



### Abstract

**Objective:** Farmers' markets are a food environment venue with the potential to increase fruit and vegetable consumption among rural residents of the United States. This study evaluated a social marketing campaign, Plate It Up Kentucky Proud, to determine the association between exposure to PIUKP and fruit and vegetable purchasing habits.

**Study Design, Setting and Participants:** This study used a cross-sectional survey design to measure the impact of PIUKP on consumer shopping behaviors at rural farmers' markets. The surveys were administered in six rural communities with obesity rates greater than 40% over a two-year period. Surveys were completed by 112 farmers' market patrons in year one and 139 farmers' market patrons in year two.

**Outcome Measures and Analysis:** Data were collected in summer 2015 and summer 2016 using a customer intercept survey. The survey included demographic questions and also asked participants about their eating patterns over the past year, including fruit and vegetable intakes. Additionally, barriers to consuming fruits and vegetables were included. Data were imported using SPSS Statistics 23 to perform statistical analyses.

**Results:** Having recipe cards available at the farmers' market was associated with influencing the purchase of fruits and vegetables ( $p < 0.001$ ). As well, PIUKP recipe samples were associated with purchasing the ingredients for the recipe ( $p < 0.001$ ) and a willingness to prepare the recipe at home ( $p < 0.001$ ).

**Conclusions and Implications:** Utilizing social marketing campaigns at farmers' markets may be an effective way to increase fruit and vegetable consumption, which can aid in the prevention and management of many chronic disease conditions, including obesity. This is an important strategy to consider, especially for residents of rural communities in the United States.

### Background

Greater intakes of fruits and vegetable have been associated with lower risks of several chronic diseases such as type 2 diabetes, cardiovascular disease, and cancer (Ford et al. 2002, Hartley et al. 2012, Turati et al. 2015). These diseases can be managed with dietary changes; however, consumption of these foods remains low among adults in the United States (Dietary Guidelines for Americans, 2015-2020). One approach to improve intakes is through a social marketing strategy and improvement in access to healthy foods.

Having access to healthy foods, including fruits and vegetables, is important for making healthy dietary choices. Farmers' markets are one venue that provide access to fresh, local fruits and vegetables. Shopping at farmers' markets may increase the consumption of fruits and vegetables (Pitts et al. 2014, Pitts et al. 2015), making them a desirable venue to increase the purchase of fruits and vegetables in many community settings.

To encourage the purchase of fruits and vegetables, marketing strategies, specifically social marketing strategies, may be useful. Social marketing strategies have successfully been used in several settings with many populations to achieve a variety of healthy eating goals, including fruit and vegetable consumption (Gordon et al. 2006, Blitstein et al. 2012, Freedman et al. 2011).

By utilizing social marketing campaigns, and encouraging farmers' market shoppers to purchase fruits and vegetables, more healthful dietary patterns are expected.

### Research Question

How does a fruit and vegetable social marketing campaign influence rural farmers' market patrons' purchasing decisions?

### Funding Source

This study was supported by a cooperative agreement number 5NU58DP005483, Division of Nutrition, Physical Activity, and Obesity, Centers for Disease Control and Prevention.

### Methods

- A cross-sectional survey design was used to measure the impact of the social marketing campaign, Plate It Up Kentucky Proud, on consumer fruit and vegetable shopping behaviors at rural farmers' markets in Kentucky during summer 2015 and 2016. The campaign utilizes recipe cards, food samples, incentives, poster board displays, and food demonstrations to encourage fruit and vegetable consumption.
- Adolescents and adults, aged 12-91, participated in the study in summer 2015 (year one – five counties) and in summer 2016 (year two – six counties). These counties have 40% or higher obesity rates among adults, are rural geographically, and are comprised of primarily white residents (approximately 98%). A convenience sample was used for this study and included 112 participants in year one and 139 participants in year two.
- Data were collected by graduate students who visited the farmers' markets, one in each county, in July and August of both years. An IRB approved customer intercept survey was used for this study. The survey contained demographic questions and study participants were asked to reflect on their eating habits over the past year, including fruit and vegetable intakes. The survey was developed to collect data about the effectiveness of Plate It Up Kentucky Proud.
- Survey participation was voluntary and surveys were self-administered. In both year one and year two, participants were given a tote bag and gel pack as an incentive for sampling the recipe and completing the survey. Data were analyzed using SPSS Statistics 23. For all analyses, alpha was set at  $p < 0.05$ . Descriptive statistics were used to characterize survey responses. Chi-square tests were used to examine associations between exposure to a social marketing campaign and fruit and vegetable shopping behaviors.

