

INCENTIVIZING FRUIT AND VEGETABLE PURCHASERS AT FRESH MARKETS IN LOWER 9TH WARD, NEW ORLEANS

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Objective: Disparities in fruit and vegetable consumption have been observed across income and race-ethnicity and shown to be associated with both access to fresh food venues and price. This study assesses the feasibility of increasing produce consumption by incentivizing fruit and vegetable purchases at local markets.

Design: We conducted analyses of a cross-sectional survey of program participants and point-of-sale reports on fruit and vegetable purchases at the fresh food markets.

Participants: A total of 176 participants were enrolled in the “Veggie Dollars” program (VDP).

Setting: Five fresh food markets in the Lower Ninth Ward (LNW) of New Orleans, Louisiana.

Intervention: From January to July 2016, Sankofa, our community partner, recruited patrons at its markets into the VDP, a fresh food incentive program. Participants received coupons worth \$4 per week for fruit and vegetables over a six-week period.

Main Outcome Measures: Total monthly gross, VDP, and SNAP benefit sales at the markets measured program participation. A survey (N=96) assessed the demographics and fruit and vegetable purchasing practices of participants.

Results: Participants were predominantly women (81%), African American (94%) and raising children at home (53%). Point-of-sales data indicated that VDP sales nearly doubled over the intervention period. Total market sales and SNAP benefit purchases also increased. The majority (63%) of VDP participants reported their produce purchases increased and 89% reported increasing

INTRODUCTION

Health goals set for this decade include recommendations for fruit and vegetable consumption outlined in *Healthy People 2020*, the strategic plan for improving the nation’s health published by the U.S Department of Health and Human Services.¹ However, national surveys conducted by the Center for Disease Control and Prevention (CDC) indicate only 33% of adults meet the fruit and 27% meet vegetable consumption recommendations.²

Improving fruit and vegetable consumption among adults has become a national health priority not only in the interest of promoting basic nutritional health, but also because of the demonstrated link between their consumption and risk for chronic disease³⁻⁵ and

some cancers.⁶⁻¹² Individual behaviors and preferences are the factors most commonly used to predict lower fruit and vegetable consumption.¹³⁻¹⁶ However, analyses conducted from a food systems perspective take into account how social, economic and political factors – the social determinants of health – impact fresh fruit and vegetable consumption patterns.¹⁷ The linkages between social determinants and fresh produce consumption are revealed by the substantial evidence of disparities in consumption in terms of ethnicity and race, gender and marital status^{18,19} and by poverty income ratio.²⁰ Access is considered an important factor associated with these disparities in fruit and vegetable consumption. One indicator that has been developed to understand access to fresh fruits and

their consumption of fruit and vegetables since entering the program.

Conclusions: Monetary incentives were associated with increased fruit and vegetable purchases at local fresh food markets in a low-income minority community. *Ethn Dis.* 2017;27(Suppl 1):287-294; doi:10.18865/ed.27.S1.287.

Keywords: Farmer’s Markets; Community Engagement; SNAP; Fruits; Vegetables

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vegetables is the “food desert,” defined in the 2008 Farm Bill as “an area in the United States with limited access to affordable and nutritious food, particularly such an area composed of predominately lower-income neighborhoods and communities.”²¹

Food deserts, and thus disparities in access to fresh fruits and vegetables, disproportionately affect ethnic and racial minority populations living in low-income communities – neigh-

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borhoods with a high concentration of minority residents have been found to have less access to supermarkets and healthy foods.^{22–25} While much of early food desert research focused on the availability of large supermarkets, some studies have found that, despite a lack of supermarkets, healthy food may

be available in small food retail outlets.²⁶ These small retail stores can have a more pronounced impact on local food access in low-income communities compared with large supermarkets as they overcome one of the primary barriers to access, transportation.²⁷ However, price point has been shown to be more important than distance in healthy food choices among residents of low-income neighborhoods.²⁸

