

## Introduction

To meet the needs of Community Supported Agriculture (CSA) members who use SNAP and to help members make the most of the vegetables and fruits they receive, Michigan Fitness Foundation (MFF) developed the Michigan Farm to Family: CSA Food Navigators (MF2FCSA Food Navigators) program. This program connects local organizations delivering SNAP-Education programming to CSA farmers/vendors participating in the Michigan Farm to Family CSA (MF2FCSA) program, a Gus Schumacher Nutrition Incentive Program (GusNIP). SNAP-Education provides resources and nutrition education opportunities for members such as information about less familiar produce being distributed in the food boxes, food demonstrations and tastings showing new ways to prepare local produce, and recipes to use foods provided through the CSA. In FY 2024, participating CSA sites where SNAP-Education was implemented through Food Navigators (FNs) (n=5) are located in urban (n=5) locations around Michigan where the range of food assistance program recipients range from 17,513 to 71,512. The models used by CSA sites where SNAP-Education was implemented were markets (resembling a brick-and-mortar store or farmers market) (n=2), a farm (n=5), a farm embedded on health system property (n=1), or a community-based organization (n=2).

FNs assessed how and to what extent CSA members were getting their nutrition education needs met through at least one of several methods including dot surveys, a brief series of open-ended questions, point-in-time conversations, or a short survey. Members were asked to complete a pre-post survey to assess outcomes of participation by conveying their self-reported nutrition behaviors and circumstances. FN completed an activity log to document the depth and breadth of implementation and describe opportunities for strengthening the implementation. A match case control design was employed towards discovering outcomes when SNAP-Education is implemented and when it is not implemented at CSA sites.

## Activity Log Data

Activity logs were submitted by FN for each week of programming. A total of 50 logs were received from FN who represented 3 local SNAP-Education organizations across five CSA sites where SNAP-Education was being implemented.

## Shopper and staff interactions

All FN reported being present at the CSA site once every week. One site had four weeks of SNAP-Education activities, one site had 10 weeks of SNAP-Education activities, and the others (three) had 12 weeks of SNAP-Education activities over the season.

### Number of shopper interactions

CSA Site	Mean	Min	Max
Argus Farm Stop	43	23	58
Green Wagon Farm	54	35	65
Long Valley Farm	34	23	45
The Farm at Trinity Health	106	87	127
United Church Outreach Ministry (UCOM)	42	35	45
<b>Overall</b>	<b>60</b>	<b>23</b>	<b>127</b>

### Number of shopper interactions > 20 minutes

CSA Site	Mean	Min	Max
Argus Farm Stop	0	0	0
Green Wagon Farm	0	0	2
Long Valley Farm	6	2	10
The Farm at Trinity Health	0	0	0
United Church Outreach Ministry (UCOM)	0	0	0
<b>Overall</b>	<b>1</b>	<b>0</b>	<b>10</b>

### Average weekly interaction time with shoppers

CSA Site	Under 1 minute	1-5 minutes	5-10 minutes	10-15 minutes	15-20 minutes	Over 20 minutes
Argus Farm Stop	33%	67%	0%	0%	0%	0%
Green Wagon Farm	25%	75%	0%	0%	0%	0%
Long Valley Farm	0%	25%	75%	0%	0%	0%
The Farm at Trinity Health	8%	92%	0%	0%	0%	0%
United Church Outreach Ministry (UCOM)	0%	100%	0%	0%	0%	0%
<b>Overall</b>	<b>16%</b>	<b>78%</b>	<b>6%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>

## Average weekly interaction time with CSA staff

CSA Site	Under 1 minute	1-5 minutes	5-10 minutes	10-15 minutes	15-20 minutes	Over 20 minutes
Argus Farm Stop	0%	100%	0%	0%	0%	0%
Green Wagon Farm	0%	92%	8%	0%	0%	0%
Long Valley Farm	0%	0%	0%	0%	25%	75%
The Farm at Trinity Health	0%	100%	0%	0%	0%	0%
United Church Outreach Ministry (UCOM)	0%	90%	10%	0%	0%	0%
<b>Overall</b>	<b>0%</b>	<b>88%</b>	<b>4%</b>	<b>0%</b>	<b>2%</b>	<b>6%</b>

## Food Navigator Activities

### Activities performed

FNs implemented one or more activities at the CSA sites including food demonstrations, food tastings, providing NERI, using recipe cards, or something different. Percentages were calculated by number of times the activity was conducted out of the number of weeks operated.

