of the program will be solicited in employer surveys. Faculty maintain documents and artifacts from each course that track success and performance of the program in the completion of student learning outcomes, for program assessment, and for accreditation purposes. Success of the program for administrators will be their evaluation of program impact upon student recruitment and retention, and the reputation of Eastern Kentucky University as a provider of safe, healthful, and modern facilities that promote and advance the teaching, research, and service mission of the university.

The Department of Family and Consumer Sciences at Eastern Kentucky University is accredited by the American Association of Family and Consumer Sciences. The general Dietetics Bachelor of Science and the Master of Science in Community Nutrition degree programs at Eastern Kentucky University are individually accredited by the Commission on Accreditation for Dietetics Education of the American Dietetic Association.

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STUDENT ATTITUDES TOWARD PODCASTING FOR FOOD SAFETY EDUCATION: AN EXAMPLE-BASED APPROACH

Lakshman Rajagopal, PhD[1*]; Catherine H. Strohbehn, PhD, RD, CP-FS[2]

[1]Assistant Professor, Iowa State University, Ames, IA 50011-1121 , USA
[2]Professor, HRIM Extension Specialist, Iowa State University, Ames, IA 50011-1121, USA

ABSTRACT

Podcasting has recently emerged as a major technological invention and has been immensely popular with applications in entertainment and education. This study aimed at determining the attitudes of hospitality management students toward the use of podcasting as an instructional tool in a food safety course. Student attitudes toward using podcasting as an instruction tool were positive. Colleges and universities can use podcasting as a tool for instruction in their on-campus and distance education courses. However, faculty should clearly delineate educational objectives and familiarize themselves with technology operational procedures before podcasting can be successfully incorporated in the classroom.

Keywords: Podcasting, food safety, education, training.

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INTRODUCTION

Over the past several decades, the advent of new technology has influenced the delivery of educational messages, particularly in the higher education setting. College professors have used videos, software presentations, CDs, laptop computers with internet access, digital cameras and more recently, the iPod. Increased use of technology on college campuses may be because today's college students (Generation Y) have been raised with technology and are pre-skilled with how to use it. Technology can be used in hospitality management education for teaching a variety of courses such as cost controls, quantity food production, human resources management, and food safety.

Food safety education is an important component of foodservice curricula. Providing food safety training and education has been shown to increase employees' self-reported food safety practices (Cotterchio et al., 1998) and improve governmental sanitation inspection scores (McElroy & Cutter, 2004). Employees in retail foodservices represent various generations, ethnicities, technological capabilities, and literacy levels. Thus, fundamental food safety messages may be "lost in translation" if managers and educators provide training using singular and/or outdated methods.

Generational Differences

Assessing and meeting employee training needs will become increasingly important for management as baby boomers retire, Generation X become leaders within the work organization, and Generation Y continue to enter the workforce (Rodriques, Green, & Ree, 2003). There has been a recognition by employers that Generation X and Y employees have different work expectations and values than baby boomers, which has begun to influence recruiting, training, and retention efforts (Roberts, 2005). Research by both Loomis (2000) and Tulgan (1996) found that the baby boomers group lived to work; Generation X worked to live; while Generation Y generally lived in the moment with no long-term work plans, especially if they perceived that no one at the work site cared about them (Roberts, 2005). Given the current economic circumstances and employment uncertainties, the attitudes of Generation Y are likely widespread. It has been noted that today's students are social, competent multi-taskers who expect immediate results and feedback, and seek interactivity in their learning (Tucker, 2006).

Technology in Training and Education

The use of computer-based learning has been reported in the literature. Distance education is an emerging trend gaining importance for those desiring convenience or for those wishing to continue in the workforce while continuing school (Beldarrian, 2006). In a study conducted by Costello, Gaddis, Tamplin and Morris (1997) it was found that quick service managers receiving computer-based food safety training scored higher on food safety knowledge tests than those receiving the same content via face-to-face lecture.

A survey among Iowa State University students enrolled during the 2007 – 2008 academic year found that electronic medium was used to discuss or complete an assignment by 56% of Freshmen and 53% of Seniors, illustrating a trend of increased use within the classroom (Iowa State University, 2008). In one study at the University of Wisconsin – Madison, which enrolls close to 30,000 students, respondents (25%) assessed benefits of online lecture and other types of web-based instruction (Vermanni, 2008). Over 90% of students in this study rated online lecture availability as very or somewhat important; 82% stated a preference for a course that records and streams lecture content online; and more than 60% indicated a willingness to pay more for these services. Students self-reported better retention, improved ability to review for exams, and greater engagement during classes. Non-interactive audio and video has been found to be less effective as an educational tool than computer-aided learning (Cohen, Ebeling & Kulik, 1981).

iPod use in Higher Education

The Pew Internet & American Life Project has tracked use of technology in the United States (US) society over the past several years (Madden, 2008). In the 2007 study, it found that 34% of US adults and 43% of internet users owned an iPod or other MP3 player, up from 20% of the population and 26% of internet users in 2006. The 2008 study found that 19% of internet users had downloaded podcasts to listen or view at a later date, compared to the 12% reported doing this in 2006. A clear trend is emerging of increased podcast use. Men continue to be more likely than women (22% and 16%, respectively) to download podcasts.