Expanding food options to smaller stores and direct-to-consumer marketing interventions, like food stands, community-supported agriculture and farmers’ markets have shown a correlation with an increased consumption of fruits and vegetables.^{5,29–32} A study of women in North Carolina found that women who shopped at farmers’ markets were more likely to consume more fruits and vegetables³⁰ and the use of an incentive program in New York was shown to increase shopping at markets and self-reported fruit and vegetable consumption.^{11,33} Another study that examined the impact of the introduction of fresh fruit and vegetable stands in an ethnically diverse and low-income neighborhood in Austin, Texas, found that simply providing fruit and vegetables alone without additional educational materials increased fruit and vegetable consumption among community members.⁵

Researchers and city planners in New Orleans, Louisiana, have used the food deserts concept to better understand disparities in the city. A study on the consumption of fruits and vegetables by New Orleans residents found that only 19% of New Orleans households met the five-a-day recommendation.²⁷ Furthermore, consumption levels were directly related to the amount

of vegetable shelf space near their homes. Residents who lived more than a block away from stores with fresh vegetable shelf space had the lowest rates of consumption.²⁷ Interest in improving food access for communities in the Lower Ninth Ward have led communities to look for innovative solutions.

In line with this research, we conducted a community-based participatory research project that aimed to encourage fresh produce consumption and to better understand the relationship between fruit and vegetable consumption and the availability of fresh produce in a New Orleans community. Specifically, we assessed how the Veggie Dollars Program (VDP), a direct-to-consumer intervention incentivizing fresh fruit and vegetable purchases at a community fresh produce market organized by Sankofa Community Development Corporation (CDC), affected produce purchases for market patrons. Recognizing the impact of location and price barriers to fruit and vegetable consumption, we look at how price incentives affect market sales and consumer-reported produce-purchasing habits over the course of the pilot program period.

METHODS

Design Overview

Sankofa CDC, a non-profit organization, was founded as an effort to initiate preventive health services in New Orleans’ Lower Ninth Ward following the devastation of Hurricane Katrina and serves vulnerable populations throughout the Greater New Orleans Area. Understanding that disparities in food access as

both a location and price problem,³⁴ Sankofa CDC operated the Veggie Dollar Program (VDP) pilot project from January to July 2016. The VDP aimed to increase the accessibility and affordability of locally sourced fresh fruits and vegetables through the implementation of a voucher program at four of Sankofa's five neighborhood fresh markets in the Greater New Orleans area: the Fresh Stop Market; Lower Nine Senior Center Mobile Market; Harmony House Mobile Market; and the Mercy Endeavors Mobile Market. All fresh market sites accept federal food assistance benefits including Supplemental Nutrition Assistance Program (SNAP) and Louisiana Department of Agriculture Farmers' Market Nutrition Program (FMNP) vouchers.³⁵ Veggie Dollars were distributed as booklets with six weekly coupons valued at \$4 each to purchase fresh fruits and vegetables at the markets without having to spend their SNAP benefits, though participants could make additional purchases on their own accord.

The VDP was designed as a community-based participatory research project to improve community access to fresh produce and to increase the purchasing power of fresh fruits and vegetables for families who receive SNAP, FMNP, Women and Infant Children (WIC) and Medicaid benefits. Community-based participatory research is an approach to research that collaboratively involves community members, practitioners and researchers in the research process.³⁶ We used responses from a cross-sectional, observational survey to assess how the program affected produce purchase habits and overall market

sales. Additionally, we used point of sales (POS) data and participant surveys data to explore the relationship between total market sales and Veggie Dollar voucher redemptions, as well as participation of SNAP benefit recipients in the program and their use of additional SNAP benefits.

Data Collection

The survey was designed and data collected by the Sankofa staff. Participants were recruited at the five markets with assistance from Mobile Market partner organization site directors and members. Families were also recruited and registered at the Daughters of Charity at St. Cecelia's community health clinic, the largest health clinic in the Ninth Ward, in addition to the markets. Recruitment and community engagement for the program was also led by two neighborhood volunteers, appointed as community ambassadors to provide Fresh Stop Market customers with information on food items for purchase, assisted with sales operations, and help VDP participants. Purchases with Veggie Dollar voucher redemptions were recorded with a Square (<https://squareup.com/pos>) point-of-sale system. Data were collected on program participants' purchasing and consumption habits by administering surveys to program participants during the program period. Lower Ninth Ward residents who volunteered at the Markets served as community ambassadors to assist with dissemination of information and registration of participants for the VDP. The Louisiana State University institutional review board approved researcher analysis of the VDP data Sankofa collected.