CSA Site	Offered a food demonstration	Offered a food tasting	Offered NERI	Used MIHarvest™ recipe cards	Other*
Argus Farm Stop	0%	100%	17%	0%	0%
Green Wagon Farm	0%	100%	17%	100%	0%
Long Valley Farm	0%	0%	0%	75%	100%
The Farm at Trinity Health	0%	100%	17%	0%	0%
United Church Outreach Ministry (UCOM)	40%	90%	50%	90%	0%
<b>Overall</b>	<b>8%</b>	<b>90%</b>	<b>22%</b>	<b>48%</b>	<b>8%</b>

\*An “**Other**” activity was performed at Long Valley Farm each of the four weeks. During the first week, SNAP-Ed staff conducted a needs assessment with members to inform the types of nutrition education activities to implement. During the last three weeks, SNAP-Ed staff displayed a “Did you know?” board with nutrition education information for members.

### Featured produce item

This table shows the number of weeks featured produce items were offered at a site by the FN to members. Individual produce items were categorized into produce colors and tabulated as follows:

Featured produce color	Number of weeks offered at CSA sites
Red	11
Orange	4
Yellow	4
Green	17
Blue	1
Other	12

\*Other: white, brown, tan

## Food demonstrations

One site FN (UCOM) offered food demonstrations. The FN offered the following four food demonstrations, with each being offered once: *Beautiful Beet Salad, Citrus Broccoli Sunflower Salad, Sweet and Spicy Slaw, and Zesty Peach, Corn, and Tomato Salad.*

## Food tastings

Four of five CSA sites had food tastings offered by the FN to the members. Of the featured tasting options provided, the options below were selected the following number of weeks across all sites:

Recipe	Number of weeks offered
<b>Other</b> (see table to the right)	16
Easy Peach Salsa Fresca	3
Sweet and Spicy Slaw	3
Zesty Kale Pesto	3
Zesty Peach, Corn, and Tomato Salad	3
Citrus Broccoli Sunflower Salad	2
Corn, Zucchini, and Tomato Pasta	2
Curry Carrot Salad	2
Kale and Apple Salad	2
Mediterranean Rainbow Pepper Salad	2
Sauteed Green Beans with Tomatoes	2
Strawberry Spinach Salad	2
Watermelon Salsa	2
Beautiful Beet Salad	1
Blueberry Corn Salad	1

The following were “**Other**” food tasting recipes that were featured by local SNAP-Ed staff:

Recipe	Number of weeks offered
Broccoli Strawberry Orzo Salad	2
Cucumber Sandwiches	2
Myplate Citrus Salad	2
Myplate Eggplant And Pepper Dip	2
Myplate Veggie Dip	2
Autumn Pear Salad	1
Beet Butter	1
Cucumber And Chickpea Salad	1
Cucumber Chickpea Salad	1
Gingery Quinoa With Green Beans	1
Peach Smoothie	1

## Tasting Samples

FNS from four sites distributed food samples to CSA members.

CSA Site	Mean	Min	Max
Argus Farm Stop	38	27	49
Green Wagon Farm	49	35	50
The Farm at Trinity Health	98	80	114
United Church Outreach Ministry (UCOM)	50	50	50
<b>Overall</b>	<b>59</b>	<b>27</b>	<b>114</b>

## Member Needs and Benefits Assessment

A hybrid qualitative analysis was applied to assess member input. Four themes were formed from the data 1) Expressed Nutrition Education Needs, 2) Support Needed to Change Nutrition Behavior, 3) Benefits of Nutrition Education to Members, and 4) Extent Member Nutrition Behavior Influenced.

### **Expressed Needs**

Core nutrition education needs of members were to have literacy-friendly, budget-friendly, inter-generational, and adaptable recipes. Hands-on nutrition education that includes supplementary resources with pictures and complementary visuals was called for and, when used, met the needs of members. Nutrition education resources should be in online formats to support skill-building.

### **Support for Behavior Change**

Building confidence and reducing fear were key strategies to support behavior change. Personalizing education to meet specific needs and preferences can influence behavior change and demonstrates a humanized experience lined with empathy which promotes an interaction that feels supportive. Nutrition educators need to establish trusted relationships, encourage weekly CSA pick up, and intentionally connect with CSA members to link CSA products to nutrition education each week. Members need intentional support to promote behavior change, namely, to increase consumption of produce items in their CSA boxes.

