

Fresh Produce Awareness and Consumption of Food Bank Patrons: A Case Study of the "Farm to Food Banks" in Kentucky

Shang-Ho Yang^[1]

ABSTRACT Food banks have made efforts to distribute more fresh produce as part of their goal to bring healthier food to lower-income consumers. The Kentucky Association of Food Banks investigated the impact of their "Farms to Food Banks" fresh produce nutrition and recipe education program and sourcing project. An evaluation of this program shows evidence of expanded fresh produce utilization among recipients. Cost associated with fresh produce is by far the largest barrier to consumption. The Extension implications of this study focus on educating food bank patrons about various subsidy programs, like SNAP, as well as the healthiness associated with fresh produce.

Key Words: Consumption, food bank, food pantry, fresh produce.

I. Introduction

Food banks are organizations which collect and distribute food to people who are unable to purchase adequate supplies. The growing evidence shows that individuals lacking food security are more likely to have less nutritious diets, compared to those who are food secure^[3,4,9]. A number of epidemiologic studies have found a linkage that enhancing fruit and vegetable consumption would decrease risks of obesity and cardiovascular disease, and the overall health status may increase as well^[7,8,5]. However, food bank clientele may have a hard time changing their consumption behavior by utilizing more fresh produce in their diets^[1]. Therefore, food banks have attempted to improve access for food bank clientele to adequate healthy foods, such as fresh produce^[1,6]. Consequently, this study attempts to investigate whether the food bank clientele may or may not change their behavior to utilize more fresh produce in their diets.

The Kentucky Association of Food Banks (KAFB) received a Specialty Crop Block Grant from the Kentucky Department of Agriculture in 2011 to launch a nutrition education and direct produce purchase program during the growing season of 2012. The "Farms to Food Banks" program was designed to increase consumption and awareness of fruits and vegetables among low-income consumers through a nutrition and recipe education program delivered by the University of Kentucky's Expanded Food, Nutrition and Education Program (EFNEP) and a targeted local fresh produce distribution program based on a direct purchase from growers. The direct purchase produce was used by the food banks to supplement traditional donation methods. The volume and quality of this produce distributed was significantly enhanced through this program, adding over one million pounds of Kentucky-grown produce from 217 farmers in 49 counties^[14]. An evaluation was initiated to determine some of the behavioral impacts of this program on food bank clients

[1] Assistant Professor at Graduate Institute of Bio-Industry Management, National Chung Hsing University, Taichung 40227, Taiwan. The author is grateful to Dr. Timothy A. Woods, FSIC research team and two anonymous referees for valuable comments. All remaining errors are the author's.

* Corresponding Author. E-mail: bruce.yang@nchu.edu.tw

Fresh Produce Awareness and Consumption of Food Bank Patrons: A Case Study of the "Farm to Food Banks" in Kentucky after it was implemented in 2012.

The KAFB is comprised of seven food banks that provide food and services to emergency pantries, soup kitchens, and shelters that help to distribute food. KAFB sources fresh produce from a variety of sources, including direct from the growers, distributors, manufacturers, individual donors, and retailers who have surplus food which they cannot sell. The quality and variety of produce provided by food banks, subsequently, is often different from the selection and quality of products sold at grocery stores. Growers, for example, are encouraged to donate seconds and surpluses – good quality products, but leading to more variable inventories in the food bank. We need to understand food bank clients' consumption behavior, especially for use of fresh produce.

Due to food safety concerns, food banks used to only accept processed foods packaged in cans and boxes. In recent years, the higher awareness of health and food nutrition associated with fresh produce has become a concern^[13]. Some food banks have attempted to change the diversity of food available to food bank clientele to be more nutritious. They have made remarkable changes to deal with fresh, perishable foods. Miyamoto *et al.*^[10] and Mobley^[11] demonstrated that food banks can be a good education outlet for recipients about food and nutrition. Remley *et al.*^[12] found that recipients want to have more "choices" of food items. However, it is uncertain that the recipients' consumption behavior of fresh produce can be derived from 1) the awareness and familiarity with fresh produce, 2) a main shopper or cook in a family, 3) the change of cooking behavior by using more fresh produce compared to one year ago, 4) the change of sourcing fresh produce from different sites compared to one year ago, 5) the experiences at a food pantry, or 6) some potential demographic factors. If we can learn from recipients' consumption behavior, we may have a better sense of managing fresh produce access at food banks. This study attempts to explain how these six factors may

affect the consumption of fresh produce.