Outcome Measures and Analysis

The analysis focused on three primary outcome measures: 1) overall market and program participation; 2) SNAP recipient participation and additional benefit spending; and 3) produce purchasing habits. Market participation was measured in terms of the number of transactions made at the markets overall, as well as the number of transactions made by program participants during the pilot period. Data on market transactions were collected from the point-of-sale processing system. SNAP recipient participation measures included the percentage of participants who are SNAP recipients as reported in survey and registration data. Additional benefit spending was captured in a survey question asking participants whether they spent additional benefit money at the market.

Finally, produce-purchasing habits were examined using survey questions that asked participants whether their fruit and vegetable purchases increased, if the variety of the fruit and vegetables they purchase expanded and whether program participation was important to those purchases. Specifically, regarding quantity, participants were asked, "Because of the Veggie Dollars Program, the amount of fresh fruits and vegetables I buy has: a) increased; b) stayed the same; c) decreased; or they were d) not sure/ don't know." Regarding variety, they were asked, "Because of Veggie Dollars Program, I am buying: a) about the same kinds of fruits and vegetables I used to buy before using Veggie Dollars; b) some different kinds of fruits and vegetables; c) many different kinds of fruits and vegetables; d) Fewer kinds of fruits

and vegetables; or e) not sure / don't know." Descriptive analyses including chi-square tests were conducted to assess differences between program recipients by receipt of SNAP benefits and other demographic characteristics.

RESULTS

There were 176 program participants and 96 completed survey questionnaires to evaluate their experience in the program. The survey response rate was 66%; of the 176 program participants surveyed: 50 people did not return the survey and 30 could not be reached to complete the survey. All participants who did not return the

survey were excluded from the analysis.

As shown in Table 1, of the 96 participants in the program who completed the survey, 80% were female. Almost all the participants (94%) identified as African American. The majority (52%) were raising children in their household and 67% of the adults aged >55 years were raising children. Among parents raising children, 48% were raising children aged > 12 years. Approximately 79% of the male respondents were not raising children as compared with 47% of the female respondents. The most popular means of accessing the markets was by driving a vehicle (41%). However, a substantial percentage of community members (34%),

particularly those who shop at the Lower Nine Senior Home or Mercy Endeavors, walked to the markets.

During the program period, gross market sales nearly doubled and Veggie Dollar redemptions more than quadrupled. Figure 1 shows monthly gross and Veggie Dollar sales at all market sites over the program period. For general market usage, 56% of survey respondents stated that the program increased their number of visits to the Sankofa Markets. Looking at market-specific usage, 71% of respondents shopped at the Fresh Stop Market, 13% at the Lower Nine Senior Center Mobile Market, 10% at Mercy Endeavors Mobile Market and 6% at the Harmony House Mobile Market. Respondents aged <45 years only shopped at Fresh Stop Market. Respondents aged >45 years shopped at all five markets, with the majority shopping at the Lower Nine Senior Center Mobile Market.

Survey respondents noted changes in their produce purchasing habits along one or both measures: 1) amount purchased and 2) variety purchased. As seen in Table 2, most survey participants reported that they increased their purchase of fruits and vegetables. In terms of produce variety, 66% reported that program participation resulted in their purchase of a wider variety of fruits and vegetables. Additionally, 89% reported positive changes in their consumption habits responding that since beginning the VDP they and their family were eating more fruits and vegetables. Respondents also indicated that they linked their program participation to their use of the fresh markets and to their fruit and vegetable purchases. A

