

**"University Foodservice Managers' and Employees'
Perceptions of Food Safety Training and Managers'
Comparison of Student and Full-Time Employees Food Safety Practices**

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ABSTRACT

Food safety is a critical issue facing the foodservice industry. Foodservice workers play a major role in preventing outbreaks of foodborne illness and meeting the goal of serving safe food. The purpose of this study was to compare food safety topics that were included in training or orientation from student and full-time employees' and managers' perspectives and to determine foodservice managers' perceptions of student employees' food safety practices compared to those of full-time employees in one university foodservice operation.

Written surveys were distributed to student and full-time employees and managers at their workplace. Surveys were returned by 221 student employees (40%), 38 full-time employees (38%), and 16 managers (84%). The majority of student employees (65%) had worked only one or two semesters for university foodservice. For nine of 16 food safety topics, 80% or more students reported training had been received. Over 92% of full-time employees reported to have had training in 15 areas, for procedures in cleaning and sanitizing dishes only 75% reported to have training. Topics where fewer student employees reported training related to hand maintenance (short fingernails, no polish) and cross contamination, and 14% reported that they did not have training related to handwashing. Managers reported no difference between student and full-time employees for eight practices, but observed worse performance in students for seven practices. Training emphasis needs to be given to handwashing and cross contamination in this operation. This study points out the need for university foodservice managers to evaluate training effectiveness.

INTRODUCTION

Foodborne illness can be caused by employees' lack of food safety knowledge and poor personal hygiene (Bryan, 1988; Cohen, Reichel, & Schwartz, 2001; GAO, 1996; Harrington, 1992; Olsen et al., 2000). People are primary agents for spreading contamination, and food handlers can contaminate food by transmitting microorganisms, thus, causing a foodborne illness (NRAEF, 2004). Improper holding temperature, inadequate cooking, and poor personal hygiene were the top three improper food preparation practices that contributed to foodborne illness from 1988 through 1992 (Bean, Goulding, & Angulo, 1996) and from 1993 through 1997 (Olsen et al., 2000). Several studies have reported inappropriate food handling practices in school foodservice, such as unsafe food handling with bare hand contact, infrequent changing of gloves between tasks, insufficient handwashing, inappropriate hair restraints, improper eating and drinking in food preparation areas, and inadequate cleaning and sanitation of utensils, equipment, and facilities (Giampaoli, Cluskey, & Sneed, 2002; Gilmore, Brown, & Dana, 1998; Henroid & Sneed, 2004). There is a paucity of observational studies conducted in college and university foodservices.

It is not uncommon for university foodservice managers to hire part-time student employees with no foodservice experience. In addition, many student employees work in university foodservice for only one or two semesters and leave for employment in other fields (Fiihr, 2001). As a result, student employees may have less awareness of and concern about principles of food safety than full-time employees.

It is very important for managers to educate all employees about food safety, train them to use appropriate food handling procedures, and monitor their performance. To ensure safe food handling and change incorrect food handling behaviors, employees must be provided with

accurate knowledge and be motivated to apply that knowledge. Moreover, ongoing reinforcement of training programs must be given regularly in the workplace so that employees consistently use desired food handling practices (Rennie, 1994). Penner, Shanklin, and Thomson (1997) stated that managers have a responsibility to train employees when they are first hired. These researchers found that managers and employees needed more food safety training than currently provided.

Several challenges to providing training exist in foodservice. Lydecker (1991) stated that challenges to planning successful food safety training program in foodservice operations include 1) scheduling blocks of time for different shifts, 2) having high turnover rates that create a constant need for training new employees, and 3) delivering food safety concepts to employees with limited education or those who speak English as a second language.

The purpose in this study was to compare food safety topics included in training or orientation programs from student and full-time employees' and managers' perspectives and determine managers' perceptions of student employees' food safety practices compared to those of full-time employees in one university foodservice operation. Results of this study provide baseline data to support university foodservice managers in developing and evaluating training programs to improve food safety practices.

Methods

Sample

A convenience sample of 547 student employees, 91 full-time employees, and 19 managers working in six residence dining centers in one self-operated dining services at a Midwestern land-grant university was used. Employees from other department operations such

as convenience stores, catering, and central bakery were not included in this study to control for job variations.