A study examining similar behavioral outcomes by Cason (2) showed that the consumption of fresh produce from low-income participants had increased significantly. The study applied traditional pre- and post-test methods with a panel-type data collection on low-income consumers' fruit and vegetable consumption. This study takes a similar approach while focusing on food bank clients.

II. Methodology

Food bank clients tend to be fairly fluid, so traditional pre-test/post-test methods using a panel-type data collection would be especially difficult. A one-time, in-person intercept survey targeting 25-50 clients at each site was used. In order to ease the potential bias if the clients feel any pressure, in general, the surveyors were trained to obtain permission for a short survey. Surveys were distributed to 3 food banks supporting 9 emergency food pantries participating in the region where produce had been acquired and distributed. Questionnaires were provided at the front desk but not pushing clients to fill it out. A total of 213 useable surveys were collected on December, 2012, from clients who source food from one of nine regional pantries.

In order to understand the determinants of fresh produce consumption via sourcing items from food banks, the survey asked clients to recall changes in consumption and attitude compared to 1 year ago to approximate pre- and post-test behaviors related to produce consumption. These behaviors included 1) change in fresh produce consumption and awareness, 2) change in cooking behavior with fresh produce, 3) change in sourcing fresh produce from different sourcing venues, and 4) experience with fresh produce at the pantry. In addition, identification of the barriers to increasing fresh produce consumption is examined by demographic factors, like age, whether or not the family has kids, and gender. Table 1 presents the

definitions and sample statistics for each variable.

Surveyed clients were asked to classify the change of fresh produce consumption compared to one year ago: 1) remained the same, 2) increased, but not too much, 3) increased, by a lot. Responses were fairly

evenly distributed among 213 usable surveys over consumption changes; same (39%), increased, but not too much (31%), and by a lot (30%). These are admittedly somewhat qualitative and subjective measures², but given the nature of the survey, these

Table 1 Definitions and Sample Statistics of Variables (N= 213)

Variables	Description of Variables	Mean	Std. Dev.	Min.	Max.
<i>Consumption</i>	Discrete variable; respondents may respond (1) <i>remained the same</i> , (2) <i>increased, but not too much</i> , and (3) <i>increased by a lot</i> as to their consumption of fresh produce compared to one year ago.			1	3
<i>Awareness</i>	Binary variable=1 if respondents have increased their awareness of and familiarity with fresh produce compared to one year ago, 0 otherwise.	0.52	0.50	0	1
<i>Main shopper</i>	Binary variable=1 if respondent was the main grocery shopper among household members, 0 otherwise.	0.93	0.23	0	1
<i>Main cook</i>	Binary variable=1 if respondent was the main person to prepare meals for household members, 0 otherwise.	0.92	0.26	0	1
<i>Cook more fresh produce</i>	Continuous variable; the changes of average meals per week including fresh produce for fresh or cooked utilization between 2011 and 2012.	1.14	4.82	-43.51	27.65
<i>Get fresh produce from grocery</i>	Continuous variable; the percentage changes of fresh produce obtained from grocery store between 2011 and 2012.	-8.42	29.12	-100	65
<i>Get fresh produce from food pantry</i>	Continuous variable; the percentage changes of fresh produce obtained from food pantry during between 2011 and 2012.	4.58	24.53	-100	100
<i>Get fresh produce from garden</i>	Continuous variable; the percentage changes of fresh produce obtained from garden during between 2011 and 2012.	-2.45	20.37	-100	100
<i>Get fresh produce from friends & family</i>	Continuous variable; the percentage changes of fresh produce obtained from friends & family during between 2011 and 2012.	1.17	21.33	-87.63	100
<i>Get fresh produce from farmers market</i>	Continuous variable; the percentage changes of fresh produce obtained from farmers' market during between 2011 and 2012.	-0.83	14.14	-100	50
<i>Experience at pantry – just switch source</i>	Binary variable=1 if respondent classified their experience with fresh produce at the food pantry is just switching source, 0 otherwise.	0.71	0.39	0	1
<i>Experience at pantry – new and not tried before</i>	Binary variable=1 if respondent classified their experience with fresh produce at the food pantry was new and not tried before, 0 otherwise.	0.76	0.36	0	1
<i>Experience at pantry – feel eating healthier</i>	Binary variable=1 if respondent classified their experience with fresh produce at the food pantry is feeling like I am eating healthier, 0 otherwise.	0.87	0.30	0	1
<i>Experience at pantry – awareness of seasons</i>	Binary variable=1 if respondent classified their experience with fresh produce at the food pantry is higher awareness of seasons, 0 otherwise.	0.83	0.32	0	1
<i>Female</i>	Binary variable=1 if respondent is female, 0 otherwise.	0.78	0.40	0	1
<i>Age</i>	Continuous variable; years of age.	51.50	13.95	20	80
<i>Have Kids</i>	Binary variable=1 if respondent has at least one kid in their family, 0 otherwise.	0.44	0.49	0	1

