CHALLENGES, BENEFITS AND STRATEGIES OF IMPLEMENTING A FARM-TO-CAFETERIA PROGRAM IN COLLEGE AND UNIVERSITY FOODSERVICE OPERATIONS

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ABSTRACT

A survey was conducted using both online and mail survey methods to investigate college/university foodservice (CUF) administrators' perceptions about challenges, benefits, and strategies regarding farm-to-cafeteria (FTC) programs. Data included demographics of CUF administrators and their foodservice operations, agreement ratings of challenges and benefit statements, and importance ratings of strategies that affect the success of FTC. Challenges included availability, adequacy, menu planning, space, procurement, price, and administration. Benefits included connection to local community, public image, sustainability awareness and local economy. Important strategies included reasonable price, buyers and sellers relationships, back-up plan, student education, and local agricultural organization relationships.

Keywords: College/university foodservice administrators, farm-to-cafeteria programs, challenges, benefits, strategies

INTRODUCTION

Sustainability of food and agricultural resources has become an important issue nationally and globally. The 2006 Environmental Scan of the American Dietetic Association (ADA) predicted that public interest in local food production would increase as the cost of energy boosted transportation expenses (Jarrat, J., & Mahaffie, J.B., 2007). The Scan also predicted that interest in fresh and organic foods would continue to grow. A 2007 ADA Position Paper recommended that foodservice managers promote ecological sustainability by purchasing foods direct from local growers and purchasing food produced with fewer agricultural inputs (Harmon, & Gerald, 2007).

The idea of farm-to-school programs was born in 1996-1997 when several pilot projects began in California and Florida (Eschmeyer, 2008). Since then, various schools, colleges, and universities have taken the initiative to implement farm-to-school or farm-to-cafeteria (FTC) programs. These programs allow operators to procure fresh locally grown farm products with the objective of serving healthier meals. There are currently over 2,000 farm-to-school programs involving K-12 schools in the United States (U.S.) (Joshi, & Azuma, 2009). There are over 150 farm-to-cafeteria programs involving colleges or universities in the U.S. and Canada (Community Food Security Coalition, 2010). Colleges and universities in California, Indiana, Iowa, Montana, New York, Ohio and Wisconsin have been cited as examples of successful FTC programs (Oklahoma Food Policy Council, 2003; Schuster, 2009).

In the U.S., there are 4,409 degree-granting colleges and universities (National Center for Education Statistics, 2009), and the majority of these have foodservice operations providing meals to their students.

FTC programs are a key element in sustainable college and university foodservice (CUF) operations which encompass other types of programs such as recycling, composting food waste, using biodegradable utensils and plates, and organizing community gardens (Beitenhaus, 2008). Education regarding the benefits of local, seasonal, and organic foods to consumers and institutions has been recommended as an evidence-based strategy to build community food security (McCullum, Desjardins, Kraak, Ladipo, & Costello, 2005). Winne (n.d.) defines local food as food produced within the state or sub-region where a school district is located.

A survey of college/universities participating in FTC programs indicated that 25.4% of local products come from the same city/county, 45.7% within a 50-200 mile radius, 25.4% from within the state or region, and 3.5% from unknown sources (Community Food Security Coalition, 2010). Purchasing locally grown foods may provide CUF operations with an alternative economical method of acquiring fresh and healthy foods for their students. Strohbehn and Gregoire (2005) advocated purchasing local foods as a means "to support regional economies, provide fresher and higher quality food, good public relations, availability of safer food and ability to purchase smaller quantities" (p. 2).

Foodservice operators who wish to procure local foods for menus may face several issues, challenges, or barriers. These include federal and state procurement regulations, concern about food safety, coordinating purchase and delivery of products from local growers, availability of local food products in appropriate quantities, seasonality of local products, increased product prices, and food preferences of students (Bellows, Dufour, & Bachmann, 2003; Community Food Security Coalition, 2010; Izuma, Rostant, Moss, & Hamm, 2006; Schuster, 2009; United States Department of Agriculture [USDA], 2005). According to a survey conducted by the Community Food Security Coalition (2010), the most frequently cited benefits of FTC programs were supporting the local farmers, community, and economy; higher quality food; lower environmental impact; and improved school and/or company public relations. A qualitative study of seven farm-to-school programs revealed three major reasons for serving local foods: "the students like it," "the price is right," and "we're helping our local farmer" (Izumi, Alaino, & Hamm, 2010, p.85).

