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Ladder for Growth: A National Network to Build Capacity and Test Innovative Strategies for Healthy Food Initiatives

Final Grant Report

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Executive Summary

The randomized control trial (RCT) described herein was managed and evaluated by the University of Delaware's Center for Research in Education and Social Policy (UD-CRESP), at 76 farmers markets (FMs) in 13 states and the District of Columbia, over a two-year time span. The RCT randomly awarded incentives to Supplemental Nutrition Assistance Program (SNAP) recipients to use to purchase fruits and vegetables (FVs) at FMs. Changes in three pre-designated outcome variables FV consumption, FV purchase, Body Mass Index (BMI)) were calculated using results of an online survey that addressed: standard dietary consumption over time; food insecurity; health status and perception; food purchasing; and, demographics. UD-CRESP also analyzed the effect of FV incentives randomly awarded to SNAP recipients on their FM spending.

The research resulted in the following findings. First, it was found that financial incentives awarded at FMs to SNAP participants have statistically significant, positive effects on FV consumption. No statistically significant changes were found in the other two pre-designated outcome variables, i.e. FV purchase and BMI for the national or overall sample. Secondly, the research showed statistically significant higher SNAP spending on FV at most incentive levels when compared to baseline, for all participants and for the subset of Hispanic participants.

Based on these results, our first recommendation is that a codified incentive program at the highest level be implemented. Additionally, based on a breakdown of participant characteristics, a relatively high percentage of Hispanic shoppers was revealed in two participating FM networks: Florida Certified Organic Growers and Consumers, and the New York City Department of Health and Mental Hygiene. This subset of participants also spent statistically significant higher amounts of their SNAP dollars on FVs at FMs when compared to baseline. Based on this related finding, our second recommendation is that culturally appropriate programming for Hispanic participants at FMs within these networks be developed.

Background

Between 2015 and 2017, University of Delaware's Center for Research in Education and Social Policy (UD-CRESP) partnered with Wholesome Wave, Inc. (WW), Florida Certified Organic Growers and Consumers (referred to as Florida Organic Growers, or FOG), and the New York City Department of Health and Mental Hygiene (NYCDOHMH) to measure the impact of expanded nutrition program incentives at the networks of farmers markets (FMs) supported by these three organizations, utilizing a Randomized Control Trial (RCT) research design. A three-year USDA Food Insecurity Nutrition Incentive (FINI) grant was implemented directly by WW for the RCT at FMs across the country. In addition, FOG and NYCDOHMH received individual FINI grants that funded the RCT within their respective FM networks. In total the national, FOG, and NYCDOHMH efforts represented the largest RCT ever conducted at FMs in the United States.

UD-CRESP conducted the multi-site RCT to assess the impact of awarding additional Supplemental Nutrition Assistance Program (SNAP) incentives at the 76 FMs operating under the auspices of WW, FOG, and NYCDOHMH on recipients' fruit and vegetable (FV) purchase and consumption practices, among other parameters. UD-CRESP also evaluated multiple health, food security, and FV consumption parameters of members of 18 Consumer Supported Agriculture (CSA) sites throughout the eastern United States.

Unless otherwise noted, this report provides results and outcomes of the RCT conducted at the 76 WW, FOG, and NYCDOHMH FMs between 2015 and 2017 – referred to herein as the "national sample." Similarly, this report also provides key data from participating CSA members. Additional details regarding these participating markets (i.e., tickets received, surveys sent, surveys completed, unique individuals, number and percent double completers, RCT monetary and nonmonetary incentives, and SNAP dollars spent) are provided on the separate Excel spreadsheet ("All FMs_all Rounds_3-30-18") that was provided directly to WW via email.

Design

Participant Recruitment and Retention

SNAP shoppers at the FMs described above were offered the opportunity to participate in the RCT study where they would be eligible for additional funds (referred to as monetary incentives) to spend at their FM. Participants were initially made aware of their potential eligibility for the study through a yellow enrollment ticket provided by the market manager, as well as a printed flier containing RCT information. The numbered enrollment ticket requested the shopper's first name, email address, and cell phone number. The shopper's enrollment ticket number and identifier (i.e., the initials of their first and last names plus the last four digits of the Electronic Benefits Transaction (EBT) card used to access SNAP benefits) were recorded using the specialized software, "FMTracks™[1]". Ultimately a link was able to be made, then between the FM Tracks sales data and the online survey.

UD-CRESP sent enrollment tickets and pre-stamped return envelopes to FM managers, prior to implementation of the RCT. Upon receipt of completed tickets, UD-CRESP staff entered data from each ticket into an Excel spreadsheet. Through linkage of Qualtrics™ survey software to the spreadsheet, SNAP shoppers were invited to participate in the study via email or text, or both.

Shoppers who responded to the invitation, and who both consented to participate and completed the corresponding online survey, were randomly awarded one of three monetary incentive amounts, or the nonmonetary incentive if available and as previously described. At the start of the following month, shoppers were sent an email and/or text with instructions on how to participate again, unless they opted out. Continued participation required completion of the survey again, after which, another randomized additional incentive was assigned.

Incentives were authorized for use at the participants' primary FM, or at another allowable FM within their network, for the remainder of the month, when the monetary incentive expired. At the start of the next month, participants were invited to complete another survey if they had chosen to remain in the study. Finally, at the end of each round (roughly a farmers' market season) we included a final 'follow-up' month during which prior participants were invited to complete the survey, with the same odds of winning randomly assigned

[1] FMTracks™ is an IOS-based program developed by Case Western Reserve University. It organizes market sales data, individual purchase data, incentive redemptions/expenditures, and EBT transactions.

incentives as in prior months. No new RCT participants were recruited during this follow-up month.

All consent, survey, and other forms of formal communication with participants were reviewed and approved by UD's Institutional Review Board prior to its use in the RCT. Study materials were made available in English and Spanish.

Incentive Levels

After enrollment and baseline survey completion, participants were randomly assigned (computer generated) to one of three conditions (described below in more detail): 1) no additional monetary incentive beyond baseline; 2) moderate monetary incentive; or, 3) highest monetary incentive. During certain times in the RCT and at certain FMs, a nonmonetary incentive (i.e., a reusable grocery bag imprinted with a healthy eating message) was randomly assigned as a fourth option. When awarded, the nonmonetary incentive was given only once during the month; however, the recipient remained eligible to receive their FM's baseline monetary incentive throughout the entire month.

Participant levels of incentive were determined based on the FM where they shopped. That is to say, each FM always had the same three possible levels of incentive and depending on the FM where the participant reported shopping, he or she would be eligible for one of that FM's three incentive amounts. For example, FM incentive amounts included:

- FM Type A: $1 (spent) received $0.40 additional (1:0.4 baseline); $1 (spent) received $0.80 (1:0.8 moderate); or, $1 (spent) received $1.00 (1:1.0 highest).
- FM Type B: $1 (spent) received $1 additional (1:1 baseline); $1 (spent) received $1.50 (1:1.5 moderate); or, $1 (spent) received $2.00 (1:2 highest).

Incentive levels are further explained as follows:

- Baseline Incentive: All FMs participating in the RCT offered *either* a 1:1.0 or 1:0.4 baseline monetary incentive match (or ratio). This means that for every $1 in SNAP funds spent, SNAP shoppers randomly assigned to the baseline condition were provided an additional $0.40 or $1, depending on how the FM where they shopped had its baseline set. As noted, the amount of the baseline incentive was determined by the FM where the participant shopped, and as such, the baseline incentive level was consistent for the same FM throughout the study. That said, the participant was randomly assigned to an incentive level that could vary from month to month.

- Moderate Incentive: The next interval of additional funds participants could receive is referred to as the moderate incentive. Two possible levels of moderate incentives were available, 1:0.8 *or* 1:1.5. For example, if a participant spent $6 in SNAP funds at the FM and was provided with a moderate 1:1.5 incentive ratio, that participant would receive an additional $9 to spend on FVs for a total of $15.
- Highest Incentive: Depending on the FM, participants could have received one of two possible maximum incentive ratios, 1:1 or 1:2. For example, if a participant spent $8 in SNAP funds at the FM and was provided with the highest 1:1 incentive ratio, that participant would receive an additional $8 to spend on FVs for a total of $16.
- Non-monetary incentive: At certain times, and at certain FMs, a grocery bag was provided in addition to the baseline incentive and here is termed as a non-monetary incentive.

As previously noted, participants were given an equal chance of being assigned to one of the three or four possible incentive levels, depending on whether the non-monetary incentive was an option. In all cases, an additional monetary incentive allowed the RCT participant to utilize the additional incentive on FVs only (vs. any SNAP-eligible product available for purchase at the FM).

Survey Measures

The online survey was modified from the Dietary Screener Questionnaire (DSQ) in the National Health and Nutrition Examination Survey (NHANES), 2009 – 2010. Survey questions selected for the RCT include FV dietary recall questions for the previous month. This 16-item FV screener's intraclass correlations for test – retest reliability ranged from 0.62 to 0.67 for FVs for men and women combined. These reliabilities are considered adequate and approach accepted levels (0.7) for research. The survey also included questions regarding food expenditures at the FM; demographics information based on US Census parameters; and, health status and perception questions selected from the Behavioral Risk Factor Surveillance System Questionnaire.

As a monthly dietary recall, the modified DSQ asks about the frequency (e.g., three times per week) of consumption in the past month of selected foods and drinks. The modified DSQ considered fresh FVs as well as FVs bought in prepared forms or from mixed foods (e.g., 100% fruit juices, refried beans, salsa, tomato sauces, french fries, and pizza). Responses to these survey questions were converted to estimates of dietary FV intake, provided in cup equivalents and based on a set of scoring algorithms developed by NHANES (2009-2010), providing daily FV/legume intake, in cups, of RCT participants.

A two-item food insecurity (FI) screener was used to identify families at risk for food insecurity: (1) "Within the past 12 months we worried whether our food would run out before we got money to buy more," and (2) "Within the past 12 months the food we bought just didn't last and we didn't have money to get more." The two-item FI screener has high sensitivity (83%), specificity (97%), and convergent validity compared with the longer 18-item US Household Food Security Scale used by the Current Population Survey, making it an effective substitute tool to annually monitor food-security status.

Calculation of BMI used the participant's self-reported weight/height and was interpreted using standard weight status categories. These categories are the same for men and women of all body types and ages[2]. Specifically, the BMI scores are defined as follows: below 18.5 is underweight; 18.5 – 24.9 is Normal or Healthy Weight; 25.0 – 29.9 is Overweight; and, 30.0 and above is Obese.

The individual purchase amount by different incentive levels was collected at the FM using FMTracks™ and Mobile Market+™ (in NYC only). These data sets were connected to the survey data in order to compare the variation in purchase amount by different incentive levels, using the participant's identifier (i.e., the initials of their first and last names plus the last four digits of their unique SNAP card, or in the case of Mobile Market+ ™ data, only the last four digits of the SNAP card).

Research Approach

The data presented here reflect differences in participant purchasing, or changes to survey responses over the course of a single month, derived from both the online survey and from sales information provided by the FM. Each month of the RCT at participating FMs constituted its own distinct trial. As previously described, during each month, interested SNAP shoppers were given the opportunity to enroll in the study, take the dietary intake and shopping behavior survey, and receive one of the three or four possible incentive amounts.

Survey and participation data were downloaded from Qualtrics™ and analyzed using SAS9.4™. This report provides the results of and outcomes from RCT participants between September 2015 and October 2017.

Our analysis examined the following evaluation questions:

[2] https://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/index.html.

1. What is the impact of selected (and incrementally different) incentive program innovations, both financial and non-financial, on SNAP customers' purchases of FV at the farmers market and overall grocery purchasing?
2. What is the impact of selected (and incrementally different) incentive program innovations, both financial and non-financial, on SNAP customers' consumption of fruits and vegetables?
3. What is the impact of selected (and incrementally different) incentive program innovations, both financial and non-financial, on SNAP customers' BMI?

In order to answer these questions we initially conducted descriptive analysis of the characteristics of SNAP FM customers and SNAP customers at CSAs; SNAP FM participant grocery spending, FV consumption, and health status; and examined differences in FV purchasing, grocery purchasing, consumption, and related indicators based on the level of the incentive amount received. Examination of SNAP expenditure data using a one-way ANOVA was used to detect any significant differences in SNAP dollars spent by participants at different incentive levels.

Further, we conducted a repeated measures mixed effects analysis to estimate potential changes in outcome variables after participants were assigned an incentive. Regarding FV expenditures, the repeated measures model uses a log transformation of the dollars spent on FVs over the course of the month to account for skewness in the data. In addition, the model controls for household size since the dollars spent is related to the number of people to feed in the household.

A Complier Average Causal Effect (CACE) was also calculated for FV consumption, where a significant finding was identified, in order to adjust the repeated measures model results to calculate the effects for only those participants *who used* their randomly assigned incentive.

All outcomes were examined based on data from SNAP participants who completed a survey once at the beginning of the month and again at the start of the following month.

The field-based, coordinated, multi-site RCT was conducted at a total of 76 FMs. An additional 14 FMs signed up for the RCT but did not solicit RCT participants. A total of 7,097 independent responses were generated from the national sample of FMs.

RCT Results

Sample

Between September 2015 and October 2017, 5,186 tickets were received from the national sample of FMs participating in the RCT (as reported on the "All FMs_all Rounds_3-30-18" spreadsheet): 2,728 tickets from WW FMs (Rounds 1 through 4); 818 tickets from FOG FMs (Rounds 2 and 4); and, 1,640 tickets from NYCDOHMH FMs (Rounds 3, 4, 5). A total of 23,291 survey invitations were sent via email or text to both first-time participants, and to those who agreed to complete the survey in subsequent months. Of the surveys sent, 30.5% (n=7,097) were completed. The number of first-time completers of the survey, between September 2015 and October 2017, was 3,073.

Further, the sample size is not consistent across all variables since participants had the option to skip over certain questions and still complete the survey. The following data report and analysis sections encompass the results from the national sample of FMs (i.e., the WW, FOG, NYCDOHMH network-based FMs), and subsets thereof, that recruited SNAP shoppers to participate in the RCT.

Characteristics of RCT Participants

Of the 2,968 first-time survey respondents who answered the gender questions, 82% (n= 2,446) were female. The majority of respondents 64% (n=1,851) were between the ages of 18 and 47.

Regarding race and ethnicity, 72% (n=1,959) of the respondents were white and 18% (n=515) were Hispanic. Given the demographic data, the Hispanic population's participation in SNAP and programs such as the RCT are of particular interest, presenting an opportunity to focus on culturally appropriate nutrition education and on outreach to this population. Three-quarters of the RCT's Hispanic participants represented FMs from the FOG (17%) and NYCDOHMH (58%) networks, reflecting the relatively high percentage of Hispanic residents in those communities. According to the Pew Research Center (2019), Florida's and New York's Hispanic populations represent 15% of all Hispanics in the US, third and fourth behind California and Texas, respectively[3].

[3] Krogstad, JM. Hispanics have accounted for more than half of total U.S. population growth since 2010. https://www.pewresearch.org/fact-tank/2020/07/10/hispanics-have-accounted-for-more-than-half-of-total-u-s-population-growth-since-2010/. Published July 10, 2020.

Table 1 summarizes much of these gender, race, and ethnicity data, for RCT participants from the: overall/national sample of FMs; three network-based FM programs (i.e., WW, FOG, NYCDOHMH-individually reported); and, subset of Hispanic participants from WW's network of FMs.

Table 1: Demographic Information, exclusive of CSA Data

Characteristics	Overall[1]	WW	FOG	NYCDOHMH	Hispanic Participants[2]
Total Participants	3,073	1,659	600	814	515
Gender					
Male	18%	17%	17%	20%	10%
Female	82%	83%	83%	80%	90%
Race					
White	72%	80%	79%	50%	36%
Black or African American	12%	9%	9%	19%	10%
Asian/Other Pacific Islander	4%	3%	4%	7%	5%
American Indian/Alaskan Native	4%	4%	4%	3%	5%
Other Race	8%	4%	4%	20%	44%
Ethnicity					
Hispanic	18%	8%	16%	40%	100%
Non-Hispanic	82%	92%	84%	60%	0%
Age					
18 to 27 years	15%	17%	17%	9%	16%
28 to 37 years	28%	29%	25%	29%	39%
38 to 47 years	21%	20%	21%	23%	24%
48 to 57 years	16%	16%	17%	15%	13%
58 to 67 years	15%	14%	14%	16%	5%
68 to 77 years	5%	3%	6%	6%	2%
78 and above	1%	1%	1%	3%	2%

[1] Overall: the national sample of all FMs; i.e., the WW, FOG, NYCDOHMH network-based FMs that recruited SNAP shoppers to participate in the RCT.
[2] Hispanic participants from the WW network of FMs.

At baseline, overall, 82% (n=2,424) of FM SNAP shoppers had experienced food insecurity in the prior year. More than half (61% n=1,803) reported that they were overweight or obese (BMI ≥ 25). More than one in four (26%, n=758) stated that they were in fair or poor health. When asked about health conditions, 13% reported having diabetes and 23% reported having high blood pressure. Table 2 presents the prevalence of health conditions faced by

SNAP shoppers from the: national sample of FMs; three network-based FM programs (i.e., WW, FOG, NYCDOHMH-individually reported); and, subset of Hispanic participants from WW's network of FMs.

Table 2: Participant Health Information, exclusive of CSA Data

	Overall[1]	WW	FOG	NYCDOHMH	Hispanic Participants[2]
BMI					
Underweight (BMI below 18.5)	3%	2%	3%	3%	2%
Normal Weight ((BMI 18.5 – 24.9)	37%	33%	43%	40%	34%
Overweight (BMI 25.0 – 29.9)	27%	25%	28%	30%	30%
Obese (BMI 30.0 – 34.9)	16%	17%	14%	15%	17%
Severely Obese (BMI 35.0-39.9)	9%	10%	7%	7%	10%
Morbidly Obese (BMI 40.0 and over)	9%	12%	5%	5%	6%
Food Insecurity					
Food Insecure	82%	81%	82%	86%	89%
Food Secure	18%	19%	18%	14%	11%
Health Status					
Excellent	9%	7%	11%	13%	12%
Very Good	28%	26%	31%	29%	28%
Good	37%	36%	36%	38%	38%
Fair	19%	21%	17%	15%	12%
Poor	7%	9%	5%	5%	9%
Health Conditions					
Heart Disease	5%	5%	4%	6%	3%
Diabetes	13%	14%	12%	12%	11%
High Blood Pressure	23%	24%	23%	21%	16%

[1] Overall: the national sample of all FMs; i.e., the WW, FOG, NYCDOHMH network-based FMs that recruited SNAP shoppers to participate in the RCT.
[2] Hispanic participants from the WW network of FMs.

The survey also asked SNAP FM shoppers about the amount spent on all groceries and the amount spent on FVs as part of their overall grocery budget – not just items purchased at the FM. Per month, each household spent on average $153.76 on FVs. When compared to the total amount spent on groceries, FV purchasing comprised 45% of the total. Refer to Table 3 for expenditure data; data in these same categories are also reported for SNAP shoppers from each of the three network-based FM programs (i.e., WW, FOG,

NYCDOHMH-individually reported) and for the subset of Hispanic participants from WW's network of FMs.