2 The subjective measures may be confused when adopting mean and standard deviation in Table 1. The statistics of the variable, consumption, only provide minimum and maximum for readers' information.

Fresh Produce Awareness and Consumption of Food Bank Patrons: A Case Study of the "Farm to Food Banks" in Kentucky measures were chosen to at least provide some relative measures in change in consumption.

A multinomial logit model is ideal to explain the determinants of fresh produce consumption with the nature of this question. The multinomial logit model can be specified as:

$$\text{Pr } ob(Y_i = j) = \frac{e^{\beta_j' x_i}}{\sum_{k=0}^m e^{\beta_k' x_i}} \quad (1)$$

for $j = 0, \dots, m$

The estimated equation (1) provide a set of probabilities for the m choice (the change of fresh produce consumption) for food bank patrons with characteristics, i.e., to remain the same fresh produce consumption or to enhance more fresh produce consumption of j alternatives. This model is unidentified because many parameter values lead to the same probabilities: a convenient normalization would solve the problem by setting. Since the probabilities sum to one, only parameter vectors are estimated to determine m probabilities. With this estimation process, the remaining coefficients measure the change relative to the reference group (the base category).

We assume that there were few or no "decreases" in consumption with the offering of more fresh produce through the food banks, so the base category is "remained the same". The dependent variable, changing fresh produce consumption, is explained by sixteen independent variables (see Table 1). This study only focuses on how fresh produce consumption is affected by fresh produce awareness, the fresh produce awareness only causing effects on fresh produce consumption is assumed. However, a potential endogeneity is recognized.

One of the goals of the KAFB program was to increase awareness of produce. This is different from simply consumption. Awareness, in this context, refers to conscious integration into the diet while recognizing the need and nutritional contribution associated with fresh produce. Awareness can be a product of educational efforts hopefully leading to increased

consumption. Awareness of fresh produce "increased" for 52% of the KAFB clients compared to one year ago prior to the expanded buying program.

The vast majority of completed survey responses came from persons primarily responsible for the grocery shopping (93%) and preparing the main meals at home (92%). Sourcing of fresh produce shifted slightly to heavier reliance on the food banks while shifting away from grocery stores – but this is in share of sourcing rather than measuring absolute consumption amounts. Sourcing experiences at the pantry specifically were explored. One of the more striking results was that 87.4% of the KAFB clients surveyed indicated "feel like I'm eating healthier" when asked "What has been your experience with fresh produce at the food bank?"

Approximately 78% of clients are female; the average age is 51 years old. At least one child is noted to be present in 44% of client families.

III. Results

1. Barriers to Sourcing Fresh Produce

Surveyed clients were asked to identify barriers to increasing their fresh produce consumption, and the outcomes are presented in Table 2. A simple t-test by groups in each category was performed. Cost was identified most frequently as "more of a barrier" with an average ranking of 5.42 on a 7 point Likert scale, well ahead of the other potential barriers. Females more frequently ranked cost is a major limit to increasing fresh produce consumption compared to males. Barriers related to family interest and home storage were rated at 3.09. Bulky packaging (2.73), knowledge of food preparation (2.51), and access to stores that sell fresh produce (2.50) were lesser barriers. This last result was perhaps a little surprising given the heightened focus on food deserts and access. Cost for this group was clearly the overwhelming limit.

2. Fresh Produce Consumption

Table 3 presents the results for fresh produce consumption specified in each group, i.e., age, family with kids, gender, and eagerness for additional produce items. A simple t-test in each category was performed as well. After the food bank was providing more fresh produce, many food bank clients hoped to see more fresh produce items. Note that younger females (under 50) have significantly increased their fresh produce consumption by a lot compared to males.

