

Reducing Food Insecurity and Improving Fruit and Vegetable Intake Among Farmers' Market Incentive Program Participants

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ABSTRACT

Objective: To determine whether participation in a farmers' market incentive pilot program had an impact on food security and fruit and vegetable (F&V) intake of participants.

Methods: Participants in the Supplemental Nutrition Assistance Program were eligible to receive a dollar-per-dollar match up to \$10/wk in farmers' market incentives. The researchers used a pretest-posttest design to measure F&V intake and food security status of 54 adult participants before and after receiving farmers' market incentives. The 6-item Behavior Risk Factor Surveillance System questionnaire and US Household Food Security Survey Module were used to measure F&V intake and food security, respectively. Wilcoxon signed-rank test was used to compare scores of F&V intake.

Results: After receiving incentives, fewer individuals reported experiencing food insecurity-related behaviors. A significantly increased intake ($P < .05$) was found among selected vegetables.

Conclusion and Implications: Participation in a farmers' market incentive program was positively related to greater food security and intake of select vegetables among participants in the Supplemental Nutrition Assistance Program.

Key Words: farmers' markets, food security, Supplemental Nutrition Assistance Program, fruits, vegetables (*J Nutr Educ Behav.* 2015; ■:1-7.)

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INTRODUCTION

Food security refers to the ability to have sufficient food available at all times, resources available to purchase nutritious foods, and appropriate use of food based on nutrition knowledge.¹ Roughly 14.3% of American households experienced food insecurity at some time in 2013.² Food insecurity is most prevalent among households that are at or below the federal poverty line.² Households in rural communities and those with

children are also more likely to experience food insecurity.² The diet of food-insecure individuals tends to be less nutritious and balanced compared with their food-secure counterparts.³ More specifically, food-insecure individuals are more likely to have diets that do not meet the dietary guideline recommendations for fruit and vegetables (F&V).^{4,5}

Shopping at farmers' markets is associated with improved food security and greater F&V consumption especially among low-income individ-

uals.⁶⁻⁸ This development corresponds with the current focus on incentivizing *Supplemental Nutrition Assistance Program* (SNAP) participants to improve dietary intake and raise health outcomes among these individuals.⁹ Major federal nutrition assistance programs such as SNAP and the *Special Supplemental Nutrition Program for Women, Infants, and Children* (WIC) now allow benefits to be used at farmers' markets as a way to improve food security and increase F&V consumption among low-income participants.¹⁰⁻¹² People who rely on federal nutrition assistance are encouraged to use nutrition assistance benefits at farmers' markets through newly established farmers' market incentive programs.^{13,14} The *WIC Farmers' Market Nutrition Program* (FMNP) and the *Senior Farmers' Market Nutrition Program* provide up to \$30 and \$50, respectively, as annual F&V incentives for eligible participants.¹⁵ Matching programs have become a common strategy for incentivizing SNAP participants to use benefits at farmers' markets by providing a

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dollar-for-dollar match on each dollar spent with federal benefits.¹⁶⁻¹⁹ Few studies have been published demonstrating the effect of farmers' market incentive programs, more specifically matching programs, on food security and F&V intake among program participants. Furthermore, few studies have used validated measurement tools to investigate behavior change before and after program participation. Thus, the goal of the current pilot study was to determine whether the *Double-Up Food Bucks* farmers' market incentive program improved food security and F&V intake among SNAP participants in Utah.

METHODS

Study Design

The researchers chose a pretest-posttest study design for this pilot study. The design allowed the researchers to measure the change in food security status and F&V consumption of participants from baseline to 4 weeks after initial participation in the *Double-Up Food Bucks* program at a farmers' market in Utah. The protocol for this study was considered exempt and was approved by the Institutional Review Board at Utah State University. Participants' consent was obtained before data collection after review of the informed consent document.