### Results

A total of 112 participants completed the survey in year one and 139 participants completed the survey in year two.

In year one, the mean age of participants was 49 years. Most participants were white (97%), female (77%), and owned or leased a car (87%). Of the 112 participants, 24% had completed high school or obtained their GED, 25% had completed some college, and 34% were college graduates. Many reported an annual income less than \$20,000 (28%) and 16% reported receiving SNAP benefits or food stamps.

Participant characteristics were similar in year two. The mean age of participants was 51 years. Most were white (96%), female (88%), and owned or leased a car (85%). Of the 139 participants, 25% had completed high school or obtained their GED, 23% had completed some college, and 24% were college graduates. Nearly half of participants reported an annual income less than \$20,000 (44%) and 30% reported receiving SNAP benefits or food stamps.

#### Descriptive Statistics of Association Between Exposure to Plate It Up Kentucky Proud and Farmers' Market Patrons Purchasing Habits

Characteristic	Year One (n=112)	Year Two (n=139)
Does having recipe cards available at the market influence your buying of fruits and vegetables while at the market? – Yes	28%	55%
Did the recipe sample available contribute to your buying the ingredients for the recipe sampled? – Yes	36%	54%
In the past several weeks, did you hear about the Plate It Up Kentucky Proud program? – Yes	69%	50%
If you took a food sample from the Plate It Up Kentucky Proud program, did that sample make you want to prepare the food item at home? – Yes	19%	74%

#### Chi-Square Analysis of Change in Shopping Behaviors Related to Plate It Up Kentucky Proud Social Marketing Campaign

Variable	P-value
Does having recipe cards available at the market influence your buying of fruits and vegetables while at the market?	$p < 0.001$
Did the recipe sample available contribute to your buying the ingredients for the recipe sampled?	$p < 0.001$
In the past several weeks, did you hear about the Plate It Up Kentucky Proud program?	$p < 0.932$
If you took a food sample from the Plate It Up Kentucky Proud program, did that sample make you want to prepare the food item at home?	$p < 0.001$

Significance Level:  $\alpha = 0.05$

### Discussion and Conclusions

The results of this study indicate that shopping behaviors may have been influenced by the Plate It Up Kentucky Proud social marketing campaign. Exposure to the Plate It Up Kentucky Proud social marketing campaign via recipe cards and sampling were both significantly associated with influencing the purchase of fruits and vegetables at the farmers' market. Previous findings utilizing the Plate It Up Kentucky Proud campaign had similar results. Two weeks following the recipe sampling experience, 36% of those surveyed had prepared the recipe at home (Stephenson et al. 2013). These results lend support as evidence for the current study, as 74% of participants were willing to prepare the recipe at home following sampling. This suggests patrons' likelihood of purchasing items from the farmers' market and preparing the recipe at home may have increased following survey participation. This may also increase exposure to and intakes of fresh fruits and vegetables among rural residents.

This study assessed the influence of Plate It Up Kentucky Proud on fruit and vegetable purchasing habits at farmers' markets in rural Kentucky counties with obesity rates greater than 40%. Dietary changes, like increased consumption of fruits and vegetables, can aid in the prevention and management of chronic disease conditions, and may also lead to improved dietary patterns among community residents. This study provides evidence for the importance of utilizing social marketing campaigns at farmers' markets in rural communities as a way to promote greater fruit and vegetable purchases and consumption, and most importantly, overall health.

### Sources

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