3. Fresh Produce Consumption at Food Bank

Table 4 summarizes in a multinomial logit model the factors that help explain variation in the reported consumption of fresh produce at the food bank based on sixteen variables. Most of these variables represent

other behavior changes reported over the past year along with selected demographic measures. The Wald χ^2 test shows that there are differences overall across consumption responses. The multinomial logit model allows us to examine the significance of specific variables within each group. The category "remained the same" is normalized to zero (a base category). Results show that the fresh produce awareness, fresh produce sourcing location, sourcing experience, and gender are important determinants explaining consumption and significantly different from zero. The average marginal effects are presented in Table 5 The marginal effects in this case sum up to zero in each variable across different categories.

Awareness of fresh produce utilization is one of the

Table 2 The Barriers of Increasing Fresh Produce Consumption Among Groups by Age, Families with Kids, and Gender

Barrier ² to	Age		t-test	Family with Kids			Gender			Average
	Below 50	Over 50		Yes	No	t-test	Female	Male	t-test	
Cost	5.56	5.33	-	5.24	5.55	-	5.52	4.99	*	5.42c ³
Family Interest	3.33	2.94	*	3.19	3.00	-	2.89	3.85	***	3.09b
Home Storage	3.35	2.90	*	3.14	3.02	-	2.99	3.41	*	3.07b
Bulky Packaging	2.79	2.70	-	2.72	2.75	-	2.68	2.94	-	2.73ab
Preparation	2.72	2.39	*	2.57	2.47	-	2.42	2.89	*	2.51a
Access to stores	2.77	2.33	*	2.37	2.60	-	2.45	2.67	-	2.50a

Note: 1. Asterisks indicate levels of significance: * = 0.10, ** = 0.05 and *** = 0.01.

2. A Likert scale was used to examine barriers to consumption with 1 = "less of a barrier" and 7 = "more of a barrier".

3. Means within a column followed by the same letter are not significantly different (Tukey's HSD, P < 0.05).

Table 3 The Consumption of Fresh Produce Among Groups by Age, Families with Kids, Gender, and Eagerness for Additional Produce Items

Fresh Produce Consumption Compared to 1 Year Ago	Age			Family has kids			Gender			Eagerness for additional produce items			Average
	Below 50	Over 50	t-test	Yes	No	t-test	Female	Male	t-test	Yes	No	t-test	
Remained the same	0.31	0.44	*	0.35	0.42	-	0.38	0.43	-	0.37	0.47	-	0.394
Increased but not much	0.30	0.31	-	0.34	0.28	-	0.27	0.45	**	0.30	0.31	-	0.309
Increased by a lot	0.38	0.24	**	0.30	0.28	-	0.34	0.11	***	0.32	0.21	*	0.295

Note: 1. Asterisks indicate levels of significance: * = 0.10, ** = 0.05 and *** = 0.01.

Fresh Produce Awareness and Consumption of Food Bank Patrons: A Case Study of the "Farm to Food Banks" in Kentucky

largest factors contributing to changing fresh produce consumption behavior. Any positive awareness of fresh produce utilization is associated with "Consumption remained same" being 37% less likely, "Consumption increased, but not too much" being 19% more likely, and "Consumption increased by a lot" being 17% more likely. The cooking behavior by using more fresh produce does reveal a slight influence on the changing fresh produce consumption behavior. Any positive change on cooking more fresh produce compared to one year ago is associated with "Consumption increased, but not too much" being 1% less likely and "Consumption increased by a lot" being 2% more likely.

Awareness played a significant role positively shaping fresh produce consumption among KAFB patrons. There were limited educational programs accompanying the distribution of produce, but individuals clearly consumed more as they became more aware of fresh produce. Cooking with fresh produce also contributed positively to consumption. There were strong gender differences. Female were 18% more likely to indicate consumption increased by a lot and 24% less likely to indicate consumption increased but not much compared to men. Consumption increases were not limited to only product sourced at the food banks. There appears to be evidence that higher shares of produce sourced through