Table 1. Participant characteristics, N=96

Number	n	%
Age		
18 to 24 years	3	3
25 to 34 years	12	12
35 to 44 years	14	15
45 to 54 years	13	14
55 to 64 years	27	28
≥64	27	28
Sex		
Female	77	80
Male	19	20
Race/Ethnicity		
African American	90	94
Hispanic	1	1
Other	2	2
White	3	3
Parenting children in home	50	52
Age range of children		
0 to 5 years	19	20
6 to 11 years	31	32
12 to 17 years	46	48
SNAP recipient	72	75
Transportation to market		
Driving	37	41
Walking	31	34
Bicycling	3	3
Ride from friends/family	14	15
Public transportation	4	4
Other	4	2

wide majority of respondents (86%) said the program was important to motivating their visit to the market, and an even wider majority (98%) reported that the VDP was important to their purchase of fruits and vegetables. Even among participants who visited the Market weekly, 64% responded that, with involvement in the program, their purchases of fruits and vegetables increased. Approximately 66% reported purchasing a wider variety of fruits and vegetables. More than 94% of these frequent visitors said that their program participation increased their family's consumption of fruits and vegetables.

Among survey respondents, 75% of those who received the Veggie Dollar vouchers were also SNAP benefit recipients. The demographics of SNAP Veggie Dollar participants were similar to survey respondents who did not receive SNAP in terms of race/ethnicity (94% African American), age (the majority of both non-recipients [67%] and recipients [53%] were seniors aged >55 years), and parent status (50% of non-recipients and 55% of recipients were raising a child in the home). However, a significantly higher percentage (89%) of SNAP recipient respondents were female (Table 3). Both SNAP recipients and non-recipients used similar

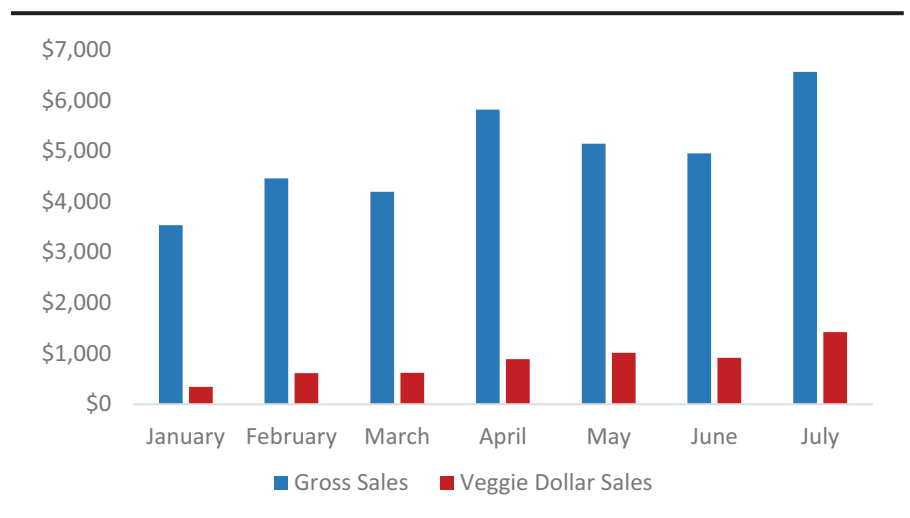


Figure 1. Gross market and veggie dollar sales over program period.

modes of transportation to the market, the majority driving or walking.

While VDP participants were not required to use their SNAP card to participate in the program, some opted to also use their SNAP benefits at the markets. Monthly point-of sale data for SNAP purchases increased over the program consistent with a program effect (Figure 2). Differences between SNAP recipients and non-recipients in terms of reported changes in produce purchases were not significant. Among SNAP recipients, survey respondents also reported increases in the quantity of their fruit and vegetable purchases and the variety of those purchases. As shown in Table 2, 70% of survey respondents who re-

ceived SNAP reported that they had increased their purchase of fruits and vegetables with the VDP and another 16% reported at least maintaining their previous purchase levels. Similar to the patterns among all respondents and not significantly different from non-recipients, 63% of SNAP benefit recipients reported they purchased a wider variety of fruits and vegetables and 90% reported that their family was consuming more fruits and vegetables as a result of their participation. Approximately 87% of recipients responded that the VDP was important to their decision to come to the market and an even greater percentage, 98%, said it was important to their decision to purchase fruits and vegetables.

