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DETERMINING FRESH FRUIT AND VEGETABLE PROGRAM (FFVP) IMPLEMENTATION CORRELATES
WITH FRUIT AND VEGETABLE OUTCOMES IN K-2ND GRADERS

BY

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DISSERTATION

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ABSTRACT

Background: The positive health effects of fruits and vegetables (FV) are well known. School-based FV interventions have been used as preventative child health strategies and may include nutrition education, gardening, or FV distribution. The Fresh Fruit and Vegetable Program (FFVP) supports low-income schools in providing FV as snacks. The objectives of this research were to evaluate available K-2nd grade nutrition curricula related to FV, to determine differences in FV outcomes in an FFVP and non-FFVP school, determine the impact of FFVP on FV preferences, and evaluate the FFVP statewide in Illinois.

Methods: Web of Science, EBSCO, and PubMed were searched for articles with named curricula and curricula impact for K-2nd grade. Publications listed (n=5,498) were reviewed for relevancy (grade, curricula named, impact). To evaluate differences in an FFVP and a non-FFVP school, a FV Preference survey was developed for K-2nd graders (12 fruits/12 vegetables). Data were collected from K-2nd graders (n=435, FFVP school n=235 with 12 teachers, non-FFVP school n=200, 10 teachers). Fruits (F=28) and vegetables (V=29) were distributed twice/week over 35 weeks at the participating FFVP school. Preference ratings were analyzed over time. FFVP surveys were developed and distributed to Illinois schools to assess implementation of the program statewide. Additionally, a scoring index was created to classify schools as low/high implementers of the FFVP.

Results: Twelve nutrition curricula were found within 11 publications. Most had control groups (n=9); were part of multi-component studies (n=11); and curricula included food model use, healthy eating, and food groups. Regarding preferences, there were significant differences in mean preference scores, with higher fruit scores at the FFVP school ($P<.05$); higher vegetable scores for the non-FFVP school ($P<.05$); and fewer *I don't know* responses in the FFVP school ($P<.01$). For the 57 different FV rated for preference over time at the FFVP school, ratings (n=10,335) revealed that fruits had a higher frequency of children choosing *I like it* than for vegetables (78% F; 38.2% V). Significant relationships were found between liking and: 1) grade ($r=-0.02$, $P=.02$), and 2) time ($r=-0.09$, $P<.001$). Models indicated that vegetables served (compared to fruits; $\beta=-.40$), time point ($\beta= -.07$), and grade level ($\beta=-.02$) accounted for a significant variance in preference ratings ($R^2=0.17$, $P<.001$), indicating that preference ratings went down over time. When assessing the FFVP in Illinois schools, it was found that school staff generally had favorable views of the FFVP. Principals (>50%) reported coordinating FV from FFVP with school-wide NE activities, and almost 80% reported having a committee in place for the FFVP. A low percentage of teachers and FFVP coordinators noted receiving training for the FFVP (4.4 to 44.8%). A school

categorized as a high implementer, according to the FFVP teacher survey, was a significant predictive variable for the amount of FV consumed by children. However, more teachers and coordinators noted that children consumed all or most of the fruits compared to vegetables.

Conclusions: The 12 curricula found had minimal research supporting impact. For differences between the FFVP and non-FFVP school, results suggest the students at the FFVP school had better FV identification. At the FFVP school, it was found that, overall, preference ratings were negatively impacted by time, grade level, and vegetables served. Being exposed to a variety of FV, generally, did not improve ratings for vegetables. Finally, FFVP surveys distributed to schools statewide in Illinois revealed differences between preferences and consumption patterns of children for FV according to teacher and coordinator surveys. High implementer schools may be predictive of children's consumption of FV. More research is needed to determine factors of implementation that are particularly impactful and methods of improving implementation of the FFVP.

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Chapter 1.

Literature Review

Health issues in children of the United States

In the United States, nearly one-third of children are overweight or obese.^{1,2} Many nutrition- and physical activity-related chronic diseases and risk factors affect children and adults alike.¹ Interventions and recommendations for children have been made by the Institute of Medicine (IOM) and the White House, in addition to regulatory changes to food packages in programs that serve children such as the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) in order to address the issue of childhood obesity.² A study identifying the incidence of obesity among children showed that overweight kindergarteners had four times the risk of becoming obese by the age of 14 years.³ The researchers of this study indicated that obesity-prevention efforts that are focused on children who are overweight by the age of 5 might be a way to target children most susceptible to becoming obese later on in life.³ The consumption of fruits and vegetables (FV) has been associated with a reduction in long-term risk of obesity, risk of heart disease and some cancers.⁴⁻⁶ Additionally, it has been researched that eating behaviors that are developed during childhood track into adulthood, furthering the need to help children establish healthy eating behaviors early in life.^{7,8} This can include establishing patterns of FV consumption in children and adolescents, as it has been shown that correlates of taste preferences for FV intake exist during young adulthood suggesting that interventions should try to provide more opportunities for FV exposure.⁹

Fruit and vegetable consumption among school-aged children and factors of influence

To ensure that children obtain the necessary type of nutrients they need for growth, such as vitamins, minerals, carbohydrates, proteins, and fat, the 2015-2020 Dietary Guidelines for Americans have listed recommended portions of calories, proteins, fruits, vegetables, grains and dairy for children of various age groups.¹ For both boys and girls of elementary school age, recommendations consist of consuming 3.5-5 ounces of protein, 1-2 cups of fruits, 1.5-2.5 cups of vegetables, 4-6 ounces of grains, and 2.5 cups of dairy per day.¹ Less than 10% of children and adolescents in the US consume the recommended amounts of FV.^{4,5} Because of the benefits of nutrients from FV for the demands of growth and development in children, it is essential to work towards programming and nutrition education to help increase the intake of these nutrient-dense foods.⁴

In general, children consume fewer FV and more fat and energy than recommended amounts.¹⁰ Various factors may influence a child's preference for FV such as appearance, the familiarity of taste, smell, and textures.^{7,8} It has been shown that children have higher preferences for fruits than vegetables.⁷ In addition, variety has been shown to impact preferences among children as children who like a broad variety of FV are more likely to eat them.⁷ Familiarity of taste and earlier exposure to FV have been found to play an important role in children's acceptance of FV.⁷ A review of determinants of FV consumption found that in terms of availability of FV, and irrespective of country setting, it is consistent that FV are only available in small quantities in school or not available at all.⁷

School interventions for fruits and vegetables and outcomes

Because of the prevalence of childhood obesity and its consequences for public health, the US government has focused on school-based nutrition programs to prevent an upward trend in obesity.¹¹ More than 55 million students from ages 5-19 spend the majority of their day at school.¹² The National School Lunch Program (NSLP) serves lunch to more than 31 million children each day.^{12,13} Children who participate in this program along with the School Breakfast Program may consume up to 47% of their daily energy intake from school meals/snacks.¹² Children from lower-income families depend on school meal programs for up to half of their daily calories.¹³ This shows the impact that schools hold in influencing children's food choices.¹³

School meal standards, in general, have changed throughout the years, and a national legislation by the US Department of Agriculture (USDA) led to an update for school meals to align with recommendations from the IOM.¹² These meal standard changes were released in 2012 for reimbursable school meals that were mandated by the Healthy, Hunger-Free Kids Act of 2010.¹³ The updates included adding more fruit, vegetables, and whole grains to school meals and aimed to reduce saturated fats, trans fats, sodium, and calories.¹³ Despite the changes to meal standards, children may not consume the strengthened recommendations as reflected in a study evaluating consumption patterns and food choices among elementary and middle school students in Colorado.¹² Suggestions from this study found that marketing, communication and behavioral economics related to FV would be necessary for helping to increase vegetable intake to meet the new meal standards.¹²

Along with providing guidelines for appropriate meal patterns, the USDA has the *Team Nutrition* (TN) program which aims to provide training and technical assistance for schools to improve the nutritional quality of their meals. In addition, it strives to help with encouraging school-aged children to

eat a variety of foods and to eat more FV.¹³ Over a third of all public schools participate in the TN program, and it has been shown that TN schools were more likely to serve fresh fruit, salads, and whole grains and less likely to serve unhealthful options than schools without the program.¹³ This reflects the essentiality of investigating the roles of programs and their level of impact on children's food choices.

Comprehensive reviews have assessed the effectiveness school-based nutrition interventions for increasing FV consumption.^{8,11,14} It has been found that the more effective interventions included a nutrition education component.¹¹ Despite efforts of these interventions, most school-based interventions had a low impact on vegetable intake but moderate and significant impact on fruit intake.⁸ It was stressed from one review that because little is still known of effective school-based nutrition education programs and that although large amounts of public funds are used to fund these interventions, more needs to be done to attempt to ascertain the most effective components of interventions.¹¹ However, factors that may impact interventions to increase FV consumption among children are parental or family involvement, teacher involvement, antecedents for increasing consumption, such as self-efficacy, and employing a behavior change theory as a backbone for an intervention.^{11,15}

School-based interventions fall into two main categories: multi-component and single-component programs.⁸ Multi-component programs include more than a single component, such as a home and school element.⁸ Multi-component programs have resulted in larger improvements in FV intake.^{8,14} An example of a multi-component program that has had impact on FV intake is the Food Dudes program which uses role modeling, repeated tasting, and a reward system for children delivered contingent on consumption of a criterion amount of FV.^{16,17} In contrast to multi-component programs, single component programs may include one element such as free or subsidized FV distribution schemes or gardening.⁸ In particular, school-gardening has served as a way to impact FV consumption.¹⁸⁻²⁰ The impact of liking and intake of FV may be related to an increase in children's exposure to FV from gardening.¹⁹ These effects are via the interactive nature of gardening as it provides the opportunity for students to see how FV are grown and the benefits to health.¹⁹ Single component programs, such as those with FV distribution schemes, are easier to implement than multi-component programs; however, have been found to be less effective than multi-component programs.⁸ Further evaluation of these types of programs is needed to enable firm conclusions to be made on their effectiveness.