In this same study, internet users under the age of 50 were also found to be "significantly more likely" to download podcasts to watch or listen to later than those over the age of 50, with 23% reporting they had downloaded a podcast and 4% of these indicating it had been done within the past 24 hours. However, only 13% of over-50s had ever downloaded a podcast. Thus, gender and generational

*Corresponding Author: Phone: 515-294-9740 ; E-mail: lraj@iastate.edu

differences in the use of podcasts are suggested. In addition, podcast availability has increased, with one directory listing almost twice the number of podcast episodes in a recent two-year period. It has been suggested that iTunes, which prompts users to subscribe to podcasts, has had an impact on the increase, as did the wider use of podcasts academically (Madden, 2008).

College campuses have shown leadership in podcast use with professors investigating effectiveness of this method of information delivery. Traditional college age students (between 18 and 20) are the age group most likely to own iPods and mp3 players, with 61% reportedly owning this type of device (Madden, 2008). Podcasting has been used in medical schools where students view/listen to podcasts of lectures, and these have been reported as well received by students (Palmer & Devitt, 2007). Blaisdell (2006) suggested that podcasting has a relevant application in higher education, but cautioned that careful integration into the curriculum was necessary.

This exploratory study assessed the attitudes of hospitality students in a university-level food safety course about the use of podcasting for food safety education.

METHODS

Sample

Upon Institutional Review Board approval, 65 undergraduate students who were enrolled in the Hospitality Sanitation and Safety course at a Midwestern university were invited to participate in this study. Participants were mostly hospitality management majors but other majors such as culinary science, animal science, architecture, and journalism were also represented. Participation in this study was voluntary and informed consent was obtained prior to participation in this study. Students could use their personal video iPod for this study or could loan out a video iPod from the instructor. Students could earn 10 bonus points by participating in this study and those who did not choose to participate were given the option to complete a two-page review of a food safety education website such as Fight BAC!®.

Assignments

Participants completed two assignments that aimed at determining their attitudes toward podcasting technology for food safety education in the classroom. For Assignment 1, participants accessed (listened and/or viewed) podcasts containing food safety information on the Iowa State University Extension website at *www.extension.iastate.edu/foodsafety.* Food safety topics addressed in the audio and video-based podcasts were: a) employee health and hygiene, b) time and temperature control, and c) cleaning and sanitizing. The short assessment evaluated podcasting as a learning tool. Participants were also asked to rate the delivery mechanism, relevance of the content and usefulness of the content in terms of food safety knowledge gained using a scale of 1-5, with 1 = Strongly Dislike and 5 = Strongly Like. Participants also included information about when and where the podcasts were accessed.

For Assignment 2, participants identified and critically evaluated a food safety-related podcast of their choice which they obtained from the web. In addition to evaluating the podcasts on criteria similar to Assignment 1, participants also identified strengths and weaknesses of the podcasts. Demographic information was also collected. Participants were given one week to complete each assignment. Participants were allowed to begin Assignment 2 only after they completed Assignment 1.

Data analysis

Descriptive statistics were computed using The Statistical Package for Social Sciences (*SPSS*, Windows 17.0) software.

RESULTS

Demographics

Out of the 65 students that were invited to participate in this study, 58 students participated and completed both assignments. A majority of the participants were less than 21 years old (79.3%, n = 46), while others were 21-24 years (15.5%, n = 9), and older than 24 years (5.2%, n = 3). Females represented 69% (n = 40) of the total sample and the remaining were males (31%, n = 18).

Attitudes towards podcasting technology

Mean attitude ratings on a scale of 1-5 (1 = Strongly dislike, 5 = Strongly like) for podcasts viewed and listened on the Iowa State University Extension website (Assignment 1) were: usefulness of content (M = 3.63±0.95), relevance of content (M = 4.00±0.86), and the delivery mechanism (M = 3.54±1.16). Most participants viewed/ listened to the podcasts when they were in their dormitory room, at home, exercising at the gym, or watching television, mostly in the weekends or late at night. One participant mentioned that she viewed/listened to the podcasts while walking around campus after class. Participants found podcasts to be convenient to access and download onto their mp3 players (iPods) or view/listen to the podcasts on the computer at any time. This convenience sample of participants highly favored using podcasting technology.