### **Benefits of Nutrition Education**

Members build confidence through nutrition education. Members reported an evolved comfort with unfamiliar produce. An increased level of food waste consciousness was developed among members who interacted with a FN who taught practical cooking tips with the CSA produce. Adaptable, family-friendly recipes helped shift minds from unfamiliarity, scarcity, and/or taste aversion of members who could apply nutrition education tips to meal planning. Nutrition education benefits members who were engaged to participate in food discovery activities which increased satisfaction and positive food experiences.

### **Nutrition Education Influenced Behavior**

Member nutrition behavior changed due to nutrition education interactions. Members reported a more sustainable use of CSA produce over the season – consuming more greens in recipes. Members tried new recipes, family members increased vegetable consumption, and members also incorporated recipes into weekly meal planning routines. Members began purchasing more diverse produce to complement their CSA box items – increased confidence reduced fear and led to improved food management habits. Thus, budgets were able to be stretched further.

## Outcome Data

Sites that offered SNAP-Ed (n=4) were matched with sites not offering SNAP-Ed (n=4) on four factors 1) CSA site type; 2) geography using county type as a proxy; 3) shares sold; and 4) population Food Assistance Program eligibility. Member surveys were disseminated at all case-control sites (n=8) and then data from the surveys were used to explore differences in outcomes. A total of n=36 matched pairs from case sites and n=21 from control sites were identified for a total of **57 matched survey pairs**. Both start of season member surveys (collected during June and July 2024) and end of season member surveys (collected during August 2024) were solicited from new and returning CSA members. Surveys were matched iteratively using responses to demographic questions.

### Number of surveys by matched sites

SNAP-Ed CSA Sites		Matched control site	
Site name	Number of matched survey pairs	Site name	Number of matched survey pairs
Argus Farm Stop	12	Fulton Street Farmers Market	2
Green Wagon Farm	12	Providence Organic Farm	9
Long Valley Farm	3	Eighth Day Farm	2
United Church Outreach Ministry (UCOM)	9	Allen Neighborhood Center	8
<b>Total</b>	<b>36</b>	<b>Total</b>	<b>21</b>

## Member demographics

### Race of member survey respondents

How would you describe your racial or ethnic background? Check all that apply.	Cases	Controls	Overall
American Indian or Alaska Native	2.8%	4.8%	3.5%
Asian	0.0%	9.5%	3.5%
Black or African American	5.6%	9.5%	7.0%
Don't know/not sure	0.0%	4.8%	1.8%
Other Pacific Islander	5.6%	0.0%	3.5%
Prefer not to answer	8.3%	4.8%	7.0%
Some other race	11.1%	0.0%	7.0%
White	94.4%	90.5%	93.0%

### Ethnicity of member survey respondents.

Are you of Hispanic, Latino/a, or Spanish origin?	Cases	Controls	Overall
No	88.9%	100.0%	93.0%
Prefer not to answer	2.8%	0.0%	1.8%
Yes	8.3%	0.0%	5.3%

### Gender of member survey respondents.

How do you describe yourself?	Cases	Controls	Overall
Man	13.9%	19.0%	15.8%
Non-binary/third gender	0.0%	9.5%	3.5%
Prefer not to answer	2.8%	0.0%	1.8%
Woman	83.3%	71.4%	78.9%

### Age of member survey respondents.

What is your age?	Cases	Controls	Overall
18-29	8.3%	19.0%	12.3%
30-44	36.1%	33.3%	35.1%
45-59	19.4%	28.6%	22.8%
60-74	27.8%	9.5%	21.1%
75 and older	8.3%	9.5%	8.8%

### Length of program participation among member survey respondents at post.

How long have you been a part of the Michigan Farm to Family CSA program vegetables?	Cases	Controls	Overall
1-3 months	22.2%	38.1%	28.1%
4-6 months	2.8%	14.3%	7.0%
7-9 months	5.6%	14.3%	8.8%
10-12 months	13.9%	4.8%	10.5%
1-2 years	38.9%	23.8%	33.3%
More than 2 years	16.7%	4.8%	12.3%

## Household produce sources among member survey respondents at post.

From what places has your household typically bought fruits and vegetables? Check all that apply.	Cases	Controls	Overall
A CSA different than your MF2FCSA site	17%	5%	12%
Dollar store	3%	0%	2%
Farmers market	56%	67%	60%
Grocery store (e.g., Sam's Club, Meijer, Family Fare, ethnic grocery stores)	94%	95%	95%