A USDA-Food and Nutrition Service (2005) report stated that learning from the experiences of established programs is one successful strategy for implementing a new farm-to-school program. Hence, identification of problems faced and resolved while implementing FTC programs will make the process easier for other foodservice directors. The purpose of this study was to evaluate perceptions of CUF administrators about challenges, benefits, and strategies related to FTC operations and to share this information.

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METHODS
All methods used in this study received prior approval by a university Institutional Review Board.

Instrument
A questionnaire was developed based on a review of the literature and telephone interviews with three university foodservice directors who had implemented FTC programs.. The questionnaire was validated by six individuals including educators and college/university foodservice administrators. Revisions were made according to their suggestions.

Ten college/university foodservice directors participated in a pilot study to test reliability of the questionnaire and estimate time needed to complete the survey. Cronbach alpha analyses was used to test inter-item reliability of questions that used a Likert-type scale. After several statements were removed, the questions met research standards for reliability as follows: Local product supply and distribution methods ($\alpha = 0.685$, n = 5); Foodservice operation ($\alpha = 0.887$, n = 6); budget and purchasing ($\alpha = 0.827$, n = 8), administrative support ($\alpha = 0.868$, n = 4); benefits ($\alpha = 0.877$, n = 8); and strategies ($\alpha = 0.835$, n = 14). The final questionnaire gathered demographic information for foodservice administrators and operational characteristics. Participants were asked to evaluate a list of 45 statements related to local product supply and distribution methods (5), foodservice operation (6), budget and purchasing (8), administrative support (4) and benefits (8) using a 5-point Likert-scale (1=Strongly Disagree to 5=Strongly Agree). Participants assessed strategies (14) using a 5-point Likert-scale (1=Not at all important to 5=Extremely Important).

Sample and Data Collection
A sample of college/university foodservice administrators who were voting delegates of the National Association of College and University Food Services (NACUFS) was obtained. Due to a limited research budget and the increased postage cost of mailing outside the U.S., delegates from Canada, Mexico, and Taiwan were excluded from the study. The researchers also felt that production and purchasing practices would likely be quite different outside the U.S. Five-hundred thirty-eight administrators were invited to participate in the survey by a formal mailed letter with a direct web address to the online survey. PsychData software was used to manage the online survey. Two weeks after the letter mailing, 493 paper surveys were mailed to those who had not yet responded. Reminder postcards were mailed to administrators approximately two weeks following the paper survey, and administrators also received an email reminder each week for six consecutive weeks.

A $25 gift card was mailed to the participants of the three initial telephone interviews. All other participants were included in a drawing for one of four $25 gift cards.

Fifteen online surveys were unusable because participants answered only one question. A total of 24 paper surveys and 75 online surveys were completed. Thus 99 college/university foodservice administrators completed the study for a response rate of 19%.

Statistical Analyses
SPSS for Windows (Version 15.0, 2006, SPSS Inc., Chicago, IL) was used to summarize and analyze data. Descriptive statistics were used to summarize demographics of foodservice directors and characteristics of foodservice operations. Analysis of variance (ANOVA) was used to analyze differences between implementation of an FTC program, type of food production, location of foodservice operation, and the following variables: local product supply and distribution method, foodservice operation, budget and purchasing, administrative support, benefits, and strategies of implementing an FTC program.

RESULTS AND DISCUSSION

Demographics
The majority of respondents had more than 15 years of experience in foodservice and a bachelor's degree or higher. One-third were located in the Midwest region that included Illinois, Indiana, Iowa, Kansas, Michigan, Missouri, Nebraska, Ohio, and Wisconsin (Table 1). A higher participation rate from these states may indicate greater interest in FTC implementation in that region.

