

The USDA Fresh Fruit and Vegetable Program: A Case Study of Implementation and Consumption in Wisconsin

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ABSTRACT

Purpose/Objectives

The US Department of Agriculture created its Fresh Fruit and Vegetable Program (FFVP) to address poor nutrition and rising obesity among children. The FFVP allocates funding for selected elementary schools with at least 50% free/reduced price school meal enrollments to provide free fresh fruit and vegetable snacks to students. The purpose of this case study in one Wisconsin FFVP-funded school is to provide 1) an account of what fruits and vegetables were served and consumed and 2) information about FFVP implementation, including benefits, challenges and opportunities for collaborative partnerships.

Methods

Seventy-six 4th and 5th grade students, four teachers, and the school nutrition director participated in this study. Teachers recorded student consumption of fruits and vegetables over 95 days. The school nutrition director provided information through a telephone interview.

Results

Fruits were served 66 times, and vegetables were served 29 times. Most items were determined by the school nutrition director to be familiar to students. Students consistently ate the FFVP snacks, consuming fruits at a higher rate than vegetables. FFVP procedures and implementation were relatively easy to execute for this school.

Applications to Child Nutrition Professionals

These findings provide a useful example of FFVP planning, implementation, and evaluation of outcomes, while also highlighting how schools, researchers and community partners can collaborate to enhance the FFVP. This case study of FFVP implementation and outcomes in a small Midwestern school should prove useful to staff from FFVP schools with similar demographics, especially school nutrition directors with limited experience and schools new to the FFVP.

Keywords: nutrition; fruit and vegetable; child obesity; health policy; school-based intervention; Fresh Fruit and Vegetable Program

INTRODUCTION

Poor nutrition is prevalent among today's youth, particularly concerning fruit and vegetable (FV) consumption. Current US Department of Agriculture (USDA) guidelines recommend 6-13 daily servings of FV (USDA, 2010). Data from the 2011 Youth Risk Behavior Surveillance and the 2001-04 National Health and Nutrition Examination Survey indicate FV intake significantly below recommended guidelines for children (Centers for Disease Control and Prevention, 2012; National Cancer Institute, 2013). Efforts to provide America's youth access to nutritious food

and opportunities to learn about healthy eating are needed. Schools can be optimum settings for such efforts (Kubik, Lytle, Hannan, Perry, & Story, 2003). In 2002, the USDA piloted its Fresh Fruit and Vegetable Program (FFVP) to address children's poor nutrition and rising obesity rates. The FFVP, which was expanded nationwide in 2008, allocates funding for selected elementary schools with at least 50% free/reduced price school meal enrollments to provide free fresh FV snacks to students outside of school lunch/breakfast. The purpose of this program is to increase the variety and amount of FV children experience and consume, with the long-term goal of positively influencing eating habits and combating obesity. For more information on the history of the FFVP see the USDA website (USDA, 2009).

Three studies have examined FFVP implementation processes of purchasing and serving free FV snacks (Bai, Feldman, Wunderlich, & Aletras, 2011; Potter et al., 2011; Bartlett, Olsho, Klerman, et al., 2013). Additional studies have examined impacts of the FFVP, finding a variety of positive outcomes related to children's attitudes and preferences toward FV and increased FV consumption (Davis, Cullen, Watson, Konarik, & Radcliffe, 2009; Coyle et al., 2009; Jamelske & Bica, 2012; Bica & Jamelske, 2012; Bartlett, Olsho, Klerman, et al., 2013).

This study describes the experience of one Wisconsin school in its first year of FFVP implementation. These findings provide a useful case study of FFVP planning, implementation and evaluation of outcomes, while also highlighting how schools, researchers and community partners can collaborate to enhance the FFVP.

METHODOLOGY

Participants

Seventy-six students from two 4th grade (59.2%) and two 5th grade (40.8%) classrooms participated in this study. Girls constituted 51.6% of the sample, with an average age of 9.6. According to self-report, 95.2% of the sample identified as White, 3.2% as African American, and 1.6% as Hispanic/Latino(a). Across approximately 300 enrolled students, administrators reported a rate of 58% qualifying for free/reduced price school meals. Teachers in all four classrooms (two 4th grade and two fifth grade) and the school nutrition director also participated. No incentives were offered to encourage participation, and all arrangements for the study design and implementation were made jointly between researchers and school administrators and staff.

Materials

Data recording sheets consisted of weekly calendar pages listing student names vertically and days of the week horizontally. Teachers used the calendar pages to record one of four levels of student consumption of FFVP snacks (i.e., *ate none, tried, ate half, ate all*). A series of pre-determined questions regarding program implementation were used to conduct an interview with the school nutrition director.