## Self-rated general health of member survey respondents at post.

Would you say that in general your health is poor, fair, good, very good, or excellent?	Cases	Controls	Overall
Excellent	5.6%	4.8%	5.3%
Very good	22.2%	14.3%	19.3%
Good	50.0%	47.6%	49.1%
Fair	16.7%	23.8%	19.3%
Poor	5.6%	9.5%	7.0%

## Change (pre to post) in self-rated general health of member survey respondents.

Change in self-rated general health status from pre to post	Cases	Controls	Overall
Worsened health status	13.9%	14.3%	14%
Maintained health status	69.4%	76.2%	72%
Improved health status	16.7%	9.5%	14%

## Fruit and vegetable consumption

Member surveys measured food consumption of fruits and vegetables using the Dietary Screening Questionnaire (DSQ-10), developed by the National Cancer Institute. Mean change in consumption frequency of the following items is presented below.



Case site results demonstrate that members increased their total mean fruit consumption which was more pronounced compared to control site members; however, control site members had better mean scores for total vegetables and total vegetables without fried potatoes.

Daily consumption of...	Mean change among case site members	Mean change among control site members	Mean change among all members
100% pure fruit juices	-0.020	-0.036	-0.026
Fruit	<b>0.155</b>	0.014	0.103
Green leafy or lettuce salad	-0.105	-0.079	-0.098
Fried potatoes	-0.065	-0.038	-0.055
Other kind of potatoes	-0.012	-0.036	-0.021
Beans	<b>0.008</b>	0.026	0.014
Other vegetables	-0.051	-0.062	-0.057
Tomato-based salsa	-0.045	0.077	0.000
Pizza	0.000	-0.016	-0.006
Tomato sauce	-0.043	0.001	-0.027
Total fruit (fruit juice & fruit combined)	<b>0.134</b>	-0.022	0.077
Total vegetables	-0.277	-0.234	-0.275
Total vegetables without fried potatoes	-0.214	-0.176	-0.216

## Food and nutrition security

Member surveys measured both food security, using the USDA six-question food security module, and nutrition security and related measures, using measures developed by the Center for Nutrition and Health Impact ([Calloway et al., 2022](#)).

### Food security measures

Food security is displayed below as the categorical classifications as well as mean food security score calculated from survey responses (0 = High food security; 1 = Marginal food security; 2-4 = Low food security, 5-6 = Very low food security). It is important to consider the difference in case and control matched pair sample size.

In the case group, the proportion of individuals with high food security increased from 38.9% to 47.2%, while low food security decreased from 36.1% to 27.8%. Marginal food security saw a slight decline (13.9% to 11.1%), but very low food security increased from 11.1% to 13.9%. In the control group, high food security rose substantially from 23.8% to 38.1%, and very low food security decreased markedly from 23.8% to 14.3%. Marginal food security remained unchanged, while low food security experienced a small decrease from 38.1% to 33.3%.

Contingent analysis of improvement revealed that food security improved for 11 individuals in the case group and 12 in the control group, while it did not improve for 25 and 9 individuals, respectively. The odds of food security improvement were higher in the control group (1.33) compared to the case group (0.44). A Fisher's Exact Test revealed there was no statistically significant association between food security status outcomes between case participants and their peers in the control group (p-value = 0.05716). The odds ratio for this association was calculated as 0.37 (95% CI: 0.09 - 1.16). Overall, these findings suggest a general

trend toward improvement in food security among both groups; however, improvement is more notable in the control group. The lack of statistical significance underscores the need for caution in interpreting the results and highlights potential variability in the intervention’s effectiveness. For instance, it may be tempting to conclude that food security is influenced by access to a CSA that accepts SNAP under the same conditions as the CSA models outlined here; however, the statistical test does not substantiate that claim.

### Food security: Categorical makeup at pre and post

type	Food security	pre	post
case	High food security	38.9%	47.2%
case	Low food security	36.1%	27.8%
case	Marginal food security	13.9%	11.1%
case	Very low food security	11.1%	13.9%
control	High food security	23.8%	38.1%
control	Low food security	38.1%	33.3%
control	Marginal food security	14.3%	14.3%
control	Very low food security	23.8%	14.3%

### Contingent Pre-Post Food Security Status Improved and Odds of Improvement

type	Food security improved	Food security did not improve	Odds
case	11	25	0.44
control	12	9	1.33

[Fisher’s Exact Test: p-value = 0.05716; alternative hypothesis: true odds ratio is not equal to 1  
95 percent confidence interval: [0.09304082, 1.15802330] odds ratio: 0.3369384

### Nutrition security and related measures

Adults reported scores to describe their household absorptive capacity, nutrition security, dietary choice, and healthfulness choice. The following proportions indicate those who scored “low” in each area, indicating that support is needed in the respective area.