Programs to increase FV consumption: The USDA Fresh Fruit and Vegetable Program

The USDA-funded Fresh Fruit and Vegetable Program (FFVP) can impact and influence healthful eating habits in young children nationwide attending low-income elementary schools, with funding having reached \$184.5 million for the 2016-2017 school year.^{1,5} This program began when the 2002 Farm Act provided \$6 million for the USDA to award schools to pilot this FV program for the 2002-03 school year to promote FV consumption.²¹ The FFVP reimburses schools with high rates of free/reduced-price meal enrollment for providing fresh FV to students outside of normal school breakfast/lunch meals. As part of the program, schools must allocate \$50 to \$75 per student per year for FV and schools are required to provide these FV as snacks throughout the week.⁵ Currently, only elementary schools are eligible for the program,^{22,23} although it has been offered in high schools in the past.²⁴ This program had expanded to all 50 states as of 2008.²⁵

A pilot of this program was completed in the 2002-03 school year, and a report of this pilot indicated that 100 out of the 105 pilot schools found it feasible to continue implementation of the program.²¹ Regarding acceptability by students, the report found that 80% of the students were interested in the pilot and 71% of the students' interest had increased during the pilot period.²¹ However, the 10% cap on nonfood costs, such as labor, was deemed too restrictive by many of the schools who participated in this pilot.²¹ This evaluative report of this pilot provided suggestions on how to improve the program, including details on distribution, types of foods to serve, and tips on administration of the program.²¹

Further evaluations of the program have reported its effects on attitudes, familiarity, preferences, and behaviors related to FV.²⁶⁻²⁹ One analysis took place during the 2004-2005 school year in schools in Mississippi.²⁶ At the various Mississippi schools, snacks were distributed during the morning break, and baskets, trays, and carts were used to aid with distribution.²⁶ Measures were obtained from students in 5th, 8th, and 10th grades. Schools varied in how they encouraged the new FV snack tastings by using things such as promotional posters and food tasting events.²⁶ Final results of this pilot showed that there was great familiarity with FV at all grade levels, increased preferences among 8th and 10th-grade students, and higher fruit consumption compared with the student's baseline intake.²⁶ However, results did not show an increase in vegetable consumption.²⁶ Despite not reporting changes in FV intake behavior, another evaluation completed in Wisconsin schools conducted among 4th, 7th, and 9th graders showed a reported increase of willingness to try new fruits (24.8% vs. 12.8%, $P < .01$) and vegetables in the intervention school versus the control (25.1% vs. 18.4%, $P = .01$).²⁷ Overall, the program has been found to impact children's changes in willingness to try fruit or identify fruit, but these changes have not

been observed for vegetables²⁸ making it important to increase exposing children to various vegetables along with fruits to aid in their preferences for these foods.^{28,29} When evaluating consumption of FV combined, participation in the program led to a 1/3 cup higher daily FV intake among students in FFVP schools than in children at schools who do not participate in the program (0.32 cups per day, $P < .001$), a difference of 15.5%.⁵

This program has been examined both on the effects of outcome measures related to FV and factors on the implementation of the program in schools. To identify how the program was being implemented, one study examined factors of facilitation and challenges in implementing the program in a New Jersey school.³⁰ With surveys and interviews to assess facilitators and challenges of implementation via information provided by the program's stakeholders (i.e. FFVP coordinator, principals, teachers, school nutrition staff, and parents who participated in the study), the most notable facilitators of the program included the ability to deliver the snacks at an appropriate time, such as in the morning versus the afternoon and encouragement during snack distribution.³⁰ Some barriers included insufficient funding and an insufficient number of volunteers to aid the implementation.³⁰ Aspects of the school environment have also been shown to influence FFVP participation with schools that offer the FFVP also offer more fruit in school lunches in addition to a synergy of using other resources such as Team Nutrition or professionally-trained staff.²³ Additionally, participation in the FFVP significantly predicts the presence of a salad bar at a school.³¹ There is general favorability with this program among students and staff,^{29,32} and positive impact regarding FV outcome measures. However, an evaluation of this program has noted that it would be best to capture research on the effect of this program on younger children.²⁶ Thus, further research is needed in this program to evaluate its impact along with measures that may affect its impact in younger children.

Summary of Review

According to the review, there is a critical need to assess factors that may influence children's preferences for FV, particularly as children are not consuming the recommended amounts.^{4,5} School intervention programs can be an avenue to address these discrepancies of children's consumption as children may consume almost 50% of their daily intake at a school setting.¹² School intervention programs that have been successful have been multi-component and have incorporated nutrition education to have effective results in behavior change.⁸ FV distribution schemes, such as the FFVP²⁶ have also been introduced in schools to produce positive behavior change in relation to FV consumption in children. However, evaluations of this program, in particular, have been limited in younger children

and outcomes have been reported in older adolescence and teens.^{26,27} Thus, it is important to assess programs, such as interventions, or specific curricula, that aim to improve children's FV outcomes and evaluate their strategies and results.

Chapter 2.

Scope and Significance

Schools have served as an important venue for nutrition interventions, as they have the opportunity to influence approximately 95% of children and adolescents across the United States.²⁷ In addition, schools have the opportunity to impact student meals as about 80% of children are enrolled in schools where they may consume two meals and a snack a day.²³ Fruit and vegetable (FV) interventions have demonstrated short-term effectiveness in reducing body weight and may have the potential to have a long-lasting impact on health in relation to reduced risk of heart disease and some cancers.⁵ Additionally, childhood obesity health care expenditures have a direct health care cost of up to \$14.3 billion a year and childhood is an important time to intervene as healthy behaviors that are developed in early childhood are adopted later in life.^{33,34} To help in providing more FV exposure in schools, the 2002 Farm Bill created the USDA Fresh Fruit and Vegetable Program (FFVP) to increase consumption of these foods. Funding for this program has increased each year, from \$177 million in 2015-2016 to \$184.5 million in the 2016-2017 school year; but there has been relatively little recent evaluation of its impact.^{1,5,35}

Although funds are spent each year for this program that aims to improve child nutrition, as FV consumption is low and childhood obesity rates are high, there is limited assessment of impact of the program among younger children where dietary behaviors can deeply influence health later on in life.³⁶ Process evaluation measures are lacking in the available studies; which is unfortunate because process evaluation can provide information about mechanisms and possible pathways that lead to specific behavior changes.^{37,38} Process evaluation helps identify the what, how, why, and for whom interventions work through the use of indicators in interventions.³⁷ Additionally, process evaluation may indicate barriers, facilitators, fidelity, dose, and reach of intervention components.³⁹ Specifically, diagramming how an intervention is expected to work and including quantifiable measures in these diagrams can provide information for effective interventions and this type of information may be critical for interventions that may have limited resources.³⁷

The research included in this dissertation aims to:

- 1) evaluate nutrition curricula available for K-2nd grade;

- 2) assess differences between two schools, one with the USDA FFVP and one without the program using the following methods:
 - a) web-based surveys regarding the school nutrition environment,
 - b) school/classroom/lunchroom observations to assess differences in the school nutrition environment,
 - c) fruit and vegetable preference differences among K-2nd graders, and
 - d) fruit and vegetable intake differences between K-2nd graders at the two schools;
- 3) assess if introducing a variety of fruits and vegetables through the FFVP impacts FV ratings over time, and
- 4) assess implementation of the FFVP in schools in Illinois for the 2016-2017 year and determine levels of implementation through the creation of an index.

The contribution of this proposed project is expected to help in understanding different strategies for FFVP in limited resource schools that have a higher percentage of students from low socioeconomic backgrounds. This contribution will be significant because it will provide stakeholders, schools, and funding parties most relevant information on best implementation strategies that can impact students nationwide on developing healthful eating behaviors. Once these specific implementation strategies are identified, a proper implementation plan and additional resources can be provided for schools to adopt the FFVP. With limited resources, it is critical that only the most effective programs be supported.

A past assessment of the FFVP focused on evaluating the impact of the program on FV consumption in children from grades 4 to 6 but did not take into account the process evaluation of the different schools evaluated.⁵ Additionally, the program had just been operating nationwide for only 3 years when the data was collected, and some schools were in their first year of participation.⁵ A process evaluation was done on the program during its first year of implementation in Mississippi, and the information found may have differed from implementation-related issues of the full population of the program during that time.³² Most evaluations of the FFVP have focused on older children.^{23,32,40} Additionally, it is important to understand the synergy of using various resources to help with improving school food environments.²³ One study reported the importance of understanding why children may not take FFVP snacks, and other studies were not able to draw conclusions about student intake in relation

to the use of the FFVP.^{5,23} A past study has shown the importance of evaluating the allocation of appropriate resources and the inclusion of process evaluation that can be useful in other multi-site studies.⁴¹ The proposed research is innovative, in author's opinion, because it is the first of the FFVP studies to assess implementation and outcomes of the program in younger children. By knowing what strategies are most effective, a more profound implementation toolkit and protocol can be used in schools which may have robust results related to healthy eating behaviors from the use of the FFVP.

Further, we expect our research to generate important data on the effectiveness of the FFVP in the State of Illinois. We will also develop tools that can readily be used to continue evaluating the effectiveness of the program, and that can be administered in classrooms of participating schools. Also, our tools assessing preferences may help determine mid-term and long-term changes in the consumption of FV and lower incidences of overweight and obesity. Our research is instrumental in continuing to support and fund schools for programs such as these and to continue to provide tools for schools to independently contribute to positive outcomes in the healthy eating behaviors among children. In addition, future directions may lead to improvements to school policy changes about healthy eating in classrooms and creating a healthier school environment.

Chapter 3.

Evaluative Review of Nutrition Curricula in K-2nd Grade¹

INTRODUCTION

Schools have served as promoters of health among young children for many decades. Because children are in school for a large percentage of their waking hours, schools are a convenient place for many health promotions, and many organizations, such as the American Psychological Association, note the importance of schools in encouraging healthy behaviors.³⁴ School settings may be most appropriate when implementing interventions since almost 55 million children attend public and private schools.⁴² With the health issues associated with childhood obesity and behaviors that often continue and expand into adulthood, the use of schools for health promotion has been particularly important.⁴³

As the prevalence of childhood obesity continues to be of concern for both the health community and individuals, the number of interventions with goals of decreasing this health threat continues to grow. Indeed, in the previous five years, a total of 440 trials have been registered whose specific aim is to address childhood obesity, compared to the 155 studies found for the year of 2010.⁴⁴ Of those 440 trials, 129 were based in school settings (NIH Clinical Trials Registry, search terms “childhood obesity” AND “school”).⁴⁴ Upon entering kindergarten, almost 15% of children are overweight and just over 12% are obese.³ The prevalence increases with each subsequent age up until 8th grade.³

With almost 34% of children and adolescents age 2-19 being at risk for overweight, it is imperative to establish preventative strategies to address risk factors of overweight and obesity. Establishing healthy eating patterns earlier in life may help in reducing the risk of overweight and obesity in the future.⁴⁵ For example, there is strong evidence that sugar-sweetened beverages are associated with childhood obesity; moderate evidence that dietary fat is associated with obesity; and limited evidence that fruit and vegetable (FV) intake is associated with childhood obesity.⁴⁶ While nutrition interventions at schools may be beneficial in helping to mitigate the issues associated with

¹ Masis N, McCaffrey J, Johnson S, Chapman-Novakofski K. Evaluation of Nutrition Curricula in K-2nd Grades. *J Nutr Educ Behav.* 2014;46(4):S148-S149. doi:10.1016/j.jneb.2014.04.135.

childhood overweight and obesity,⁴⁷ others have shown less effect on other outcomes, such as FV intake.⁸

Even when deciding that schools may be the appropriate setting for obesity prevention, deciding the “what,” “how,” and “who” for nutrition education in schools is a difficult discussion, and may lead to some of the discrepancies of reported outcomes. There are at least five reviews or reports of best practices for obesity prevention in schools.^{48–52} The review by Roseman et al. (2011) included recommendations for school-based nutrition interventions for kindergarten (K)-12th grade, such as designing interventions that are behaviorally-focused and multi-component, which means to have more than one component in an intervention such as food service and classroom nutrition education.⁴⁸ The other reviews focused on the components of programs that are associated with the individual program’s targeted outcomes such as reducing body mass index (BMI), general health promotion strategies, and finding more effective nutrition programs to teach at schools. The review by Shirley et al. (2014) critically examined obesity prevention strategies in schools which found 12 studies that specifically measured BMI, percent body fat, and or/weight as a primary outcome.⁵¹ While a summary of the “what,” “how,” and “who” is presented, there is not enough detail to replicate the intervention or recommended curriculum.

Adding to the vagueness is semantic uncertainty. An intervention in a school may be an “intervention,” a “program,” or a “curriculum.” While the latter may seem to be most distinct, the term *curriculum* does not have a clear definition.⁵³ Nevertheless, for this chapter, the term *curriculum* includes the educational content, materials, resources, and evaluation to achieve an objective.⁵⁴ To clearly identify a curriculum, it is often given a name or title. *Interventions* and *programs* may have all the components of a curriculum but could include parts of several curricula, be less formally identified, or be considered as a research protocol. Interventions, programs, and curricula are evaluated in this review, with the distinctions as previously mentioned, grouping unnamed programs with *interventions*, and named programs with *curricula*. The rationale for this grouping is that named programs and curricula have enough details on who teaches, what is taught, and how it is taught that it could be replicated, whereas unnamed programs or interventions do not have that information published or available without contacting the individual investigator.