Procedure

Snack distribution. Data were collected during the first year of the FFVP at this school. Distribution of free FV occurred three days per week from October 2009 to April 2010, resulting in 95 snacks served (66 fruits, 29 vegetables). The snacks were prepared in the school kitchen and distributed to classrooms for an afternoon snack. Some fruits including apples were served

whole, while others such as oranges were cut into wedges. Some vegetables including cucumbers were served sliced, while others including celery were cut into sticks. Serving size varied between 1/4 - 1 cup, typically representing approximately one full serving. Serving decisions were based on the school nutrition director's knowledge of consumption for FV included in school meals. No dips or condiments were used. The authors were not aware of any food quality issues that would have impacted consumption.

Data collection. All four teachers were trained to observe/record student FV consumption on the weekly calendar pages during a two-hour training session. All four teachers reported feeling confident they could accurately and effectively perform this task. School administrators provided data on age, gender, and race/ethnicity. An interview was conducted with the school nutrition director addressing a variety of issues regarding program procedures and implementation. This interview took place in a 30 minute phone conversation at the conclusion of the study. The University of Wisconsin-Eau Claire Institutional Review Board approved all research materials and procedures.

RESULTS AND DISCUSSION

Snack Consumption

Figure 1 shows the number of times different FV were served. The majority of items served were determined by the school nutrition director to be familiar to students, although infrequent exposure was characteristic of certain items. For example, the director indicated blueberries and strawberries, are not often available in students' homes and school meals because of cost, and many students have not seen sweet potato or jicama. Table 1 shows average student consumption levels across FV served. Students consistently ate the free snacks; however, fruits were consumed more than vegetables. The percentage of students eating the entire snack for fruits (73.9%) was higher than vegetables (50.6%), and the rate of refusal for fruits (3.5%) was lower than vegetables (10.2%).

Figure 2 shows FV ordered by average consumption rates. Consumption was high across nearly all fruits, with pear (0.68) and blueberries (0.64) the lowest. Consumption of vegetables was lower, with carrots (0.80) and cucumber (0.72) the only vegetables eaten at a rate of at least 0.70.

Nutrition Director Interview

Promotion methods. Several promotional methods were used including displaying posters and mailing monthly menus to students' homes indicating which FV would be served. Additionally, the director shared information about less familiar FV via the public announcement system. This information included the food name, how it is eaten, the texture and names of familiar foods with similar textures, and a description of the taste. No classroom nutrition education activities were undertaken in conjunction with this program.