- **Household Nutrition Security:** Assesses a household’s perceived ability to acquire foods without resource limitations or worry.
- **Household Healthfulness Choice:** Assesses the degree of control a household perceives they have in acquiring foods that meet their healthfulness needs.
- **Household Dietary Choice:** Assesses the degree of control a household perceives they have in acquiring foods that meet their food preferences.
- **Absorptive Capacity:** A household’s ability to absorb a household-level financial shock (e.g., job loss, large and/or unexpected expense, etc.) in the short-term using resources on hand that can be mobilized quickly.

There are mixed nutrition security results. Case sites showed slightly lower proportions of respondents with low absorptive capacity (36% vs. 43% in controls) and low household dietary and healthfulness choice scores (31% each vs. 33% in controls). It is important to consider the difference in case and control matched pair sample size.

### Proportion of respondents with low scores to nutrition security measures at post

Nutrition security measure	Cases	Controls	Overall
Low absorptive capacity	<b>36%</b>	43%	39%
Low household dietary choice	<b>31%</b>	33%	32%
Low household healthfulness choice	<b>31%</b>	33%	32%
Low household nutrition security	<b>33%</b>	38%	35%

Improvements in nutrition security were more notable among case site participants (25.0%) compared to controls (14.3%), suggesting that the SNAP-Ed nutrition education at CSA sites and resources provided through SNAP-Ed may have supported households in overcoming barriers to nutrition security, such as confidence in acquiring nutritious and culturally relevant foods. Control sites by variable, however, had more improvements when looking at each component. It is important to consider the difference in case and control matched pair sample size.

### Proportion of respondents with **improvements** to nutrition security measures

Nutrition security measure	Case sites	Control sites	Overall
Absorptive capacity	8.8%	10.0%	9.3%
Dietary choice	8.3%	14.3%	10.5%
Healthfulness choice	11.1%	19.0%	14.0%
Nutrition security	<b>25.0%</b>	14.3%	21.1%

## Conclusion

Michigan Farm to Family Food Navigator program at CSA sites demonstrates promising potential in addressing food and nutrition security among low-income households. Quantitative findings indicate conservative improvements in food security: case site participants reported higher rates of high food security and lower rates of marginal and low food security compared to controls. There was a notable decreased in the proportion of control participants who reported very low food security. The persistence of very low food security in case participants and the lack of statistically significant differences shown in the Fishers Exact test results between groups, however, highlight the complexities of addressing food insecurity through education-centric interventions alone. The odds ratio for food security improvement outcomes, while favoring the control group, underscores variability in intervention impacts and calls for further exploration of contextual factors influencing these outcomes.

Qualitative insights reinforce the quantitative findings, illustrating that participants perceive SNAP-Ed activities as addressing expressed needs and fostering self-efficacy. Member narratives emphasized the value of in-person, culturally adaptable, and literacy-friendly educational approaches, paired with digital resources to ensure sustainable nutrition related behavior change. However, persistent barriers such as economic instability and limited access to diverse, affordable food options point to the need for systemic changes beyond the scope of education.

Despite positive trends, the observed decline in overall vegetable consumption warrants further investigation. Potential explanations include an overestimation of pre-survey consumption, seasonality affecting CSA produce diversity, and the predominance of green vegetables in CSA boxes. Addressing these limitations through intentional CSA design and participant education could mitigate these effects in future implementations.

Higher participation rates among returning members at case sites suggest that sustained engagement contributes to improved outcomes, highlighting the importance of long-term programming strategies. Demographic differences, such as higher rates of female respondents in case sites, also point to the need for further research into gender-specific programming efficacy.

The findings underscore the role of SNAP-Ed nutrition education programming in advancing nutrition equity but emphasize that education must be complemented by structural supports to address the systemic barriers perpetuating food insecurity. A multi-faceted approach integrating policy, systems, and environmental changes alongside refined educational strategies will be critical to achieving sustainable improvements in food security, nutrition security, and health equity.