The data on dietary intake or consumption revealed that SNAP shoppers consumed on average 3.00 daily cups of FVs (an amount that includes french fries), at baseline. Males typically consumed 3.27 daily cups of FVs, while females consumed 2.95 cups per day. Overall, the average amount of FVs adults age 18-47 consumed was about 3.03 cups per day. Adults age 48-67 consumed 2.95 cups of FVs per day and older adults (68+) consumed about 2.96 cups of FVs per day. Table 3 summarizes these data from the national sample, as well as the FV consumption data from the three network-based FM programs (i.e., WW, FOG, NYCDOHMH-individually reported) and for the subset of Hispanic participants from the WW network of FMs.

Table 3: Mean Baseline FV Intake and Expenditures, exclusive of CSA Data

	Overall[1]	WW	FOG	NYCDOHMH	Hispanic Participants[2]
Daily Cups, FV Intake by Gender					
Male	3.27	3.24	3.33	3.29	3.15
Female	2.95	3.16	3.10	2.99	3.03
Daily Cups, FV Intake by Age					
18 to 27 years	2.93	2.87	3.08	2.97	2.92
28 to 37 years	3.03	2.92	3.26	3.10	3.03
38 to 47 years	3.12	3.13	3.20	3.06	3.14
48 to 57 years	2.98	2.94	2.98	3.08	2.86
58 to 67 years	2.91	2.80	3.10	3.00	3.42
68 to 77 years	3.03	2.99	3.03	3.08	3.22
78 years and above	2.75	2.11	3.46	2.80	2.90
Daily Cups, FV Intake Overall Average (in cups)	3.00	2.93	3.13	3.05	3.04
Monthly FV Grocery Expenditures, all sources, in dollars	153.76	143.99	162.66	167.53	182.52
BMI	28.5	29.7	27.1	27.2	28.2

[1] Overall: the national sample of all FMs; i.e., the WW, FOG, NYCDOHMH network-based FMs that recruited SNAP shoppers to participate in the RCT.
[2] Hispanic participants from the WW network of FMs.

RCT Incentive Coupon Usage

In total, the study issued 6,979 monetary incentives that could be used multiple times over one month at the national sample of FMs. Of these, 3,144 incentives were redeemed at

least once, and in total, incentives were redeemed during 5,253 visits. In other words, participants who used incentives redeemed them an average of 1.67 times across the month. Those with an incentive spent an average of $34.39 in SNAP funds alone (before any additional incentive was applied) per visit to the FM, as shown in Table 7.

Table 4 provides a summary of the incentives issued for use at FMs by incentive level, including whether the incentive level was considered to be baseline, moderate, or highest for that FM.

Table 4: Sample Analysis for the National Sample of FMs

Incentive Ratio	Incentive Level			Total
	Baseline	Level1 (Moderate)	Level2 (Highest)	
0.4	1199	--	--	1199
0.8	--	1060	--	1060
1	1627	--	1108	2735
1.5	--	1002	--	1002
2	--	--	982	982
Non-monetary	858	--	--	858
Total monetary	2826	2062	2090	6978

Table 5 establishes incentive assignment according to the: national sample of FMs; three network-based FM programs (i.e., WW, FOG, NYCDOHMH-individually reported); and, subset of Hispanic participants from WW's network of FMs.

Table 5: Incentive Assignment

Incentive Ratio	Overall[1]	WW	FOG	NYCDOHMH	Hispanic Participants[2]
0.4	17%	14%	--	32%	22%
0.8	15%	10%	--	34%	21%
1	39%	41%	43%	34%	33%
1.5	14%	18%	28%	--	8%
2	14%	17%	30%	--	9%
Non-monetary	24%	24%	25%	--	7%

[1] Overall: the national sample of all FMs; i.e., the WW, FOG, NYCDOHMH network-based FMs that recruited SNAP shoppers to participate in the RCT.
[2] Hispanic participants from the WW network of FMs.

Change in Outcome Variables

Repeated measures mixed effects analysis was conducted to estimate potential changes in outcome variables after participants were assigned an incentive. Table 6 summarizes outcomes data based on the repeated measures mixed effects analysis and reports the data according to incentive level for: all participants from the national sample and those reported individually by the three network-based FM programs (i.e., WW, FOG, NYCDOHMH). The data are further analyzed according to the Hispanic subsets of these cohorts.

Statistically significant differences were found for participants assigned the highest incentive; i.e., $2.00 for $1.00 baseline FMs. receiving the highest incentive level resulted in an increased FV consumption of 0.16 daily cups. Hispanic participants did not experience any additional increases in in FV consumption beyond the increases seen in the full sample.

The repeated measures model estimates include all participants, whether or not they used the incentive they were randomly assigned. As noted, the Complier Average Causal Effect (CACE) methodology adjusts the repeated measures model results to calculate the effects for only those participants who used their randomly assigned incentive. Based on the CACE calculation, the FV consumption of participants who used their 2.0 incentive increased by 0.31 cups per day, almost twice the average for all participants who were randomly assigned the 2.0 incentive level.

Regarding FV expenditures, the repeated measures model uses a log transformation of the dollars spent on FVs over the course of the month to account for skewness in the data. In addition, the model controls for household size since the dollars spent is related to the number of people to feed in the household. With one exception, no significant differences were found for monthly FV expenditures between incentive levels. One estimate was statistically significant in the subset of Hispanic participants from the WW network of FMs (n=91): at the 0.8 level (n=7). Hispanic participants spent significantly more on FV when compared to Hispanic participants at the 0.4 level (n=9). However, with such small sample sizes, generalizability to a larger Hispanic population is limited due to the likelihood of outliers. Finally, no significant differences were found between incentive levels for participants from the three network-based programs.

Not unexpectedly, no significant change in BMI was found for participants regardless of incentive level. This finding is likely due to the short periods of time under study;it is unlikely that large changes in BMI are detectable over a month’s time. Additional research of longer-

term effects is recommended in order to better estimate the impacts of FV incentives on BMI. Further, no significant differences in FV consumption, purchasing or BMI were found for those that received a non-monetary incentive (a grocery bag).

Table 6: Repeated-Measures Fixed-Effects on Outcomes

	Overall[1]	WW	FOG	NYCDOHMH
FV Consumption (in cups)				
Intercept	2.77*	2.76*	2.88*	2.98*
0.4			--	
0.8	-0.04	0.02	--	-0.07
1.0	0.00	-0.03		0.00
1.5	0.08	0.03	0.11	--
2.0	0.16*	0.15	0.11	--
Non-monetary	-0.03	-0.03	-0.17	--
Hispanic intercept	-0.02	0.19	0.01	-0.02
Hispanic 0.4			--	
Hispanic 0.8	-0.01	-0.24	--	0.05
Hispanic 1.0	0.00	-0.35		0.04
Hispanic 1.5	0.11	-0.17	0.08	--
Hispanic 2.0	-0.10	-0.40	-0.04	--
Hispanic Non-monetary	-0.07	-0.45	0.32	--
Monthly Grocery Expenditures on FV (Log transformation; percent change in FV expenditures)				
Intercept	4.44*	4.45*	4.51*	4.66*
0.4			--	
0.8	0.04	0.06	--	0.02
1.0	-0.02	-0.04		-0.01
1.5	0.05	0.00	0.20	--
2.0	0.03	0.00	0.13	--
Non-monetary	-0.01	-0.03	0.11	--
Hispanic intercept	0.04	-0.31	0.12	-0.01
Hispanic 0.4			--	
Hispanic 0.8	-0.09	-0.62*	--	-0.04
Hispanic 1.0	0.06	-0.06		0.05
Hispanic 1.5	0.00	-0.19	-0.12	--
Hispanic 2.0	0.05	0.01	-0.16	--
Hispanic Non-monetary	-0.04	-0.25	-0.04	--
Household size	0.02*	0.01*	0.15*	0.05

	Overall[1]	WW	FOG	NYCDOHMH
BMI				
Intercept	25.33*	25.70*	24.45*	26.77*
0.4			--	
0.8	0.22	0.45	--	0.06
1.0	-0.09	0.00		-0.12
1.5	-0.01	0.03	0.20	--
2.0	-0.09	0.03	0.04	--
Non-monetary	0.11	0.13	0.76	--
Hispanic intercept	1.21	-1.08	1.28	1.46*
Hispanic 0.4			--	
Hispanic 0.8	0.37	0.66	--	0.38
Hispanic 1.0	-0.19	0.89		-0.15
Hispanic 1.5	-0.92	-0.32	-0.06	--
Hispanic 2.0	-0.82	-0.35	0.27	--
Hispanic Non-monetary	-0.73	-0.40	0.18	--

* $p < .05$ Indicates a value different from 0.
[1] Overall: the national sample of all FMs; i.e., the WW, FOG, NYCDOHMH network-based FMs that recruited SNAP shoppers to participate in the RCT.

Analyses of SNAP Expenditures

As noted earlier, participants who used incentives at the FM spent an average of $34.39 SNAP dollars per transaction, before any additional incentive was applied. Examination of these data using a one-way ANOVA shows significant increases of SNAP dollars spent by participants in the national sample of FMs, as shown in Table 7. Specifically, Table 7 presents these expenditure data for SNAP shoppers from the: national sample of FMs; three network-based FM programs (i.e., WW, FOG, NYCDOHMH-individually reported); and, subset of Hispanic participants from WW's network of FMs.

For the FMs with a baseline of 0.4, participants spent a statistically significant higher amount of their SNAP dollars at both the moderate (0.8) and highest (1.0) incentive levels when compared to baseline. For the FMs with a baseline of 1.0, the highest incentive level (2.0) showed a statistically significant increase from baseline. Between incentive levels, SNAP expenditures at the highest (2.0) level were showed to statistically significant increase when compared to the moderate (1.5) level, as shown in Table 7. SNAP recipients who shopped at FMs that were awarded a baseline incentive of $0.40 for every $1.00 in SNAP spent an average of $19.03 per transaction. Since not all incentive levels were available at all markets which limited the true comparability across all incentive levels, the data show a steady increase in the amount of SNAP spent at each incremental incentive level to the highest incentive level of 2.0, where $36.28 was spent on average per transaction.

Table 7: SNAP Expenditures at Farmers Markets, per Transaction and by Incentive Level, in Dollars

Incentive Ratio	Overall[1]	WW	FOG	NYCDOHMH	Hispanic Participants[2]
0.4	19.03	28.02	--	18.33	20.25
0.8	25.30*+	34.20	--	24.56*+	28.61
1	26.87+	29.84	20.40	26.62+	26.45
1.5	29.73	27.19	33.81*+	--	28.16
2	36.28*+	30.76	44.07*+	--	43.48+

* $p < .05$. Statistical significance indicated for the difference with the preceding incentive level; + $p < .05$ with baseline level
[1] Overall: the national sample of all FMs; i.e., the WW, FOG, NYCDOHMH network-based FMs that recruited SNAP shoppers to participate in the RCT.
[2] Hispanic participants from the WW network of FMs.

Community Supported Agriculture: Participant Feedback and Characteristics

Design

UD-CRESP researchers, in coordination with WW, gathered information regarding the CSA sites including, but not limited to: mailing address; CSA pickup logistics; and, the number of customers. Prior to the start of each of the two sampling rounds, the managers of all participating CSAs were provided with paper surveys and a postage-paid return envelope, or an electronic link to the survey, depending on their preference.

The CSA survey was conducted at 18 sites between 2015 and 2016; i.e., 10 sites in 2015 and 8 sites in 2016. Specifically, 2,242 SNAP and non-SNAP CSA members were provided a paper survey, or a link to an online version of the same (2015 only), and asked to complete the survey during the month of October (2015) or July (2016). No USDA funding was used to provide any financial incentives for completing the survey. The CSA survey administration was not randomized nor limited to only SNAP participants. Finally, CSA members could select a reusable grocery bag imprinted with a healthy eating message on one side of the bag, whether or not they completed the CSA survey.

Sample

Upon receipt of completed paper surveys, data were manually entered into an Excel spreadsheet using a codebook developed by UD-CRESP. Data from surveys completed electronically were mined from Qualtrics™ and stored with the paper survey codebook data;

in combination; the data were analyzed using SAS9.4™. During the two rounds of sampling, a total of 330 independent responses were generated.

Survey Measures

The survey presented to CSA members mirrored most aspects of the RCT survey, including questions related to: the modified DSQ; FI; demographics; and, BMI and health status. The survey also asked several additional questions unique to the CSA setting (e.g., CSA location).

Results

A total of 2,242 surveys were provided to the 18 participating CSA sites; 15% (n=330) were completed in either paper or electronic format, although not all 330 respondents answered every survey question. Of the 330 respondents, 85% were female (n=280), and 15% (n=50) were male. Regarding race and ethnicity, a significant majority of respondents, 88% (n=291), were white, and 8% (n=25) were Hispanic. The average age of respondents was 45.3 years.

Regarding sample members' participation in food assistance programs in the prior year, 8% (n=25) had received Women, Infants, and Children (WIC) benefits, and 19% (n=63) had received SNAP benefits. Almost half (47%, n=18) of those receiving SNAP benefits had done so for longer than five years.

Of the 236 surveys that provided food security information, 33% (n=78) were considered food insecure based on the same validated FI screener used with RCT participants. A number of the participants (8%, n=26) stated that they had fair or poor health, and 13% (n= 43) (averaged) reported that they had high blood pressure or hypertension. The sample population was obese (BMI ≥ 25), given its average BMI of 27.3.

The average amount that a participant spent per month on FVs as part of their total grocery shopping purchases was $207.42, which comprised 48% of their total expenditure on food and drinks. Overall, about 3.16 cups of FVs per day were consumed by the sample as a whole.

No comparison between 2015 and 2016 results was made due to the limited size of each year's sample.

Anecdotal Feedback

Communication received from FM managers and RCT participants during the RCT is included verbatim in Appendix AAppendix A. Overall, there was little to no criticism of the RCT process. Rather, FM managers recognized the benefit of additional RCT spending to their market's farmer vendors, and on the overall reputations and desirability of their FMs. Further, numerous participants expressed appreciation for the increased incentives and the value of the additional FVs to their health. All questions and concerns were promptly addressed. Further, acknowledgement of communications that did not necessitate a response was provided in most cases.

Conclusions and Recommendations

The study showed three notable effects. First, financial FV incentives randomly awarded to SNAP shoppers at FMs had statistically significant, positive effects on FV consumption, increasing consumption for those at the highest (2.0) incentive level by 0.16 cups/day. Even stronger positive effects were found when FV consumption was calculated for only those SNAP shoppers who used their incentive: at the 2.0 level, consumption increase almost doubled to 0.31 cups/day. Second, the data show a steady increase in the amount of SNAP spent on FV at each incremental incentive level – and most of these increases were statistically significant when compared to the baseline incentive level. Specifically, and finally, Hispanic participants spent a statistically significant higher amount of their SNAP dollars on FV at the highest incentive level when compared to the baseline incentive level.

Based on these effects, we make two recommendations. Our first recommendation is that an incentive be codified at the highest incentive level. At baseline, participants reported consuming 2.77 cups of FVs per day which increased to 2.93 cups at the highest incentive level, a statistically significant increase. Accordingly, a dedicated FV incentive for SNAP shoppers would help to close the gap between current FV consumption and that recommended by the Dietary Guidelines for Americans (4.5 cups of FVs per day)[4]. Improving dietary quality among participants results in numerous health benefits for the individual, including a reduced risk of stroke and other cardiovascular diseases, a reduced

[4] U.S. Department of Health and Human Services and U.S. Department of Agriculture. *2015–2020 Dietary Guidelines for Americans*. 8th Edition. December 2015. Available at http://health.gov/dietaryguidelines/2015/guidelines/.

risk of developing cancer , and a reduced risk of Type 2 Diabetes[5,6,7]. Beyond the individual level, improved dietary quality also results in a reduced strain on the health system as a decreased incidence of health problems for the individual reduces the need for care and interventions.

Further, a codified FV incentive for SNAP shoppers at FMs conveys economic benefits since the highest incentive level is associated with a statistically significant increase in SNAP FV expenditures at FMs. Also, incentive programs have the potential to bring new customers to FMs and bolster FM use among participants. The increases in FM sales relieves local farmers of the need to ship their products over long distances and is mutually beneficial for the consumers and sellers.

An alternative to our recommendation for an incentive at the highest level is codification of an FV incentive at the moderate level. This would still confer the benefits of increases in both FV consumption and SNAP spending on FVs, creating a cost-saving alternative to an FV incentive at the highest level. For example, it was found that for FMs with $1 incentives or less, there was little difference between providing a *"spend $1 and get $0.80"* versus a "*spend $1 and get $1"* offer. In both cases, SNAP shoppers spent between $25 and $27/transaction at FMs.

Our second recommendation is that culturally appropriate programming for Hispanic participants at FMs be created or expanded given that SNAP spending on FV for this subset of the population also increased at higher incentive levels. The relatively high percentage of Hispanic residents in the FOG and NYCDOHMH networks presents a unique opportunity to offer this specialized programming

In conclusion, investing in FM incentive programs, which is supported by this study's findings and widely across the literature, should be prioritized. Specifically, this RCT supports the effectiveness of incentive programs in improving nutrition behaviors of SNAP shoppers and increasing spending at FMs. Such programs address the need to increase

[5] Jardim TV, Mozaffarian D, Abrahams- Gessel S, Sy S, Lee Y, Liu J, et al. (2019) Cardiometabolic disease costs associated with suboptimal diet in the United States: A cost analysis based on a microsimulation model. PLoS Med 16(12): e1002981. https://doi.org/10.1371/ journal.pmed.1002981

[6] Mozaffarian D, Benjamin EJ, Go AS, et. al. (2016) Heart Disease and Stroke Statistics—2016 Update. American Heart Association Statistics Committee and Stroke Statistics Subcommittee. Circulation. 133:e38–e360. https://doi.org/10.1161/CIR.0000000000000350

[7] Mozaffariam D, (2016) Dietary and Policy Priorities for Cardiovascular Disease, Diabetes, and Obesity A Comprehensive Review. American Heart Association. Circulation. 133:187–225. https://doi.org/10.1161/CIRCULATIONAHA.115.018585

purchasing power for low-income consumers, such as SNAP participants, enabling the purchase of healthy foods. This is particularly timely as, in recent years, the price of healthy items such as FVs has increased relative to unhealthy items. Accordingly, incentive programs such as the one analyzed in this RCT, improve the affordability of FVs for program participants. Therefore, incentive programs that increase SNAP shoppers' ability to purchase additional FVs should be part of future policies to support this population which will create more equitable access for those whose food budgets are otherwise limited. Further, efforts to maximize incentive usage should be undertaken in order to maximize program benefits.

Appendix A: Anecdotal Feedback from all FMs

(Note, in many cases participants and FM managers refer to "vouchers," which means the incentive randomly awarded by the RCT process.)