The curricula itself, or intervention components, are vital to an understanding of what can and should be taught and how it should be taught for optimal behavior change relative to healthy eating patterns that support healthy weight among younger children. To our knowledge, there are no reviews

that specifically target the K-2nd grade age group with an emphasis on the curricula or intervention components. This age group was chosen due to the importance of having nutrition education in the earlier stages of life to promote healthy eating behaviors.⁵⁵ Therefore, the purpose of this review was to identify and evaluate nutrition curricula and intervention components currently used within K-2nd grade, the specific content, and the impact on behavior change outcomes as reported in the original literature. This evaluation has the potential of furthering knowledge of effective intervention strategies among K-2nd grade in elementary school settings.

METHODS

Initial search

Studies considered for this review were found using EBSCO, PubMed, and Web of Science. The Expanded Food and Nutrition Education Program (EFNEP) website was also searched to determine what programs were being utilized in different states through EFNEP or the Supplemental Nutrition Assistance Program Education (SNAP-Ed) program. Additional studies were found using Google Scholar, as well as those recommended through personal communication with Dr. Jennifer McCaffrey, University of Illinois Extension Assistant Dean, and Dr. Susan Johnson, Professor of Pediatrics at the University of Colorado at Denver. One investigator conducted all searches during August 2013 and January 2014.

Because of the specificity of the research question and the small number of papers expected, a formal systematic review was not conducted; however, aspects of a systematic review were incorporated. Systematic retrieval of articles was conducted, as each database was evaluated in the same way, and used the same search term and inclusion criteria, and included a timetable for conducting the review. Finding an assessment of the individual studies was done using broad and not subject-specific databases as per Standard 3.1.8 by the Institute of Medicine.⁵⁶

Studies were found in PubMed using the search terms “nutrition education” and “school,” and filters including United States, studies published within ten years, humans, and English (n=4394). Other filter criteria for inclusion in the results such as: “children: 2-5 years” and “child: 6-12 years”, and “elementary school” instead of “schools” yielded 250 results. The filter criteria in PubMed of “child: 6-12 years” was included since 2nd grade children are often of the age of 7-8 years old. The same search strategy was used in Web of Science and EBSCO yielding 649 and 455 results, respectively. A broader search method was used to ensure inclusion of all potential curricula used for the K-2nd grade age range as that was the focus of the current study’s search.

Nutrition curricula described (n=12) on the EFNEP website were searched within PubMed and Google Scholar. The same inclusion and exclusion criteria applied and articles were not included if the results were not within the age group in our inclusion criteria.

Articles (n=5498) from all database searches were initially scanned by article title to determine if they were interventions and if the study was conducted in an elementary school setting. Once articles were selected based on title evaluation, article abstracts and/or papers were read to determine if the intervention used a named curricula and if the intervention occurred in the United States.

Inclusion/exclusion criteria and categorization of articles

The types of articles included for this evaluation incorporated those with specific nutrition curricula, as listed by a curriculum name. Those containing one or more nutrition curricula, as well as other types of intervention components, including gardening or cooking, were also included in this evaluation. Articles were limited to those that evaluated outcomes in children who were in K to 2nd grade, and interventions during the school time. Articles were excluded if activities were conducted during after-school hours. There were 11 articles included in this evaluation from the original 5498 articles searched. The types of interventions, curricula content and outcome variables were extracted from each article.

Types of interventions or curricula were categorized as multi-component and as either having control or no control in the intervention. Articles were categorized as either interventions or curricula as previously described.

Outcome variables

Outcome variables were categorized as a reduction of overweight/obesity, changes in food and nutrient intake, and included process evaluation variables such as teachers' level of program implementation, satisfaction, the perception of the program, as well as the students' perception of the program, and barriers and benefits of implementation. Other outcome variables included knowledge change in regards to food, nutrient, and health, environmental changes, and increases in preferences for foods and nutrients.

Assessment of quality

Further evaluation of the intervention or curricula implementation from each article was done by using the behavior change techniques (BCTs) taxonomy tool that is intended to be used as a

systematic specification of behavior change interventions.⁵⁷ There are 93 BCTs that are grouped into 16 cluster solutions that are most commonly found in interventions such as *reward and threat*, *goals and planning* and *self-belief*. For example, within the *goals and planning* cluster, an example of BCTs within this cluster solution include *commitment*, *goal setting (outcome)*, and having a *behavioral contract*.⁵⁷

RESULTS

Curricula

Twelve nutrition curricula were found within 11 publications, in which some used more than one curriculum. Nutrition curricula described in the studies included gardening curricula such as *Junior Master Gardener* and curricula focusing on ways to make healthful choices (Table 3-1). Most curricula (n=11) were part of multi-component interventions that also integrated physical activity and gardening. From the 11 studies, only one study described that the intervention curricula material was based on a theoretical framework of Social Cognitive Theory, cognitive development needs, and the Piagetian education theory.⁵⁸

Curricula content, length, and duration

Curricula content included topics related to healthy eating, food groups, and understanding food labels, and identifying and choosing healthful foods. However, the exact content of the curricula was not stated within the study papers. It is also unclear as to what was taught to which grade levels for all studies or what portion was implemented of the interventions, as only one study noted implementation integrity of the program components.⁴³

Persons who led curricula activities

Some curricula was taught by physical education instructors, trained teachers, or were co-taught by a teacher and doctoral student.^{43,58-62} The study by Nolan et al. (2012), for example, noted that the researchers provided a 6-day workshop for the teachers who were going to participate in the program.⁶² The workshop involved demonstrations, mini workshops and seminars, and a field trip to an orchard to help the teachers acquaint themselves with the curriculum about gardening. Other research papers did not specify who delivered the curricula.^{28,63-66}

Intervention

Table 3-1 outlines the outcomes extracted from the 11 articles that contained a nutrition education intervention and curriculum tailored towards K-2nd grades. Types of interventions included classroom lessons, gardening, cooking, television/multimedia programs, food environment changes, parent involvement via newsletters or parent nutrition education lessons, and the use of behavioral change theory to create intervention components.

Experimental design employed in the interventions

The most common unit of randomization and analysis employed in the studies was through the school, with more than half of the studies reporting randomizing of intervention and control schools. Most studies had control groups (n=9), and interventions ranged from 29 students to 8186 students, and one school to 29 schools total, with an average of 5 schools involved in the interventions. More details on the amount of students, classrooms, and schools in the interventions are noted in Table 3-1.

Assessment of intervention quality

With respect to the assessment of intervention quality using behavior change techniques (BCTs) taxonomy described by Michie et al. (2013), many interventions utilized BCTs which included *rewards, restructuring of the physical environment, exposure, and health consequences* (Table 3-2).⁵⁷ The study by Blom-Hoffman et al. (2004) included BCT techniques of *incentives* (i.e. stickers), along with continuous exposure to curricular messages and *reward and threat*, by providing stickers upon consumption of FV.⁴³ In this intervention, newsletters were sent to parents as a form of *social support* and to create a channel at home for more exposure of the messages that had been taught in school. Similarly, in the intervention described in Belansky et al. (2006), family fun nights were held with healthy foods to allow parents to understand more about what was taught in the intervention, which would ultimately help with encouraging social support at home.⁵⁸

Interventions that included gardening curricula, such as the ones described by Parmer et al. (2009) and Nolan et al. (2012) can be classified with the *shaping knowledge* cluster of the BCTs taxonomy (Table 3-2).^{62,66} The components within this cluster include *instruction on how to perform a behavior*, such as growing the FV components, and later using what they had grown into creating a food dish.⁶⁶ From the 11 studies found, none of the study interventions had BCTs related to the cluster of *goals and planning*.

Evaluation tools used in the interventions

Table 3-2 notes that seven studies used evaluation tools that included questionnaires to assess knowledge change, self-efficacy for healthy eating, nutrition knowledge, and FV identifications and preferences. Some of the prior tools had been previously validated while other tools identified in the interventions were created but not validated (noted in Table 3-2). Nolan et al. (2012) reported that their testing of the reliability of the instrument resulted in a reliability coefficient of $\alpha=0.67$ for the knowledge section of the instrument, a reliability coefficient of $\alpha=0.72$ for the FV preference section, and a reliability coefficient of $\alpha=0.83$ for the FV snack choice section.⁶² A previous study that used this similar instrument on second through fifth-grade students had resulted in reliability coefficients of $\alpha=0.85$ for the fruit portion of the questionnaire, $\alpha=0.81$ for the vegetable portion, and $\alpha=0.79$ for the snack portion.⁶² However, the study of Nolan et al. (2012) combined FV questions as one portion as opposed to two portions of a questionnaire as previously tested. Despite these differences, both tools found improved attitudes towards FV preferences.⁶²

Curricula ranged from 5-18 lessons, and lessons lasting from 10 to 60 minutes (n=9), with one study having a goal of conducting nutrition education for 50 hours per student per school year.⁶⁷ The length of the studies also varied from 5 weeks to 2 years. Lessons from curricula spanned from 5 weeks to being taught over the course of the school year.

Primary outcomes

The primary outcomes included changes in physical measures taken from the students such as weight, blood pressure, and body mass index (BMI) (Table 3-1). Other primary outcomes were measured through the use of surveys such as nutrition knowledge and taste ratings (Table 3-1). Validation of survey tools used was described in 5 out of the 7 studies that used surveys to assess behavior or knowledge change and preferences (Table 3-2). Primary outcomes evaluated by visual assessment (n=3) assessed dietary behaviors changes such as FV consumption at lunch and food identification tests.^{28,43,66}

Six studies had secondary outcomes that authors noted included implementation integrity of program components, preferences of FV, changes in academic scores evaluated from school state testing, evaluation of questionnaires used for nutrition education interventions, and evaluation of the long-term effects of an intervention (Table 3-1). Overall, nine studies showed statistically significant positive effects on outcomes such as blood pressure, BMI, and nutrition knowledge. Table 3-1 reports

the results of the primary and secondary outcomes of the studies along with the name of nutrition education curriculum used.

DISCUSSION

This review focuses on specific content of curricula and intervention components used in K-2nd grade nutrition education interventions and whether these components produced significant outcomes in children from this age group.

Intervention and curricula components

Interventions were multi-component and, in addition to teaching the main curriculum, incorporated additional aspects including a home component via newsletters, lunchtime behavior changes, family activities, gardening, and physical activity components. It is recommended that school interventions have some of the following components: be behavior-focused, multi-component, quantitative evaluations, self-assessments, family involvement, and be sequential and have sufficient duration.⁴⁸ For example, the study by Blom-Hoffman et al. (2004) was multi-component where it had a classroom curriculum component, along with a home component where newsletters were sent home and a lunchroom behavior component where verbal praise was provided to students who consumed FV.⁴³ In this particular intervention, there were differences in the intervention group in terms of nutrition knowledge changes.