Table 2. Changes in purchasing habits of survey respondents, N=96

	Quantity			Variety		
	Increased	Maintained	Decreased	Increased	Maintained	Decreased
All respondents, n=93 ^a	63% (59)	17% (16)	9% (8)	66% (61)	29% (27)	1% (1)
SNAP respondents, n=68 ^b	70% (48)	16% (11)	7% (5)	63% (43)	32% (22)	0

a. For all respondents, the quantity and variety variables were each missing data for 3 respondents who did not overlap with each other. Of these respondents, 10 chose "not sure/don't know" as a response to the quantity question and 4 chose it for the variety question.

b. For SNAP respondents (75% of all respondents), 1 respondent was missing data on quantity and 2 respondents were missing data on the variety question. Among these SNAP respondents, only 5 chose "not sure/don't know" as a response to the quantity question and 3 chose it for the variety question.

Table 3. Participant demographics by SNAP program participation

	Not SNAP Recipients		SNAP Recipients	
	n=24, 25%		n=72, 75%	
Age				
18 to 54 years	8	33%	33	47%
>55 years	16	67%	37	53%
Sex				
Female	15	62%	62	89%
Male	9	38%	8	11%
Race/ethnicity				
African American	23	96%	64	94%
Other	1	4%	4	6%
Parent	12	50%	38	55%
Child age range (if parent)				
Under 11 years	8	67%	14	46%
12 to 17 years	4	24%	16	53%
Transportation to market				
Drive	12	52%	24	36%
Walk	6	26%	24	36%
Other	5	22%	18	28%

DISCUSSION

The Veggie Dollar Program was associated with increased purchases of fresh fruits and vegetables at the Sankofa Fresh Markets. Participants in the program reported that they increased both the amount and variety of their produce purchases. Additionally, the gross market sales nearly

doubled and the market purchases made using SNAP benefits substantially increased during the program period. These findings are in line with recent research indicating that merely locating a market with fresh foods in neighborhoods characterized as food deserts does not necessarily increase fresh produce purchases.³⁷ That the addition of an incentive program to

subsidize the cost or decrease the price of locally available fresh fruits and vegetables increased reported purchases lends additional support to recent research on food deserts that suggests that price, more than location, poses a barrier to access to healthy food.²⁸

Community, city, and academic partnerships were engaged to develop the produce incentive model, promote offerings, and recruit participants to the program. At the local level, we partnered with the Lower Nine Senior Citizens Center, Daughters of Charity Services at St. Cecilia, Mercy Endeavors and Harmony House to recruit program participants and host Mobile Market sites. Collaborations with local farmers and food distributors to source 40% of Market produce enabled us to provide food that was familiar to the community. Market signage provided additional information to consumers on the local sources of produce they purchased.

While the results suggest that the VDP program positively affected overall market household fruit and vegetable purchases, these findings should be considered in the context of certain limitations. Firstly, both program participation and survey distribution were non-random and data were cross-sectional. A pre- post-intervention survey design would have improved the ability to evaluate program impact. Secondly, there was no information on survey non-respondents. It could be that all non-respondents were either unaffected or dissatisfied with the program, or the converse, thus the omission of them from the analysis could skew the results. Similarly, in an effort to minimize the response burden as this was a pilot study implemented a



Figure 2. Market sales using SNAP benefit dollars during pilot.

community-based program, we limited the number of survey questions, intentionally leaving out questions that would have allowed for the disaggregation of results by factors like education and income level. It could be the case that other social determinants of health are more fundamental to understanding produce-purchasing habits. Finally, survey questions could have elicited responses that were biased to more positively reflect both personal habits and program outcomes, as respondents may be interested in reflecting a more positive portrayal of their

participants develop skills and knowledge on how to prepare fresh fruits and veggies with lessons that connect the consumption of whole foods with preventative health approaches. They are also introduced to a variety of recipes, food label reading, and USDA MyPlate recommendations for a balanced diet. Evaluating these efforts will help to further understand how purchase translates to consumption and investigate the role that knowledge of fruit and vegetable preparation plays in purchasing and consumption habits alongside price and location.

support a space for regular ongoing shoppers to purchase fresh produce.