(participant, undated)
Good morning!
I was so happy to take part in your survey. I only spend my SNAP benefits at the Farmer's Market. As excited and thankful as I was to receive the awesome redemption voucher, I was discouraged as it expires barely a week after I received it. The facts are I only receive $22.00 a month in SNAP benefits....that is as a Mom of 2! Also, it is given at the beginning of the month. So when I took your survey, I had already used up September's benefits at the previous week's market. Is there any way you can send a new voucher I can use at this Saturday's market or send me a link and I will happily take the survey again please? Thanks so much in advance for your help,
****

(participant, undated)
Since I have no way to copy anything I brought my phone and showed them the email of winning... I used it all up already was down to nothing for food I want to thank you so much this helped me so much I made a nice veg roast and a large apple and blueberry pie.. can I get some more help for October?
****

(Comment by phone from a voucher winner, undated)
I am very grateful for the opportunity to purchase more fruits & vegetables. My son has had health issues, which I feel are the result of decreased fruit and vegetable intake since I went on SNAP benefits.
****

(participant, undated)
The few extra bucks was very helpful last time.
****

(Comment by phone from a market manager, undated)
The extra dollars are so helpful to our customers. I would gladly take a whole lot of hassle trying to figure out any glitches in the lottery system if it means extra benefits for our customers.
****

(participant, undated)
May I say this is helping me so much.. its very hard to stretch the little bit I do have and I try to eat healthy but can't always afford to.. many thank you. :-)
****

(Karen McGlammery, Webb City FM Manager, 10/4/15)
We had a great market yesterday with THREE very excited lottery winners redeeming!! This is such an awesome program. And our local paper ran a story on the lottery program yesterday.
****

(participant, undated)
The social culture in my particular area (Seacoast of NH) might give some skewed results. The Eat Local/Buy Local movement has been a hard driving factor throughout the entire recession. Residents are predominantly physically active and conscientious about their health and environment. Compared to the rest of the country, obesity is quite low, but smoking is very popular. Believe it or not, some SNAP recipients had perfectly good eating habits prior to enrolling in the program. SNAP acceptance at the farmer's market simply makes it possible to continue (to some degree) while enduring financial hardships.
****

(participant, undated)
This program is an amazing way to get healthy foods and choices into lower income families. It's great for us and the farmers get a whole new group of people to share their goodies with. I also plan to use the winter markets too so I'll be looking for the surveys then too. Hope this research is successful because we will be taking advantage as long as it exists. If you need an advocate I would be happy to share my experiences. Thanks again
****

(Karen McGlammery, 10/15/15)
You helped one of our market clients, Sam, be able to access the survey and she was a winner and was so happy. I've copied a couple of statements from her emails (with her permission) to share with you. [In the first paragraph she is referring to the fact that as of October our Friday market is over for the season so we are down to two markets per week instead of three, thus only two times to match EBT funds instead of three]. Also, in conversation at the market I teased Sam that she'd have to hold a dinner party now that she can buy so many veggies with the lottery. She said that seriously, she now would be able to have someone over for a meal when she never could before as she just didn't have enough food. I hadn't thought about that social aspect of not having enough food...
****

Sam:
"I am so excited!!!!! I was thinking over how the dropping of Friday markets would cut $60-$75 match dollars per month out of my budget and how I would have to shift things around for that... AND then I got a double match! That'll be like $90 extra match if I make it to every market this month! Every month seems to work out for food now because of the matches, providence of "random" food showing up, and good farmers who are very generous in general and even more so when they suspect that you don't have very much on a given day. I have always been pleased with the Webb City market and how well it works and is put together, but now it is staple in my life even more. Thank you, Karen and Eileen for all the wonderful things you do, countless hours, and hard work you put into making the market great! This is one of the hardest working programs I have seen in terms of personal, small famers agricultural, local economy, and many other intangible, impacts."
****

(participant, 10/15/15)
I am so very grateful for this program and the ability to be able to use the SNAP benefits at the

farmers market to obtain fresh food for my family and to support local farmers.
****

(from a farmers market manager, undated)
I thought you might also be interested in a quote from one of our other SNAP customers on Saturday. When I told her that the in-market survey was part of a research project that would hopefully justify future funding, she was very enthusiastic about the match program and happy to participate in the survey. As she left she said "I haven't eaten this healthy in years!"
****

(Englewood FM, undated)
So glad to be able to buy fresh, organic veggies at the farmers market instead of at WalMart.
****

(undated)
The market and this program is jessy a blessing all together, with it and exercise, I have been able to lose and keep off 135 pounds now of over a year. This program made it a much easier to be able to purchase real food. Thanks again for what you guys are doing,
****

(Tucson, AZ FM customer, 4/18/16)
Thank you for doing this. Anything to help with making fresh food available is making a huge difference in people's lives & making a difference for farmers. Incentives help to offset higher costs at farmers markets"
****

(From a participant at Southwest Community FM, 5/11/16)
"this survey has really made it possible for me to have not only enough food each month with the little help i get from the state but also able to eat much healthier. I love the fresh fruit and veg that my refrigerator is filled with as oppose to frozen dinners."
****

(From a participant from the Grandin Road FM, 6/16/16)
I'm glad to hear what you guys do with the data from the Farmers Market surveys! Sounds like it could potentially lead to some positive results! Thanks for your work on this project that, at least for me, is a worthwhile program!
****

(Tracy Herner, Williamsburg VA FM Manager, undated)
Don't know how frequently you hear stories, but this past weekend was a huge success for us! We did over $400 in SNAP, which is a record. 2 customers got over $100 in tokens, and one of those was an RCT winner. She got $120 in SNAP tokens, and $240 in F&V…..for a whopping $360 to spend at the market. She was nearly crying as that is more than she gets all year. Because of how happy she was about winning, she encourage 3 other SNAP recipients to come to the market with her.
****

(Sara Rhoades, City of Alexandria, VA, 9/9/2016)
We've increased our sales at the market by >200% this summer because of this RCT
****

(Alyssa Lerman, 11/3/15)
The Concord Farmers' Market concluded for the season this past Saturday (with positive feedback from customers participating in the RCT surveys!)
****

(Forwarded from Eileen Nichols, Webb City FM, 10/13/16)
"Hey, I just back from the doctor and my AIC dropped, meaning I am no longer considered to have prediabetes. That's something you can to take to your market match funders."
****

(Lee Perron, Englewood FM, 1/22/16)
We, as in the collective "all of us", had a BIG day at the market yesterday. Please note the photos. We had our first RCT winner! She showed with her voucher on her smart phone. That's Amy and the winner with the voucher displayed on the phone. She was so excited that she swiped for $60 in SNAP funds and she received $90 in black tokens. Wow! Katie, I checked the transaction log for data and sure enough the $90 showed up as 1.5 RCT! The tracking is working well… and Carmen you now have your data available residing in the portal. The winner is one of our participants that come every week. Amy spent time reinforcing with each sign up and with those who have already signed up the importance of filling out the survey. Some said they thought it was a little long…. But when Amy shared the story of the winner receiving a $90 dollar match… we think the list got a little easier to fill out. We had 22 participants, with 11 new, and we sent in 14 RCT cards this week. They purchased $462 in SNAP, we matched $442, and the vendors redeemed $754… including our first 20 black tokens for redemption. So, there's the numbers and the platform is humming along.
****

(participant, 10/8/15)
Tara,
Thanks for taking the time to get back to me. Yes I did win for October I plan to spend about $200 of my food assistance in Portsmouth Saturday. This program is an amazing way to get healthy foods and choices into lower income families. It's great for us and the farmers get a whole new group of people to share their goodies with. I also plan to use the winter markets too so I'll be looking for the surveys then too. Hope this research is successful because we will be taking advantage as long as it exists. If you need an advocate I would be happy to share my experiences. Thanks again.
****

(newspaper article)
Webb City market fuels healthier eating, research program for low-income customers
BY MIKE POUND mpound@joplinglobe.com | Posted: Friday, October 2, 2015 6:50 pm

WEBB CITY, Mo. — The Webb City Farmers Market has been selected to take part in a research program that hopefully will allow low-income residents to continue to receive increased access to local fresh fruits and vegetables.

In March, the market received a three-year $33,000 grant that provided matching dollars for customers enrolled in the government's food stamp program. The grant was part of a larger United States Department of Agriculture $3.77 million grant award to Wholesome Wave, a national nonprofit organization. Wholesome Wave in turn issued the $33,000 annual grant to the Webb City market. A group of St. Louis farmers markets and the Webb City market were the only markets in the state selected to take part in the program.

Karen McGlamery, volunteer market manager, said the fact that the Webb City market was even considered for the grant from Wholesome Wave is a testament to the determination of Eileen Nichols, the founder and director of the Webb City Farmers Market.

"Eileen called them (Wholesome Wave) repeatedly," McGlamery said. "The fact that we got the grant says a lot about the Webb City Farmers Market and Eileen Nichols."

Under the program, food stamp customers may swipe their Supplemental Nutrition Assistance Program (SNAP) cards at the Webb City market's information desk and receive tokens for the amount of money they wish to spend. The market then, thanks to the grant from Wholesome Wave, will issue matching tokens — up to $15 — to the customer to be used at the market. While the customers may spend their SNAP tokens on any market product, the matching token may only be used for produce, McGlamery said.

In addition to the matching token program, the market has been selected by Wholesome Wave to take part in a research program, McGlamery said.

When SNAP customers purchase their tokens at the market, they are asked to take part in a short, anonymous survey. The purpose of the survey, McGlamery said, is to gauge how the SNAP money is being spent at the market. The information will be used by Wholesome Wave to help justify continued support for farmers markets from the USDA.

As part of the research project, during three months of each year, customers who take part in the survey are entered in a drawing for a much larger token match for the month in which their name is drawn.

This year, the drawings began in September and will continue through October and November. McGlamery said that in September several Webb City customers won additional token matches.

"We had one woman who spent $40 and walked away with 123 ($1) market tokens," McGlamery said.

McGlamery said the whole idea surrounding the Wholesome Wave grant is to encourage people to eat healthier and to be able to stretch their food budgets.

"But it also helps our growers by giving them another market and increasing their business," she said.

For more information about the SNAP program and to be entered into the drawing, you may visit the market's information desk located on the east side of the market pavilion in King Jack Park.

Fall hours

The Webb City Farmers Market fall hours are from 4 p.m. to 7 p.m. on Tuesdays and from 9 a.m. to noon on Saturdays.

****

(Rob Shepard, Healthy Exchange Project Coordinator, Greenmarket GrowNYC, 2/13/17)
2/10/17 at 97th St – "A few of the EBT lottery winners used all of their available money at the market (in two cases they purchased $150 in tokens). It seems that winning the lottery is becoming an important incentive for people to shop at the market."

2/12/17 at Cortelyou – "Year round Health Bucks and RCT have had a clear positive impact on this market! Even with freezing rain all day, I still did good EBT sales due to several regulars who previously came seasonally showing up to get their Health Bucks."
****
(Eileen Nichols, Manager, Webb City FM, 2/17/17)
"We're getting the word out! The lottery is in the "continue reading" section."

****
(participant, 3/2/17)
"I found the survey. Thanks for your prompt reply. I appreciate it and your program."
****
(participant, 3/7/17)
"The program has been a godsend getting fresh vegetables and fruits."
****
(Roxanne Garcia, Co-Director, Heirloom Farmers Markets, 3/31/17)
"We have really enjoyed distributing the lottery. Our farmers and customers have really benefited!"
****
(participant, 7/26/17)

Please send me a survey. I must say I miss the extra health bucks. Last year I was able to go vegetarian because of the extra help. This year I wanted to see if I can eat vegan for a little while. This I was also able to buy white peaches. This year the prices on vegetables and fruit went up. I try to make all of my food purchases at the farmers markets. I also juice a lot. I have been able to keep my UC under control because of the changes made. Thank you for this program. It makes a difference.
****

****

(participant, undated)
Thank you. Please keep encouraging others to eat healthy. "An ounce of prevention is better than a life time of cures".
****

(participant, 8/7/17)
You guys are so nice to me and your vegetables are so fresh and healthy.
****

(participant, 9/30/17)
I want to let you know what a life-saver your program was to me and my family last month. My 9 year old has Lyme disease and will have it the rest of his life, so learning how to thrive with Lyme has been my #1 priority this past year. Before approaching what Lyme is all about, when, where and how it was identified and how it functions unlike any other disease, I have been well-advised to focus on and master 4 areas: 1. Nutrient 2. toxins 3. stress 4. sleep. It sounds a lot simpler than it is! Your program was just the thing we need that helped me with 3 of 4 of those areas last month and being able to get him the quantity of vegetables made a noticeable impact on him in just the one month I was able to participate. At the same time, I am also climbing out of a messy domestic violence situation which has made becoming financially independent a real challenge, and affects every part of our lives. I cannot express enough how just this little bit of help goes a very long way.
****

(participant, 10/11/17)
Si gracias hay mucho producto buenísimo (Yes thank you there is a lot of great produce).
****

UNIVERSITY OF DELAWARE | Center for Research in Education & Social Policy

Technical Report

PUBLICATION R19-003 [MARCH 31, 2018; FINAL REVISION AUGUST 10, 2020]

Fresh Access Bucks: Increasing Food Access and Florida Farmer Sales at Markets Statewide

Florida Organic Growers
Final Grant Report

Allison Karpyn, PhD
Sara Grajeda, PhD
Rui Wang, MA
Tara Tracy, BS
Tiffany DeMenna, BA
Nicole Kennedy, BA/MPA expected 2022

Submitted to Wholesome Wave Charitable Ventures, Inc.

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Final Grant Report Contacts

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Contents

Executive Summary

The randomized control trial (RCT) was managed and evaluated by the University of Delaware's Center for Research in Education and Social Policy (UD-CRESP) across a national sample of three networks of farmers markets (FMs) in 13 states and the District of Columbia, over a two-year time span. This report presents and analyzes the data from the subset of 13 FMs in the Florida Organic Growers and Consumers (also known as Florida Organic Growers or FOG) FM network that participated in the RCT between January 2016 and April 2017. The RCT randomly awarded incentives to Supplemental Nutrition Assistance Program (SNAP) recipients to use to purchase fruits and vegetables (FVs). Changes in three pre-designated outcome variables (FV consumption, FV purchase, Body Mass Index (BMI)) were calculated using results of an online survey that addressed: standard dietary consumption over time; food insecurity; health status and perception; food purchasing; and, demographics. UD-CRESP also analyzed the effect of FV incentives randomly awarded to SNAP recipients on their FM spending.

The research resulted in the following findings. First and due to the small size of the FOG sample, no statistically significant changes were identified in these three pre-designated outcome variables. However, SNAP expenditures for FOG participants more than doubled when spending at the baseline and highest incentive levels were compared, a statistically significant result. Specifically, the research showed statistically significant higher SNAP spending on FV at the moderate and highest incentive levels when compared to the baseline or lowest incentive level. Additionally, FOG's subset of Hispanic participants also spent statistically significant more on FV when baseline and the highest level of incentives were compared.

Regarding outcomes from the national, or overall, sample (of which FOG was a subset), financial incentives awarded at FMs to SNAP participants had statistically significant, positive effects on FV consumption while no statistically significant changes were found in either FV purchase and BMI. Analysis of SNAP spending showed statistically significant higher spending at most incentive levels when compared to baseline.

Based on these results, our first recommendation is that a codified incentive program at the highest level be implemented. Our second recommendation is that culturally appropriate programming for Hispanic participants at FOG FMs be developed.

Background

Between 2016 and 2017, the University of Delaware's Center for Research in Education and Social Policy (UD-CRESP) partnered with Florida Organic Growers and Consumers (Florida Organic Growers or FOG) to measure the impact of expanded nutrition program incentives at farmers markets (FMs), following a Randomized Control Trial (RCT) research design and using funding from an individual Food Insecurity Nutrition Incentives Program (FINI) grant. During approximately the same timeframe, parallel studies were undertaken by Wholesome Wave, Inc. (WW) and the New York City Department of Health and Mental Hygiene (NYCDOHMH). Specifically, WW was funded by a FINI grant to undertake an RCT within their national network of FMs between 2015 and 2017. Finally, NYCDOHMH received an individual FINI grant that funded the RCT within its FM network between 2016 and 2017.

UD-CRESP conducted the multi-site RCT, across the three FINI-funded grants, to assess the impact of awarding additional Supplemental Nutrition Assistance Program (SNAP) incentives at the 76 FMs operating under the auspices of FOG, NYCDOHMH, and WW on recipients' FV purchase and consumption practices, among other parameters.

This report provides the results and outcomes of the RCT conducted at the 13 FOG FMs between 2016 and 2017, unless otherwise noted.

This report also includes a separate Excel spreadsheet ("FOG FMs_all Rounds_3-30-18") that was provided directly to WW via email. The spreadsheet reports on key participation parameters (i.e., tickets received, surveys sent, surveys completed, unique individuals, number and percent double completers, RCT monetary and nonmonetary incentives, SNAP dollars spent) for all 13 FMs that participated in the RCT between 2016 and 2017.

Design

Participant Recruitment and Retention

SNAP shoppers at participating FOG FMs were offered the opportunity to participate in a study where they would be eligible to receive additional funds to spend at the FMs. Participants were initially made aware of their potential eligibility for the study through a yellow enrollment ticket provided by the market manager, as well as a printed flier containing RCT information. The numbered enrollment ticket requested the shopper's first name, email address, and cell phone number. The shopper's enrollment ticket number and identifier (i.e., the initials of their first and last names plus the last four digits of the Electronic Benefits Transaction (EBT) card used to access SNAP benefits) were recorded using the specialized software, "FMTracks™[1]". Ultimately a link was able to be made, then between the FM Tracks sales data and the online survey.

UD-CRESP sent enrollment tickets and pre-stamped return envelopes to FOG FM managers, prior to implementation of the RCT. Upon receipt of completed tickets, UD-CRESP staff entered data from each ticket into an Excel spreadsheet. Through linkage of Qualtrics™ survey software to the spreadsheet, SNAP shoppers were invited to participate in the study via email or text, or both.

Shoppers who responded to the invitation, and who both consented to participate and completed the corresponding online survey, were randomly awarded one of three monetary incentive amounts, or the nonmonetary incentive if available and as previously described. At the start of the following month, shoppers were sent an email and/or text with instructions on how to participate again, unless they opted out. Continued participation required completion of the survey again, after which, another randomized additional incentive was assigned.

Incentives were authorized for use at the participants' primary FM, or at another allowable FM within the FOG network, for the remainder of the month, when the monetary incentive expired. At the start of the next month, participants were invited to complete another survey if they had chosen to remain in the study. Finally, at the end of each round (roughly a farmers' market season), we included a final 'follow-up' month during which prior participants were invited to complete the survey, with the same odds of winning randomly assigned incentives as in prior months. No new RCT participants were recruited during this follow-up month.

[1] FMTracks™ is an IOS-based program developed by Case Western Reserve University. It organizes market sales data, individual purchase data, incentive redemptions/expenditures, and EBT transactions.

All consent, survey, and other forms of formal communication with participants were reviewed and approved by UD's Institutional Review Board prior to its use in the RCT. Study materials were made available in English and Spanish.

Incentive Levels

After enrollment and survey completion, participants were randomly and equally assigned (computer generated) to one of three conditions: 1) no additional monetary incentive beyond baseline; 2) moderate monetary incentive; or, 3) maximum monetary incentive. During certain times in the RCT, a nonmonetary incentive (i.e. a reusable grocery bag imprinted with a healthy eating message) was randomly and equally assigned as a fourth option. When awarded, the nonmonetary incentive was given only once during the month; however, the recipient remained eligible to receive their FM's baseline monetary incentive throughout the entire month.

For the participating FOG FMs, participants always had the same three possible levels of incentive; specifically: $1 (spent) received $1 additional (1:1 baseline); $1 (spent) received $1.50 additional (1:1.5 moderate); or, $1 (spent) received $2.00 additional (1:2 maximum). Nationally, participant levels of incentive were determined based on the incentive structure of the FM where they shopped.