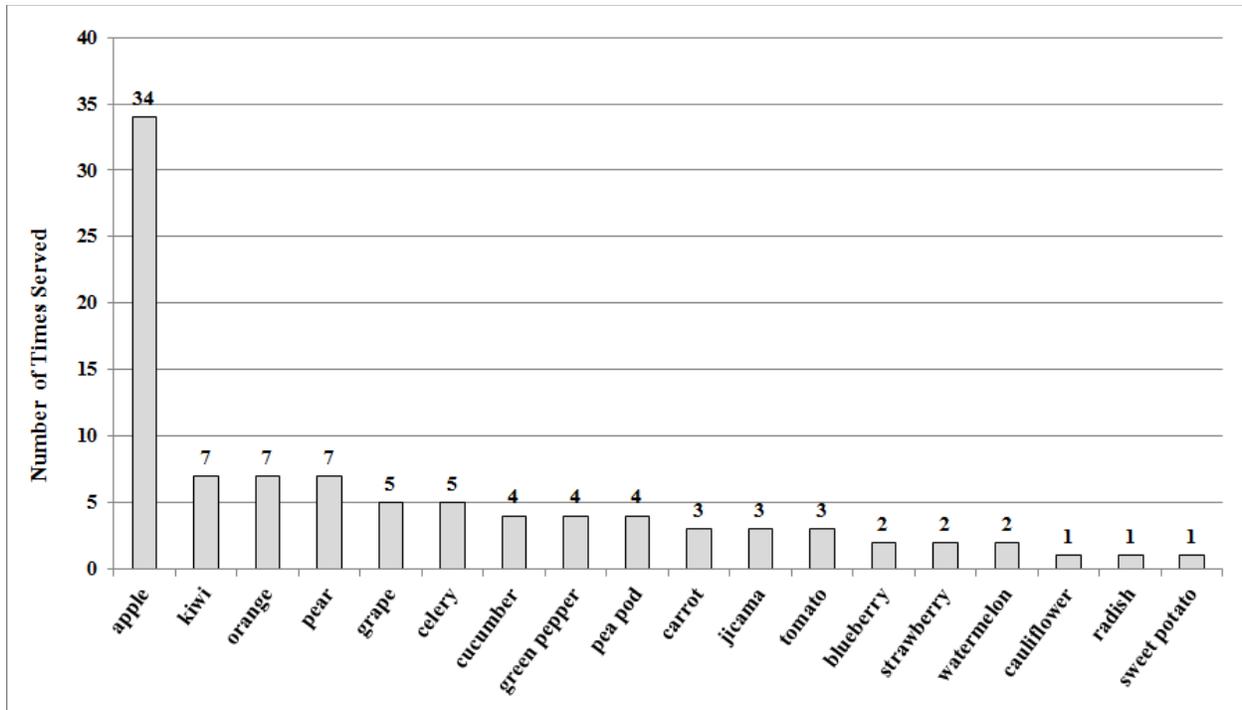


Figure 1. *Fresh Fruit and Vegetable Program Items Served*

Table 1. *Fresh Fruit and Vegetable Program Consumption Levels*

Consumption Levels	Fruits <i>M (SD)</i>	Vegetables <i>M (SD)</i>
Ate All	73.9% (10.7)	50.6% (14.9)
Ate Half	10.5% (6.0)	10.2% (6.5)
Tried	12.0% (7.6)	29.0% (12.2)
Ate None	3.6% (3.3)	10.2% (6.7)

Note: On average, 69 students were present across 66 days fruits were served, resulting in 4,583 observations. On average, 71 students were present across 29 days vegetables were served, resulting in 2,066 observations.

Benefits and challenges. In terms of understanding FFVP guidelines, the director indicated the program was thoroughly explained in the FFVP booklet provided. She also indicated anyone with a food service background would easily understand what was needed for working/storage space. The director did not identify any challenges related to equipment, facilities or labor. The school has a large walk-in cooler, so storage was not a problem; however, more racks were purchased for preparation work. Their approach was to complete routine work while also completing the extra work for FFVP implementation.

It is important to recognize different schools and nutrition directors face different situations. In terms of understanding program implementation and procedures, this director benefitted from 15 years of experience. Ease of understanding and facilitation may not be the case for new directors or for districts experiencing high food service staff turnover. This director’s experiences also

may not be typical due to school size. The participating school enrolled approximately 300 students. Schools with higher enrollment could experience equipment/facilities/labor difficulties.