Table 4 A Multinomial Logit Regression for Consumption

Determinants	Consumption ^b increased but not much	Consumption ^b increased by a lot
<i>Awareness</i>	2.377***	2.582**
<i>Main shopper</i>	-1.009	1.183
<i>Main cook</i>	-0.135	-1.037
<i>Cook more fresh produce</i>	-0.045	0.130
<i>Get fresh produce from grocery</i>	-0.011	0.004
<i>Get fresh produce from food pantry</i>	-0.010	0.012
<i>Get fresh produce from garden</i>	0.008	0.029**
<i>Get fresh produce from friends & family</i>	0.006	0.028**
<i>Get fresh produce from farmers market</i>	0.004	0.025
<i>Experience at pantry – just switch source</i>	-1.527***	-0.844
<i>Experience at pantry – new and not tried before</i>	0.511	0.592
<i>Experience at pantry – feel eating healthier</i>	1.501**	11.092**
<i>Experience at pantry – awareness of seasons</i>	-0.674	-0.253
<i>Female</i>	-1.054*	0.671
<i>Age</i>	-0.008	-0.010
<i>Have Kids</i>	0.476	0.409
<i>Constant</i>	0.762	-12.479**
<i>Number of observations</i>	213	
<i>Wald χ^2</i>	88.620***	
<i>Pseudo R²</i>	0.280	
<i>Log Pseudolikelihood</i>	-167.116	

Notes: a. Asterisks indicate levels of significance: * = 0.10, ** = 0.05 and *** = 0.01.

b. The base category "Consumption Remained Relatively the Same" is compared.

gardens and friends/family further added to consumption.

There did appear to be some evidence of just switching fresh produce sources from commercial venues to the lower cost food bank option. This reinforces the cost sensitivity among patrons, but there is further evidence that produce consuming patrons feel like they are eating healthier which would hopefully lead to longer term change in consumption behavior.

IV. Conclusions, Implications, and Recommendations

There is strong evidence of expanded fresh produce consumption among KAFB clients during the period where the "Farms to Food Banks" program was administered. The "feeling of eating healthier" suggests food banks contribute to providing a healthy variety of food products and education to clients. This client group produces a significant amount of their food

at home and leans heavily on food banks for their fresh produce.

Cost is the major barrier for these clients. The role of the food banks helping these consumers (especially females) lower cost barriers is very significant and should be considered as part of a larger effort to increase fresh produce consumption among food bank clients. Younger males (under 50) also face the major barriers of family interest and home storage to use more fresh produce. An extension implication may focus on providing more education to younger males (under 50).

Most determinants of fresh produce consumption are significantly different from zero. The major factors include 1) awareness and familiarity with fresh produce, 2) cooking behavior by using more fresh produce, 3) the shift of getting more fresh produce from different sites, 4) positive experience at pantry, like not just only switching produce sources from previous experience and feeling like eating healthier, 5) gender appearing differently on fresh produce consumption. Perceptions

Table 5 Average Marginal Effects in the Multinomial Logit Model

Determinants	Consumption remained same	Consumption increased, but not much	Consumption increased by a lot
<i>Awareness</i>	-0.374***	0.199***	0.175***
<i>Main shopper</i>	0.018	-0.270	0.251
<i>Main cook</i>	0.075	0.061	-0.137
<i>Cook more fresh produce</i>	-0.003	-0.018***	0.022*
<i>Get fresh produce from grocery</i>	0.0007	-0.002*	0.001
<i>Get fresh produce from food pantry</i>	0.0002	-0.002**	0.002**
<i>Get fresh produce from garden</i>	-0.002	-0.0008	0.003**
<i>Get fresh produce from friends & family</i>	-0.002	-0.001	0.003**
<i>Get fresh produce from farmers market</i>	-0.001	-0.001	0.003
<i>Experience at pantry – just switch source</i>	0.190**	-0.194***	0.003
<i>Experience at pantry – new and not tried before</i>	-0.082	0.039	0.042
<i>Experience at pantry – feel eating healthier</i>	-0.817***	-0.644*	1.462**
<i>Experience at pantry – awareness of seasons</i>	0.076	-0.095	0.018
<i>Female</i>	0.054	-0.236***	0.181**
<i>Age</i>	0.001	-0.0005	-0.0008
<i>Have Kids</i>	-0.068	0.045	0.019

Notes: 1. Asterisks indicate levels of significance: * = 0.10, ** = 0.05 and *** = 0.01.

Fresh Produce Awareness and Consumption of Food Bank Patrons: A Case Study of the "Farm to Food Banks" in Kentucky of eating healthier and familiarity with fresh produce do enhance clients' consumption. Therefore, the healthy aspect of fresh produce should be continuously highlighted by food banks to their clients.

There are important implications for the significant amount of Extension programming targeting lower income consumers and nutrition. As cost is by far the greatest barrier to fresh produce consumption, programs that help these consumers in any way to better utilize Federal food benefit programs like SNAP (Supplemental Nutrition Assistance Program), WIC (Women, Infants, and Children), EBT (Electronic Benefits Transfer) and other cost subsidy resources can potentially lead to meaningful changes in fresh produce consumption among food bank clients. Other Extension programs that help with preparation and access can complement programs to reduce cost and should emphasize increasing awareness of the benefits of more fresh produce as part of the diet.