Incentive levels are further explained as follows:

- Baseline Incentive: FOG FMs participating in the RCT offered a 1:1 baseline monetary incentive match (or ratio). This means that for every $1 in SNAP funds spent, SNAP shoppers randomly assigned to the baseline condition were provided an additional $1. As noted, this baseline incentive level was consistent for the FOG FMs throughout the study. That said, the participant was randomly assigned to an incentive level that could vary from month to month.
- Moderate Incentive: The next interval of additional funds participants could receive is referred to as the moderate incentive, or 1:1.5. For example, if a participant spent $6 in SNAP funds at a FOG FM and was provided with a moderate 1:1.5 incentive ratio, that participant would receive an additional $9 to spend on FVs for a total of $15.
- Maximum Incentive: The highest incentive ratio provided was 1:2. For example, if a participant spent $8 in SNAP funds at the FM and was provided with the maximum 1:2 incentive ratio, that participant would receive an additional $16 to spend on FVs for a total of $24.
- Non-monetary incentive: A reusable grocery bag was provided in addition to the baseline incentive and here is termed as a non-monetary incentive.

As previously noted, participants were given an equal chance of being assigned to one of the three or four possible incentive levels, depending on whether the non-monetary incentive was an option. In all cases, an additional monetary incentive allowed the RCT participant to utilize the additional incentive on FVs only (vs. any SNAP-eligible product available for purchase at the FM).

Survey Measures

The online survey was modified from the Dietary Screener Questionnaire (DSQ) in the National Health and Nutrition Examination Survey (NHANES), 2009 – 2010. Survey questions selected for the RCT include FV dietary recall questions for the previous month. This 16-item FV screener's intraclass correlations for test – retest reliability ranged from 0.62 to 0.67 for FVs for men and women combined. These reliabilities are considered adequate and approach accepted levels (0.7) for research. The survey also included questions regarding food expenditures at the FM; demographics information based on US Census parameters; and, health status and perception questions selected from the Behavioral Risk Factor Surveillance System Questionnaire.

As a monthly dietary recall, the modified DSQ asks about the frequency (e.g., three times per week) of consumption in the past month of selected foods and drinks. The modified DSQ considered fresh FVs as well as FVs bought in prepared forms or from mixed foods (e.g., 100% fruit juices, refried beans, salsa, tomato sauces, french fries, and pizza). Responses to these survey questions were converted to estimates of dietary FV intake, provided in cup equivalents and based on a set of scoring algorithms developed by NHANES (2009-2010), providing daily FV/legume intake, in cups, of RCT participants.

A two-item food insecurity (FI) screener was used to identify families at risk for food insecurity: (1) "Within the past 12 months we worried whether our food would run out before we got money to buy more," and (2) "Within the past 12 months the food we bought just didn't last and we didn't have money to get more." The two-item FI screener has high sensitivity (83%), specificity (97%), and convergent validity compared with the longer 18-item US Household Food Security Scale used by the Current Population Survey, making it an effective substitute tool to annually monitor food-security status.

Calculation of BMI used the participant's self-reported weight/height and was interpreted using standard weight status categories. These categories are the same for men and women of all body types and ages[2]. Specifically, the BMI scores are defined as follows:

[2] https://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/index.html.

below 18.5 is underweight; 18.5 – 24.9 is Normal or Healthy Weight; 25.0 – 29.9 is Overweight; and, 30.0 and above is Obese.

The individual purchase amount by different incentive levels was collected at the FM using FMTracks™. These data were connected to the survey data in order to compare the variation in purchase amount by different incentive levels, using the participant's identifier (i.e., the initials of their first and last names plus the last four digits of their unique SNAP card).

Research Approach

The data presented here reflect differences in participant purchasing, or changes to survey responses over the course of a single month, derived from both the online survey and from sales information provided by the FM. As previously described, during each month, interested SNAP shoppers were given the opportunity to enroll in the study, take the dietary intake and shopping behavior survey, and receive one of the three or four possible incentive amounts.

Survey and participation data were downloaded from Qualtrics™ and analyzed using SAS9.4™. Data collection was conducted online in two waves (or "rounds"), each four months in length between January and April 2016, and again between January and April 2017. As previously noted, winning an additional monetary incentive allowed the RCT participant to utilize the additional incentive on FVs only (vs. any SNAP-eligible product available for purchase at the FM).

Our analysis examined the following evaluation questions:

1. What is the impact of selected (and incrementally different) incentive program innovations, both financial and non-financial, on SNAP customers' purchases of FV at the farmers market and overall grocery purchasing?
2. What is the impact of selected (and incrementally different) incentive program innovations, both financial and non-financial, on SNAP customers' consumption of fruits and vegetables?
3. What is the impact of selected (and incrementally different) incentive program innovations, both financial and non-financial, on SNAP customers' BMI?

In order to answer these questions, we initially conducted descriptive analysis of the characteristics of SNAP FM customers; SNAP FM participant grocery spending, FV consumption, and health status; and, examined differences in FV purchasing, grocery

purchasing, consumption, and related indicators based on the level of the incentive amount received. Examination of SNAP expenditure data using a one-way ANOVA was used to detect any significant differences in SNAP dollars spent by participants at different incentive levels.

We conducted a repeated measures mixed effects analysis to estimate potential changes in outcome variables after participants were assigned an incentive. Regarding FV expenditures, the repeated measures model uses a log transformation of the dollars spent on FVs over the course of the month to account for skewness in the data. In addition, the model controls for household size since the dollars spent is related to the number of people to feed in the household.

The present report also provides findings from a Complier Average Causal Effect (CACE) analysis conducted only on the larger national sample, of which the FOG data was a part. The CACE model was calculated for FV consumption, where a significant finding was identified, in order to adjust the repeated measures model results to calculate the effects for only those participants *who used* their randomly assigned incentive.

All outcomes were examined based on data from SNAP participants who completed a survey once at the beginning of the month and again at the start of the following month.

The field-based, coordinated, multi-site RCT was conducted at a total of 13 FMs; one additional FM signed up for the RCT but did not solicit RCT participants. A total of 1,241 independent responses were generated from participating FOG FMs. In addition, this report at times, and where specified, draws from data from a larger national sample of FMs, which includes a total of 76 FMs and 7,097 independent responses.

RCT Results

Sample

Between January 2016 and April 2017, 818 tickets were received from all FOG FMs participating in the RCT (as reported on “FOG FMs_all Rounds_3-30-18” spreadsheet). A total of 2,672 survey invitations were sent via email or text to both first-time participants and to those who agreed to consider completion of the survey in subsequent months. Of the surveys sent, 46.4% (n=1,241) were completed. The number of first-time completers of the survey between January 2016 and April 2017 was 600.

Note that the sample size is not consistent across the gender variable nor across the following variables since participants had the option to skip over certain questions and still complete the survey.

Characteristics of RCT Participants from all FOG FMs

Of the 600 first-time survey respondents from FOG FMs who answered the gender questions, 83% (n= 486) were female. The majority of respondents 63% (n=355) were between the ages of 18 and 47.

Regarding race and ethnicity, 79% (n=427) of the respondents from FOG FMs were white and 16% (n=88) were Hispanic. Additionally, 16% of the respondents in the overall sample were Hispanic. These data reflect the relatively high percentage of Hispanic residents in the communities whose FMs participated in the RCT. Specifically and according to the Pew Research Center, Florida's Hispanic population represents almost nine percent of all Hispanics in the US, third behind California and Texas, respectively.[3] In both Florida and other parts of the country, Hispanic participation in SNAP and programs such as the RCT is of particular interest, presenting an opportunity to focus on culturally appropriate nutrition education and outreach to this population.

Table 1 summarizes much of these gender, race, and ethnicity data, for participants from FOG's network of FMs and the subset of Hispanic participants from FOG's network of FMs. Data for the national sample of participants from WW, FOG, and NYCDOHMH FMs can be found in Table 8 (Appendix A).

Table 1: Demographic Information for FOG FMs

Characteristics	FOG	Hispanic Participants from FOG FMs
Total Participants	600	88
Gender		
Male	17%	13%
Female	83%	87%
Race		
White	79%	59%
Black or African American	9%	11%
Asian/Other Pacific Islander	4%	10%
American Indian/Alaskan Native	4%	4%
Other Race	4%	17%

[3] Krogstad, JM. Hispanics have accounted for more than half of total U.S. population growth since 2010. https://www.pewresearch.org/fact-tank/2020/07/10/hispanics-have-accounted-for-more-than-half-of-total-u-s-population-growth-since-2010/. Published July 10, 2020.

Characteristics	FOG	Hispanic Participants from FOG FMs
Ethnicity		
Hispanic	16%	100%
Non-Hispanic	84%	0%
Age		
18 to 27 years	17%	20%
28 to 37 years	25%	31%
38 to 47 years	21%	23%
48 to 57 years	17%	21%
58 to 67 years	14%	2%
68 to 77 years	6%	4%
78 and above	1%	0%

[1] Overall: the national sample of all FMs; i.e., the WW, FOG, NYCDOHMH network-based FMs that recruited SNAP shoppers to participate in the RCT.

Regarding participant health information, at baseline, it was found that 82% (n=476) of FOG FM SNAP shoppers had experienced food insecurity in the prior year. More than 54% (n=315) reported that they were overweight or obese (BMI ≥ 25). More than one in five (22%, n=128) stated that they were in fair or poor health. When asked about health conditions, 12% reported having diabetes and 23% had high blood pressure.

The prevalence of the health conditions faced by SNAP FM shoppers is summarized in Table 2, specifically categorized according to: participants from FOG's network of FMs and the subset of Hispanic participants from FOG's network of FMs. Data for the national sample of participants from WW, FOG, and NYCDOHMH FMs can be found in Table 9 (Appendix A).

Table 2: Self-reported Participant Health Information for FOG FMs

	FOG	Hispanic Participants from FOG FMs
BMI		
Underweight (BMI below 18.5)	3%	1%
Normal Weight (BMI 18.5 – 24.9)	43%	46%
Overweight (BMI 25.0 – 29.9)	28%	25%
Obese (BMI 30.0 – 34.9)	14%	16%
Severely Obese (BMI 35.0-39.9)	7%	6%
Morbidly Obese (BMI 40.0 and over)	5%	6%

	FOG	Hispanic Participants from FOG FMs
Food Insecurity		
Food Insecure	82%	92%
Food Secure	18%	8%
Health Status		
Excellent	11%	14%
Very Good	31%	22%
Good	36%	41%
Fair	17%	15%
Poor	5%	8%
Health Conditions		
Heart Disease	4%	7%
Diabetes	12%	11%
High Blood Pressure	23%	15%

The survey also asked SNAP FM shoppers about the amount they spent on all groceries and the amount they spent on FVs as part of their overall grocery budget – not just on items purchased at the FM. Per month, each household spent on average $162.66 on FVs. When compared to the total amount spent on groceries, FV purchasing comprised 47% of the total.

Finally, the data on dietary intake (or consumption) revealed that FOG FM SNAP shoppers consumed on average 3.13 cups of FVs per day (an amount that includes french fries), at baseline. Further, males consumed an average of 3.33 cups of FVs per day, while females consumed 3.10 cups of FVs per day. Overall, the average amount of FVs that adults age 18-47 consumed was about 3.19 cups per day. Adults age 48-67 consumed 3.04 cups of FVs per day and older adults (68+) consumed about 3.10 cups of FVs per day.

Dietary intake and expenditure data are summarized in Table 3, specifically categorized according to: participants from FOG's network of FMs and the subset of Hispanic participants from FOG's network of FMs. Data for the national sample of participants from WW, FOG, and NYCDOHMH FMs can be found in Table 10 (Appendix A).

Table 3: Mean Baseline FV Intake (or Consumption) and Expenditures for FOG FMs

	FOG	Hispanic Participants from FOG FMs
Daily Cups, FV Intake by Gender		
Male	3.33	2.88
Female	3.10	2.98
Daily Cups, FV Intake by Age		
18 to 27 years	3.08	2.76
28 to 37 years	3.26	3.14
38 to 47 years	3.20	3.20
48 to 57 years	2.98	2.67
58 to 67 years	3.10	4.18
68 to 77 years	3.03	2.21
78 years and above	3.46	--
Daily Cups, FV Intake Overall Average (in cups)	3.13	2.97
Monthly FV Grocery Expenditures, all sources, in dollars	162.66	176.98
BMI	27.1	27.0

RCT Incentive Coupon Usage for all FOG FMs

In total and as shown in Table 4, the study issued 1,220 monetary incentives that could be used multiple times over one month. Of these, 577 incentives were redeemed at least once, and in total, incentives were redeemed 1,028 times. In other words, participants who used incentives redeemed them an average of 1.8 times across the month. Those with an incentive spent an average of $33.81 in SNAP funds alone (before any additional incentive was applied) per visit to the FM, as shown in Table 7.

Table 4 provides a summary of incentives issued by incentive level, including whether the incentive level was considered to be baseline, moderate, or maximum at participating FOG FMs. Sample analysis for the national sample of participants from WW, FOG, and NYCDOHMH FMs can be found in Table 11 (Appendix A).

Table 4: Sample Analysis for FOG FMs

Incentive Ratio	Incentive Level		
	Baseline	Level1 (Moderate)	Level2 (Maximum)
1	361	--	--
1.5	--	344	--
2	--	--	356
Non-monetary	159	--	--
Total incentives	520	344	356

Table 5 establishes incentive assignment according to: participants from FOG's network of FMs and the subset of Hispanic participants from FOG's network of FMs. Incentive assignment for the national sample of participants from WW, FOG, and NYCDOHMH FMs can be found in Table 12 (Appendix A).

Table 5: Incentive Assignment for FOG FMs

Incentive Ratio	FOG	Hispanic Participants from FOG FMs
1	30%	32%
1.5	28%	29%
2	29%	30%
Non-monetary[1]	13%	10%

[1] Participants who received the non-monetary incentive were also eligible to receive the 1.0 monetary incentive.

Changes in Outcome Variables for all FOG FMs, and National FMs

A repeated measures mixed effects analysis was conducted to estimate the potential change in FV consumption, FV expenditures and BMI, after participants were assigned an incentive. Table 6 summarizes outcomes data based on the repeated measures mixed effects analyses for the FOG sample[4,5]. No statistically significant differences were identified, which is likely due to sample size limitations.

[4] Outcomes data for participants from WW, FOG, and NYCDOHMH FMs can be found in Table 13 (Appendix A) for comparison purposes.
[5] It should be noted that these tables include data from FMs that have different baseline and therefore incentive levels than the FOG FMs.

Table 6: Repeated-Measures Fixed-Effects on Outcomes for FOG FMs

	FOG
FV Consumption (in cups)	
Intercept	2.88*
0.4	--
0.8	--
1.0	
1.5	0.11
2.0	0.11
Non-monetary	-0.17
Hispanic intercept	0.0801
Hispanic 0.4	--
Hispanic 0.8	--
Hispanic 1.0	
Hispanic 1.5	0.1108
Hispanic 2.0	-0.0904
Hispanic Non-monetary	0.3632
Monthly Grocery Expenditures on FV (Log transformation; percent change in FV expenditures)	
Intercept	4.4351*
0.4	--
0.8	--
1.0	
1.5	0.20
2.0	0.13
Non-monetary	0.11
Hispanic intercept	0.0912
Hispanic 0.4	--
Hispanic 0.8	--
Hispanic 1.0	
Hispanic 1.5	-0.1312
Hispanic 2.0	-0.2016
Hispanic Non-monetary	-0.0604
Household size	0.15*
BMI	
Intercept	24.45*
0.4	--
0.8	--
1.0	
1.5	0.20
2.0	0.04
Non-monetary	0.76
Hispanic intercept	1.28
Hispanic 0.4	--
Hispanic 0.8	--
Hispanic 1.0	
Hispanic 1.5	-0.06
Hispanic 2.0	0.27
Hispanic Non-monetary	0.18

* $p < .05$ Indicates a value different from 0.

However, significant differences were found for the aggregate, larger, sample of FM which included FOG markets. Statistically significant differences were found for participants assigned the maximum incentive (i.e., $2.00 for $1.00 baseline FMs) in the national sample of FMs. Specifically, and for this national sample, receiving the maximum incentive level resulted in an increased FV consumption of 0.16 daily cups. Hispanic participants did not experience any additional increases in FV consumption beyond the increases seen in the overall sample.

To understand the impact of the program for those participants that used the incentive (excluding those that received, but never used), a Complier Average Causal Effect (CACE) methodology was applied. This approach adjusts the repeated measures model results to calculate the effects for only those participants who used their randomly assigned incentive. Based on the CACE calculation, the FV consumption of participants, from the national sample of FMs, who used their 2.0 incentive was 0.31 cups per day, almost twice the average for all participants who were randomly assigned the 2.0 incentive level.

Regarding FV expenditures, the repeated measures model uses a log transformation of the dollars spent on fruits and vegetables over the course of the month to account for skewness in the data. In addition, the model controls for household size since the dollars spent is related to the number of people to feed in the household. No significant differences were found between incentive levels for the national sample or for the subsamples.

Not unexpectedly, no significant change in BMI was found for national participants regardless of incentive level. This finding is likely due to the short periods of time under study; it is unlikely that large changes in BMI are detectable over a month's time. Additional research of longer-term effects is recommended in order to better estimate the impacts of FV incentives on BMI.

Analysis of SNAP Expenditures for Participants from FOG FMs

As noted earlier, FOG participants who used incentives at the FM spent an average of $33.81 SNAP dollars per transaction. Examination of SNAP expenditure data using a one-way ANOVA shows significant increases of SNAP dollars spent. Refer to Table 7, which presents these results according to: participants from FOG's network of FMs and the subset of Hispanic participants from FOG's network of FMs. Results for the national sample of participants from WW, FOG, and NYCDOHMH FMs can be found in Table 14 (Appendix A).

Specifically, for all FOG FM participants, a statistically significant increase in SNAP spending was observed between the baseline and moderate incentive levels ($20.40 to $33.81); SNAP spending between the baseline and highest incentive levels more than

doubled ($20.40 to $40.07), also a statistically significant increase. Data analysis showed similar, statistically significant increases in SNAP spending ($19.84 to $38.62) for FOG FMs' Hispanic participants between the baseline and highest incentive levels.

Table 7: SNAP Expenditures at Farmers Markets, per Transaction and by Incentive Level, in Dollars

Incentive Ratio	FOG	Hispanic Participants from FOG FMs
0.4	--	--
0.8	--	--
1	20.40	19.84
1.5	33.81*+	32.44
2	44.07*+	38.62+

* p < .05. Statistical significance indicated for the difference with the preceding incentive level.
+ p < .05 Statistical significance indicated for the difference with the baseline level.

Anecdotal Feedback

Communication received from FM managers and RCT participants during the RCT is included verbatim in Appendix B. Overall, there was little to no criticism of the RCT process. Rather, FM managers recognized the benefit of additional RCT spending to their market's farmer vendors, and on the overall reputations and desirability of their FMs. Further, numerous participants expressed appreciation for the increased incentives and the value of the additional FVs to their health. All questions and concerns were promptly addressed. Acknowledgement of communications that did not necessitate a response was provided in most cases.