In Assignment 2, the participants viewed/listened to podcasts of their choice obtained from the web and rated it on the same 5-point scale with addition of items about their perceptions of the credibility and level of engagement of podcasts. Mean attitude ratings were usefulness (M = 4.13±0.87), relevance (M = 4.29±0.79), credibility (M = 4.29±0.77), and level of engagement (M = 3.56±0.84). Table 1 summarizes the results from Assignment 1 and 2.

Table 1. Mean scores of student attitudes toward two podcasting assignments (N = 58)

Assignment 1	Usefulness of content M^a	Relevance of content M^a	Delivery Mechanism M^a	
	3.63±0.95	4.00±0.86	3.54±1.16	
Assignment 2	**Engaging** M^a	**Relevant** M^a	**Useful** M^a	**Credibility** M^a
	3.56±0.84	4.13±0.87	4.29±0.79	4.29±0.77

[a]1 = Strongly Disagree; 5 = Strongly Agree

In addition to rating the podcasts on a 1-5 point scale, the participants also identified the strengths and weaknesses of podcasts. Some strengths of podcasting technology identified by majority of the students were; provides useful information, has short duration, gets straight to the point, serves as a good visual aid, is convenient, and can be viewed repeatedly. Weaknesses of podcasting technology identified by majority of the students were; speakers are monotonous, visuals are unclear, provides excessive information in a short duration, too many speakers speaking at the same time, and is too long. In general, there was a preference for podcasts that were of shorter duration (less than 5 minutes), engaging, with enthusiastic speakers, and that had interesting visuals. Participants preferred to have video along with audio in podcasts as opposed to having audio only. Table 2 summarizes the students' analysis of strengths and weaknesses of podcasts viewed in Assignment 1 and 2. Identifying strengths and weaknesses of presently available podcasts helps

Table 2. Strengths and weaknesses identified by students of selected podcasts in Assignment 2 (*N* = 58)

Strengths	Weaknesses
Presented useful information.	Some podcasts were too long, it should be broken into smaller bits.
Provided good information.	
Provided relevant information in a succinct manner.	Presenter spoke in a monotonous tone, which made it disengaging.
It did a good job explaining information.	Picture was not very clear.
It was straight to the point and accurate.	Used too much technical terminology.
Good visual aid to keep you interested.	Too many people speaking at the same time.
Duration was short.	Threw a lot of information too quickly making it confusing and overwhelming.

educators in developing future podcasts that are user friendly, engaging, useful, and informative.

DISCUSSION

This study provided insight into the attitudes of undergraduate hospitality management students toward the use of podcasting technology as an instructional tool in the classroom in a food safety course. Participants highly rated podcasting, perceived it as an interesting tool, and were enthusiastic of its inclusion in the classroom for teaching food safety. Traditional food safety training utilizes face-to-face lecture, videos, discussion or activities as methods for instruction. While, these methods are effective, it is advisable to also include instruction that matches a person's learning style and preferences, as previous studies have shown that when instructional methods are matched to student learning styles, there is greater learning achievement (Dunn & Dunn, 1993).

Students use iPods and other mp3 players to listen to music as they walk across the campus and/or to view movies when they travel (Davidson, 2005). Students can also use iPods to view/listen to information when they are performing other mundane tasks of daily life such as exercising or watching television. However, students in previous studies have indicated resentment toward academic intrusion into their entertainment and leisure time, and use of "their" social media (Guess, 2008). Podcasts were viewed by the students in this study either late in the evening, late night or on weekends, illustrating the 24/7 convenience expected by today's generation of college students. While students identified podcasts as being useful, engaging, and user-friendly, the students preferred podcasts that were interactive, fun and of shorter duration. This finding is not surprising given the generational preferences of today's students (Roberts, 2005; Tucker, 2006) Podcasts that were of longer duration and involved a group of individuals who were conversing were not considered desirable; again, an unsurprising finding given the literature.

Also, as noted by findings in this study, development of an interactive component within educational podcasts is considered desirable to eliminate boredom (Palmer & Devitt, 2007). For example, quizzes and short movie clips (i.e. actual demonstrations of poor food handling behaviors) that require reflection of the material viewed/listened on the iPod can be used to make food safety education fun and interactive. Most of today's students, who appear to have an understanding of the technology, may benefit more from participating in the learning process (i.e. actually developing a podcast) rather than being spectators in the educational process. This approach to education is consistent with literature encouraging engagement among students.