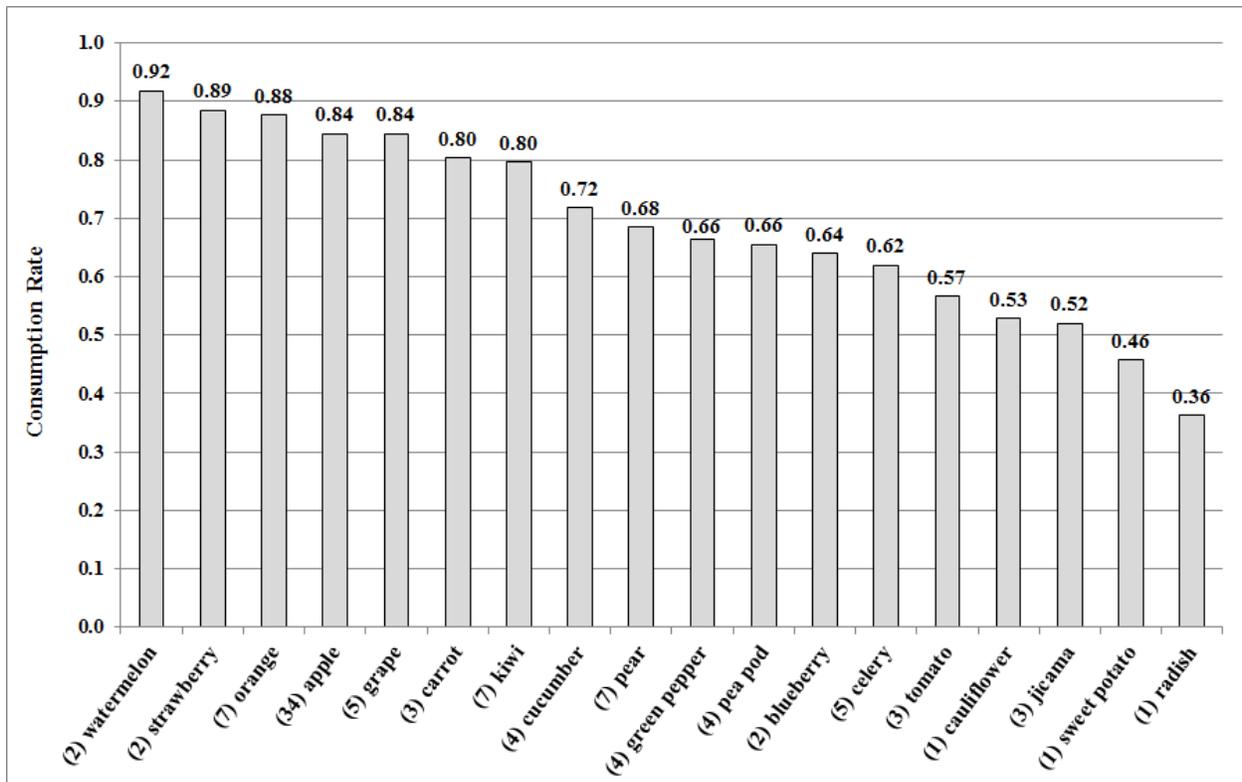


Figure 2: Fresh Fruit and Vegetable Program Consumption Rates

Note: Average consumption rates calculated for individual FV using students present on days each item was served, coded as 0 = none, 0.25 = tried, 0.5 = half, 1 = all.

Overall, the director perceived the program to be effective for two reasons. First, parents asked about FV their children were eating. Second, students began asking for more fruits in school meals and many items served through the FFVP were incorporated into these meals. Unlike students' response to fruits, they did not ask for more vegetables.

Strengths and Limitations

Strengths of this study include frequency and accuracy of data collection, use of trained teacher-observers, and relevance/practicality of findings. Daily collection of student FV consumption data yielded richer information about student behavior than more intermittent approaches.

Teacher observation and recording of data avoided limitations associated with self-reporting and also allowed more precise quantification of the amount of each snack consumed as none, tried, half or all. This case study of FFVP implementation in a small Midwestern school should prove useful to staff from FFVP schools with similar demographics, especially nutrition directors with limited experience and schools new to the FFVP. It is also important to note that this case study serves as an example of how researchers and school administrators and staff can partner on projects to improve student health and nutrition.

There are limitations to this study that could be addressed by future research. Analyses of the impact of the FFVP would benefit from larger, more diverse, randomized samples. The small size and homogeneous characteristics of the sample limit the generalizability of findings. Also, given that certain snacks were only served a limited number of times, effects of repeated exposure could not be determined. Coordination between researchers and food service to ensure items are served an adequate number of times is essential for documenting effects of repeated exposure. Finally, future studies could include analyses of factors influencing consumption. It would be useful to explore/quantify the impacts of student familiarity with foods, food quality, methods of preparation/serving, nutrition education, promotional methods, and parent/family involvement.

CONCLUSIONS AND APPLICATION

The FFVP has two goals—increase consumption and expose children to a variety of FV (USDA, 2009). Given the number of exposures needed to alter children’s taste preferences (Birch, 1999), there are challenges in meeting both goals while operating within budget and limiting waste. In this study, nearly all FV were selected by the nutrition director because they were determined to be familiar to students. Consumption of most fruits was consistently high, while consumption of vegetables was moderately high. Students typically ate at least some of all fruits and they were willing to at least try most vegetables. Based on this information, school food service personnel charged with FFVP implementation should strike a balance between serving familiar/popular items versus less familiar items. A reasonable strategy might be to introduce unfamiliar items once a week and serve familiar items the other days. Over several years of FFVP funding, a school could offer a wide variety of FV, many of which can be new to students.

Further advances in studying the FFVP require collaborative efforts between researchers, school staff, and other community partners to implement evidence-based methods to enhance the FFVP and design effective evaluations. Given schools’ limited resources, it is important to maximize the effectiveness of promotional approaches. Researchers can bring knowledge of marketing psychology, which has shown success identifying effective advertising/sales techniques in grocery stores that could be utilized by schools (Bennett, 1998).

Effectively designed tasting activities could assist in exposing students to a wider variety of FV and also offer more opportunity for repeated exposures (Tuorila & Mustonen, 2010). This is particularly important/beneficial for vegetables. Educational lessons could also be integrated into tasting activities (e.g., measurement, culture). When tastings and other activities are used, it is important to schedule them during regular school hours so all students have access. See Eliassen and Wilson (2007) for information on curricular best practices.

Because of limited funding, additional partnerships and resources are necessary to support these activities beyond the FFVP. Every county in Wisconsin has a university extension office with nutrition education staff and programs supported by USDA funding through the Healthy Kids Act. These programs are designated for schools with 50% free/reduced meal price enrollment which matches FFVP selection criterion. Partnerships between FFVP schools and university extension programs could provide tasting/education activities as described above. In speaking with the participating school nutrition director and the director of the local county extension nutrition education office, some programs were run in this school during the year of this study.

However, both parties acknowledged these programs were not linked to the FFVP, and cooperative efforts to coordinate these activities to be complementary to the FFVP could have a pronounced positive impact.

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BIOGRAPHY

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