Questionnaire Design

Two questionnaires were developed for the study, one for employees and one for managers. The employee questionnaire, developed to identify food safety topics employees perceived to be taught to them during orientation or on-the-job training, was identical for student and full-time employees except for demographic items. Food safety topics were identified based on the *ServSafe Coursebook* (2002), the FDA Food Code (1997), and common food handling errors observed in foodservice (Giampaoli, Cluskey, & Sneed, 2002; Gilmore, Brown, and Dana, 1998; Henroid & Sneed, 2004). For 16 food safety topics, respondents were asked to indicate whether food safety training related to this topic had been provided at the current workplace by checking yes or no. No other response choices were given. The questionnaire was pilot tested by 20 undergraduate students who work in foodservice, but not currently in university foodservice. Changes were made to the questionnaire to improve readability.

A second questionnaire was developed to survey managers to determine if 16 food safety topics were included in orientation or training provided to student employees (using responses of yes and no) and to determine how student employees' performance in those areas compared to full-time employees' performance (using responses of "better", "same", or "worse"). This questionnaire was critiqued by three faculty members and three graduate students with foodservice management experience (half of whom had university foodservice experience) to ensure validity.

The research protocol and questionnaires were approved by the University Human Subjects Research Office prior to data collection. Approval of the project also was obtained

from the director and assistant director of Dining Services.

Data Collection

A questionnaire and cover letter were distributed to all student employees before or after they had clocked out for a shift by the researcher. Copies were placed under the time clock for student employees who were willing to participate in this study but were not present at the time of distribution. A questionnaire and cover letter were placed in full-time employees' work mailboxes. Employees placed completed questionnaires in designated sealed boxes in managers' offices. To encourage participation, respondents could sign up for two prize drawings. A questionnaire, cover letter, and return envelope were mailed to all managers (n=10) in six university dining centers. Managers returned completed questionnaires by campus mail.

Data Analyses

SPSS version 11.0 for Windows was used for all data analyses. Descriptive statistics, including frequencies and percents, were calculated for all variables. Chi-square analysis was used to compare student and full-time employees' perceptions of training related to food safety topics. Because of differences in sample size, the expected count for each group was examined and if the count were less than five, a comparison could not be done. Comparisons could not be done for four of the 16 topics. A probability of less than or equal 0.05 was considered significant.

RESULTS AND DISCUSSION

Demographic Information

Questionnaires were returned by 221 student employees, representing 40% of all student employees. Questionnaires were completed by 38 full-time employees, a 42% response rate.

Perceptions of Employee Food Safety Training

Sixteen questionnaires were completed by managers for an 84% response rate. Selected demographic characteristics of student and full-time employees are presented in Table 1. The majority (65%) of student employees reported to have been employed one or two semesters.

Training Related to Food Safety Topics

Student and full-time employees were asked to indicate what food safety topics had been included in training that they had received at their current place of employment. The Cronbach alpha reliability coefficient for the 16 training items was 0.87. Table 2 presents the number and percent of employees who perceived that they had received training related to 16 food safety topics.

Full-time employees reported more training on 11 of 16 food safety topics ($p \leq 0.05$) than student employees, which may reflect more longevity with dining services. There was only one topic, “procedures for cleaning and sanitizing glassware, silverware, and dishes”, for which full-time employees had a lower percent of yes responses than student employees. This perhaps reflects the high number of student employees assigned to dishroom duties compared to a very small number of full-time employees.

“Preventing cross contamination” and “temperature danger zone” were the two topics for which the smallest percent of student employees reported training. Again, this may reflect that a lower proportion of student workers are involved in food preparation compared to full-time employees. However, “preventing cross contamination” would be an essential concept for students involved in other areas, especially service and dishwashing.

Table 3 presents student employees’ and managers’ perceptions of food safety training. Generally, the proportion of students and managers who believed that training had been given for each topic was similar. Nearly 14% of student employees reported that they did not receive

training on proper handwashing procedures, yet 15 of 16 managers believed that training had been given. These results indicate that attention to training of student employees is needed for areas of proper handwashing, hand maintenance, role of personal hygiene in disease, and cross contamination.

Comparison of Student and Full-Time Employees' Food Safety Practices

Table 4 presents managers' comparison of student employees' performance related to food safety practices to full-time employees. The majority of managers indicated that student employees had worse performance than full-time employees for seven of 16 listed food safety practices. Many of these practices, such as proper handwashing and preventing cross contamination, are critical for food safety. For eight practices, the majority of managers indicated that there was no difference in performance between students and full-time employees.