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CONFLICT OF INTEREST

No conflicts of interest to report.

AUTHOR CONTRIBUTIONS

Research concept and design: Ferdinand, Torres, Saeed; Acquisition of data: Ferdinand, Torres; Data analysis and interpretation: Ferdinand, Torres, Scott; Manuscript draft: Ferdinand, Scott, Saeed, Scribner; Statistical expertise: Scott; Acquisition of funding: Ferdinand; Administrative: Ferdinand, Torres, Saeed, Scribner; Supervision: Ferdinand, Torres, Scribner

REFERENCES

1. US Department of Health and Human Services (USDHHS). *Healthy People 2020*. 2014. Last accessed Sept 26, 2017 from <https://www.healthypeople.gov/>
2. Center for Disease Control. Majority of Americans Not Meeting Recommendations for Fruit and Vegetable Consumption. *CDC Online Newsroom - Press Release*. September 2009.
3. Lock K, Pomerleau J, Causer L, McKee. Low fruit and vegetable consumption. In: Ezzati M, Lopez AD, Rodgers A, Murray, eds. *Comparative Quantification of Health Risks: Global and Regional Burden of Disease Attributable to Selected Major Risk Factors*. Vol 1. Geneva: World Health Organization; 2004:597-728.
4. He K, Hu FB, Colditz GA, Manson JE, Willett WC, Liu S. Changes in intake of fruits and vegetables in relation to risk of obesity and weight gain among middle-aged women. *Int J Obes Relat Metab Disord*. 2004;28(12):1569-1574. <https://doi.org/10.1038/sj.ijo.0802795>. PMID:15467774.
5. Evans AE, Jennings R, Smiley AW, et al. Introduction of farm stands in low-income communities increases fruit and vegetable among community residents. *Health Place*. 2012;18(5):1137-1143. <https://doi.org/10.1016/j.healthplace.2012.04.007>. PMID:22608130.
6. Dauchet L, Amouyel P, Hercberg S, Dallongeville J. Fruit and vegetable consumption and risk of coronary heart disease: a meta-analysis of cohort studies. *J Nutr*. 2006;136(10):2588-2593. PMID:16988131.

The Veggie Dollar Program was associated with increased purchases of fresh fruits and vegetables at the Sankofa Fresh Markets.

habits or in supporting the program.

Future research could continue to explore the relationship between price, location and fruit and vegetable purchase and consumption. During 2017, Sankofa has transitioned the VDP to a SNAP-match program and increased the supplemental incentive amount in order to increase SNAP benefit usage at the markets.²⁸ Program participants presently receive a match of up to \$20 of their SNAP purchases to acquire fruits and vegetables at the Sankofa Fresh Stop and Mobile Markets. Community and organizational partnerships also support Sankofa's efforts to host healthy cooking and gardening educational programs. Par-

CONCLUSIONS

This study found that location of markets that sell fresh fruits and vegetables was important but not the sole factor supporting an individual's increase in produce purchases. Findings suggest that strategies to increase fresh produce access include: 1) incentives to improve one's purchasing power; 2) direct community engagement in provision of food and involvement of participants; and 3) convenient location. Furthermore, any program or campaign would be most effective when directly aligned with community needs, planning, and decision-making to ensure its growth, expansion and success.

The participation of SNAP benefit customers at the Sankofa Fresh Stop and Mobile Markets indicate that the VDP should be explored for adoption in other communities. A well-structured program with an outreach plan and engaged community members would provide a viable method for initial recruitment of neighborhood-based participants and