About three-fourths (n = 75) of the operations were self-operated and one-fourth (n = 24) were contract-managed. Over half of the facilities (44 self-operated and 13 contract-managed) were implementing FTC programs. Operations that administered FTC programs purchased 17% of their products locally and 72% from foodservice distributors. The most frequently purchased local products included fresh fruits and vegetables followed by milk and cheese, beef, poultry, and other products such as honey, pork, and seafood. Self-operated operations may have fewer limitations in implementing FTC compared to contract managed operations which have corporate purchasing policies and annual purchasing contracts. However, this study found no relationship between types of foodservice management and implementation of FTC.

Table 1. Demographic Characteristics of Respondents and Foodservice Operations

No. of Years in Foodservice	n	No. of Years in CUF	n
≤5 years	6	≤5 years	14
>5 years-10 years	3	>5 years-10 years	13
>10 years-15 years	7	>10 years-15 years	10
>15 years	82	>15 years	61
Level of Education		Regional Location	
High school	2	Continental	12
Some college	6	Mid Atlantic	14
Associate's degree	15	Midwest	33
Bachelor's degree	52	North East	14
Master's degree	23	Pacific	14
Doctoral degree	1	Southern	12
Management Type		Production Type	
Contract management	24	Conventional	94
In-house or self-operation	75	Assembly-serve	49
		Central production	41
Implementation of FTC Program		Cook-chill	19
		Other	5
Yes	57		
No	42		

Types of food production used by respondents in this study included conventional (94), assembly-serve (49), central production (41), and cook-chill (19). Many indicated using two or more types of production methods. Five respondents indicated other production types included convenience store, display cooking and grab and go. The average number of students enrolled at these colleges/universities was

12,241, and 78% were considered full-time students. The average number of meal plans sold for fall semester 2008 was 3,258, and average number of meals produced in seven days was 27,622. An average of 93 full-time employees and 114 part-time employees were employed at these operations.

Challenges to Implementing FTC Programs

Challenges to implementing FTC programs were categorized as local product supply and distribution methods, foodservice operation, budget and purchasing, and administrative support. Challenges that received the highest levels of agreement included "Local farmers do not have enough supplies to meet our institution's needs," "Local products in our area are more expensive than products purchased from foodservice distributors," "Ordering and payment procedures for farmers are not efficient compared to foodservice distributors," "Purchasing local products will increase my institution's production costs," and "Products needed by my institution are not available from local farmers." The mean level of administrators' agreement with these challenge statements is shown in Table 2 in order of highest to lowest levels of agreement within categories. Table 2 also compares responses from those administrators who had implemented FTC programs with those who had not. For 22 of the 23 statements, administrators who had not implemented FTC had higher levels of agreement concerning challenges to implementing FTC programs. One-way Multivariate Analyses of Variance (MANOVA) and univariate analyses showed there was not a significant difference in level of agreement between those who had implemented an FTC program and those who had not concerning five statements about local product supply and distribution methods, but that there were significant differences in the other three categories.

Those who had not implemented FTC had higher levels of agreement that product storage space, limited skills of staff, and type of food production were challenges to implementing an FTC program. Administrators who utilized other types of food production (assembly-serve, central kitchen, and cook-chill) were also more likely to agree that lack of skilled staff to prepare local products, type of food production, and lack of storage space would prevent implementation of FTC programs. Assembly-serve production, which uses convenience products that only need to be reheated and served, would not be compatible with FTC methods. Cook-chill and central kitchens also might require larger quantities of products that would be available locally. Furthermore, the design of cook-chill and central kitchens might make it less feasible to process and store local products. Lack of facilities and staffing to handle and prepare local products were listed as barriers to FTC programs by Michigan school foodservice directors (Izuma et al., 2006). The Oklahoma Food Policy Council (2003) also reported "lack facilities to handle large amounts of fresh produce" as one of the challenges to purchasing local foods.