FUTURE RESEARCH RECOMMENDATIONS

The effective use of podcasting in particular (Palmer & Devitt, 2007) and technology in general in higher education has been reported in published studies (Bates & Poole, 2003). Institutions can explore development of podcasts for foodservice and hospitality management courses as this would help educational institutions provide students with an alternative method of obtaining classroom materials and help reach more students via distance education. A library of developed podcasts can provide distant learners with easy accessibility to educational materials while on-campus students can also use the content, add variety to learning, and provide support resources for important and difficult concepts that require repeated delivery. More research is needed to assess the effectiveness of this educational strategy.

Consideration of podcast development for foodservice management topics such as cost controls, management information systems, procurement, and human resources is recommended. Not all concepts can be provided on podcasts, such as those that require hands-on training (i.e. technical skills such as knife cutting) but podcasts containing concepts related to laboratory-oriented courses (i.e. knife materials and selection) is a possible avenue for future development. Further, the effectiveness of podcasting by students (future managers) to train foodservice workers employed in retail foodservice settings about food safety could be assessed.

While this study only looked at attitudes toward podcasting, future research could assess whether learning occurred when podcasting was used as an educational tool. Transfer of knowledge could be assessed using a pre- and post- design method with podcasting used as an intervention. Comparisons between podcasting and other teaching methods can also be conducted to evaluate the benefits of podcasting as an instructional tool over other teaching methods.

The role faculty play in the incorporation of technology into the classroom must also be considered. It is important to address faculty concerns about using new technologies and provide hands-on training to alleviate any fear associated with using new technology prior to assimilation as an instructional method. Evan-Adris (1995) identified three patterns of technology use among teachers: a) avoidance (faculty who assign use of technology to students but do not use technology for their own purpose); b) integration (faculty who experiment and learn to use technology and promote use in the classroom); and c) technical specialization (faculty with strong technology skills and who use technology in an organized and purposeful manner).

Future research should also investigate direct and indirect costs associated with use and development of podcasts. While it may be assumed, most students have the necessary equipment (iPod or mp3 player), that may not necessarily be the case. It is important to note that iPods are the not the only mp3 players available in the market, other inexpensive mp3 players are also available (such as iRiver Clix, sanDisk's Sansa, Microsoft's Zune) along with PDA's (Personal Digital Assistant). New generations of mobile phones also possess capabilities of playing audio and video podcasts (Palmer & Devitt, 2007). Some other technologies that have recently emerged can

potentially also be used for podcasting such as iTouch, iPads, mobile tablets, and 3G/Wi-Fi enabled devices (Waters, 2010).

According to Campbell (2005), bringing together classroom material with leisure-time entertainment and providing that through the same medium aids in integrating a student's educational experience with other aspects of his/her life. Yet, some students may desire to maintain a distance between their social media and academic technology.

CONCLUSIONS AND IMPLICATIONS

Overall, this study provided information about student attitudes toward the use of podcasting in the classroom for teaching food safety and provided information useful to educators when considering use of podcasts in their courses. The major limitation of this study was the relatively small sample size. This study should be carried out with a larger sample to determine if there are any statistically significant differences in attitudes towards podcasting for food safety education. Since participation in this study was voluntary, it is possible that it may have skewed results as evidenced by higher mean scores. However, informal conversations with students after the study revealed high interest and excitement among students for the use of podcasting technology for food safety education.

Technology is an indispensible part of faculty and students' daily lives and is in constant metamorphosis. It is imperative learning experiences involve technology, thus faculty must adapt to new methods of instruction. Food safety education is heading in new directions in an effort to make it effective and to get messages across to audiences using innovative methods that are engaging and fun. In addition, by using technology for education and training, consistency in training will be achieved thus avoiding any inconsistencies that may result from varying trainers. One of the major advantages of podcasting is that it can be used for training at anytime, anywhere and by anyone.

The cost associated with development and maintenance of podcasts (i.e. server fees and instructional technology support) is a major concern to educators and institutions. Cost of equipment (mp3 players) could be a concern to students and not all students may be willing to purchase an mp3 player or use one for academic purposes. Students can also access podcasts on their laptops, hence buying an mp3 player is not mandatory. It is advisable for today's educators to weigh in the pros and cons of using podcasting in their instruction and accordingly work towards incorporating it in their coursework.

Institutions that do not march ahead along with the current times are at the risk of lagging behind in today's digital world. Technology continues to evolve every day and the question faculty must ask is "are we ready?"

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