Conclusions and Recommendations

The study showed three notable effects. First, participants shopping at participating FOG FMs spent statistically significant higher amounts of their SNAP dollars on FVs at the moderate and highest incentive levels, when compared to baseline. Second, the Hispanic subset of these FOG participants spent statistically significant higher amounts of their SNAP dollars on FVs at the highest incentive level, when compared to baseline. Last, when considering the overall or national sample of SNAP shoppers at FMs, statistically signification changes between baseline and the highest incentive level were shown both in the amount of FVs consumed and in the amount of SNAP dollars spent.

Based on these effects, we make two recommendations. First, and from a policy perspective, our recommendation is that an incentive program at the highest level be codified. Our analysis of the national or overall sample showed that a FV incentive for

SNAP recipients at FMs at the highest level increased FV consumption. At baseline, participants reported consuming 2.77 cups of FVs per day which increased to 2.93 cups at the highest incentive level, a statistically significant increase. Accordingly, a dedicated FV incentive at the highest level for SNAP recipients would help to close the gap between current FV consumption and that recommended by the Dietary Guidelines for Americans (4.5 cups of FVs per day)[6]. Improving dietary quality among participants results in numerous health benefits for the individual, including a reduced risk of stroke and other cardiovascular diseases, a reduced risk of developing cancer, and a reduced risk of Type 2 Diabetes[7,8,9.] Beyond the individual level, improved dietary quality also results in a reduced strain on the health system as a decreased incidence of health problems for the individual reduces the need for care and interventions.

Further, a codified FV incentive for SNAP recipients at FMs conveys economic benefits since the highest incentive level is associated with a statistically significant increase in SNAP FV expenditures at FMs. Also, incentive programs have the potential to bring new customers to FMs and bolster FM use among participants. The increases in FM sales relieves local farmers of the need to ship their products over long distances and is mutually beneficial for the consumers and sellers.

An alternative to our recommendation for an incentive at the highest level is codification of an FV incentive at the moderate level. This would still confer the benefits of an increase in FV consumption and a statistically significant increase in SNAP spending, creating a cost-saving alternative to an FV incentive at the highest level. At FOG FMs, providing a *"spend $1 and get $1.50"* would still result in $14 additional SNAP dollars spent per transaction on FV, while "*spend $1 and get $2"* resulted in an increase of $24 per transaction.

Our second recommendation is that culturally appropriate programming for Hispanic participants at FMs be created or expanded given that SNAP spending on FV for this subset of the population also increased at higher incentive levels. The relatively high percentage of

[6] U.S. Department of Health and Human Services and U.S. Department of Agriculture. *2015–2020 Dietary Guidelines for Americans*. 8th Edition. December 2015. Available at http://health.gov/dietaryguidelines/2015/guidelines/.
[7] Jardim TV, Mozaffarian D, Abrahams- Gessel S, Sy S, Lee Y, Liu J, et al. (2019) Cardiometabolic disease costs associated with suboptimal diet in the United States: A cost analysis based on a microsimulation model. PLoS Med 16(12): e1002981. https://doi.org/10.1371/ journal.pmed.1002981
[8] Mozaffarian D, Benjamin EJ, Go AS, et. al. (2016) Heart Disease and Stroke Statistics—2016 Update. American Heart Association Statistics Committee and Stroke Statistics Subcommittee. Circulation. 133:e38–e360. https://doi.org/10.1161/CIR.0000000000000350
[9] Mozaffariam D, (2016) Dietary and Policy Priorities for Cardiovascular Disease, Diabetes, and Obesity A Comprehensive Review. American Heart Association. Circulation. 133:187–225. https://doi.org/10.1161/CIRCULATIONAHA.115.018585

Hispanic residents in the communities whose FOG FMs participated in the RCT presents a unique opportunity to offer this specialized programming.

In conclusion, investing in FM incentive programs, which is supported by this study's findings and widely across the literature, should be prioritized. Specifically, this RCT supports the effectiveness of incentive programs in improving nutrition behaviors of SNAP shoppers and increasing spending at FMs. Such programs address the need to increase purchasing power for low-income consumers, such as SNAP participants, enabling the purchase of healthy foods. This is particularly timely as, in recent years, the price of healthy items such as FVs has increased relative to unhealthy items. Accordingly, incentive programs such as the one analyzed in this RCT, improve the affordability of FVs for program participants. Therefore, incentive programs that increase SNAP shoppers' ability to purchase additional FVs should be part of future policies to support this population which will create more equitable access for those whose food budgets are otherwise limited.

Appendix A: Additional Tables

Table 8: Demographic Information for the Overall Sample of FMs

Characteristics	Overall[1]
Total Participants	3,073
Gender	
Male	18%
Female	82%
Race	
White	72%
Black or African American	12%
Asian/Other Pacific Islander	4%
American Indian/Alaskan Native	4%
Other Race	8%
Ethnicity	
Hispanic	18%
Non-Hispanic	82%
Age	
18 to 27 years	15%
28 to 37 years	28%
38 to 47 years	21%
48 to 57 years	16%
58 to 67 years	15%
68 to 77 years	5%
78 and above	1%

[1] Overall: the national sample of all FMs; i.e., the WW, FOG, NYCDOHMH network-based FMs that recruited SNAP shoppers to participate in the RCT.

Table 9: Self-reported Participant Health Information for the Overall Sample of FMs

	Overall[1]
BMI	
Underweight (BMI below 18.5)	3%
Normal Weight ((BMI 18.5 – 24.9)	37%
Overweight (BMI 25.0 – 29.9)	27%
Obese (BMI 30.0 – 34.9)	16%
Severely Obese (BMI 35.0-39.9)	9%
Morbidly Obese ((BMI 40.0 and over)	9%
Food Insecurity	
Food Insecure	82%
Food Secure	18%
Health Status	
Excellent	9%
Very Good	28%
Good	37%
Fair	19%
Poor	7%
Health Conditions	
Heart Disease	5%
Diabetes	13%
High Blood Pressure	23%

[1] Overall: the national sample of all FMs; i.e., the WW, FOG, NYCDOHMH network-based FMs that recruited SNAP shoppers to participate in the RCT.

Table 10: Mean Baseline FV Intake (or Consumption) and Expenditures for the Overall Sample of FMs

	Overall[1]
Daily Cups, FV Intake by Gender	
Male	3.27
Female	2.95
Daily Cups, FV Intake by Age	
18 to 27 years	2.93
28 to 37 years	3.03
38 to 47 years	3.12
48 to 57 years	2.98
58 to 67 years	2.91
68 to 77 years	3.03
78 years and above	2.75
Daily Cups, FV Intake Overall Average (in cups)	3.00
Monthly FV Grocery Expenditures, all sources, in dollars	153.76
BMI	28.5

[1] Overall: the national sample of all FMs; i.e., the WW, FOG, NYCDOHMH network-based FMs that recruited SNAP shoppers to participate in the RCT.

Table 11: Sample Analysis for the Overall[1] Sample of FMs

	Incentive Level			
Incentive Ratio	**Baseline**	**Level1 (Moderate)**	**Level2 (Maximum)**	**Total**
0.4	1199	--	--	1199
0.8	--	1060	--	1060
1	1627	--	1108	2735
1.5	--	1002	--	1002
2	--	--	982	982
Non-monetary	858	--	--	858
Total monetary	2826	2062	2090	6978

[1]Overall: the national sample of all FMs; i.e., the WW, FOG, NYCDOHMH network-based FMs that recruited SNAP shoppers to participate in the RCT.

Table 12: Incentive Assignment for the Overall Sample of FMs

Incentive Ratio	Overall[1]
0.4	17%
0.8	15%
1[2]	39%
1.5	14%
2	14%
Non-monetary[3]	24%

[1] Overall: the national sample of all FMs; i.e., the WW, FOG, NYCDOHMH network-based FMs that recruited SNAP shoppers to participate in the RCT.
[2] The1.0 incentive ratio includes FMs, including FOG, whose baseline incentive ratio was 1.0 (moderate 1.5 and maximum 2.0), as well as FMs whose 1.0 incentive ratio represented the maximum possible monetary incentive (baseline 0.4 and moderate 0.8).
[3] Participants who received the non-monetary incentive were also eligible to receive the 1.0 monetary incentive.

Table 13: Repeated-Measures Fixed-Effects on Outcomes for the Overall Sample of FMs

	Overall[1]
FV Consumption (in cups)	
Intercept	2.77*
0.4	
0.8	-0.04
1.0	0.00
1.5	0.08
2.0	0.16*
Non-monetary	-0.03
Hispanic intercept	-0.02
Hispanic 0.4	
Hispanic 0.8	-0.01
Hispanic 1.0	0.00
Hispanic 1.5	0.11
Hispanic 2.0	-0.10
Hispanic Non-monetary	-0.07
Monthly Grocery Expenditures on FV (Log transformation; percent change in FV expenditures)	
Intercept	4.44*
0.4	
0.8	0.04
1.0	-0.02
1.5	0.05
2.0	0.03
Non-monetary	-0.01
Hispanic intercept	0.04
Hispanic 0.4	
Hispanic 0.8	-0.09
Hispanic 1.0	0.06
Hispanic 1.5	0.00
Hispanic 2.0	0.05
Hispanic Non-monetary	-0.04
Household size	0.02*
BMI	
Intercept	25.33*
0.4	
0.8	0.22
1.0	-0.09
1.5	-0.01
2.0	-0.09
Non-monetary	0.11
Hispanic intercept	1.21
Hispanic 0.4	
Hispanic 0.8	0.37
Hispanic 1.0	-0.19
Hispanic 1.5	-0.92
Hispanic 2.0	-0.82
Hispanic Non-monetary	-0.73

* $p < .05$ Indicates a value different from 0.

[1] Overall: the national sample of all FMs; i.e., the WW, FOG, NYCDOHMH network-based FMs that recruited SNAP shoppers to participate in the RCT.

Table 14: SNAP Expenditures at Farmers Markets, per Transaction and by Incentive Level, in Dollars for the Overall Sample of FMs

Incentive Ratio	Overall[1]
0.4	26.10
0.8	36.71*+
1	33.59+
1.5	29.42*
2	35.78*+

* p < .05. Statistical significance indicated for the difference with the preceding incentive level.
+ p < .05 Statistical significance indicated for the difference with the baseline level.
[1] Overall: the national sample of all FMs; i.e., the WW, FOG, NYCDOHMH network-based FMs that recruited SNAP shoppers to participate in the RCT. The baseline reference level for the national sample of FMs is .4.

Appendix B: Anecdotal Feedback from all FMs

(Note, in many cases participants and FM managers refer to "vouchers," which means the incentive randomly awarded by the RCT process.)

(participant, undated)
Good morning!
I was so happy to take part in your survey. I only spend my SNAP benefits at the Farmer's Market. As excited and thankful as I was to receive the awesome redemption voucher, I was discouraged as it expires barely a week after I received it. The facts are I only receive $22.00 a month in SNAP benefits....that is as a Mom of 2! Also, it is given at the beginning of the month. So when I took your survey, I had already used up September's benefits at the previous week's market. Is there any way you can send a new voucher I can use at this Saturday's market or send me a link and I will happily take the survey again please?
Thanks so much in advance for your help,
****

(participant, undated)
Since I have no way to copy anything I brought my phone and showed them the email of winning... I used it all up already was down to nothing for food I want to thank you so much this helped me so much I made a nice veg roast and a large apple and blueberry pie.. can I get some more help for October?
****

(Comment by phone from a voucher winner, undated)
I am very grateful for the opportunity to purchase more fruits & vegetables. My son has had health issues, which I feel are the result of decreased fruit and vegetable intake since I went on SNAP benefits.
****

(participant, undated)
The few extra bucks was very helpful last time.
****

(Comment by phone from a market manager, undated)
The extra dollars are so helpful to our customers. I would gladly take a whole lot of hassle trying to figure out any glitches in the lottery system if it means extra benefits for our customers.
****

(participant, undated)
May I say this is helping me so much.. its very hard to stretch the little bit I do have and I try to eat healthy but can't always afford to.. many thank you. :-)
****

(Karen McGlammery, Webb City FM Manager, 10/4/15)
We had a great market yesterday with THREE very excited lottery winners redeeming!! This is such an awesome program. And our local paper ran a story on the lottery program yesterday.
****

(participant, undated)
The social culture in my particular area (Seacoast of NH) might give some skewed

results. The Eat Local/Buy Local movement has been a hard driving factor throughout the entire recession. Residents are predominantly physically active and conscientious about their health and environment. Compared to the rest of the country, obesity is quite low, but smoking is very popular. Believe it or not, some SNAP recipients had perfectly good eating habits prior to enrolling in the program. SNAP acceptance at the farmer's market simply makes it possible to continue (to some degree) while enduring financial hardships.

****

(participant, undated)

This program is an amazing way to get healthy foods and choices into lower income families. It's great for us and the farmers get a whole new group of people to share their goodies with. I also plan to use the winter markets too so I'll be looking for the surveys then too. Hope this research is successful because we will be taking advantage as long as it exists. If you need an advocate I would be happy to share my experiences. Thanks again

****

(Karen McGlammery, 10/15/15)

You helped one of our market clients, Sam, be able to access the survey and she was a winner and was so happy. I've copied a couple of statements from her emails (with her permission) to share with you. [In the first paragraph she is referring to the fact that as of October our Friday market is over for the season so we are down to two markets per week instead of three, thus only two times to match EBT funds instead of three]. Also, in conversation at the market I teased Sam that she'd have to hold a dinner party now that she can buy so many veggies with the lottery. She said that seriously, she now would be able to have someone over for a meal when she never could before as she just didn't have enough food. I hadn't thought about that social aspect of not having enough food...

Sam:

"I am so excited!!!!! I was thinking over how the dropping of Friday markets would cut $60-$75 match dollars per month out of my budget and how I would have to shift things around for that... AND then I got a double match! That'll be like $90 extra match if I make it to every market this month! Every month seems to work out for food now because of the matches, providence of "random" food showing up, and good farmers who are very generous in general and even more so when they suspect that you don't have very much on a given day. I have always been pleased with the Webb City market and how well it works and is put together, but now it is staple in my life even more. Thank you, Karen and Eileen for all the wonderful things you do, countless hours, and hard work you put into making the market great! This is one of the hardest working programs I have seen in terms of personal, small famers agricultural, local economy, and many other intangible, impacts."

****

(participant, 10/15/15)

I am so very grateful for this program and the ability to be able to use the SNAP benefits at the farmers market to obtain fresh food for my family and to support local farmers.

****

(from a farmers market manager, undated)

I thought you might also be interested in a quote from one of our other SNAP customers on

Saturday. When I told her that the in-market survey was part of a research project that would hopefully justify future funding, she was very enthusiastic about the match program and happy to participate in the survey. As she left she said "I haven't eaten this healthy in years!"
****

(Englewood FM, undated)
So glad to be able to buy fresh, organic veggies at the farmers market instead of at WalMart.
****

(undated)
The market and this program is jessy a blessing all together, with it and exercise, I have been able to lose and keep off 135 pounds now of over a year. This program made it a much easier to be able to purchase real food. Thanks again for what you guys are doing,
****

(Tucson, AZ FM customer, 4/18/16)
Thank you for doing this. Anything to help with making fresh food available is making a huge difference in people's lives & making a difference for farmers. Incentives help to offset higher costs at farmers markets"
****

(From a participant at Southwest Community FM, 5/11/16)
"this survey has really made it possible for me to have not only enough food each month with the little help i get from the state but also able to eat much healthier. I love the fresh fruit and veg that my refrigerator is filled with as oppose to frozen dinners."
****

(From a participant from the Grandin Road FM, 6/16/16)
I'm glad to hear what you guys do with the data from the Farmers Market surveys! Sounds like it could potentially lead to some positive results! Thanks for your work on this project that, at least for me, is a worthwhile program!
****

(Tracy Herner, Williamsburg VA FM Manager, undated)
Don't know how frequently you hear stories, but this past weekend was a huge success for us! We did over $400 in SNAP, which is a record. 2 customers got over $100 in tokens, and one of those was an RCT winner. She got $120 in SNAP tokens, and $240 in F&V…..for a whopping $360 to spend at the market. She was nearly crying as that is more than she gets all year. Because of how happy she was about winning, she encourage 3 other SNAP recipients to come to the market with her.
****

(Sara Rhoades, City of Alexandria, VA, 9/9/2016)
We've increased our sales at the market by >200% this summer because of this RCT
****

(Alyssa Lerman, 11/3/15)
The Concord Farmers' Market concluded for the season this past Saturday (with positive feedback from customers participating in the RCT surveys!)
****

(Forwarded from Eileen Nichols, Webb City FM, 10/13/16)
"Hey, I just back from the doctor and my AIC dropped, meaning I am no longer considered to have prediabetes. That's something you can to take to your market match funders."

****

(Lee Perron, Englewood FM, 1/22/16)

We, as in the collective "all of us", had a BIG day at the market yesterday. Please note the photos. We had our first RCT winner! She showed with her voucher on her smart phone. That's Amy and the winner with the voucher displayed on the phone. She was so excited that she swiped for $60 in SNAP funds and she received $90 in black tokens. Wow! Katie, I checked the transaction log for data and sure enough the $90 showed up as 1.5 RCT! The tracking is working well… and Carmen you now have your data available residing in the portal. The winner is one of our participants that come every week. Amy spent time reinforcing with each sign up and with those who have already signed up the importance of filling out the survey. Some said they thought it was a little long…. But when Amy shared the story of the winner receiving a $90 dollar match… we think the list got a little easier to fill out. We had 22 participants, with 11 new, and we sent in 14 RCT cards this week. They purchased $462 in SNAP, we matched $442, and the vendors redeemed $754… including our first 20 black tokens for redemption. So, there's the numbers and the platform is humming along.

****

(participant, 10/8/15)

Tara,

Thanks for taking the time to get back to me. Yes I did win for October I plan to spend about $200 of my food assistance in Portsmouth Saturday. This program is an amazing way to get healthy foods and choices into lower income families. It's great for us and the farmers get a whole new group of people to share their goodies with. I also plan to use the winter markets too so I'll be looking for the surveys then too. Hope this research is successful because we will be taking advantage as long as it exists. If you need an advocate I would be happy to share my experiences. Thanks again.

****

(newspaper article)

Webb City market fuels healthier eating, research program for low-income customers

BY MIKE POUND mpound@joplinglobe.com | Posted: Friday, October 2, 2015 6:50 pm

WEBB CITY, Mo. — The Webb City Farmers Market has been selected to take part in a research program that hopefully will allow low-income residents to continue to receive increased access to local fresh fruits and vegetables.

In March, the market received a three-year $33,000 grant that provided matching dollars for customers enrolled in the government's food stamp program. The grant was part of a larger United States Department of Agriculture $3.77 million grant award to Wholesome Wave, a national nonprofit organization. Wholesome Wave in turn issued the $33,000 annual grant to the Webb City market. A group of St. Louis farmers markets and the Webb City market were the only markets in the state selected to take part in the program.

Karen McGlamery, volunteer market manager, said the fact that the Webb City market was even considered for the grant from Wholesome Wave is a testament to the determination of Eileen Nichols, the founder and director of the Webb City Farmers Market.