Assessment of intervention quality

Many of the studies had components which included *social support, feedback of behavior, exposure, restructuring of the physical environment, health consequences, and incentives*. The difficulty in replication of these studies is not uncommon as many complex interventions present challenges for identifying which components produced a positive effect throughout the intervention.⁵⁷ The study by Michie et al. (2013) suggests that the BCT Taxonomy be used for systematic specification of intervention content to assess what content was most effective.⁵⁷ It is suggested that how these BCTs are delivered may have a greater impact on outcomes and that these dimensions of delivery would benefit from being specified using this BCT Taxonomy.⁵⁷

Evaluation tools used in the interventions

The outcome measures of the present studies evaluated included questionnaires assessing knowledge, preference, attitude, and self-efficacy changes regarding FV. Lunchroom and other visual

observations were made to assess the acceptability of food items. It is important to identify which assessment tools are most reliable and oftentimes, direct observations and questionnaires are combined to assess reliability and validity of tools.⁶⁸ Interventions that are aimed at increasing FV intake, along with physical activity, can assess behavioral changes via questionnaires, such as what was done in a study by Economos et al. (2008).⁶⁸ In this study, they measured the FV intake, physical activity and television viewing of 8-11 year olds and had the children take a questionnaire to identify if what they input was in line with the direct observations of the study staff and the information reported by the parents.⁶⁸ Using test-retest reliability methods, they found that children were able to answer the questions regarding their FV intake, while was also aided by pictures to cue their memory. In conjunction with observer-validated food intake, they found that this method may be promising in assessing FV intake of children.⁶⁸ From the studies evaluated in this review, the use of FV intake questionnaires was not described, and direct observations were most commonly used to assess FV intake.

Visual estimates of plate waste were used to examine vegetable consumption during lunch⁴³ and lunchroom observations were done to examine vegetable items chosen and consumed.⁶⁶ Dietary patterns were observed in one study,⁵⁹ using a Youth and Adolescent Questionnaire (YAQ) that was given to parents to fill out for their child, however, the results of the questionnaire did not specify foods groups or quantify FV consumption; rather, items were grouped according to major macronutrients and micronutrient sources.⁵⁹ Though school-based behavioral assessment tools may be reliable in assessing intake among the 8-11 year old age group, these tools may not be as applicable for younger children who are below the 2nd grade level. More testing on reliable testing methods may be needed to assess FV intake among younger children.

Although lunchroom observations, along with weighed-plate waste, which is considered the gold standard measurement, can help with documenting and assessing children's dietary intake, they are time consuming. Two of the studies reviewed used visual estimates of food consumption to assess FV consumption.^{43,66} The primary investigator of the Parmer et al. (2009) study had visually inspected vegetable consumption but did not provide information about whether the method of observation was a validated technique.⁶⁶ In the Blom-Hoffman et al. (2004) study, research assistants used visual estimation techniques which include methods from Comstock et al. (1981) where a 6-point Comstock Scale is used to determine portion eaten.^{43,69} The two research assistants from the study were trained on the use of the Comstock Scale by the first author and practiced until the research assistants were in

90% of agreement. The use of visual estimate techniques has been found to be a valid and reliable alternative to plate waste measurements.⁴³ More recent methods are identifying the use of digital imaging to measure children's FV consumption within the lunchroom.⁷⁰ Digital imaging was used to compare images of selection and plate waste, and was found to be a reliable measure for estimating children's FV consumption.⁷⁰ This less time-consuming technique may be helpful in future interventions where FV intake can be measured in a school setting.

Curricula content, length, and duration

All curricula included aspects of health and nutrition such as FV and healthy eating. However, many of the curricula descriptions in these studies were not very specific regarding what aspects of gardening, healthy eating, or general nutrition knowledge were discussed. It was also unclear whether the same lessons were used for children of the various age groups. It was reported in the studies that the curricula lesson length ranged from 5-18 lessons and 10 to 60 minutes of instruction. An average of 50 hours of instruction has been shown to change behavior.⁴⁸ Because of the lack of information, it would be difficult to replicate the studies as there was no information about how much actual time the lessons took to complete from the listed curricula and what lessons teachers or health educators used throughout the interventions.

Primary outcomes of the studies

Most primary outcomes of the studies related to changing students' knowledge, attitudes, and preferences toward healthier food options, more commonly, of FV. Similar to a content analysis of Roseman et al. (2011), the studies found in this current evaluation of K-2nd grade programs primarily focused on knowledge change and behaviorally-focused nutrition interventions.⁴⁸ Though articles focused on behavior change in the interventions, only one article specifically mentioned the use of behavior theory in the development of the curriculum.⁵⁸ A review by Cerin et al. (2009) identified interventions involving dietary behavior changes and the relationship of these interventions with theories.⁷¹ Ultimately they found that to change dietary behavior, interventions should target self-efficacy, habit, and outcome expectations which are key constructs of Social Cognitive Theory and the Theory of Planned Behavior.⁷¹ However, they noted that it would be important to find more optimal measures of mediators to assess the validity of the theoretical determinants of specific dietary behavior changes. Still, not much is known about the mechanisms involving dietary behavior change and more needs to be investigated. An after-school nutrition intervention modeling the constructs of self-efficacy

from the Social Cognitive Theory provided statistically significant improvements of self-efficacy among Native American youth of an urban setting, although this age group was older than K-2nd grade.⁷² This intervention, in particular, had activities based on four major sources of efficacy expectations including performance accomplishments, vicarious experience, verbal persuasion, and emotional arousal.⁷² Moreover, lessons focused on various ways of improving self-efficacy by increasing exposure to healthful foods and allowing modeling opportunities among the youth. The use of theory, particularly Social Cognitive Theory, can help in creating a model for an intervention and can provide effective improvements in self-efficacy related to health and behavior.

From the studies that had a primary outcome of improving BMI and blood pressure status, the current evaluation found positive outcomes indicating the potential for nutrition education interventions to help with improving overall health status. Specifically, there have been other school-based interventions that target reduction of BMI among overweight and obese children.⁴⁹ However, evidence is lacking on what parts of these interventions are contributing to the BMI reduction among the children. Many of the studies in the present review lacked process evaluation tools to assess what was implemented by the schools for these nutrition education curriculum materials. Process evaluation helps identify whether an intervention or program was delivered to the appropriate audience, how it was delivered, and potential facilitators and barriers to implementing the program or intervention.⁷³ Process evaluation can support the understanding of the mechanisms of interventions and the possible pathways by which those mechanisms affect specific behavior changes.³⁷ Only two out of the 12 articles indicated using tools to assess implementation integrity of interventions.^{43,58} Similarly, process evaluation measures were lacking or not reported in most studies, as presented in a review assessing the implementation of school-based nutrition programming in schools.⁵⁰ In their search, out of 19 articles, only 6 described process evaluation measures.⁵⁰ More specifically, a study assessing process evaluation in improving children's health in Peru stressed the importance of process evaluation in an intervention and presented strategies of using these process evaluations in future interventions.³⁷ In a study by Robert et al. (2006), researchers diagrammed how the intervention was expected to work and included measures of important indicators in their diagram.³⁷ Such process indicators included dose delivered, fidelity, exposure (dose received), message recall, and proximal outcomes.³⁷ Ultimately, using process evaluation and diagramming this information into a model can provide an outlook on how effective interventions work which may be critical for interventions using limited resources.³⁷

Limitations of the Review

A limitation of this review was that a systematic review approach was not taken. A more detailed systematic review would ensure that the relevance of the study's population, interventions, and outcome measures would be assessed (Standard 3.6, Institute of Medicine, 2011).⁵⁶ The reasoning for not including a systematic review approach to our review was because of our limited research question and the expectation of limited search results.

IMPLICATIONS FOR RESEARCH AND PRACTICE

This evaluation for K-2nd grade nutrition education curricula and interventions helps with guiding future researchers and policymakers in recommending nutrition curriculum for use in schools. Understanding past methodology and outcome measures can help curriculum developers create more effective strategies that meet the needs of the teachers and the students. From the 11 articles found, we found that there have been 12 nutrition curricula used. Additionally, process evaluation tools were lacking from the studies. The use of process evaluation tools, such as tools assessing fidelity and dose-responses, would be helpful in aligning the use of program components and their contributions to the various outcome measures. Using the taxonomy of behavior change techniques (BCTs), most interventions found included techniques related to *exposure* and *incentives* to create changes in behavior. Along with using the taxonomy of BCTs and tying it with intervention content, more research is needed to link BCTs to theories of behavior change and how these can be extended in creating and implementing more effective behavior-change interventions. However, linking interventions with theoretical determinants of behavior is a professional skill that needs to be mastered.⁷⁴ Although there are preliminary attempts that have tried to link BCTs to theory, this is still an ongoing program of research.⁵⁷ A paper by Kok et al. (2004) provides guidance on a protocol of Intervention Mapping which describes the progress of developing theory-based programs since it is often difficult and challenging for health promotion researchers and practitioners to apply theory to practice.⁷⁴ The results of the current review also indicated that only one study had curriculum and intervention components based on behavior theory. Future interventions may try to link behavior change theory and BCTs to build more effective interventions to be used in school systems.

More published impact is needed specifically for this age group and for public and private schools in the United States. The broad range of impact is noted from evaluation of these studies as it has been demonstrated that nutrition education can impact children through their FV intake, healthy

food knowledge, preferences, attitudes, and self-efficacy in consumption of these foods. Despite that some changes, such as in weight or BMI, may need more long-term interventions, there may still be potential for impact in reducing overweight and obesity among school children.

Though it has been demonstrated that nutrition education can impact various attitudes and behaviors among school-aged children, what is vital in evidence-based programming is for the different parts of an intervention to be able to be reproducible in various school settings. Without proper process evaluation or clear understanding of what was carried out in a multi-component intervention, it would be difficult to replicate these methods for use for changing behaviors among school children. Many programs in EFNEP or SNAP-Ed utilize evidence-based programming,^{75,76} and it would be essential to better understand what aspects of these interventions helped produce these health and behavior changes to rightfully deliver these programs in schools through these programs. Further, the various outcome measures make it difficult to compare the effectiveness of different interventions. The establishment of consistent outcomes research, process evaluation, and knowledge of behavior change techniques may be helpful in the replication and delivery of nutrition interventions for changed behaviors in K-2nd grade children.