CONCLUSIONS AND APPLICATIONS

This study reveals that there are differences in perceptions of food safety training for student and full-time employees. Differences probably reflect factors such as time employed with Dining Services, type of training given to student and full-time employees (full-time employees are provided ServSafe training), and differences in job responsibilities. Some food safety topics may not be essential to the job responsibilities of student employees, such as use of thermometers or the temperature danger zone. Nearly 40% of student employees did not perceive that they had training related to preventing cross contamination yet that is a critical responsibility for all jobs. Also, nearly 14% of students did not perceive that they had training related to proper handwashing. This is a concern because inadequate handwashing was often

observed in research studies of foodservice operations (Giampaoli, Cluskey, & Sneed, 2002; Gilmore, Brown, & Dana, 1998; Henroid & Sneed, 2004).

Most managers in this study believed that they had provided training related to handwashing, while some students did not believe that they had received training. This difference in perceptions may indicate that orientation programs need to be strengthened and that more emphasis needs to be given on basic tasks. One strategy might be to provide training, a handout, and have employees sign off that training had occurred. A written test would be another strategy to reinforce training and provide feedback to managers.

Results of this study also may support the need to have on-going training. Perhaps managers provide training but it is not internalized by employees. Reinforcement of training through techniques such as use of posters and continual monitoring of performance by managers and co-workers may change employees' perceptions of training that they receive.

A survey of employees' perceptions of training could be a useful tool for foodservice managers to assess the effectiveness of training. Planned observational studies in foodservice operations would be another approach to determine if training leads to implementation of appropriate food handling behaviors. Future research also could explore gaps between knowledge of food safety and food handling practices (behavior).

Table 1. Demographic Characteristics of Student (N = 221) and Full-Time Employees (N = 38)

Characteristic	<u>Student</u> n (%)		<u>Full-Time</u> n (%)
Age (years)		Age (years)	
18-19	105 (47.5%)	<30	9 (23.7%)
20-21	81 (36.7%)	31-50	15 (39.5%)
22-23	27 (12.2%)	51-65	12 (31.6%)
24-28	6 (2.7%)	>65	1 (2.6%)
Gender		Gender	
Female	135 (61.1%)	Female	34 (89.5%)
Male	86 (38.9%)	Male	4 (10.5%)
Country		Education level	
United States	207 (93.7%)	High school	15 (39.5%)
International	14 (6.3%)	Some college	16 (42.1%)
College status		Bachelor's degree	1 (2.6%)
Freshman	85 (38.5%)	Years worked in Dining Services	
Sophomore	65 (29.4%)	≤5	18 (47.4%)
Junior	39 (17.6%)	6-15	12 (31.6%)
Senior	32 (14.5%)	16-25	6 (15.8%)
College or Major		≤26	1 (2.6%)
Liberal arts and sciences	71 (32.1%)	Number of food safety training sessions received in current job	
Engineering	38 (17.2%)	0	0 (0%)
Business	32 (14.5%)	1-2	17 (44.7%)
Education	17 (7.7%)	3-4	5 (13.2%)
Design	15 (6.8%)	5-6	2 (5.3%)
Family and consumer Sciences	15 (6.8%)	>6	8 (21.1%)
Agriculture	9 (4.1%)	Food safety certification	
Undecided	6 (2.7%)	Yes	27 (71.1%)
Food science and human nutrition	5 (2.3%)	No	5 (13.2%)
Hotel, restaurant, and institution management	5 (2.3%)		

Table 1. (Continued)

Characteristic	<u>Student</u> n (%)
Position	
Student employee	188 (85.1%)
Student supervisor/leader	33 (14.9%)
Hours worked	
<10 hrs/wk	11 (5.0%)
10-15 hrs/wk	144 (65.2%)
16-20 hrs/wk	61 (27.6%)
Semesters employed by Dining Services	
1-2	144 (65.2%)
3-4	38 (17.2%)
5-6	24 (10.9%)
>6	13 (5.9%)
Number of on-the-job food safety training received in current job	
0	30 (13.6%)
1-2	117 (52.9%)
3-4	40 (18.1%)
5-6	8 (3.6%)
>6	1 (0.5%)

Note. Percentages may not total 100% due to non-response to a question.