“Eileen called them (Wholesome Wave) repeatedly," McGlamery said. "The fact that we got the grant says a lot about the Webb City Farmers Market and Eileen Nichols.”
Under the program, food stamp customers may swipe their Supplemental Nutrition Assistance Program (SNAP) cards at the Webb City market’s information desk and receive tokens for the amount of money they wish to spend. The market then, thanks to the grant from Wholesome Wave, will issue matching tokens — up to $15 — to the customer to be used at the market. While the customers may spend their SNAP tokens on any market product, the matching token may only be used for produce, McGlamery said.
In addition to the matching token program, the market has been selected by Wholesome Wave to take part in a research program, McGlamery said.
When SNAP customers purchase their tokens at the market, they are asked to take part in a short, anonymous survey. The purpose of the survey, McGlamery said, is to gauge how the SNAP money is being spent at the market. The information will be used by Wholesome Wave to help justify continued support for farmers markets from the USDA.
As part of the research project, during three months of each year, customers who take part in the survey are entered in a drawing for a much larger token match for the month in which their name is drawn.
This year, the drawings began in September and will continue through October and November. McGlamery said that in September several Webb City customers won additional token matches.
“We had one woman who spent $40 and walked away with 123 ($1) market tokens,” McGlamery said.
McGlamery said the whole idea surrounding the Wholesome Wave grant is to encourage people to eat healthier and to be able to stretch their food budgets.
“But it also helps our growers by giving them another market and increasing their business,” she said.
For more information about the SNAP program and to be entered into the drawing, you may visit the market’s information desk located on the east side of the market pavilion in King Jack Park.
Fall hours
The Webb City Farmers Market fall hours are from 4 p.m. to 7 p.m. on Tuesdays and from 9 a.m. to noon on Saturdays.
****
(Rob Shepard, Healthy Exchange Project Coordinator, Greenmarket GrowNYC, 2/13/17)
2/10/17 at 97th St – “A few of the EBT lottery winners used all of their available money at the market (in two cases they purchased $150 in tokens). It seems that winning the lottery is becoming an important incentive for people to shop at the market.”

2/12/17 at Cortelyou – “Year round Health Bucks and RCT have had a clear positive impact on this market! Even with freezing rain all day, I still did good EBT sales due to several regulars who previously came seasonally showing up to get their Health Bucks.”
****

****

(Eileen Nichols, Manager, Webb City FM, 2/17/17)
“We're getting the word out! The lottery is in the "continue reading" section.”

****

(participant, 3/2/17)
“I found the survey. Thanks for your prompt reply. I appreciate it and your program.”
****

(participant, 3/7/17)
“The program has been a godsend getting fresh vegetables and fruits.”
****

(Roxanne Garcia, Co-Director, Heirloom Farmers Markets, 3/31/17)
“We have really enjoyed distributing the lottery. Our farmers and customers have really benefited!”
****

(participant, 7/26/17)
Please send me a survey. I must say I miss the extra health bucks. Last year I was able to go vegetarian because of the extra help. This year I wanted to see if I can eat vegan for a little while. This I was also able to buy white peaches. This year the prices on vegetables and fruit went up. I try to make all of my food purchases at the farmers markets. I also juice a lot. I have been able to keep my UC under control because of the changes made. Thank you for this program. It makes a difference.
****

****

(participant, undated)
Thank you. Please keep encouraging others to eat healthy. "An ounce of prevention is better than a life time of cures".
****

(participant, 8/7/17)
You guys are so nice to me and your vegetables are so fresh and healthy.
****

(participant, 9/30/17)
I want to let you know what a life-saver your program was to me and my family last month. My 9 year old has Lyme disease and will have it the rest of his life, so learning how to thrive with Lyme has been my #1 priority this past year. Before approaching what Lyme is all about, when, where and how it was identified and how it functions unlike any other disease, I have been well-advised to focus on and master 4 areas: 1. Nutrient 2. toxins 3. stress 4. sleep. It sounds a lot simpler than it is! Your program was just the thing we need that helped me with 3 of 4 of those areas last month and being able to get him the quantity of vegetables made a noticeable impact on him in just the one month I was able to participate. At the same time, I am also climbing out of a messy domestic violence situation which has made becoming financially independent a real challenge, and affects every part of our lives. I cannot express enough how just this little bit of help goes a very long way.
****

(participant, 10/11/17)
Si gracias hay mucho producto buenísimo (Yes thank you there is a lot of great produce).
****

University of Delaware | Center for Research in Education & Social Policy

Technical Report

PUBLICATION R19-004

[FINAL REPORT: AUGUST 10, 2020]

Incentivizing Fruit and Vegetable Consumption in the Big Apple

New York City Department of Mental Health and Hygiene
Year 3/Final Grant Report

Allison Karpyn, PhD
Sara Grajeda, PhD
Rui Wang, MA
Tara Tracy, BS
Tiffany DeMenna, BA
Nicole Kennedy, BA/MPA expected 2022

Submitted to New York City Department of Mental Health and Hygiene, and Wholesome Wave Charitable Ventures, Inc.

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Contents

Executive Summary

The randomized control trial (RCT) described herein was managed and evaluated by the University of Delaware's Center for Research in Education and Social Policy (UD-CRESP), at 76 farmers markets (FMs) in 13 states and the District of Columbia, over a two-year time span. This report presents data from the 21 New York City FMs within the GrowNYC FM network that participated in the RCT. These FMs partnered with the New York City Department of Health and Mental Hygiene (NYCDOHMH) in a randomized incentive program, which provided variable amounts of Health Bucks to Supplemental Nutrition Assistance Program (SNAP) participants shopping at FMs between August 2016 and October 2017.

The RCT program randomly awarded one of three incentive levels to SNAP recipients to use to purchase fruits and vegetables (FVs) at participating FMs. The incentives were provided to customers who elected to participate and were valued at $0.40/$0.80/$1 for every $1 spent in SNAP benefits. Changes in FV consumption, FV purchase, and Body Mass Index (BMI) were compared using the $0.40 level (1:0.4) as a baseline level and were calculated using results of an online survey that addressed: standard dietary consumption over time, food insecurity, health status and perception, food purchasing, and demographics. UD-CRESP also analyzed the effect of FV incentives randomly awarded to SNAP recipients on their FM spending.

National findings reveal that financial incentives awarded at FMs to SNAP participants have statistically significant, positive effects on SNAP expenditures at FMs, with significantly higher SNAP spending occurring at the $0.80 and the $1 levels compared to the $0.40 level (average FM SNAP spending was $38.63 at $0.80 and $43.11 at $1 as compared to $23.75 at the $0.40 level). No statistically significant differences in BMI or FV consumption were identified for the NYCDOHMH sample alone. However, when the NYCDOHMH data were combined with a larger sample of FMs, which followed the same protocol but for which a wider range of incentives was offered (13 states, 76 total FMs), findings revealed significant changes in FV consumption with a $2 incentive level (2:1).

Based on these effects, our first and overall recommendation is that a codified incentive program at the maximum level be implemented given its statistically significant effect on both FV consumption and SNAP expenditures. Alternately, and to maximize resources, offering incentives at the $0.80 level would result in about the same levels of SNAP

spending as those at the $1 level and would still increase FV consumption. Our second and final recommendation is that culturally appropriate programming for Hispanic participants at FMs be expanded given that SNAP spending for this subset of the population also increased at higher incentive levels.

Background

This report provides results and outcomes of the randomized controlled trial (RCT) conducted at the subset of GrowNYC farmers markets (FMs) (i.e., 21 FMs) that were supported by the New York City Department of Health and Mental Hygiene (NYCDOHMH) to award the RCT's additional incentives, between 2016 and 2017.

The NYCDOHMH's participation in the RCT was part of a larger effort that occurred between 2015 and 2017. The University of Delaware's Center for Research in Education and Social Policy (UD-CRESP)'s partnership with Wholesome Wave, Inc. (WW) also included Florida Certified Organic Growers and Consumers (referred to as Florida Organic Growers, or FOG). A three-year USDA Food Insecurity Nutrition Incentive (FINI) grant was implemented directly by WW for the RCT at FMs across the country. In addition, FOG and NYCDOHMH received individual FINI grants that funded the RCT within their own FM network (FOG) or partner network – GrowNYC in the case of the NYCDOHMH FINI grant. Specifically, UD-CRESP conducted the multi-site RCT to assess the impact of randomly awarding additional SNAP incentives at the 76 FMs operating under the auspices of WW, FOG, and NYCDOHMH on recipients' purchase and consumption practices, among other parameters.

This report also includes a separate Excel spreadsheet ("NYC FMs_all Rounds_3-30-18" spreadsheet") that was provided directly via email. The spreadsheet reports on key participation parameters (i.e., tickets received, surveys sent, surveys completed, unique individuals, number and percent double completers, RCT monetary and nonmonetary incentives, SNAP dollars spent).

Design

Participant Recruitment and Retention

SNAP shoppers at participating FMs were offered the opportunity to participate in a study where they would be eligible for additional funds to spend at their FM. A shopper was eligible if they used any SNAP benefit at a participating FM. These monetary incentives are referred to as "Health Bucks" in NYC. Participants were initially made aware of their potential eligibility for the study through a yellow enrollment ticket provided by the market manager, as well as a printed flier containing RCT information. The numbered enrollment ticket requested the shopper's first name, email address, and cell phone number. The shopper's enrollment ticket number and identifier (i.e., the initials of their first and last names plus the last four digits of the Electronic Benefits Transaction (EBT) card used to access SNAP benefits) were recorded using the specialized software, "FMTracks™[1]." These numbering systems and software facilitated a linkage between the FM Tracks sales data and the online survey.

UD-CRESP sent enrollment tickets and pre-stamped return envelopes to FM managers, prior to implementation of the RCT. Upon receipt of completed tickets, UD-CRESP staff entered data from each ticket into an Excel spreadsheet. Through linkage of Qualtrics™ survey software to the spreadsheet, SNAP shoppers were invited to participate in the study via email or text, or both.

Shoppers who responded to the invitation, and who both consented to participate and completed the corresponding online survey, were randomly awarded one of three monetary incentive amounts, or the nonmonetary incentive if available and as previously described. At the start of the following month, shoppers were sent an email and/or text with instructions on how to participate again, unless they opted out. Continued participation required completion of the survey again, after which, another randomized additional incentive, redeemable for Health Bucks, was assigned.

Incentives were authorized for use at the participants' primary FM, or at another allowable FM within their network, for the remainder of the month, when the monetary incentive expired. At the start of the next month, participants were invited to complete another survey if they had chosen to remain in the study. Finally, at the end of each round (roughly a farmers' market season), we included a final 'follow-up' month during which prior

[1] FMTracks™ is an IOS-based program developed by Case Western Reserve University. It organizes market sales data, individual purchase data, incentive redemptions/expenditures, and EBT transactions.

participants were invited to complete the survey, with the same odds of winning randomly assigned incentives as in prior months. No new RCT participants were recruited during this follow-up month.

All consent, survey, and other forms of formal communication with participants were reviewed and approved by UD's Institutional Review Board prior to its use in the RCT. Study materials were made available in English and Spanish.

Incentive Levels

Upon consenting, after enrolling in the study online, and completing a survey (see the *Design* section of this report), participants were randomly assigned (computer generated) to one of three conditions: 1) no additional monetary incentive beyond baseline; 2) moderate monetary incentive; or, 3) maximum monetary incentive. Specifically for the NYC FMs, participants always had the same three possible levels of incentive: 1) baseline level of Health Bucks, which is the default incentive level ($0.40 in Health Bucks received for every $1 spent in SNAP [1:0.4]); 2) moderate level of additional Health Bucks (additional $0.80 in Health Bucks received for every $1 spent in SNAP [1:0.8]); and, 3) maximum level of additional Health Bucks (additional $1 in Health Bucks received for every $1 spent in SNAP [1:1]). Nationally, participant levels of incentive were determined based on the incentive structure of the FM where they shopped.

Incentive levels are further explained as follows:

- Baseline Incentive: All FMs participating in the RCT offered a 1:0.4 baseline monetary incentive match (or ratio). To illustrate, if a participant who was randomly assigned the baseline incentive spent $5 in SNAP funds at the FM, that participant would receive an additional $2 to spend on FVs for a total of $7.
- Moderate Incentive: The next incentive level was referred to as the moderate incentive, or 1:0.8. For example, if a participant who was randomly assigned the moderate incentive spent $5 in SNAP funds at the FM, that participant would receive an additional $4 to spend on FVs for a total of $9.
- Maximum Incentive: The maximum incentive (or highest) ratio provided was 1:1. For example, if a participant who was randomly assigned the maximum incentive spent $5 in SNAP funds at the FM, that participant would receive an additional $5 to spend on FVs for a total of $10.

Participants were given an equal chance of being assigned to one of the three possible incentive levels. And while the incentive level amounts (e.g., $0.40, $0.80, $1) remained consistent throughout the study, a participant's incentive assignment could vary from month-to-month because each month constituted its own RCT. In all cases, an additional monetary incentive allowed the RCT participant to utilize the additional incentive on FVs only (vs. any SNAP-eligible product available for purchase at the FM).

Survey Measures

The online survey was modified from the Dietary Screener Questionnaire (DSQ) in the National Health and Nutrition Examination Survey (NHANES), 2009-2010. Survey questions selected for the RCT include FV dietary recall questions for the previous month. This 16-item FV screener's intraclass correlations for test-retest reliability ranged from 0.62 to 0.67 for FVs for men and women combined. These reliabilities are considered adequate and approach accepted levels (0.7) for research. The survey also included questions regarding food expenditures at the FM, demographics information based on US Census parameters and health status and perception questions selected from the Behavioral Risk Factor Surveillance System Questionnaire.

As a monthly dietary recall, the modified DSQ asks about the frequency of consumption (i.e., times per day, per week, or per month) of selected foods and drinks. The modified DSQ considered fresh FVs, as well as FVs bought in prepared forms or from mixed foods (e.g., 100% fruit juices, refried beans, salsa, tomato sauces, french fries and pizza). Responses to these survey questions were converted to estimates of dietary FV intake, provided in cup equivalents and based on a set of scoring algorithms developed by NHANES (2009-2010)), providing daily FV/legume intake, in cups, of RCT participants.

A two-item food insecurity (FI) screener was used to identify families at risk for food insecurity: (1) "Within the past 12 months we worried whether our food would run out before we got money to buy more" and (2) "Within the past 12 months the food we bought just didn't last and we didn't have money to get more." The two -item FI screener has high sensitivity (83%), specificity (97%), and convergent validity compared with the 18-item US Household Food Security Scale used by the Current Population Survey, making it an effective substitute tool to monitor food-security status to annually monitor national food-security status.

The survey also requested information specific to respondents from NYC, including zip code of residence, years of college completed, country of birth, income, and willingness to try new FV.

Calculation of BMI used the participant's self-reported weight/height and was interpreted using standard weight status categories. These categories are the same for men and women of all body types and ages[2]. Specifically, BMI below 18.5 is underweight; 18.5 – 24.9 is Normal or Healthy Weight; 25.0 – 29.9 is Overweight; and, 30.0 and above is Obese.

The individual purchase amount by different incentive levels was collected at the FM using FMTracks™ and MM+™[3]; however, NYCDOHMH requested that MM+ data be excluded from this report's analyses due to concerns about data quality. FMTracks data were connected to the survey data in order to compare the variation in purchase amount by different incentive levels, using the participant's identifier. Any FMTracks data utilized was limited to that originating from consenting RCT participants.

Research Approach

The data presented here reflect differences in participant purchasing, or changes to survey responses over the course of a single month, derived from both the online survey and from sales information provided by the FM. As previously described, during each month, interested SNAP shoppers were given the opportunity to enroll in the study, take the dietary intake and shopping behavior survey, and receive one of the three possible incentive amounts.

The NYCDOMH FMs were part of the national sample of FMs that participated in the RCT. Specifically, this national sample was comprised of 76 FMs across 13 states, including the District of Columbia. The research methods remained constant across the larger national trial in order to allow for larger comparisons and data analysis. This national sample also included the higher, additional incentive levels: 1:1.5 and 1:2 with baseline at 1:1.

Survey and participation data were downloaded from Qualtrics™ and analyzed using SAS9.4™. This report provides the results of and outcomes from data collected from RCT participants during three waves (or "rounds"), ranging from three to four months in length,

[2] For more information visit https://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/index.html.
[3] Mobile Market+™ is an application developed by the NovoDia Group that enables FMs the ability to process SNAP transactions, as well as WIC, credit, and debit transactions.

between August 2016 and October 2017. As previously noted, winning an additional monetary incentive allowed the RCT participant to utilize the additional incentive on FVs only (vs. any SNAP-eligible product available for purchase at the FM).

Our analysis examined the following evaluation questions:

1. What is the impact of selected (and incrementally different) incentive program innovations, both financial and non-financial, on SNAP customers' purchases of FV at the farmers market and overall grocery purchasing?
2. What is the impact of selected (and incrementally different) incentive program innovations, both financial and non-financial, on SNAP customers' consumption of fruits and vegetables?
3. What is the impact of selected (and incrementally different) incentive program innovations, both financial and non-financial, on SNAP customers' BMI?

In order to answer these questions, we initially conducted descriptive analysis of the characteristics of SNAP FM customers; SNAP FM participant grocery spending, FV consumption, and health status; and, examined differences in FV purchasing, grocery purchasing, consumption, and related indicators based on the level of the incentive amount received. Examination of SNAP expenditure data using a one-way ANOVA was used to detect any significant differences in SNAP dollars spent by participants at different incentive levels.

We conducted a repeated measures mixed effects analysis to estimate potential changes in outcome variables after participants were assigned an incentive. Regarding FV expenditures, the repeated measures model uses a log transformation of the dollars spent on FVs over the course of the month to account for skewness in the data. In addition, the model controls for household size since the dollars spent is related to the number of people to feed in the household.

The present report also provides findings from the Complier Average Causal Effect (CACE) analysis for FV consumption only on the larger national sample, of which the NYC data was a part. The CACE model was calculated for FV consumption, where a significant finding was previously identified, in order to adjust the repeated measures model results to calculate the effects for only those participants *who used* their randomly assigned incentive.

All outcomes were examined based on data from SNAP participants who completed a survey once at the beginning of the month and again at the start of the following month.

RCT Results

Sample

The field-based, coordinated, multi-site RCT was conducted at a total of 21 FMs which were located in all five NYC boroughs (see Appendix A for FM list). The summer 2016 round included 12 FMs, winter 2017 included six FMs, and the summer 2017 round included 18 FMs. In order to increase study participants, the winter 2017 round was cancelled and more FMs were added to the summer 2017 round (increased from 12 to 18) and the time period was extended an additional month from July through October. Of the 21 FMs, six recruited enrollees and conducted Health Bucks transactions during all three waves. A variety of factors contributed to six of the same FMs participating across all rounds: FMs had to be open both in the winter and summer; FMs selected for participation were chosen based on the demographics of the area; and, FM staff/volunteers had the capacity to implement study activities and otherwise reach potential SNAP customers.

Between August 2016 and October 2017, 1,640 tickets were received from all FMs participating in the RCT (as reported on the "NYC FMs_all Rounds_3-30-18" spreadsheet). A total of 8,333 survey invitations were sent via email or text to both first-time participants and to those who agreed to complete the survey in subsequent months. Of the surveys sent, 25.1% (n=2,083) were completed. The number of first-time completers of the survey, between August 2016 and October 2017, was 814. Also, sample size is not consistent across all variables since participants had the option to skip over certain questions and still complete the survey.