TABLES

Table 3-1 Outcomes Extracted from Evaluation of Studies with K-2nd Grade Nutrition Curriculum (n=11)

First author (year)	Nutrition education curriculum used	Intervention components	Sample size and target grade	Primary outcomes
Blom-Hoffman et al. (2004) ⁴³	<i>Every Day, Lots of Ways</i>	Classroom/knowledge component using <i>Every Day, Lots of Ways</i> (EDLW) curriculum addressing 5-A-Day goal Home component with newsletters sent to parents (one newsletter for 10 lessons); cookbook with favorite family recipes Lunchtime/behavior component with assistants asking students to identify FV in their lunches, provided verbal praise, and provided stickers	6 K-1 st grade classrooms Average 25 children per classroom (power analysis needed 70 children to detect medium effect size at 0.05 sig.)	Primary outcomes: Changing students' knowledge about healthy eating (2x2 ANOVA) and increasing vegetable consumption at lunch (t-test) <ul style="list-style-type: none"> • Students in intervention group had improvements in nutrition knowledge, at post-test (P<.001) • No sig. differences in vegetable consumption between intervention and control group
Belansky et al. (2006) ⁷⁷	<i>Integrated Nutrition and Physical Activity Program</i> (INPAP)	Classroom lessons (28 lessons) from <i>Integrated Nutrition and Physical Activity Program</i> (INPAP) Three Family Fun Nights were held in school each year (free healthy dinner with foods they learned in class; break-out session for parents to know each other better and an activity)	Resource teacher model: 2 nd grade (n=149), 3 rd grade (n=123) Classroom teacher model: 2 nd grade (n=119)	Primary outcomes: Effectiveness of intervention on students' attitudes, knowledge and self-efficacy (Wilcoxon rank -um test) <ul style="list-style-type: none"> • Students in intervention group had increases in knowledge, attitudes, and self-efficacy related to nutrition and physical activity (P<.05)
Parmer et al. (2009) ⁶⁶	<i>Pyramid Café</i> <i>Health and Nutrition From the Garden</i>	Classroom nutrition education from <i>Pyramid Café</i> and <i>Health and Nutrition from the Garden</i> and one treatment group received gardening experience (Nutrition education [NE]+Gardening [G])	115 2 nd grade students (NE+G) group (n=39), NE group (n=37), Control group (CG) (n=39)	Primary outcome: Fruit and vegetable knowledge (mixed-model ANOVA) <ul style="list-style-type: none"> • NE+G and NE treatment groups had greater improvements in nutrition knowledge for nutrition-food association, nutrient-job association, and fruit and vegetable identification (P<.001)

Table 3-1 Outcomes Extracted from Evaluation of Studies with K-2nd Grade Nutrition Curriculum (n=11) (continued)

First author (year)	Nutrition education curriculum used	Intervention components	Sample size and target grade	Primary outcomes
Tsai et al. (2009) ⁷⁸	<i>Take 10!</i> - nutrition component uses <i>The OrganWise Guys</i> (OWG)	<i>Take 10!</i> program that integrates 10-minute sessions of physical activity and includes discussion guides related to nutrition and health obtained from <i>The OrganWise Guys</i> curriculum	840 students 35 K-6 th classrooms	Primary outcomes: Nutrition and physical activity knowledge (chi-square test) <ul style="list-style-type: none"> • No sig. increase in nutrition knowledge • Increases in physical activity knowledge (P<.001 to P<.05)
Hollar et al. (2010a) ⁷⁹	<i>Healthier Options for Public School</i> (HOPS) - uses curriculum from <i>The OrganWise Guys</i> (OWG) and USDA <i>Team Nutrition</i> materials	<i>Healthier Options for Public Schoolchildren</i> (HOPS) integrated the following: Dietary component: modifications of breakfast, lunches, and extended-day snacks Curricula component: USDA <i>Team Nutrition</i> materials and <i>The OrganWise Guys</i> ; fruit and vegetable gardens at intervention schools Physical activity component: pedometers, WISERCISE from OWG or <i>Take 10!</i> , other opportunities to increase physical activity	2494 children 4 intervention schools, 1 control school	Primary outcomes: BMI, blood pressure (BP) (repeated measures analysis; chi-square) <ul style="list-style-type: none"> • BMI z score and weight z score decreased for girls in intervention compared to control (P<.05 and P<.01, respectively) • Systolic BP decreased for girls in intervention compared to control; during year 1 (P<.05) but not for year 2
Hollar et al. (2010b) ⁶³	<i>Healthier Options for Public School</i> (HOPS) - uses curriculum from <i>The OrganWise Guys</i> (OWG) and USDA <i>Team Nutrition</i> materials	HOPS/OWG integrated the following: Dietary component: modifications of breakfast, lunches, and extended-day snacks Curricula component: USDA <i>Team Nutrition</i> materials and the OWG; fruit and vegetable gardens at intervention schools Physical activity component: pedometers, WISERCISE from OWG or <i>Take 10!</i> , other opportunities to increase physical activity	3769 children 4 intervention schools, 1 control school 1172 children of low-income background	Primary outcomes: BMI, BP, academic scores (repeated measures analysis; chi-square) <ul style="list-style-type: none"> • BMI percentiles improved for all children <ul style="list-style-type: none"> • Sig. improvements experienced by intervention children (P=.007) • Hispanic and Non-Hispanic White children in intervention schools had higher math scores (P<.001)

Table 3-1 Outcomes Extracted from Evaluation of Studies with K-2nd Grade Nutrition Curriculum (n=11) (continued)

First author (year)	Nutrition education curriculum used	Intervention components	Sample size and target grade	Primary outcomes
Katz et al. (2010) ⁵⁹	<i>The Nutrition Detectives Program</i>	<i>The Nutrition Detectives Program</i>	1180 2 nd -4 th grade students 3 intervention schools (n=628), 2 control schools (n=552)	Primary outcomes: Food label literacy and nutrition-related knowledge regarding healthful food choices <ul style="list-style-type: none"> Intervention students had increase in nutrition label literacy (P<.01)
Manger et al. (2012) ⁶⁵	<i>Values Initiative Teaching About Lifestyle (VITAL) program</i>	<i>Values Initiative Teaching About Lifestyle (VITAL) program</i>	14 intervention schools (n=396), 15 control schools (n=301)	Primary outcome: Prevention of excess weight gain <ul style="list-style-type: none"> Adjusted mean BMI percentiles decline and the rates of change in the 2 groups were sig. different (P=.015)
Nolan et al. (2012) ⁶²	<i>Junior Master Gardener (JMG) program</i>	<i>Junior Master Gardener (JMG) program</i>	141 2 nd -5 th grade students	Primary outcomes: Attitudes, preferences, and knowledge toward fruits and vegetables <ul style="list-style-type: none"> Sig. improvements between pre and post- test for increased nutrition knowledge (P=.001), fruit and vegetable preference (P=.011), and snack choices (P=.001)
Rappaport et al. (2013) ⁸⁰	<i>School Nutrition Policy Initiative (SNPI)</i> - uses <i>Planet Health and Know your Body</i>	<i>School Nutrition Policy Initiative (SNPI)</i> , multi-component program School self-assessment, teacher nutrition education training, student nutrition education by the trained teachers, school nutrition policy changes, social marketing, and parent/community outreach	8186 students 5 intervention schools (n=4511), 5 control schools (n=3675)	Primary outcome: BMI z scores <ul style="list-style-type: none"> Non-sig. increases in BMI z-score
Schindler et al. (2013) ⁸¹	<i>School Health Initiative Program (SHIP)</i> -uses <i>The OrganWise Guys</i>	<i>School Health Initiative Program (SHIP)</i> ; uses activities by OWG program Exposure to variety of fruits and vegetables (57 fruits, 23 vegetables)	Intervention group (n=29), control group (n=30); no power analysis	Primary outcomes: Identifying and willingness to try fruits and vegetables <ul style="list-style-type: none"> Children identified more fruits at the end overall (P<.001) Intervention group tried more fruits (P<.003)

Table 3-2 Evaluation Tools and Behavior Change Techniques (BCT) Utilized in Studies with K-2nd Grade Nutrition Curriculum

First author (year)	Evaluation tools (validity stated when applicable)	BCT utilized
Blom-Hoffman et al. (2004) ⁴³	<ul style="list-style-type: none"> -Knowledge change evaluated with curriculum-based measure developed by authors of the EDLW program (test-retest reliability was 0.64 for young children over 2-week period) -Visual estimates of plate waste were used to examine vegetable consumption during lunch (reliability and valid alternative to plate waste weighing; reliability of ratings examined in 33% of lunch trays; 80% mean percentage agreement a priori criterion for acceptable agreement) -Treatment integrity checks conducted by first and second authors across 28% of classroom lessons -Treatment integrity checks conducted across 21% of lunches -Treatment acceptability measures were completed at last week of instruction, using Intervention Rating Profile -Student acceptability of program was assessed using the Children’s Intervention Rating Profile with 3-point Likert scale 	<p><i>Reward and threat:</i> stickers upon consumption of fruits and vegetables</p> <p><i>Associations:</i> continuous exposure to curricular messages</p> <p><i>Antecedents:</i> verbal praise upon consumption of fruits and vegetables</p> <p><i>Feedback on behavior:</i> verbal praise upon consumption of fruits and vegetables</p> <p><i>Social support:</i> newsletters sent to parents as a form of social support (“help bring the lessons home”); development of home-school fruit and vegetable cookbook</p> <p><i>Shaping knowledge:</i> teaching two lessons per week</p>
Belansky et al. (2006) ⁷⁷	<ul style="list-style-type: none"> -Classroom survey (40-item), 5 items on nutrition knowledge, 5 on self-efficacy on nutrition, 6 on attitudes about healthy eating, 4 items on self-efficacy for physical activity, 14 items on attitudes about physical activity, 5 items related to attitudes about watching TV, and one item about gender (survey used prior to previous intervention and test-retest reliability scores for 0.72 for knowledge, 0.75 for self-efficacy, and 0.73 for attitudes) -Classroom observations (one per lesson, filled out Resource Teacher Lesson Documentation Form/Classroom Teacher Observation Form/PRC Staff Lesson Observation Form) 	<p><i>Associations:</i> family fun night, exposure to healthy dinner of what was taught in lessons</p> <p><i>Social support:</i> three family fun nights to encourage social support at the home</p> <p><i>Shaping knowledge:</i> school year, 28 lessons were taught</p>

Table 3-2 Evaluation Tools and Behavior Change Techniques (BCT) Utilized in Studies with K-2nd Grade Nutrition Curriculum (continued)

First author (year)	Evaluation tools (validity stated when applicable)	BCT utilized
Parmer et al. (2009) ⁶⁶	<p>-Fruit and vegetable survey: nutrition knowledge topics about food groups ($\alpha=0.79$), nutrient-food relationship [matching common nutrients to food items such as <i>vitamin C</i> to <i>fruit</i>] ($\alpha=0.82$), and nutrition-job association [matching common nutrients to tasks performed in the body, such as <i>vitamin C</i> to <i>heals cuts and bruises</i>] ($\alpha=0.72$)</p> <p>-Fruit and vegetable preference questionnaire ($\alpha=0.83$); “taste and rate” method, children tasted and rated the fruits and vegetables (method previously developed)</p> <p>-Lunchroom observation form: observation of three variables, type of lunch chosen, vegetable item selection, and if they actually ate the vegetable (previous method not cited as validated/tested)</p>	<p><i>Shaping knowledge</i>: 2 garden curricula used; instruction on how to perform a behavior through growing fruit and vegetables; using these grown fruits and vegetables to create a food dish</p>
Tsai et al. (2009) ⁷⁸	<p>-Pre- and posttest knowledge questionnaires supplied with <i>Take 10!</i> Program (low internal consistency reliability for nutrition and physical activity knowledge, below 0.70 for all items)</p> <p>-BMI assessment (not used as program outcome measure but to assess status of obesity of children)</p>	<p><i>Shaping knowledge</i>: Up to five 10-minute activity breaks each week in the classroom</p>
Hollar et al. (2010a) ⁷⁹	<p>-Weight and BMI z scores, systolic and diastolic blood pressure</p>	<p><i>Antecedents/Repetition and substitution</i>: restructuring physical environment by changing the dietary component of breakfast, lunches, and extended day snacks</p> <p><i>Shaping knowledge</i>: curriculum taught using <i>The OrganWise Guys</i> and <i>USDA Team Nutrition</i> materials; activities included gardening and tastings of Foods of the Month (FoM)</p>
Hollar et al. (2010b) ⁶³	<p>-BMI, blood pressure, academic data from Florida Comprehensive Achievement Test (FCAT)</p>	<p><i>Antecedents/Repetition and substitution</i>: restructuring physical environment by changing the dietary component of breakfast, lunches, and extended day snacks</p> <p><i>Shaping knowledge</i>: curriculum taught using <i>The OrganWise Guys</i> and <i>USDA Team Nutrition</i> materials; activities included gardening and tastings of Foods of the Month (FoM)</p>

Table 3-2 Evaluation Tools and Behavior Change Techniques (BCT) Utilized in Studies with K-2nd Grade Nutrition Curriculum (continued)