Table 2. Comparison^a of the percent of student (N = 221) and full-time (N = 38) employees' who perceived that training on food safety topics was provided in their current job

Training Topics	Student		Full-time		X ²
	n	%	n	%	
Proper work attire (e.g. hair restraint, uniform)	214	97.7%	38	100%	
Use of gloves	207	95.0%	38	100%	9.0*
General personal cleanliness	192	88.9%	37	97.4%	
Procedures for cleaning and sanitizing glassware, silverware, and dishes	190	86.8%	28	75.7%	
Proper handwashing	188	86.2%	37	97.4%	
Reporting illness and injury	185	84.5%	37	97.4%	4.6*
Policies regarding eating and drinking in work area	178	81.3%	36	94.7%	4.2*
Procedures for cleaning and sanitizing utensils, equipments, and food contact surfaces	177	80.8%	37	97.4%	12.1***
Hand maintenance (e.g. short fingernails, no nail polish)	175	80.3%	38	100%	6.4*
Safe serving procedures	168	76.7%	36	94.7%	3.1
Use of thermometers and taking temperatures of food	163	74.4%	36	94.7%	22.4***
Types of chemicals used in the dining center and how to safely store and use	157	71.7%	35	92.1%	9.8**
The relationship between personal hygiene and the spread of disease	155	70.8%	37	97.4%	6.4*
Holding foods for service	154	70.6%	36	94.7%	21.3***
Preventing cross contamination	133	60.7%	38	100%	7.6**
Temperature danger zone where microorganisms can grow rapidly	113	52.1%	35	92.1%	7.1**

NOTE: Employees were asked to indicate whether or not (Yes or No) they had training related to food safety topics at their current place of employment.

^aChi square analysis was done to compare the two groups. Because of sample size differences, expected scores were calculated. If the expected score was less than five, a comparison could not be made.

* p ≤ 0.05

** p ≤ 0.01

*** p ≤ 0.001

Table 3. Comparison of Food Safety Training Provided from the Perspective of Student Employees (N = 221) and Managers (N = 16)

Training Topics	Students		Managers
	n	%	n
Proper work attire (e.g. hair restraint, uniform)	214	97.7%	16
Use of gloves	207	95.0%	16
General personal cleanliness	192	88.9%	14
Procedures for cleaning and sanitizing glassware, silverware, and dishes	190	86.8%	15
Proper handwashing	188	86.2%	15
Reporting illness and injury	185	84.5%	14
Policies regarding eating and drinking in work area	178	81.3%	16
Procedures for cleaning and sanitizing utensils, equipments, and food contact surfaces	177	80.8%	16
Hand maintenance (e.g. short fingernails, no nail polish)	175	80.3%	15
Safe serving procedures	168	76.7%	14
Use of thermometers and taking temperatures of food	163	74.4%	14
Types of chemicals used in the dining center and how to safely store and use	157	71.7%	12
The relationship between personal hygiene and the spread of disease	155	70.8%	12
Holding foods for service	154	70.6%	11
Preventing cross contamination	133	60.7%	13
Temperature danger zone where microorganisms can grow rapidly	113	52.1%	8

NOTE: Employees were asked to indicate whether or not (Yes or No) they had training related to food safety topics at their current place of employment. Managers were asked to indicate if training is given to student employees in their operation using Yes or No responses

Table 4. Managers' Comparison of Student and Full-Time Employees' Performance Related to Food Safety Practices (N = 16)

Food Safety Practices	Worse	Same	Better
	n	n	n
Proper work attire (e.g. hair restraint, uniform)	13	3	0
Preventing cross contamination	13	1	1
Hand maintenance (e.g. short fingernails, no nail polish)	12	3	1
Policies regarding eating and drinking in work area	11	5	0
Temperature danger zone where microorganisms can grow rapidly	11	4	1
Proper handwashing	9	6	1
Safe serving procedures	9	6	1
Holding foods for service	8	7	1
Procedures for cleaning and sanitizing utensils, equipment, and food contact surfaces	6	9	1
Use of thermometers and taking temperatures of food	6	9	1
The relationship between personal hygiene and the spread of disease	5	10	1
Types of chemicals used in the dining center and how to safely store and use	5	10	1
Procedures for cleaning and sanitizing glassware, silverware, and dishes	3	12	1
General personal cleanliness	2	13	1
Reporting illness and injury	2	11	3
Use of gloves	1	12	3

Note. Percentage may not total 100% due to non-response to a question.

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