Food bank patrons can be a little challenging to reach as an Extension audience. But as hunger relief needs expand, Extension has the opportunity to become a great partner for food banks nationally developing innovative programs to make nutritious food more accessible. These outcomes can be practical for any other country, like Taiwan, which has gradually paid more attention on targeting lower income consumers and enhancing awareness of the benefits of more fresh produce as part of their diet. However, different country may exist differences on the specific demographic and economic characteristics. It will be worthy for Extension experts to process a further study to confirm if these outcomes receive a similar contribution.

Acknowledgments

The authors are grateful to FSIC research team and two anonymous referees for valuable comments. All remaining errors are the authors'.

References

- [1] Algert, S. J., Lewis, D. and Agrawal, A. (2006). "Disparities in access to fresh produce among food pantry clients in Los Angeles." *Faseb Journal*, 20(4): A552-A552.
- [2] Cason, K. L. (2005). "Effectiveness of a program to increase fruit and vegetable consumption." *Journal of Extension* [On-line], 43(4) Article 4IAW2.
- [3] Dave, J. M., Evans, A. E., Saunders, R. P., Watkins, K. W. and Pfeiffer, K. A. (2009). "Associations among food insecurity, acculturation, demographic factors, and fruit and vegetable intake at home in Hispanic children." *Journal of the American Dietetic Association*, 109(4): 697-701.
- [4] Duffy, P., Zizza, C., Jacoby, J. and Tayie, F. A. (2009). "Diet quality is low among female food pantry clients in Eastern Alabama." *Journal of Nutrition Education and Behavior*, 41(6): 414-419.
- [5] He, K., Hu, F. B., Colditz, G. A., Manson, J. E., Willett, W. C. and Liu, S. (2004). "Changes in intake of fruits and vegetables in relation to risk of obesity and weight gain among middle-aged women." *International Journal of Obesity*, 28(12): 1569-1574.
- [6] Holben, D. H. (2013). "Food bank users in and around the lower mainland of British Columbia, Canada, are characterized by food insecurity and poor produce intake." *Journal of Hunger and Environmental Nutrition*, 7(4), 449-458.
- [7] Hung, H. C., Joshipura, K. J., Jiang, R., Hu, F. B., Hunter, D. and Smith-Warner, S. A. (2004). "Fruit and vegetable intake and risk of major chronic disease." *Journal of the National Cancer Institute*, 96(21): 1577-1584.
- [8] Johnsen, S. P. (2004). "Intake of fruit and vegetables and risk of stroke: an overview." *Current Opinion in Clinical Nutrition and Metabolic Care*, 7(6): 665-670.
- [9] Mello, J. A., Gans, K. M., Risica, P. M., Kirtania, U., Strolla, L. O. and Fournier, L. (2010). "How is food

insecurity associated with dietary behaviors? An analysis with low-income, ethnically diverse participants in a nutrition intervention study." *Journal of the American Dietetic Association*, 110(12): 1906-1911.

- [10] Miyamoto, A., Chun, L., Kanehiro, N. and Nakatsuka, C. (2006). "Food pantries: food and nutrition education in a non-traditional setting." *Journal of Extension* [On-line], 44(1) Article 1IAW2.
- [11] Mobley, A. R. (2012). "Emergency food programs: untapped opportunities for extension?" *Journal of Extension* [On-line], 50(4) Article 4RIB8.
- [12] Remley, D. T., Gallagher, T., McDowell, J., Kershaw, M., Lambea, M. C. and Melgar-Quinonez, H. (2006). "Extension's role in developing "choice" food pantries in southwest Ohio." *Journal of Extension* [On-line], 44(6) Article 6IAW5.
- [13] Troy, L. M., Miller, E. A. and Olson, S. (2011). "Hunger and obesity: understanding a food insecurity paradigm: workshop summary." *National Academies Press*.
- [14] Sandberg, T. (2013). "Summary Report for the KAFB Block Grant. " Unpublished document filed with the Kentucky Department of Agriculture. Highlights of the report are available at: <http://www.kafb.org/farmstofoodbanks/>

2014 年 08 月 16 日 收稿

2014 年 09 月 16 日 修正

2014 年 09 月 29 日 接受

國立中興大學 

National Chung Hsing University