First author (year)	Evaluation tools (validity stated when applicable)	BCT utilized
Katz et al. (2010) ⁵⁹	<p>-Nutrition knowledge using standardized test instrument (food label literacy and nutrition-related knowledge regarding healthful choices); uses the Overall Nutritional Quality Index (ONQI) algorithm for the program's messages or "clues" – however, validation of instrument not noted</p> <p>-Dietary pattern using Youth and Adolescent Questionnaire (YAQ) (valid and reproducible in children 9 to 19) to assess dietary patterns, and Harvard Services Food Frequency Questionnaire (FFQ) to assess parent dietary patterns</p> <p>-BMI</p>	<p><i>Shaping knowledge</i>: 5 mini lessons with interactive activities</p>
Manger et al. (2012) ⁶⁵	<p>-BMI change assessed for 2-year period (August 2005 to August 2007)</p> <p>-Teachers' evaluation of VITAL program</p> <p>-Parents' evaluation of VITAL program in other elementary schools</p>	<p><i>Feedback and monitoring</i>: children are provided pedometers and are taught how to use them</p> <p><i>Social support</i>: parent involvement for some of the lessons</p> <p><i>Shaping knowledge</i>: 8 lessons of the VITAL program promoting good nutrition and physical activity; provide children's book about too much junk food</p>
Nolan et al. (2012) ⁶²	<p>-Modified version of the <i>Fruit and Vegetable Preference</i> questionnaire, used to measure fourth and fifth graders' preference (one section asks about preference for FV, the second section asks about knowledge gained from curriculum and gardening project, and the third section asks about demographics) (instrument that was used for this modified version was considered reliable, valid, and easy-to-administer, $\alpha=0.70$ for vegetable portion, $\alpha=0.73$ for fruit portion, and $\alpha=0.74$ for snack portion; this tool was again reported to be reliable with $\alpha=0.85$ for fruit portion, $\alpha=0.81$ for vegetable portion and $\alpha=0.79$ for snack portion when administered for 2nd through 5th grade students)</p>	<p><i>Shaping knowledge</i>: taught <i>Junior Master Gardener</i> lessons</p>
Rappaport et al. (2013) ⁸⁰	<p>-BMI z-scores, prevalence of overweight/obesity, incidence of overweight/obesity, remission of overweight/obesity</p>	<p><i>Feedback and monitoring</i>: School self-assessment</p> <p>Teacher nutrition education training</p> <p><i>Antecedents</i>: school nutrition policy changes</p> <p><i>Associations</i>: social marketing</p> <p><i>Social support</i>: parent and community outreach</p> <p><i>Shaping knowledge</i>: student nutrition education</p>
Schindler et al. (2013) ⁸¹	<p>-Pre-test, post-test to determine if children could correctly identify and try different fruits and vegetables</p>	<p><i>Associations</i>: fruit and vegetable exposure through tastings</p> <p><i>Shaping knowledge</i>: Activities taught through <i>The OrganWise Guys</i> program</p>

Chapter 4.

Development of Surveys and Classroom/Lunchroom Observations to Assess the School Nutrition Environment²

INTRODUCTION

Students spend a large part of their waking hours at a school setting⁸² and various factors in a school environment may influence their eating behaviors.^{82,83} The Centers for Disease Control and Prevention (CDC) developed a School Nutrition Environment Model (Figure 4-1) that presents a pictorial representation of how students' access to healthy food and beverages at school are impacted by food and beverage marketing, healthy eating learning opportunities, and staff role modeling.⁸⁴ To inform and generate guidelines for student wellness, the Child Nutrition and Women, Infants, and Children (WIC) Reauthorization Act of 2004 requires all school districts participating in a federal school meal program to develop a school wellness policy which includes nutrition education (NE) activities, physical activity, and other school-based activities.^{45,85} These different factors may play a critical role in influencing students' health behaviors.

School nutrition environments have been shown to affect students' food consumption⁸⁶ and weight status.⁸⁷ Moreover, participation in programs, such as *Team Nutrition* (TN) which provide technical assistance for schools to influence both the nutrition environment and NE, can impact students' eating patterns.¹³ A past study evaluated school food environments in a sample of US public schools using surveys distributed to food service managers and observation checklists to document competitive foods sold at the schools.⁸⁷ Some environmental characteristics or practices that were examined in the school setting included the availability of low nutrient, energy-dense snacks sold *a la carte* or at vending machines, whole or 2% milk offered, fresh fruit/raw vegetables not offered during lunches, desserts offered more than once per week, and a school having an open campus policy.⁸⁷ In addition to the nutrition environment, factors influencing levels of NE implementation have also been assessed.⁴⁵ Despite the inclusion of NE in school wellness policies, there may be difficulty in introducing NE because of barriers such as inadequate resources to incorporate nutrition competencies, or

² Masis N, Johnson S, McCaffrey J, Chapman-Novakofski K. Nutrition Environment Survey Development for Elementary School Settings. In: *Society for the Advancement of Chicanos and Native Americans in Science (SACNAS) Abstracts.* ; 2014:FRI-G48.

inadequate classroom time to incorporate nutrition competencies, particularly in low-income school settings.^{85,88} Because of the complexities of the school environment and NE offered in schools, the current study aimed to develop a survey that encompasses various factors that may affect the school environment: school wellness policies, committees involved in wellness at schools, partnerships the school has, NE information and barriers to implementation, and factors that influence the nutrition environment and barriers to enhancing the nutrition environment. To assess differences in the nutrition environment, the surveys were distributed to two schools near Chicago, IL. Additionally, school, classroom, and lunchroom observations were conducted at the two schools to assess the physical environment.

METHODS

Participants

Two schools near Chicago, IL were selected for this project based on their affiliation with the University of Illinois Extension. One school was located in Addison, IL and one was in Waukegan, IL. The school located in Addison, IL participated in the USDA Fresh Fruit and Vegetable Program (FFVP) and will be known as the FFVP school throughout this dissertation, and the other school in Waukegan, IL did not participate in the program (non-FFVP school). The two principals from these elementary schools agreed to have their schools participate in the current study. There were no identifiers in the survey or in the school, classroom, or lunchroom observations. The study protocol was approved by the Institutional Review Board of the University of Illinois at Urbana-Champaign.

In addition to the FFVP, the school in Addison, IL participated in additional activities provided by the University of Illinois Extension and researchers from the Dr. Chapman-Novakofski laboratory. The activities were part of the current study's project called The FoodWise Project. The additional activities of The FoodWise Project are described below in more detail:

The FoodWise Project

The FoodWise Project Activity Booklet

An activity booklet with activities for teachers was created for The FoodWise Project (Appendix A). It contains both short and long activities related to fruits and vegetables. The short activities are activities that are intended to be shorter than 5 minutes and are recommended to be completed at the beginning of class. The long activities are greater than 5 minutes and up to 30 minutes and range from

drawing fruits or vegetables or having interactive games. The booklet has 15 short activities and 29 long activities. Activities were found either online or through modifications of similar activities conducted with children from the K-2nd grade age group. Each activity lists a nutrition objective, the Common Core standard that it fulfills, materials needed, instructions, and a reference link. The aim of the activities is to increase students' exposure to fruit and vegetables through interactive and fun activities. The activity booklet was distributed to all teachers in K-2nd grade at the FFVP school. In addition to the activity booklet, fruit and vegetable plush toys and grocery totes, and additional activity sheets were provided to the teachers to accompany the activities in the booklet.

Additional activities provided to the school

The FFVP school was provided additional activities and resources throughout the year. There were monthly bulletin boards made for the FFVP school on topics related to healthy eating and fruits and vegetables. There were also monthly activities and themes provided by the research team for the school, such as campaigns like "Favorite Fruit," "Favorite Vegetable," "5 or More," "Garden Month" and a "Career in Nutrition" day for National Nutrition Month.

Book reviews

The curriculum at both schools (FFVP and non-FFVP schools), *The OrganWise Guys* (OWG, Duluth, GA),⁸⁹ was reviewed for nutrition messages, unclear food/nutrition messages, and wrong information regarding food/nutrition. Topics were explored by a doctoral student and an undergraduate nutrition researcher, and content had a final assessment by the principal investigator. Topics and items that were explored included the OWG books, DVDs, and plush toy activities.

Development of School Nutrition Environment Survey

School nutrition environment surveys were developed based on a review of previous literature and past surveys^{82,85,88,90-95} that have assessed different aspects of the nutrition environment, policies related to foods, and information about NE in schools. Surveys were developed for staff members who would know different aspects of the nutrition environment: principals, teachers, food service directors/managers, and community workers/health educators who teacher NE. The survey for principals contained 87 questions, the teacher survey contained 119 questions, the food service manager survey contained 71 questions, and the community worker survey contained 66 questions. Table 4-1 notes the questions and information derived from the literature or other past surveys and how

they were incorporated in the different surveys. Further, Table 4-2 has information about the categories and topics found throughout the surveys.

A research team composed of a professor in nutrition, a professor with experience in school nutrition interventions, and an assistant dean of family consumer sciences reviewed the surveys' content. Surveys were then modified and would be reviewed for content and face validity.

After exemption by the University of Illinois Institutional Review Board (IRB), a panel of reviewers was identified to cover the breadth of occupations and perspectives (n=7) for content and face validity of the surveys. These individuals were identified through the affiliated elementary schools that the University of Illinois Extension worked with and were contacted via phone or e-mail. Occupations from those identified included school principals, an occupational therapist, community workers working with the University of Illinois Extension, and a food service manager. Feedback from individual panel members was gathered through interview and written comments. Specific questions were asked about the wording of the survey questions or phrases for clarity, the option of having the survey in an online format, and questions regarding formatting (font, colors, page breaks, check boxes, bolding, headings). Participants were also asked about further suggestions or thoughts about the overall survey, and emergent probes were used at the time of the interviews.⁹⁶ Some comments included issues with survey length, questions being relevant to survey taker, question formatting, and confusing wording. Comments were gathered and consensus on changes was achieved by a discussion of each item by three researchers. A summary of the comments and changes made to the surveys is provided in Table 4-3. Surveys were then modified and input in an online survey tool (Qualtrics, Provo, UT, 2014). The final modified surveys and informational letters are located in Appendix B. The final survey for principals contained 51 questions, the teacher survey contained 46 questions, the food service manager survey contained 73 questions, and the community worker survey contained 32 questions. The surveys were distributed at the beginning and end of the school year to teachers, school administrators, school food service staff, and community workers at the FFVP and non-FFVP school.

Development of school/classroom/lunchroom observation protocols

School, classroom, and lunchroom observations were to be conducted in both the FFVP and non-FFVP school to better inform the researchers of the physical school nutrition environment, including things that may affect the environment such as nutrition marketing around the school, visible food policies, and messages regarding nutrition. Further, these observations were to be conducted to aid the

researchers in developing a better understanding of the data collection sites at the two schools and because of the notion of fieldwork observations potentially positively contributing to the survey collections and analyses.⁹⁷

Before conducting physical observations at the FFVP and non-FFVP school, protocols and data collection forms were developed to capture various components of the school nutrition environment. The protocols and forms were based on past literature describing classroom⁹⁸ and lunchroom observations.⁹⁹ Information about the type of nutrition or food-related messages and policies to look for in the school setting were included in the protocol and forms developed for the observations. The protocols and forms were pilot tested by the current doctoral student at a local Champaign County elementary school to assess completeness and appropriateness of the protocols and forms. Modifications were made to the forms based on the pilot testing and discussion with researchers of the project. Classroom and lunchroom training procedures and reference protocols are located in Appendix C. Prior to attending the FFVP and non-FFVP schools for observation, a training was conducted with an undergraduate nutrition student who would accompany the doctoral student in assessing the classroom and lunchroom environments at the FFVP and non-FFVP school. The training included information about where to visually find food/nutrition-related items in the classroom/lunchroom settings and what the observations would entail. The two observers went to the FFVP- and non-FFVP school elementary schools and observed a total of 22 classrooms and 2 lunchroom settings. Two observers were used in this process to ensure consistency of observations

Throughout the course of the academic year, school observations (Table 4-4) were noted on a School Inventory Form when monthly visits were conducted in the schools. These observations captured the food/nutrition-related items (i.e. posters, decals) that appeared throughout the school outside of the classroom and lunchroom setting.