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7. Hung H-C, Joshipura KJ, Jiang R, et al. Fruit and vegetable intake and risk of major chronic disease. *J Natl Cancer Inst.* 2004;96(21):1577-1584. <https://doi.org/10.1093/jnci/djh296>. PMID:15523086.
8. World Health Organization (WHO), Food and Agriculture Organization (FAO). *Diet, Nutrition, and the Prevention of Chronic Diseases*. Geneva: World Health Organization; 2003.
9. Key TJ, Schatzkin A, Willett WC, Allen NE, Spencer EA, Travis RC. Diet, nutrition and the prevention of cancer. *Public Health Nutr.* 2004;7(1A):187-200. <https://doi.org/10.1079/PHN2003588>. PMID:14972060.
10. He FJ, Nowson CA, Lucas M, MacGregor GA. Increased consumption of fruit and vegetables is related to a reduced risk of coronary heart disease: meta-analysis of cohort studies. *J Hum Hypertens.* 2007;21(9):717-728. <https://doi.org/10.1038/sj.jhh.1002212>. PMID:17443205.
11. Olsho LE, Payne GH, Walker DK, Baronberg S, Jernigan J, Abrami A. Impacts of a farmers' market incentive programme on fruit and vegetable access, purchase and consumption. *Public Health Nutr.* 2015;18(15):2712-2721. <https://doi.org/10.1017/S1368980015001056>. PMID:25919225.
12. Riboli E, Norat T. Epidemiologic evidence of the protective effect of fruit and vegetables on cancer risk. *Am J Clin Nutr.* 2003;78(3)(suppl):559S-569S. PMID:12936950.
13. Dehghan M, Akhtar-Danesh N, Merchant AT. Factors associated with fruit and vegetable consumption among adults. *J Hum Nutr Diet.* 2011;24(2):128-134. <https://doi.org/10.1111/j.1365-277X.2010.01142.x>. PMID:21332835.
14. Bogers RP, Brug J, van Assema P, Dagnelie PC. Explaining fruit and vegetable consumption: the theory of planned behaviour and misconception of personal intake levels. *Appetite.* 2004;42(2):157-166. <https://doi.org/10.1016/j.appet.2003.08.015>. PMID:15010180.
15. Jackson C, Lawton R, Knapp P, et al. Beyond intention: do specific plans increase health behaviours in patients in primary care? A study of fruit and vegetable consumption. *Soc Sci Med.* 2005;60(10):2383-2391. <https://doi.org/10.1016/j.socscimed.2004.10.014>. PMID:15748685.
16. Steptoe A, Perkins-Porras L, McKay C, Rink E, Hilton S, Cappuccio FP. Behavioural counselling to increase consumption of fruit and vegetables in low income adults: randomised trial. *BMJ.* 2003;326(7394):855. <https://doi.org/10.1136/bmj.326.7394.855>. PMID:12702620.
17. Neff RA, Palmer AM, McKenzie SE, Lawrence RS. Food Systems and Public Health Disparities. *J Hunger Environ Nutr.* 2009;4(3-4):282-314. <https://doi.org/10.1080/19320240903337041>. PMID:23173027.
18. Nepal VP, Mgbere O, Banerjee D, Arafat RR. Disparities in fruits and vegetables consumption in Houston, Texas: implications for health promotion. *J Prim Care Community Health.* 2011;2(3):142-147. <https://doi.org/10.1177/2150131911399446>. PMID:23804792.
19. Dubowitz T, Heron M, Bird CE, et al. Neighborhood socioeconomic status and fruit and vegetable intake among whites, blacks, and Mexican Americans in the United States. *Am J Clin Nutr.* 2008;87(6):1883-1891. PMID:18541581.
20. Grimm KA, Foltz JL, Blanck HM, Scanlon KS. Household income disparities in fruit and vegetable consumption by state and territory: results of the 2009 Behavioral Risk Factor Surveillance System. *J Acad Nutr Diet.* 2012;112(12):2014-2021. <https://doi.org/10.1016/j.jand.2012.08.030>. PMID:23174688.
21. *Food, Conservation, and Energy Act of 2008*. Vol 7 USC 8701; 2008. Public Law 110-234. Last accessed Oct 3, 2017 from <https://www.gpo.gov/fdsys/pkg/STATUTE-122/pdf/STATUTE-122-Pg923.pdf>