Health Bucks Distribution

As part of a broader and still ongoing initiative, Health Bucks are distributed widely at FMs across NYC; a subset of these FMs recruited SNAP shoppers to participate in the RCT. Data on all Health Bucks distributed and used in NYC, during the same general time period as the RCT was operating at the 21 FMs, are provided in Table 1.

Table 1: Total Health Bucks Distribution and Redemption for NYCDOHMH FMs

Year	Total Health Bucks Redeemed	Total Health Bucks Issued	% Redeemed
2016	5,737	6,547	88%
2017	23,178	25,598	91%

Source: NYCDOHMH

Characteristics of RCT Participants

Of the 814 first-time survey respondents who answered the gender questions, 80% (n= 649) were female. The majority of respondents 61% (n=495) were between the ages of 18 and 47.

Regarding race and ethnicity, 50% (n=344) of the respondents were white and 40% (n=300) were Hispanic. However, it is worth noting that some of the demographic characteristics may also be driven by the fact that the survey was not offered in languages other than English or Spanish (at the time of the RCT, the DSQ's use was validated for only these languages). Given that nearly one-half of the study population was Hispanic, understanding any differences or unique qualities related to participation in SNAP as well as in programs such as the RCT is of particular interest and may present an opportunity to focus culturally-appropriate nutrition education and outreach to this population. Half of all the national or overall RCT's Hispanic participants represented FMs from the GrowNYC network, reflecting, in turn the relatively high percentage of Hispanic residents in those communities (i.e., New York's Hispanic populations represent almost six percent of all Hispanics in the US, fourth behind California, Texas, and Florida according to the Pew Research Center, (2019)[4]).

Table 2 summarizes much of these gender, race, and ethnicity data, for NYCDOHMH participants, the Hispanic subset thereof, and for the national sample.

Table 2: Demographic Information

Characteristics	NYCDOHMH	Hispanic Participants from NYCDOHMH	Combined 13 State/76 Market Sample (includes NYCDOHMH)
Total Participants	814	300	3,073
Gender			
Male	20%	9%	18%
Female	80%	91%	82%

[4] Krogstad, JM. Hispanics have accounted for more than half of total U.S. population growth since 2010. https://www.pewresearch.org/fact-tank/2020/07/10/hispanics-have-accounted-for-more-than-half-of-total-u-s-population-growth-since-2010/. Published July 10, 2020.

Characteristics	NYCDOHMH	Hispanic Participants from NYCDOHMH	Combined 13 State/76 Market Sample (includes NYCDOHMH)
Race			
White	50%	28%	72%
Black or African American	19%	8%	12%
Asian/Other Pacific Islander	7%	4%	4%
American Indian/Alaskan Native	3%	6%	4%
Other Race	20%	55%	8%
Ethnicity			
Hispanic	40%	100%	18%
Non-Hispanic	60%	0%	82%
Age			
18 to 27 years	9%	9%	15%
28 to 37 years	29%	42%	28%
38 to 47 years	23%	26%	21%
48 to 57 years	15%	12%	16%
58 to 67 years	16%	8%	15%
68 to 77 years	6%	1%	5%
78 and above	3%	3%	1%

No more than seven percent of participants were from any one zip code; the three zip codes most represented among the sample were 10034 (6.9%); 11368 (6.2%); and, 10301 (5.3%). Further, 29% of respondents had completed one to three years of college, while more than one-third (37.5%) had completed four or more years of college. The US had the highest rate of response as the country of birth (56%); of the remaining countries reported (71), Mexico and Dominican Republic had the second and third highest rates (12.5% and 4.2%, respectively). Regarding income, 75% of respondents indicated that their total annual family income before taxes was less than $25,000/year (47.7%: $15,000 or less/year; 27.3%: $15,000-$25,000/year). Finally, 78% of respondents responded that they were “very willing” to try new FVs.

With respect to food insecurity, it was found that 86% (n = 680) of FM SNAP shoppers had experienced food insecurity in the prior year. Further, more than half (57%) were overweight or obese (BMI ≥ 25) based on self-reported height and weight. Approximately 20% (n=161) stated that they were in fair or poor health. When asked about health conditions, 12%

reported having diabetes and 21% had high blood pressure. The prevalence of these health conditions faced by SNAP FM shoppers is summarized in Table 3 for NYCDOHMH participants, the Hispanic subset thereof, and for the overall (i.e. national) sample.

Table 3: Self-reported Participant Health Information

	NYCDOHMH	Hispanic Participants from NYCDOHMH	Combined 13 State/76 Market Sample (includes NYCDOHMH)
BMI			
Underweight (BMI below 18.5)	3%	3%	3%
Normal Weight ((BMI 18.5 – 24.9)	40%	30%	37%
Overweight (BMI 25.0 – 29.9)	30%	34%	27%
Obese (BMI 30.0 – 34.9)	15%	16%	16%
Severely Obese (BMI 35.0-39.9)	7%	10%	9%
Morbidly Obese (BMI 40.0 and over)	5%	6%	9%
Food Insecurity			
Food Insecure	86%	89%	82%
Food Secure	14%	11%	18%
Health Status			
Excellent	13%	14%	9%
Very Good	29%	30%	28%
Good	38%	38%	37%
Fair	15%	12%	19%
Poor	5%	7%	7%
Health Conditions			
Heart Disease	6%	3%	5%
Diabetes	12%	12%	13%
High Blood Pressure	21%	13%	23%

The survey also asked SNAP FM shoppers about the amount spent on all groceries and the amount spent on FVs as part of their overall grocery budget – not just items purchased at

the FM. Per month, each household spent on average $167.53 on FVs. When compared to the total amount spent on groceries, FV purchasing comprised 48% of the total grocery budget.

Finally, the data on dietary intake revealed that FM SNAP shoppers consumed, on average, 3.05 cups of FVs per day (an amount that includes french fries). Further, males consumed 3.29 cups of FVs per day, while females consumed 2.99 cups of FVs per day. Overall, the average amount of FVs adults age 18-47 consumed was about 3.06 cups per day. Adults age 48-67 consumed 3.04 cups of FVs per day and older adults (68+) consumed about 2.97 cups of FVs per day.

The dietary intake and expenditures data are summarized in Table 4 for NYCDOHMH participants, the Hispanic subset thereof, and for the national sample.

Table 4: Mean Baseline FV Intake and Expenditures

	NYCDOHMH	Hispanic Participants from NYCDOHMH FMs	Combined 13 State/76 Market Sample (includes NYCDOHMH)
Daily Cups, FV Intake by Gender			
Male	3.29	3.12	3.27
Female	2.99	3.07	2.95
Daily Cups, FV Intake by Age			
18 to 27 years	2.97	2.98	2.93
28 to 37 years	3.10	3.02	3.03
38 to 47 years	3.06	3.09	3.12
48 to 57 years	3.08	2.89	2.98
58 to 67 years	3.00	3.34	2.91
68 to 77 years	3.08	4.85	3.03
78 years and above	2.80	2.90	2.75
Daily Cups, FV Intake Overall Average (in cups)	3.05	3.06	3.00
Monthly FV Grocery Expenditures, all sources, in dollars	167.53	191.53*	153.76
BMI	27.2	28.2	28.5

*Statistically significant difference from non-Hispanics in NYCDOHMH FMs, $p < .05$.

RCT Incentive Issuance

Table 5 provides a summary of the number of duplicated individuals receiving an incentive ratio which was redeemable for Health Bucks, by incentive level. As noted, there were approximately equal proportions of 0.4., 0.8, and 1.0 incentive ratios issued. Individuals may have been duplicated given that the study restarted each month, and figures here represent the sum of Health Bucks issued (or individuals issued) each month. In total 1,621 daily FM visits were made by incentive recipients who made at least one Health Bucks transaction: 447 at the 0.4 level; 557 at the 0.8 level; and, 617 at the 1.0 level. Further, 52% of 0.8 level participants, and 59% of 1.0 level participants, utilized their incentive distribution. Refer to Page 2 for NYCDOHMH's publicly available data on Health Buck redemption rates across the time periods of the RCT.

Table 5: Sample Analysis for NYCDOHMH FMs

Incentive Ratio	
0.4 (baseline)	447
0.8	557
1	617
Number of Individuals Receiving Incentives	1,621

Table 6 establishes incentive assignment by network-based program and for Hispanic participants. For the NYCDOHMH and NYCDOHMH-Hispanic results, the number of incentives was distributed approximately equally across the three available incentive levels, consistent with the RCT's design. The "Combined 13 State/76 Market Sample" results are not equally distributed since the national sample included many FMs whose baseline incentive ratio was 1.0, with additional incentive ratios of 1.5 and 2.0. For the combined or national sample, 52% of incentives were awarded to participants to use at FMs whose *baseline* incentive level was 1.0, while 48% were awarded to participants who shopped at FMs whose *maximum* incentive level was 1.0, such as NYCDOHMH.

Table 6: Incentive Assignment

Incentive Ratio	NYCDOHMH	Hispanic Participants from NYCDOHMH FMs	Combined 13 State/76 Market Sample (includes NYCDOHMH)
0.4	32%	34%	17%
0.8	34%	31%	15%
1	34%	35%	16%[1]

[1]Amount of 1.0 incentive ratio awarded at NYCDOHMH and other FMs with 0.4 baseline incentives. The remaining 1.0 incentives awarded (52% of all participants: not reported here) represented FMs whose baseline incentive ratio was 1.0.

Also notable are the high rates of incentive distribution (i.e., when a participant exchanged the RCT-awarded incentive for Health Bucks at their FM): at least 84% of the time, participants received a distribution of their 0.4, 0.8, or 1.0 incentive at least once (participants could receive additional incentive distributions during each month, as long as their SNAP card had adequate matching funds). Specifically and per month, participants received incentive distributions 1.7 times at the 1.0 ratio, a statistically significant number higher when compared to the 0.4 incentive ratio (i.e., baseline – 1.0 times); 0.8 incentive ratio recipients received distributions 1.6 times. On a cumulative basis over the entire study, a similar pattern emerged for the actual transactions: at the 1.0 ratio, a total of 1,331 distributions occurred, a statistically significant higher number than the 632 distributions at the 0.4 incentive (baseline) ratio; 758 distributions occurred at the 0.8 incentive ratio.

Change in Outcome Variables and Other Findings

As shown in Table 7, statistically significant higher SNAP expenditures at the FMs were found as a result of offering 1:0.8 or 1:1 level incentives as compared to those issued at the 1:0.4 level. Specifically, examination of these data using a one-way ANOVA shows significant increases of SNAP dollars spent as a result of offering higher level incentives. Those receiving the smallest or baseline incentive ($0.40 for every dollar) spent an average of $23.75 per FM visit (and spent an additional $9.67 in incentives) as compared to those receiving $0.80 who spent $38.63 on average (and spent an additional $31.99 in incentives). Those receiving $1 spent on average $43.11 (and spent an additional $43.18 in incentives) per FM visit. While the maximum incentive level ($1) did produce the highest expenditures, no statistically significant difference was found between the 1:0.8 and the 1:1 levels. This same trend is true for Hispanic FM shoppers whereby the 0.8 incentive level resulted in more spending than the 0.4 level, though no statistically significant differences between 0.8 and 1.0 were seen.

Table 7: SNAP Expenditures at Farmers Markets, per Day and by Incentive Level, in Dollars

Incentive Ratio	NYCDOHMH	Hispanic Participants from NYCDOHMH FMs	Combined 13 State/76 Market Sample (includes NYCDOHMH)
0.4 (baseline)	23.75	24.33	19.03
0.8	38.63*+	43.34*+	25.30*+
1	43.11+	38.28	26.87+

* p < .05. Statistical significance indicated for the difference with the preceding incentive level.
+ p < .05 statistical significance compared to 0.4 incentive ratio.

Total SNAP plus incentive expenditures followed similar patterns for all NYCDOHMH participants. However, statistically significant expenditures of both total SNAP funds and incentive funds were seen when the 1.0 incentive level was compared to the 0.8 incentive level, and when the 0.8 incentive level was compared to the 0.4 baseline incentive level. Specifically, and cumulatively during the study, 0.4 participants spent $10,761.00 (SNAP) plus $4,378.60 (incentive); 0.8 participants spent $22,712.00 (SNAP) plus $18,811.60 (incentive); and 1.0 participants spent $27,549.00 (SNAP) plus $27,590.00 (incentive).

As previously noted, a combined FM sample which included the NYCDOHMH FMs, plus those from the larger, combined 13 state/76 FM sample, was also analyzed. Findings were similar to that of NYCDOHMH alone and found that SNAP recipients who shopped at FMs that awarded a baseline incentive of $0.40 for every $1.00 in SNAP spent an average of $19.03 per transaction; incrementally, this increased to an average of $26.87 and 36.28 per transaction with random awards of $1.00 and $2.00 for every $1.00 SNAP dollar spent, at the highest ends of the ranges of possible incentives.

Additional analysis considered gains in FV consumption across incentive level and racial/ethnic group for both the NYCDOMH sample and the national sample. The average gains in FV consumption during a one-month time frame are shown in Table 8 (NYCDOHMH) and Table 9 (national). While outcomes varied slightly, our analysis using ANOVA identified no statistically significant differences in the change in FV consumption across incentive levels nor across racial/ethnic groups, likely due to the small sample size and short timeframe over which change was analyzed.

Table 8: Average Monthly FV Consumption Gains (in cups) by Racial/Ethnic Group for NYCDOHMH Farmers Markets

Incentive Ratio	All NYCDOHMH Participants	White (Non-Hispanic) n=427	Black (Non-Hispanic) n=105	Other (Non-Hispanic) n=70	Hispanic n=206
Overall	-0.07	-0.07	-0.22	-0.02	-0.05
0.4	-0.09	-0.06	-0.20	-0.26	-0.05
0.8	-0.05	-0.08	-0.16	0.16	-0.16
1.0	-0.08	-0.08	-0.30	-0.05	0.05

Note: Differences between racial groups were not statistically significant.

Table 9: Average Monthly FV Consumption Gains (in cups) by Racial/Ethnic Group for Combined 13 State/76 Market Sample

Incentive Ratio	All Participants	White (Non-Hispanic) n=1,785	Black (Non-Hispanic) n=226	Other (Non-Hispanic) n=182	Hispanic n=347
Overall	-0.06	-0.06	-0.14	-0.05	-0.03
0.4	-0.06	0.00	-0.18	-0.28	-0.06
0.8	-0.07	-0.09	-0.18	0.14	-0.12
1.0	-0.05	-0.05	-0.14	-0.04	-0.03
1.5	-0.10	-0.12	-0.16	-0.09	0.08
2.0	-0.09	-0.14	0.08	0.07	0.18

Note: Differences between racial groups were not statistically significant.

Overall change in FV consumption, after participants received an incentive, was examined using a repeated-measures fixed effects analysis as presented in Table 10. Table 10 also summarizes the data for the RCT's remaining outcomes variables (i.e., monthly grocery expenditures, BMI). Statistically significant intercepts indicate only an overall or baseline average for each sample, and do not provide any comparison across samples. These intercepts are interpreted as significantly different from "0," rather than interpreted relative to other sample statistics. The lack of statistical significance among these variables is likely due to limitations in the size of NYCDOHMH's sample. For comparison, Table 10 also shows the results of the same analysis for the overall or national sample that includes NYCDOHMH.

Table 10: Repeated-Measures Fixed-Effects on Outcomes for all Participants

	NYCDOHMH	Combined 13 State/76 Market Sample (includes NYCDOHMH)
FV Consumption (in cups)		
Intercept	2.98*	2.77*
0.4		
0.8	-0.07	-0.04
1.0	0.00	0.00
1.5	--	0.10
2.0	--	0.16*
Non-monetary	--	-0.03
Hispanic intercept	-0.02	-0.02
Hispanic 0.4		
Hispanic 0.8	0.05	-0.01
Hispanic 1.0	0.04	0.00
Hispanic 1.5	--	0.11
Hispanic 2.0	--	-0.10
Hispanic Non-monetary	--	-0.07
Monthly Grocery Expenditures on FV (Log transformation; percent change in FV expenditures)		
Intercept	4.66*	4.44*
0.4		
0.8	0.02	0.04
1.0	-0.01	-0.02
1.5	--	0.05
2.0	--	0.03
Non-monetary	--	-0.01
Hispanic intercept	-0.01	0.04
Hispanic 0.4		
Hispanic 0.8	-0.04	-0.09
Hispanic 1.0	0.05	0.06
Hispanic 1.5	--	0.00
Hispanic 2.0	--	0.05
Hispanic Non-monetary	--	-0.04
Household size	0.05*	0.02*
BMI		
Intercept	26.77*	25.33*
0.4		
0.8	0.06	0.22
1.0	-0.12	-0.09
1.5	--	-0.01
2.0	--	-0.09
Non-monetary	--	0.10
Hispanic intercept	1.45*	1.21
Hispanic 0.4		
Hispanic 0.8	0.38	0.37

	NYCDOHMH	Combined 13 State/76 Market Sample (includes NYCDOHMH)
Hispanic 1.0	-0.15	-0.19
Hispanic 1.5	--	-0.92
Hispanic 2.0	--	-0.82
Hispanic Non-monetary	--	-0.73

* p < .05 Indicates a value different from 0.

As shown in Table 10, statistically significant differences in daily FV consumption were found for SNAP participants from the national sample who received a $2 incentive. Receiving the maximum incentive level resulted in an increased FV consumption of 0.16 daily cups.

Regarding FV expenditures, the repeated measures model uses a log transformation of the dollars spent on FVs over the course of the month to account for skewness in the data. In addition, the model controls for household size since the dollars spent is related to the number of people to feed in the household. No significant differences were found between incentive levels for the national sample or for the subsamples, including NYCDOHMH.

No significant change in BMI was found for participants regardless of incentive level or sample size/type. This finding may be in part due to the short periods of study. It is unlikely that large changes in BMI are detectable over a month's time. Additional research of longer-term effects is recommended in order to better estimate the impacts of FV incentives on BMI.

The same models were run with the subsample of participants to whom incentives were distributed, before the end of the month, at a participating FM. Model results show no significant differences in outcomes across incentive levels, as reported in Table 11.

Table 11: Repeated-Measures Fixed Effects on Outcomes for Participants to Whom Incentives were Distributed

	NYCDOHMH	Combined 13 State/76 Market Sample (includes NYCDOHMH)
FV Consumption (in cups)		
Intercept	2.99*	2.99*
0.4		
0.8	-0.04	-0.09
1.0	0.02	-0.05
1.5	--	-0.01

	NYCDOHMH	Combined 13 State/76 Market Sample (includes NYCDOHMH)
2.0	--	0.07
Non-monetary	--	-0.09
Hispanic intercept	-0.24	-0.09
Hispanic 0.4		
Hispanic 0.8	0.35	0.16
Hispanic 1.0	0.40	0.36
Hispanic 1.5	--	0.47
Hispanic 2.0	--	0.41
Hispanic Non-monetary	--	0.26
Monthly Grocery Expenditures on FV (Log transformation; percent change in FV expenditures)		
Intercept	4.52*	4.33*
0.4		
0.8	-0.02	0.02
1.0	-0.03	-0.07
1.5	--	0.03
2.0	--	-0.05
Non-monetary	--	-0.06
Hispanic intercept	-0.03	-0.07
Hispanic 0.4		
Hispanic 0.8	0.10	0.12
Hispanic 1.0	0.05	0.17
Hispanic 1.5	--	0.00
Hispanic 2.0	--	0.23
Hispanic Non-monetary	--	0.11
Household size	0.04*	0.17*
BMI		
Intercept	27.24*	24.98*
0.4		
0.8	-0.19	-0.04
1.0	0.01	-0.07
1.5	--	0.18
2.0	--	-0.01
Non-monetary	--	0.09
Hispanic intercept	1.33	0.18*
Hispanic 0.4		
Hispanic 0.8	0.14	0.33
Hispanic 1.0	-0.70	0.14
Hispanic 1.5	--	-0.89
Hispanic 2.0	--	-0.83
Hispanic Non-monetary	--	0.78

* p < .05 Indicates a value different from 0.