Challenges related to budget and purchasing may also hinder foodservice administrators from implementing FTC. Those administrators who did not have an FTC program had significantly higher agreement (p = 0.002) that the institution's purchasing policies did not allow purchase of local products. This indicates that purchasing policies could be a barrier to implementation of an FTC program for some colleges and universities. In a survey of 383 K-12 Michigan school foodservice directors, 71% indicated that federal and state procurement regulations were a barrier that could prevent purchasing foods directly from local producers (Izuma et al., 2006). Foodservice administrators who had not implemented FTC programs also showed higher level of agreement (p = 0.021) that they did not have enough customers to support the purchase of local products. This indicates that marketing FTC programs to student customers may be necessary in order to increase the sale of meals that incorporate local products. Markley (2002) also reported price, delivery, distribution, product consistency, product availability, and product volume as barriers listed by foodservice directors for starting farm-to-college projects.

Administrative support including adequate staff to maintain FTC and support from the institution may encourage the implementation of FTC programs. Foodservice administrators who had not implemented FTC programs had significantly higher level of agreement that lack of institutional support (p = 0.001), limited access to resources on how to start an FTC program (p <0.001), and lack of technical support from community and government agencies concerning local purchases (p<0.001) were challenges. Administrators of colleges/universities play an important role in granting the permission to start an FTC. Resources on how to start FTC programs are available, although they are not easily accessed. Some resources may cost a small fee to obtain, while other resources required large amount of time to research. Technical support from community and government agencies may include setting an agreement or contract between foodservice operations and local farmers, finding reliable sources of local products, and building appropriate facilities to store local products.

Benefits of FTC Programs

Administrators in this study tended to have a high level of agreement with eight statements concerning the benefits of FTC programs (Table 3). Those benefits that rated the highest were helping a college/university connect to the local community, improving the public image of a college/university, increasing sustainability awareness among students, increasing sustainability awareness among faculty and staff, and stimulating and benefiting the local economy. A MANOVA and ANOVA were used to compare responses between administrators who had implemented an FTC program and those who had not. Those who had implemented FTC programs had significantly higher levels of agreement with the benefits of providing a reliable local market for farmers (p = 0.003), connecting to the local community (p = 0.025), and improving public image (p = 0.043). Other studies have documented the benefits of implementing FTC including a dependable market for farmers and the opportunity for sustainability education for students (Bellows, Dufour, & Bachmann, 2003; Markley, 2002).

Strategies for Success of FTC Programs

Participants were asked to rate the importance of 14 strategies that may affect success of an FTC program (Table 4). The five strategies rated most important were developing a back-up plan when local products are not available, finding a source for reasonably priced local products, establishing relationships with local agricultural organizations, maintaining good relationships between buyers and sellers, and educating student customers about the program. An ANOVA revealed that administrators who had implemented FTC programs rated three of the strategies as significantly more important than those who had not implemented such programs. The three strategies included beginning a FTC program by introducing one or two local farm products at a time (p = 0.017), maintaining good relationships between buyers and sellers (p = 0.017), and educating student customers about the program (p = 0.021).

The majority of administrators who had implemented FTC programs were self-operated foodservice operations which means they may have opportunity to purchase increased amounts of local products. Furthermore, the appropriate types of local products must be available to meet the requirements of these foodservice operations. A good relationship between the buyer and seller will assist in finding local products in terms of quality, quantity, and competitive price.