22. Larson NI, Story MT, Nelson MC. Neighborhood environments: disparities in access to healthy foods in the U.S. *Am J Prev Med.* 2009;36(1):74-81. <https://doi.org/10.1016/j.amepre.2008.09.025>. PMID:18977112.
23. Treuhaf S, Karpyn A. *The Grocery Gap: Who Has Access to Healthy Food and Why It Matters*. New York, NY: PolicyLink and The Food Trust; 2010.
24. Rose D, Bodor JN, Swalm CM, Rice JC, Farley TA, Hutchinson PL. *Deserts in New Orleans: Illustrations of Urban Food Access and Implications for Policy*. Ann Arbor MI: Univ Mich Natl Poverty Center for USDA Econ Res Serv Res; 2009. Last accessed Sept 26, 2017 from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.189.2333&rep=rep1&type=pdf>
25. Zenk SN, Schulz AJ, Israel BA, James SA, Bao S, Wilson ML. Fruit and vegetable access differs by community racial composition and socioeconomic position in Detroit, Michigan. *Ethn Dis.* 2006;16(1):275-280. PMID:16599383.
26. Raja S, Changxing Ma, Yadav P. Beyond food deserts: measuring and mapping racial disparities in neighborhood food environments. *J Plann Educ Res.* 2008;27(4):469-482. <https://doi.org/10.1177/0739456X08317461>.
27. Bodor JN, Rose D, Farley TA, Swalm C, Scott SK. Neighbourhood fruit and vegetable availability and consumption: the role of small food stores in an urban environment. *Public Health Nutr.* 2008;11(4):413-420. <https://doi.org/10.1017/S1368980007000493>. PMID:17617930.
28. Ghosh-Dastidar B, Cohen D, Hunter G, et al. Distance to store, food prices, and obesity in urban food deserts. *Am J Prev Med.* 2014;47(5):587-595. <https://doi.org/10.1016/j.amepre.2014.07.005>. PMID:25217097.
29. Freedman DA, Choi SK, Hurley T, Anadu E, Hébert JR. A farmers' market at a federally qualified health center improves fruit and vegetable intake among low-income diabetics. *Prev Med.* 2013;56(5):288-292. <https://doi.org/10.1016/j.ypmed.2013.01.018>. PMID:23384473.
30. Jilcott Pitts SB, Wu Q, McGuirt JT, Crawford TW, Keyserling TC, Ammerman AS. Associations between access to farmers' markets and supermarkets, shopping patterns, fruit and vegetable consumption and health indicators among women of reproductive age in eastern North Carolina, U.S.A. *Public Health Nutr.* 2013;16(11):1944-1952. <https://doi.org/10.1017/S1368980013001389>. PMID:23701901.
31. Wang H, Qiu F, Swallow B. Can community gardens and farmers' markets relieve food desert problems? A study of Edmonton, Canada. *Appl Geogr.* 2014;55:127-137. <https://doi.org/10.1016/j.apgeog.2014.09.010>.
32. Wilson D, Ceja V. Eating and food buying behaviors of CalFresh participants who use their EBT card at farmers markets. Sacramento, CA: California State University. July 2013.
33. Lief SA, Bangia D, Baronberg S, Burlett A, Chiasson MA. Evaluation of an Educational Initiative to Promote Shopping at Farmers' Markets Among the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) Participants in New York City. *J Community Health.* 2017;42(4):701-706. PMID:27943033. <https://doi.org/10.1007/s10900-016-0306-3>.
34. Bitler M, Haider SJ. *An Economic View of Food Deserts in the US*. Ann Arbor, MI: National Poverty Center, University of Michigan; 2010.
35. Farmers Market Coalition. Supplemental Nutrition Assistance Program (SNAP). *Farmers Mark Coalit.* 2016. Last accessed Oct 3, 2017 from <https://farmersmarketcoalition.org/advocacy/snap/>
36. Minkler M, Wallerstein N, eds. *Community-Based Participatory Research for Health: From Process to Outcomes. Second*. San Francisco, CA: Jossey-Bass; 2008.
37. Block JP, Subramanian SV. Moving beyond "food deserts": reorienting United States policies to reduce disparities in diet quality. *PLoS Med.* 2015;12(12):e1001914. <https://doi.org/10.1371/journal.pmed.1001914>. PMID:26645285.