To be eligible to participate in the study, individuals had to be aged ≥ 18 years, receiving SNAP benefits, and participating in the *Double-Up Food Bucks* program at the Salt Lake City Downtown Farmers' Market. The *Double-Up Food Bucks* program is a grant-funded program that provides matching benefits to SNAP participants who spend SNAP benefits at selected farmers' markets in Utah. For every dollar spent using SNAP benefits, participants receive an additional dollar in *Double-Up Food Bucks* up to a maximum of \$10 *Double-Up Food Bucks* per farmers' market visit. *Double-Up Food Bucks* can be used only for F&V purchases.

A convenience sample of 96 adult farmers' market patrons were recruited to participate in the survey at the farmers' market when they came to participate in the *Double-Up Food Bucks* program. Participants who were inter-

ested in completing the survey were provided with the letter of information and a 2-page, 28-item paper survey, which took approximately 5–10 minutes to complete. A researcher was available to answer questions about the study and the *Double-Up Food Bucks* program. As an incentive, after participants completed the survey, they were provided with \$2 worth of tokens to use for F&V at the market. Participants were asked whether they were willing to participate in a 4-week follow up survey. The researchers collected first names and phone numbers from 74 interested participants and contacted the participants via telephone 4 weeks after completion of the initial survey. Participants were contacted up to 3 times to complete the 4-week follow-up survey. A total of 54 participants completed the follow-up survey and were mailed a voucher worth \$3 to use at the farmers' market as an additional incentive.

Confidentiality was maintained by using identification (ID) numbers on data collection instruments in place of names and other identifying information. Individuals who were interested in completing the follow-up survey filled out a form separate from the initial survey with their first name, phone number, and study ID number. The contact information of follow-up participants was compiled and stored in a computer file available only to study personnel who placed follow-up phone calls.

Data and Instrumentation

The 28-item initial survey used in this study included 16 questions about demographics, F&V consumption, food security, food assistance use, and shopping habits. These survey items were developed by nutrition faculty at Utah State University. Fruit and vegetable consumption was measured using the 6-item validated F&V module of the Behavior Risk Factor Surveillance System (BRFSS).²⁰ Responses were modified based on the National Cancer Institute F&V Screener so that it could be self-administered.²¹⁻²³ Responses for the 6 F&V BRFSS questions included: never, 1–3 times/mo, 1–2 times/wk, 3–4 times/wk, 5–6 times/wk, 1 time/d, 2 times/d, and ≥ 3 times/d. The 6-item short form

of the Food Security Module, validated by the US Department of Agriculture (USDA), was used to measure food security.^{24,25} The 16-item follow-up survey included 2 questions about self-reported changes in F&V intake and variety and 2 questions about farmers' market shopping habits; the follow-up survey included the 6-item F&V BRFSS module and the 6-item Food Security Module, as discussed earlier. Each initial survey had a unique ID number that was matched with participants' follow-up information.

To assess the content validity of the survey, several faculty and staff were asked to review the survey independently before survey administration. Changes were made to the survey to further align questions with the data being measured.

Data Analysis

Data were double-entered for accuracy. Frequencies and descriptive statistics including mean, SD, medians, and interquartile range were analyzed. If more than 1 question from the food security module or the F&V module was skipped, surveys were excluded from the final analysis. Two participants who completed both the initial and follow-up survey were excluded from the study because they completed none of the questions within the food security module and F&V module. Small amounts of data were missing randomly from other surveys; however, missing data did not exceed the threshold previously mentioned. There were no missing demographic data. Baseline differences among participants who completed only the initial survey and those who completed both the initial and 4-week follow-up surveys were analyzed using independent sample *t* tests. Scales were developed for the food security and F&V questionnaires following instructions provided by the USDA and BRFSS, respectively.^{20,25} Participants were categorized as food secure or food insecure based on the developed scales.²⁵ Wilcoxon signed-rank test was used to compare the scores for each question in the F&V module and total F&V consumption for each participant. All data analyses were conducted using SPSS 21.0 (version 21.0, SPSS, Inc, Chicago, IL, 2012).

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