Challenges Statements	FTC Program[b]	No FTC Program[b]	p^c	Overall Mean ± SD
Table 2. Differences in CUF Administrators' Mean Level of Agreement with Challenges Statements Based on FTC Program Implementation				
Local Product Supply and Distribution Methods	n[a] =53	n[a] =33		
Local farmers do not have enough supplies to meet our institution's needs	3.60	3.79	0.513	3.67 ± 1.26
The products needed by my institution are not available from local farmers	3.06	3.52	0.081	3.23 ± 1.18
Local farmers will not provide delivery to our institution	2.98	3.36	0.157	3.13 ± 1.22
Local products need more preparation compared to products purchased from foodservice distributors	2.91	2.97	0.823	2.93 ± 1.28
Our local sources have a low level of food safety protection	2.60	3.03	0.072	2.77 ± 1.07
Foodservice Operation	n = 57	n = 40		
It is difficult for me to plan menus based on seasonality of crops	2.77	2.85	0.729	2.80 ± 1.09
My institution does not have enough space to store local products	2.19	2.85	0.004**	2.46 ± 1.13
My institution has limited foodservice staff to prepare local products	2.16	2.55	0.104	2.32 ± 1.17
My institution has limited equipment to prepare local products	1.93	2.20	0.141	2.04 ± 0.89
My foodservice staff has limited skill to prepare local products	1.84	2.20	0.024*	1.99 ± 0.77
The type of food production used by my institution prevents me from preparing local products	1.79	2.25	0.002**	1.98 ± 0.74
Budget and Purchasing	n = 54	n = 35		
Local products in our area are more expensive than products purchased from foodservice distributors	3.44	3.43	0.949	3.44 ± 1.13
Ordering and payment procedures for farmers are not efficient compared to foodservice distributors	3.35	3.57	0.401	3.44 ± 1.20
Purchasing local products will increase my institution's production costs	3.24	3.43	0.444	3.31 ± 1.12
I find that it is difficult to place orders with multiple vendors	3.02	3.06	0.890	3.03 ± 1.27
Purchasing local products will increase my institution's transportation costs	2.59	2.89	0.179	2.71 ± 1.00
My institution does not have enough funding to purchase local products	2.43	2.46	0.890	2.44 ± 1.03
My institution's purchasing policies do not allow me to purchase local products	2.04	2.77	0.002**	2.33 ± 1.11
My institution does not have enough customers to support purchase of local products	1.80	2.20	0.021*	1.96 ± 0.81
Administrative Support	n = 55	n = 36		
My institution has limited staff to organize and maintain a farm-to-cafeteria program	2.95	3.28	0.171	3.08 ± 1.13
I do not have the technical support from community and government agencies to purchase locally	2.18	3.19	<0.001***	2.58 ± 1.00
I have limited access to the resources on how to start a farm-to-cafeteria program	1.98	2.89	<0.001***	2.34 ± 0.97
My institution does not support the idea of a farm-to-cafeteria program	1.60	2.11	0.001**	1.80 ± 0.73

[a]The actual number of respondents varied due to missing or invalid data.
[b]A Likert-type scale was used as follows: 1 =Strongly Disagree, 2 =Disagree, 3 =Neutral, 4 =Agree, 5 =Strongly Agree
[c] Results for Analyses of Variance of administrators' perceptions based on implementation of an FTC program; * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table 3. Differences in CUF Administrators' Mean Level of Agreement with Benefit Statements Based on FTC Program Implementation

Benefit Statements	FTC Program[b] (n=56)	No FTC Program[b] (n=37)	p[c]	Overall Mean[b] ± SD
A farm-to-cafeteria program helps a college/university connect to the local community	4.50	4.19	0.025*	4.38 ± 0.66
A farm-to-cafeteria program improves the public image of a college/university	4.45	4.16	0.043*	4.33 ± 0.66
A farm-to-cafeteria program increases sustainability awareness among college/university students	4.41	4.16	0.112	4.31 ± 0.74
A farm-to-cafeteria program increases sustainability awareness among college/university faculty and staff	4.34	4.05	0.080	4.23 ± 0.77
A farm-to-cafeteria program stimulates and benefits the local economy	4.21	4.22	0.990	4.22 ± 0.75
A farm-to-cafeteria program provides more healthful foods for customers by offering local products	3.79	3.59	0.373	3.71 ± 1.01
A farm-to-cafeteria program increases consumption of fresh fruits and vegetables	3.55	3.35	0.330	3.47 ± 0.97
My institution provides a reliable market for local farmers	3.68	3.08	0.003**	3.44 ± 0.96

[a]The actual number of participants varied due to missing or invalid data.
[b]Likert-type scale was used as follows: 1 =Strongly Disagree, 2 =Disagree, 3 =Neutral, 4 =Agree, 5 =Strongly Agree
[c]Results for Analyses of Variance of administrators' perceptions based on implementation of an FTC program; * $p<0.05$, ** $p< 0.01$.