Anecdotal Feedback

Communication received from FM managers and RCT participants during the RCT is included verbatim in Appendix B. Overall, there was little to no criticism of the RCT process. Rather, FM managers recognized the benefit of additional RCT spending to their market's

farmer vendors, and on the overall reputations and desirability of their FMs. Further, numerous participants expressed appreciation for the increased incentives and the value of the additional FVs to their health. All questions and concerns were promptly addressed. Further, acknowledgement of communications that did not necessitate a response was provided in most cases.

Conclusions and Recommendations

The study showed three notable effects. First, NYCDOHMH participants spent statistically significant higher amounts of their SNAP dollars on FVs at the moderate and maximum incentive levels (0.8 and 1.0), when compared to baseline. Second, the Hispanic subset of these NYCDOHMH participants spent statistically higher amounts of their SNAP dollars on FVs at the moderate incentive level (0.8), when compared to baseline. Last, when considering the combined (national) sample of SNAP shoppers at FMs, statistically signification changes between baseline and the maximum incentive level were shown both in the amount of FVs consumed and in the amount of SNAP dollars spent.

Based on these effects, we make two recommendations. First, and from a policy perspective, an incentive program at the maximum level should be implemented. Our analysis of the national or combined sample showed that the maximum level FV incentive awarded to SNAP recipients at FMs resulted in a statistically significant increase in FV consumption (2.93 cups) from baseline (2.77 cups). Accordingly, a dedicated FV incentive at the maximum level for SNAP recipients would help to close the gap between current FV intakes and those recommended in the Dietary Guidelines for Americans (4.5 cups of FVs per day)[5]. Improving dietary quality among participants results in numerous health benefits for the individual, including a reduced risk of stroke and other cardiovascular diseases, a reduced risk of developing cancer, and a reduced risk of Type 2 Diabetes[6,7,8]. Beyond the individual level, improved dietary quality also results in a reduced strain on the health

[5] U.S. Department of Health and Human Services and U.S. Department of Agriculture. *2015–2020 Dietary Guidelines for Americans*. 8th Edition. December 2015. Available at http://health.gov/dietaryguidelines/2015/guidelines/.
[6] Jardim TV, Mozaffarian D, Abrahams- Gessel S, Sy S, Lee Y, Liu J, et al. (2019) Cardiometabolic disease costs associated with suboptimal diet in the United States: A cost analysis based on a microsimulation model. PLoS Med 16(12): e1002981. https://doi.org/10.1371/ journal.pmed.1002981
[7] Mozaffarian D, Benjamin EJ, Go AS, et. al. (2016) Heart Disease and Stroke Statistics—2016 Update. American Heart Association Statistics Committee and Stroke Statistics Subcommittee. Circulation. 133:e38–e360. https://doi.org/10.1161/CIR.0000000000000350
[8] Mozaffariam D, (2016) Dietary and Policy Priorities for Cardiovascular Disease, Diabetes, and Obesity A Comprehensive Review. American Heart Association. Circulation. 133:187–225. https://doi.org/10.1161/CIRCULATIONAHA.115.018585

system as a decreased incidence of health problems for the individual reduces the need for care and interventions.

Further, a codified FV incentive at the maximum level for SNAP recipients at FMs conveys economic benefits since it is associated with a statistically significant increase in SNAP expenditures on FVs at FMs. Also, incentive programs have the potential to bring new customers to FMs and bolster FM use among participants. The increases in FM sales relieves local farmers of the need to ship their products over long distances to sell them and is mutually beneficial for the consumers and sellers.

An alternative to our recommendation for an incentive at the maximum (1.0) level is codification of an FV incentive at the moderate level (0.8). This would still confer the benefits of an increase in FV consumption and an increase in SNAP spending while creating a cost-saving alternative to an FV incentive at the maximum level. However, the user-friendly nature of a dollar-for-dollar benefit is also recognized and may be a significant consideration for wide-scale implementation.

Our second recommendation is that culturally appropriate programming for Hispanic participants at FMs be expanded given that spending for this subset of the population also increased at higher incentive levels. The relatively high percentage of Hispanic SNAP shoppers at NYCDOHMH FMs who participated in the RCT presents a unique opportunity to offer specialized programming.

In conclusion, investing in FM incentive programs, which is supported by this study's findings and widely across the literature, should be prioritized. Specifically, this RCT supports the effectiveness of incentive programs in improving nutrition behaviors of SNAP shoppers and increasing spending at FMs. Such programs address the need to increase purchasing power for low-income consumers, such as SNAP participants, enabling them to buy healthy foods. This is particularly timely as, in recent years, the price of healthy items such as FVs has increased relative to unhealthy items. Accordingly, incentive programs such as the one analyzed in this RCT improve the affordability of FVs for program participants. Therefore, incentive programs that increase SNAP shoppers' ability to purchase additional FVs should be part of future program policies to support this population which will create more equitable access for those whose food budgets are otherwise limited.

Appendix A: Participating Farmers' Markets (n=21)

BRONX
Bronx Borough Hall Greenmarket
Lincoln Greenmarket
Parkchester Greenmarket

BROOKLYN
Boro Park Greenmarket
Cortelyou Greenmarket
Fort Greene Greenmarket
Greenpoint Greenmarket-Saturday
Greenpoint Greenmarket-Tuesday
Parkside Greenmarket

MANHATTAN
79th St Greenmarket
92nd St Greenmarket
97th St Greenmarket
Columbia Greenmarket
Inwood Greenmarket
Mount Sinai Greenmarket

QUEENS
Astoria Greenmarket
Corona Greenmarket
Elmhurst Hospital Greenmarket
Forest Hills Greenmarket
Jackson Heights Greenmarket

STATEN ISLAND
St George Greenmarket

Appendix B: Anecdotal Feedback from all Farmers Markets

(Note: in many cases participants and FM managers refer to "vouchers," which means the incentive randomly distributed by the RCT process.)

(participant, undated)
Good morning!
I was so happy to take part in your survey. I only spend my SNAP benefits at the Farmer's Market. As excited and thankful as I was to receive the awesome redemption voucher, I was discouraged as it expires barely a week after I received it. The facts are I only receive $22.00 a month in SNAP benefits....that is as a Mom of 2! Also, it is given at the beginning of the month. So when I took your survey, I had already used up September's benefits at the previous week's market. Is there any way you can send a new voucher I can use at this Saturday's market or send me a link and I will happily take the survey again please? Thanks so much in advance for your help,
****

(participant, undated)
Since I have no way to copy anything I brought my phone and showed them the email of winning... I used it all up already was down to nothing for food I want to thank you so much this helped me so much I made a nice veg roast and a large apple and blueberry pie.. can I get some more help for October?
****

(Comment by phone from a voucher winner, undated)
I am very grateful for the opportunity to purchase more fruits & vegetables. My son has had health issues, which I feel are the result of decreased fruit and vegetable intake since I went on SNAP benefits.
****

(participant, undated)
The few extra bucks was very helpful last time.
****

(Comment by phone from a market manager, undated)
The extra dollars are so helpful to our customers. I would gladly take a whole lot of hassle trying to figure out any glitches in the lottery system if it means extra benefits for our customers.
****

(participant, undated)
May I say this is helping me so much.. its very hard to stretch the little bit I do have and I try to eat healthy but can't always afford to.. many thank you. :-)
****

(Karen McGlammery, Webb City FM Manager, 10/4/15)
We had a great market yesterday with THREE very excited lottery winners redeeming!! This is such an awesome program. And our local paper ran a story on the lottery program yesterday.
****

(participant, undated)
The social culture in my particular area (Seacoast of NH) might give some skewed results. The Eat Local/Buy Local movement has been a hard driving factor throughout the entire recession. Residents are predominantly physically active and conscientious about their health and environment. Compared to the rest of the country, obesity is quite low, but smoking is very popular. Believe it or not, some SNAP recipients had perfectly good eating habits prior to enrolling in the program. SNAP acceptance at the farmer's market simply makes it possible to continue (to some degree) while enduring financial hardships.
****

(participant, undated)
This program is an amazing way to get healthy foods and choices into lower income families. It's great for us and the farmers get a whole new group of people to share their goodies with. I also plan to use the winter markets too so I'll be looking for the surveys then too. Hope this research is successful because we will be taking advantage as long as it exists. If you need an advocate I would be happy to share my experiences. Thanks again
****

(Karen McGlammery, 10/15/15)
You helped one of our market clients, Sam, be able to access the survey and she was a winner and was so happy. I've copied a couple of statements from her emails (with her permission) to share with you. [In the first paragraph she is referring to the fact that as of October our Friday market is over for the season so we are down to two markets per week instead of three, thus only two times to match EBT funds instead of three]. Also, in conversation at the market I teased Sam that she'd have to hold a dinner party now that she can buy so many veggies with the lottery. She said that seriously, she now would be able to have someone over for a meal when she never could before as she just didn't have enough food. I hadn't thought about that social aspect of not having enough food...

Sam:
"I am so excited!!!!! I was thinking over how the dropping of Friday markets would cut $60-$75 match dollars per month out of my budget and how I would have to shift things around for that... AND then I got a double match! That'll be like $90 extra match if I make it to every market this month! Every month seems to work out for food now because of the matches, providence of "random" food showing up, and good farmers who are very generous in general and even more so when they suspect that you don't have very much on a given day. I have always been pleased with the Webb City market and how well it works and is put together, but now it is staple in my life even more. Thank you, Karen and Eileen for all the wonderful things you do, countless hours, and hard work you put into making the market great! This is one of the hardest working programs I have seen in terms of personal, small famers agricultural, local economy, and many other intangible, impacts."
****

(participant, 10/15/15)
I am so very grateful for this program and the ability to be able to use the SNAP benefits at the

farmers market to obtain fresh food for my family and to support local farmers.
****

(from a farmers market manager, undated)
I thought you might also be interested in a quote from one of our other SNAP customers on Saturday. When I told her that the in-market survey was part of a research project that would hopefully justify future funding, she was very enthusiastic about the match program and happy to participate in the survey. As she left she said "I haven't eaten this healthy in years!"
****

(Englewood FM, undated)
So glad to be able to buy fresh, organic veggies at the farmers market instead of at WalMart.
****

(undated)
The market and this program is jessy a blessing all together, with it and exercise, I have been able to lose and keep off 135 pounds now of over a year. This program made it a much easier to be able to purchase real food. Thanks again for what you guys are doing,
****

(Tucson, AZ FM customer, 4/18/16)
Thank you for doing this. Anything to help with making fresh food available is making a huge difference in people's lives & making a difference for farmers. Incentives help to offset higher costs at farmers markets"
****

(From a participant at Southwest Community FM, 5/11/16)
"this survey has really made it possible for me to have not only enough food each month with the little help i get from the state but also able to eat much healthier. I love the fresh fruit and veg that my refrigerator is filled with as oppose to frozen dinners."
****

(From a participant from the Grandin Road FM, 6/16/16)
I'm glad to hear what you guys do with the data from the Farmers Market surveys! Sounds like it could potentially lead to some positive results! Thanks for your work on this project that, at least for me, is a worthwhile program!
****

(Tracy Herner, Williamsburg VA FM Manager, undated)
Don't know how frequently you hear stories, but this past weekend was a huge success for us! We did over $400 in SNAP, which is a record. 2 customers got over $100 in tokens, and one of those was an RCT winner. She got $120 in SNAP tokens, and $240 in F&V…..for a whopping $360 to spend at the market. She was nearly crying as that is more than she gets all year. Because of how happy she was about winning, she encourage 3 other SNAP recipients to come to the market with her.
****

(Sara Rhoades, City of Alexandria, VA, 9/9/2016)
We've increased our sales at the market by >200% this summer because of this RCT
****

(Alyssa Lerman, 11/3/15)
The Concord Farmers' Market concluded for the season this past Saturday (with positive feedback from customers participating in the RCT surveys!)
****

(Forwarded from Eileen Nichols, Webb City FM, 10/13/16)
"Hey, I just back from the doctor and my AIC dropped, meaning I am no longer considered to have prediabetes. That's something you can to take to your market match funders."
****

(Lee Perron, Englewood FM, 1/22/16)
We, as in the collective "all of us", had a BIG day at the market yesterday. Please note the photos. We had our first RCT winner! She showed with her voucher on her smart phone. That's Amy and the winner with the voucher displayed on the phone. She was so excited that she swiped for $60 in SNAP funds and she received $90 in black tokens. Wow! Katie, I checked the transaction log for data and sure enough the $90 showed up as 1.5 RCT! The tracking is working well… and Carmen you now have your data available residing in the portal. The winner is one of our participants that come every week. Amy spent time reinforcing with each sign up and with those who have already signed up the importance of filling out the survey. Some said they thought it was a little long…. But when Amy shared the story of the winner receiving a $90 dollar match… we think the list got a little easier to fill out. We had 22 participants, with 11 new, and we sent in 14 RCT cards this week. They purchased $462 in SNAP, we matched $442, and the vendors redeemed $754… including our first 20 black tokens for redemption. So, there's the numbers and the platform is humming along.
****

(participant, 10/8/15)
Tara,
Thanks for taking the time to get back to me. Yes I did win for October I plan to spend about $200 of my food assistance in Portsmouth Saturday. This program is an amazing way to get healthy foods and choices into lower income families. It's great for us and the farmers get a whole new group of people to share their goodies with. I also plan to use the winter markets too so I'll be looking for the surveys then too. Hope this research is successful because we will be taking advantage as long as it exists. If you need an advocate I would be happy to share my experiences. Thanks again.
****

(newspaper article)
Webb City market fuels healthier eating, research program for low-income customers
BY MIKE POUND mpound@joplinglobe.com | Posted: Friday, October 2, 2015 6:50 pm

WEBB CITY, Mo. — The Webb City Farmers Market has been selected to take part in a research program that hopefully will allow low-income residents to continue to receive increased access to local fresh fruits and vegetables.

In March, the market received a three-year $33,000 grant that provided matching dollars for customers enrolled in the government's food stamp program. The grant was part of a larger United States Department of Agriculture $3.77 million grant award to Wholesome Wave, a national nonprofit organization. Wholesome Wave in turn issued the $33,000 annual grant to the Webb City market. A group of St. Louis farmers markets and the Webb City market were the only markets in the state selected to take part in the program.

Karen McGlamery, volunteer market manager, said the fact that the Webb City market was even considered for the grant from Wholesome Wave is a testament to the determination of Eileen Nichols, the founder and director of the Webb City Farmers Market.

"Eileen called them (Wholesome Wave) repeatedly," McGlamery said. "The fact that we got the grant says a lot about the Webb City Farmers Market and Eileen Nichols."

Under the program, food stamp customers may swipe their Supplemental Nutrition Assistance Program (SNAP) cards at the Webb City market's information desk and receive tokens for the amount of money they wish to spend. The market then, thanks to the grant from Wholesome Wave, will issue matching tokens — up to $15 — to the customer to be used at the market. While the customers may spend their SNAP tokens on any market product, the matching token may only be used for produce, McGlamery said.

In addition to the matching token program, the market has been selected by Wholesome Wave to take part in a research program, McGlamery said.

When SNAP customers purchase their tokens at the market, they are asked to take part in a short, anonymous survey. The purpose of the survey, McGlamery said, is to gauge how the SNAP money is being spent at the market. The information will be used by Wholesome Wave to help justify continued support for farmers markets from the USDA.

As part of the research project, during three months of each year, customers who take part in the survey are entered in a drawing for a much larger token match for the month in which their name is drawn.

This year, the drawings began in September and will continue through October and November. McGlamery said that in September several Webb City customers won additional token matches.

"We had one woman who spent $40 and walked away with 123 ($1) market tokens," McGlamery said.

McGlamery said the whole idea surrounding the Wholesome Wave grant is to encourage people to eat healthier and to be able to stretch their food budgets.

"But it also helps our growers by giving them another market and increasing their business," she said.

For more information about the SNAP program and to be entered into the drawing, you may visit the market's information desk located on the east side of the market pavilion in King Jack Park.

Fall hours

The Webb City Farmers Market fall hours are from 4 p.m. to 7 p.m. on Tuesdays and from 9 a.m. to noon on Saturdays.

****

(Rob Shepard, Healthy Exchange Project Coordinator, Greenmarket GrowNYC, 2/13/17)
2/10/17 at 97th St – “A few of the EBT lottery winners used all of their available money at the market (in two cases they purchased $150 in tokens). It seems that winning the lottery is becoming an important incentive for people to shop at the market.”

2/12/17 at Cortelyou – “Year round Health Bucks and RCT have had a clear positive impact on this market! Even with freezing rain all day, I still did good EBT sales due to several regulars who previously came seasonally showing up to get their Health Bucks.”
****
(Eileen Nichols, Manager, Webb City FM, 2/17/17)
“We're getting the word out! The lottery is in the "continue reading" section.”

****
(participant, 3/2/17)
“I found the survey. Thanks for your prompt reply. I appreciate it and your program.”
****
(participant, 3/7/17)
“The program has been a godsend getting fresh vegetables and fruits.”
****
(Roxanne Garcia, Co-Director, Heirloom Farmers Markets, 3/31/17)
“We have really enjoyed distributing the lottery. Our farmers and customers have really benefited!”

****

(participant, 7/26/17)

Please send me a survey. I must say I miss the extra health bucks. Last year I was able to go vegetarian because of the extra help. This year I wanted to see if I can eat vegan for a little while. This I was also able to buy white peaches. This year the prices on vegetables and fruit went up. I try to make all of my food purchases at the farmers markets. I also juice a lot. I have been able to keep my UC under control because of the changes made. Thank you for this program. It makes a difference.

****

****

(participant, undated)
Thank you. Please keep encouraging others to eat healthy. "An ounce of prevention is better than a life time of cures".
****

(participant, 8/7/17)
You guys are so nice to me and your vegetables are so fresh and healthy.
****

(participant, 9/30/17)
I want to let you know what a life-saver your program was to me and my family last month. My 9 year old has Lyme disease and will have it the rest of his life, so learning how to thrive with Lyme has been my #1 priority this past year. Before approaching what Lyme is all about, when, where and how it was identified and how it functions unlike any other disease, I have been well-advised to focus on and master 4 areas: 1. Nutrient 2. toxins 3. stress 4. sleep. It sounds a lot simpler than it is! Your program was just the thing we need that helped me with 3 of 4 of those areas last month and being able to get him the quantity of vegetables made a noticeable impact on him in just the one month I was able to participate. At the same time, I am also climbing out of a messy domestic violence situation which has made becoming financially independent a real challenge, and affects every part of our lives. I cannot express enough how just this little bit of help goes a very long way.
****

(participant, 10/11/17)
Si gracias hay mucho producto buenísimo (Yes thank you there is a lot of great produce).
****