RESULTS

School Nutrition Environment Survey

The total number of participants for the surveys distributed at baseline included two elementary school principals (one from each school), three community workers (1 from the FFVP, and 2 from the non-FFVP school), three food service workers (1 from the FFVP, 2 from non-FFVP school) and 14 teachers (9 from the FFVP, and 5 from the non-FFVP school). There were a total of 21 teachers who

were contacted, and there was 100% participation rate from the principal, community workers and food service workers.

From the principal surveys, it was determined that one principal had read the school wellness policy and the other had not. Additionally, it was found that one school had a committee in place to enforce the school wellness policies and that the committee met more than six times per year with members including administration, physical education teacher, and parents. For both schools, written policies included the prohibition of withholding food as punishment and the prohibition of fundraising low nutrient value foods, and that healthy foods be offered at celebration parties, classrooms, in school events, and *a la carte* in the lunchroom. Both principals agreed that there were healthy eating posters around the school and that their school had bulletin boards related to healthy eating. One principal noted that there were school announcements about healthy eating. Regarding lunch time, the average time the children had for the lunch period ranged from 20 to 22 minutes, and that children typically went through the lunch line in one minute. Principals mentioned that the lunchroom monitors encouraged children to eat fruits and vegetables. Most items available at the schools included baked, low-fat chips; ice cream, pretzels, fruits, vegetables; nuts and seed mix, and yogurt. Both principals said that food and nutrition information was available to parents via newsletters, classes, parent-teacher association (PTA), signs around the school, and family events. Both principals mentioned that there was too little NE available at the schools and the major barriers to implementing NE are time and lack of funding.

The community workers (n= 3) noted that they used curriculum guides, supplementary materials, and newsletters/magazines to teach nutrition. One commented that it would be useful for teachers to use NE during snacks/celebrations. Additionally, community workers noted that they taught NE 12 to 800 times per year, with lessons ranging from 30 minutes to 1 hour in length. Food service manager survey results (n= 3) revealed that breakfast time lasted from 5 to 20 minutes and the milk types offered included 1% milk, 1% chocolate milk and skimmed options. Typically, the schools revealed that 1 to 3 or more entrees were offered for lunch, only one school had a salad bar, and no fruits or vegetables were located at the front of the line at either school. Some of the feedback that the managers obtained from students were often based on the opinions of the food offered, the amount of time to eat for the meal, cafeteria atmosphere, and beverages offered. Some barriers noted by the food service managers for offering NE was the lack of time within the school, funding, planning time, interest, school wellness policy, and lack of reinforcing nutrition messages in the home setting.

Lastly, when teachers (n=14) were surveyed, fewer than half of the teachers (n=5) noted that there was a specific NE curriculum in the classroom. Almost all teachers (n=13) said that there was too little NE in the classroom. From the 14 teachers who responded, ten taught nutrition and four did not teach nutrition. Overall, the items the teachers noted that would be helpful to teach nutrition included curriculum guides (n=10), supplementary materials (n=10), newsletters/magazines (n=7), textbooks (n=2), audio/visual aids (n=9), computer software (n=4), culturally sensitive resources (n=5), other tools such as food samples, and Spanish teacher resource books (n=2). Of the teachers who taught nutrition, they noted that they taught 1 to 5 times per year and that lessons were less than 30 minutes (n=6), or from 30 minutes to an hour (n=3). The top ways teachers found in introducing NE in the school was through partnering with outside organizations to provide NE (n=12), family programs including NE (n=10), implementing a school wellness policy (n=9), and having a nutrition module at the school (n=9). The top barriers to integrating nutrition for teachers were having enough time to cover nutrition (n=12), nutrition messages not being enforced at home (n=12), and lack of materials (n=13). Some strategies that the teachers had in involving parents in NE were to send home materials (n=9), and to ask parents to send healthful snacks (n=11). Most teachers, however, did not communicate nutrition information to parents (n=8). Teachers noted that the healthy nutrition environment in their school was due to the implementation of school wellness policy (n=5). According to the teachers, the top ways that their school enforced a healthy nutrition environment was through having meals that included a variety of foods (n=12), offering low-fat, fat-free milk, and having healthy foods at school parties (n=9). The majority of the teachers (n=8) noted that there were no school-wide written policies on food and that they did not have classroom policies on food (n=8).

The survey was re-distributed to the schools at the end of the school year. The total number of participants included the 2 principals (1 from each school), 2 community workers (1 from each school), 1 food service manager (1 from the non-FFVP school), and 12 teachers (6 from the FFVP, 6 from non-FFVP school; however, there were only 5 completed surveys total). There was 100% participation rate from the principals, 67% participation rate from the community workers, 33% participation rate from the food service managers, and 44% participation rate from the teachers.

From the principal survey, both principals had reported reading the district level school wellness policies, a notable change from before where only one principal had reported reading the policy. Additionally, school wellness policies were initially not part of the student handbook, and that changed as the principals noted that the policies were now in the handbook and the handbook was distributed to

families on a yearly basis. Both principals also noted that their schools had a committee to oversee these policies, whereas before, only one mentioned having a committee. Of the written policies in the school, changes among the principals including now having policies regarding prohibiting food as a reward, prohibiting the advertising of foods with low nutrient value in the school building, and policies regarding that predominantly healthy food and beverages are offered in school stores, fundraising activities, and other concessions sold on the school campus. In this survey round, both principals noted that school staff provided positive role modeling by hosting events that serve healthy foods; however, only one principal noted that there were bulletin boards about healthy eating whereas before, both had mentioned they had this component. One school had acquired a garden, a change from the beginning of the year. Their school had a garden club and used curriculum related to using the garden to teach different subjects. One principal mentioned that the right amount of NE was given and found that integrating NE in the schools could be accomplished via teachers receiving professional development, and that a NE module be included in the Common Core curriculum.

Community workers (n=2) still reported that there was too little NE at the schools, and revealed that when they taught nutrition, they used curriculum guides, newsletters or magazines, and audio and visual aids. Regarding teaching nutrition competencies, community workers noted that they either did or did not have access to professionals to assist in teaching nutrition to students. Responses were split with a community worker noting that they did not have enough time to adequately teach nutrition and another noting that they did. One community worker now described a garden that was used as a kitchen classroom to cook or eat food grown in the garden, whereas before there was no community worker describing the use of a garden to teach. Community workers showed support for the school wellness policies and had adopted them (n=2).

When the food service manager survey was re-distributed, only one food service manager responded to the survey. Previous responses to this survey noted that there were more ways that the school supported a healthy nutrition environment including offering healthy a la carte choices and implementation of the school wellness policy, whereas this round, these two items were not chosen. The new responses for top barriers in creating a better nutrition environment included the school not understanding the impact of the nutrition environment on the food choices the students make, a better nutrition environment not being a priority at the school, and lack of community support. The issues of lack of funding, lack of interest, and the school wellness policy not being reinforced were still apparent for top barriers to integrating NE at the school.

Lastly, when teachers (n=12) were surveyed, more than half of the teachers (n=6 out of 9) responded that there was still too little NE available and 3 noted that there was the right amount of NE which differed from the previous evaluation where only one noted that there was the right amount. Among the teachers, the top tools that would be helpful to teach nutrition were the curriculum guides (n=7), supplementary materials (n=7), and audio/visual aids (n=8). Teachers responded that nutrition was taught up to 10 times per year or as an ongoing occurrences and that lessons were 30 minutes to an hour. In the previous survey distribution, there were more teachers that noted that nutrition was taught once, twice, a year, or taught 4 to 5 weeks as a complete unit during science, and that lessons were less than 30 minutes. The top 2 ways of introducing or expanding NE were having a nutrition module and partnering with organizations providing NE; which shifted from before where the top 2 ways were family programs in NE and also partnering with organizations. Similar to the responses in the previous survey distribution, lack of time and materials were still among the top barriers to integrating NE at the school. The top strategy for a school to create a healthier nutrition environment was allowing students to have at least 20 minutes to eat lunch after obtaining food, and this differed from the previous top method, where teachers noted that meals should include a variety of foods. It was found in this survey distribution round that the top barriers in creating a healthier nutrition environment were that it not a priority at the school and lack of interest, whereas before, teachers noted the barriers of having a healthy environment were the high costs of healthy snacks and easy access to unhealthy convenience foods.

Summary of school, classroom and lunchroom observations

The school observations showed that most items around the school were posters by the USDA with messages relating to healthy eating and physical activity. Schools had 19 to 24 food or nutrition-related items such as posters, bulletin boards, and student artwork around the schools. A summary of the items around the schools is located in Table 4-4.

When two observers entered the classroom and lunchroom environments, there were some differences in observations (Table 4-5 and Table 4-6). Classroom observers did not always agree when listing observations, such as nutrition-related books on bookshelves. There was the most agreement with large, visible items (i.e. posters), but there were issues when students were present which may have made observations more difficult. Because of the broadness of the scope of the observations (i.e. including food-related and nutrition-related messages), items such as welcome signs with apples or cupcake images, and more inconspicuous items (i.e. food on a USA map) were also included in the

observations. The lunchroom observations were discordant with “food is easy to see and reach” and “food is easy to eat”. There was agreement on the order of food items and noise levels but time during lunchtime varied between two observers (i.e. one noted it took 20 minutes for completion and another noted 32 minutes). There was more agreement on items on the forms that used a checklist-style of answering the question. Because both observers were positioned in different parts of the lunchroom, position in the lunchroom may affect information written in the observations.

Overall, the classroom observations revealed that some teachers at the FFVP school had nutrition posters by the USDA (provided by The FoodWise project) and had FV plush toys and grocery totes visible (Table 4-5). Additional items in the classroom related to apples (most common item) and dessert-like items (cupcakes/cakes). Both schools had food-related items located on either bulletin board borders or Letters/Math-related activities.

Lunchroom observation differences showed that the FFVP school had more items related to food on posters and murals than the non-FFVP school (Table 4-6). The FFVP school also had 4 options of FV in the lunch line compared to the non-FFVP school which had 3 options. The vegetables were placed in the middle of the lunch line at both schools, and the fruits differed in placement, where one school had fruits at the front of the line and the other school had the fruits at the end of the line. It took 20 to 32 minutes for lunch to be served at one school and it took 5 to 10 minutes at the other school. It took students at the FFVP school from 5 seconds to 3 minutes, 4 seconds to go through the lunch line, and it took students at the non-FFVP school from 8 seconds to 2 minutes, and 7 seconds to go through the lunch line. The salad bar caused some delays at the FFVP school. Noise levels also differed between the two schools as well as how many lunchroom monitors were present. Figure 4-2 and Figure 4-3 presents pictorial representations of the two lunchroom settings.