Administrators that use conventional food production also had a higher level of agreement with the strategy concerning finding a source for reasonable priced local products. This indicates that local products that are competitively priced will more likely be purchased by college/university foodservice administrators.

CONCLUSIONS AND APPLICATIONS
Administrators with FTC programs had higher over-all levels of agreement concerning program benefits; perhaps these administrators could encourage and mentor others who are facing challenges in implementing FTC programs. Administrators perceived that maintaining good relationships with local sellers including farmers was an important strategy for FTC programs. In addition, educating student customers and marketing the FTC program to the college/university and community will increase the level of success of the program. Students may begin to purchase more meals and support the implementation of FTC programs after gaining more information about them. Foodservice operations may then increase their revenue and have larger budgets to operate FTC programs.

In summary, the most frequently identified challenges of implementing FTC included availability of local product in appropriate quantities to meet demand, menu planning based on the seasonality of local products, storage space, efficiency of ordering and payment procedures for farmers, competitive priced local products, production cost, and adequate staff for FTC administration. The most frequently identified benefits of implementing FTC in CUF operations included connection to local community; improved public image; increased sustainability awareness among students, faculty and staff; and stimulated local economy. The top five strategies rated as most important to the success of FTC programs included "Developing a back-up plan when local products are not available," "Finding a source for reasonable priced local products," Establishing relationships with local agricultural organizations," "Maintaining good relationships between buyers and sellers including farmers," and "Educating student customers about the program."

Study participants were limited to voting delegates of NACUFS and results may not be generalized to overall CUF operations in the U.S. and Canada. The members of NACUFS represent only about 18% of the total of public and private institutions of higher education. The low response rate (19%) of this study may also be a limiting factor in application of its results. In addition, more members from the Midwest than other areas of the country participated in this study.

Future research might focus on investigating what local foods can most successfully be incorporated in college/university menus and what type of promotions and education are effective in encouraging students to select menu items made from local products. Researchers might also ask students if they would eat more meals at dining facilities if local foods were served. Other programs related to sustainability including recycling, composting and campus gardens could also be investigated.

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Table 4. Differences in CUF Administrators' Mean Rating of Importance of Strategy Statements Based on FTC Program Implementation

Strategy Statements	FTC Program[b] (n[a] = 57)	No FTC Program[b] (n[a] = 42)	p[c]	Overall Mean[b] ± SD
Developing a back-up plan when local products are not available	4.39	4.52	0.241	4.44 ± 0.58
Finding a source for reasonable priced local products	4.42	4.45	0.783	4.43 ± 0.56
Establishing relationships with local agricultural organizations	4.33	4.31	0.862	4.32 ± 0.67
Maintaining good relationships between buyers and sellers including farmers	4.40	4.14	0.017*	4.29 ± 0.54
Educating student customers about the program	4.35	4.05	0.021*	4.22 ± 0.65
Marketing the program to my college/university and the community	4.25	4.10	0.202	4.18 ± 0.58
Getting support from upper administration	4.16	3.88	0.127	4.04 ± 0.89
Establishing relationships with other foodservice organizations that purchase local farm products	4.04	4.02	0.935	4.03 ± 0.68
Obtaining adequate funding from my organization	4.04	3.76	0.131	3.92 ± 0.89
Beginning a small farm-to-cafeteria program by introducing one or two local farm products at a time	4.05	3.71	0.017*	3.91 ± 0.70
Maintaining adequate skilled staff to prepare the local products	3.91	3.90	0.964	3.91 ± 0.81
Assessing whether students customers are interested in purchasing local farm products	3.84	3.95	0.483	3.89 ± 0.77
Arranging foodservice administrator visits to local farmers' markets	3.95	3.69	0.117	3.84 ± 0.80
Organizing a food advisory committee	3.54	3.57	0.889	3.56 ± 0.96

[a] The actual number of participants varied due to missing or invalid data.
[b] A Likert-type scale was used as follows: 1 =Not at all Important, 2 =Not Important, 3 =Neutral, 4 =Important, 5 =Extremely Important
[b] Results for Analyses of Variance of administrators' perceptions based on implementation of an FTC program; $p<0.05$.

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