DISCUSSION

From the school nutrition environment surveys, it was found that there were written policies regarding food at the schools to offer more healthful options at celebration parties, classrooms, in-school events, and sold *a la carte* in the lunchroom. A conceptual model made for the study of nutrition environments includes variables that may impact eating patterns such as those found in the organizational nutrition environment, which encompasses the home setting and school setting.¹⁰⁰ Further, the availability of FV and school lunch selection correlates with youth FV consumption which shows the importance of the nutrition environment in impacting children’s food behaviors.¹⁰⁰ In the

current study, despite the availability of healthful options at the school, school staff noted that there were barriers in incorporating NE in the school environment such as lack of funding and time. This is not an uncommon issue encountered as other studies assessing schools have reported similar barriers.^{85,88} Furthering professional development in NE and providing more resources may be helpful in mitigating these barriers. Another study reported that the teachers had inadequate resources to incorporate nutrition competencies, which was due to a lack of exposure to available teaching materials and resources.⁸⁵ Teachers in the current study found that there was too little NE in the classroom and found that it would be helpful to partner with other outside organizations to have NE and that it would be helpful to have more family programs incorporating NE. Having more parental involvement and family involvement may help in developing a psychosocial environment that encourages healthy eating.¹⁰¹ Food service managers in the current study found that the lack of continuing positive reinforcements of nutrition messages at the home setting was a barrier in improving NE, which is problematic, seeing that home engagement may be important in establishing positive, healthy eating behaviors in children.¹⁰²

In regards to school wellness policies, the baseline survey results noted that one school had a committee in place to enforce the school wellness policies and that they met up to 6 times per year; however, the majority of the teachers surveyed noted that there were no enforced school-wide written policies on food. To increase accountability, committees may be useful and may lead to more favorable outcomes for school wellness policies.¹⁰³ One study found that schools with higher academic performance along with higher economic status developed stronger wellness policies.¹⁰³ Ultimately, what would be helpful to the success of a school wellness policy and its implementation may be more resources for teachers and having a school health council, for example.⁸⁵

The school observations showed that most items around the school related to healthy eating or physical activity were posters. Nutrition-related items around the classroom were very limited and were primarily about foods used in celebrations, like cupcakes or cakes. Another study evaluating barriers to having NE at schools found that classroom teachers needed more support such as teaching plans, posters, and pamphlets to help guide students.¹⁰⁴ In addition, having classroom NE that complements the changes in the school environment can help with creating positive change in children's behaviors.³⁵ A study found that an intervention incorporating both classroom and lunchroom enhancements was more effective in modifying psychosocial aspects of children such as self-efficacy in preparing FV at home, and eating vegetables for lunch.¹⁰⁵ This particular study noted the importance of more

comprehensive approaches in schools to address the issues of obesity epidemics, such as including educational, environmental, and behavioral economics approaches to such strategies.¹⁰⁵

Specific to the lunchroom environment observed in the current study, there were murals and posters related to FV. Major differences between the two lunchroom settings included the disposal of the food items, positioning of the FV, and the noise level. Another study incorporated cafeteria enhancements to encourage healthy eating through a project called *Project ReFresh*.¹⁰⁵ The cafeteria enhancements included placing healthy items at the beginning of the lunch line, displaying a menu describing what foods were available each day, partnering with the art department to develop a student art assignment to promote healthy foods, posting fun facts about FV and grains served, giving healthy foods descriptive names, using verbal prompting to encourage selecting of targeting foods, inviting guests to serve lunch, displaying endorsements of students and staff, and offering lunch with the principal or other staff as a reward.¹⁰⁵ Their study found that both classroom-based NE and cafeteria enhancements have the potential to influence diet-related behavior among children.¹⁰⁵ Lunchroom enhancements have also been piloted by the *Smarter Lunchroom* movement, where changes to the lunchroom included improving the convenience of FV, improving the attractiveness of FV, and making the selection of FV seem normative.¹⁰⁶ These enhancements were effective in guiding students to choose more FV.¹⁰⁶ A study by Williamson, et al. (2013), evaluated the results of two projects (*Wise Mind* and *LA Health*) that aimed to examine environmental factors for weight prevention by focusing on modifications for eating habits and physical activity.¹⁰⁷ The modifications made for changing eating habits included a cafeteria modification program to align the school lunches with recommendations from the American Academy of Pediatrics, and classroom environment alterations which included adding posters, handouts, and display items in both the classroom and cafeteria.¹⁰⁷ The researchers found that approaches such as these provided significant improvements in childhood nutrition.¹⁰⁷

Though our study explored the nutrition environment of the two schools via both surveys and physical observations, there were some limitations. First, there was limited participation in the second round of the survey distribution. Additionally, because the observations included both food- and nutrition-related items, items related to any type of food were included even though they were not necessarily healthy. Additionally, both the observations and survey were not made to link to one other to assess concurrent validity of the survey tool which could have strengthened this portion of the project.

Subtle changes in the lunchroom environment, such as the positioning of FV or having posters and displays related to nutrition may be beneficial in impacting children's diet-related behaviors. Observing the two school lunchroom environments was beneficial to the researchers in the current study in observing the subtle differences between the schools, but more information is needed in understanding how children's FV preference and intake may be impacted by the changes and differences in the school, classroom, and lunchroom environments among the two schools. Nonetheless, the survey and observational information obtained from the current study helped the researchers develop strategies for data collection for the future portions of the dissertation project. Survey and observational school environment data may be essential for future researchers to better understand the school nutrition environment in which they are working in before collecting data and conducting an intervention at a particular school site.

TABLES

Table 4-1 School Nutrition Environment Survey Questions Derived from Literature Sources

Studies or sources used for survey content	Survey(s)	Sections in the survey that incorporated source
<i>School Environment and Policy Survey, 2011-2012, Module 1</i> ⁹⁰	Principal Teacher Food service manager Community worker	<ul style="list-style-type: none"> • School committee and teams • Written policies that apply to food at your school • Communicating school health policies • Features that apply to your school recess • School lunchroom and eating environment • State and national policies • Availability of foods and beverages other than school meals • Curriculum, staff training, and requirements • Information about you and your school • Participant and school demographic questions • Progress of school wellness policy
<i>School Environment and Policy Survey, 2011-2012, Module 2</i> ⁹⁰	Food service manager	<ul style="list-style-type: none"> • USDA School Breakfast and National School Lunch program • Information about you and your school
<i>SHPPS Food Service School Questionnaire, 2006, CDC</i> ^{91,92}	Food service manager	<ul style="list-style-type: none"> • Preparation of cooked foods • Condiments • Collected suggestions about food service program from students, staff, family • Certifications as dietary manager • Staff development training information
<i>HS Barriers & Bridges Survey</i> ⁸⁸	Principal Teacher Food service manager Community worker	<ul style="list-style-type: none"> • Nutrition environment • Nutrition education in schools • Information about you and your school
<i>Food and Fitness: School Health Policies and Practices Questionnaire 2013</i> ⁹³	Principal Teacher Food service manager Community worker	<ul style="list-style-type: none"> • School reporting to district regarding local wellness policy components • Information about you and your school

Table 4-1 School Nutrition Environment Survey Questions Derived from Literature Sources (continued)

Studies or sources used for survey content	Survey(s)	Sections in the survey that incorporated source
Lambert LG, Monroe A, Wolff L. Mississippi Elementary School Teachers' Perspectives on Providing Nutrition Competencies under the Framework of Their School Wellness Policy. <i>J Nutr Educ Behav.</i> 2010;42(4):271-276.e4. doi:http://dx.doi.org.proxy2.library.illinois.edu/10.1016/j.jneb.2009.08.007. ⁸⁵	Teacher	<ul style="list-style-type: none"> • Participant and school demographic questions • Progress of school wellness policy
<i>Nutrition Education in Public Elementary School Classrooms, K-5 Survey and the Nutrition Education in Public Elementary and Secondary Schools, K-12 Survey</i> ^{94,95}	Teacher	<ul style="list-style-type: none"> • How nutrition is taught
Finkelstein DM, Hill EL, Whitaker RC. School Food Environments and Policies in US Public Schools. <i>Pediatrics.</i> 2008;122(1):e251-e259. doi:10.1542/peds.2007-2814. ⁸²	Principal Teacher Food service manager	<ul style="list-style-type: none"> • Guided questions on policies related to foods • Guided questions regarding availability of competitive foods and beverages

Table 4-2 Common Categories Found in the Content of the School Nutrition Environment Surveys

Survey	Categories found in the surveys
Principal	<p>School committee and teams</p> <p>Written policies that apply to food at school</p> <p>School health environment</p> <p>Nutrition environment</p> <p>Curriculum, staff training, and requirements</p> <p>Nutrition education in schools</p> <p>Information about you and your school</p>
Teacher	<p>School committee and teams</p> <p>Written policies that apply to food at school</p> <p>School wellness policy</p> <p>School health environment</p> <p>Nutrition environment</p> <p>State and national policies</p> <p>Availability of foods and beverages other than school meals</p> <p>Curriculum, staff training, and requirements</p> <p>Nutrition education</p> <p>Teaching nutrition education</p> <p>Information about you and your school</p>
Food service director/manager	<p>Questions about food program at school</p> <p>USDA National School Lunch Program for elementary school students</p> <p>Nutrition education</p> <p>Nutrition environment</p> <p>Information about you and your school</p>
Community worker	<p>Written policies that apply to your school</p> <p>School wellness policy</p> <p>School health environment</p> <p>State and national policies</p> <p>Curriculum, staff training, and requirements</p> <p>Nutrition education in schools</p> <p>Teaching nutrition education</p> <p>Information about you and your school</p>

Table 4-3 Summary of Comments and Changes Made to the School Nutrition Environment Surveys

Survey	Comments made	Changes made
Principal	Awkwardly worded questions; making questions shorter; principals may be busy; gave suggestions on questions on where to input examples; arranging similar questions together; changing formatting of questions	Changes arrangement of written/unwritten policy questions; consolidated questions
Teacher	Online format would be helpful; shorten survey; formatting issues; teachers may not have time and may skip through it; appropriateness of some questions to teachers; excluded and added answer choices for certain questions; screener question for whether teacher knows about policies at school	Screener question added for policy-related questions; question formatting changes
Food service director/manager	Issues with question length, lack of colors, one-side of sheet, portrait, bolding may be appropriate; included answer options for school lunch program; consolidating some answer choices; editing relevance of answer choices (i.e. instead of state-testing, changing to Partnership for Assessment of Readiness for College and Careers [PARCC]);	Included food procurement; arrangement of survey questions; long questions divided into smaller questions
Community worker	Relevancy of questions to the role of a community worker; ordering of questions; eliminating answer choices; formatting questions	Eliminated policy-related questions; included more about their own teaching of nutrition or health

Table 4-4 Results from School Inventory Form used to Assess Environment of Both Schools

School	Date	Food/Nutrition-related item	Item-type	Size	Location
FFVP school	December 18, 2014	24 items: Posters related to healthy eating, being brave to try new foods, USDA posters about powering up with foods, fruit-related items for name tags and welcome sign items	Posters, welcome signs, name tags	Medium to large	Near classrooms and hallways
Non-FFVP school	December 18, 2014	23 items: Posters regarding eating breakfast before playing, healthy eating from head to toe, Choosing MyPlate, enjoying fruits and vegetables; USDA posters	Some posters, student art, drawings, small decals of fruits and vegetables	Medium to large-sized, small student art	Near nurse's room and in the hallways
Non-FFVP school	Jan 26, 2015	21 items: Posters related to healthy eating head-to-toe, eating a variety of vegetables, being active, and assessing drink preferences, small drawings of food items (gingerbread, hamburgers, apples)	Mostly posters, name tags, display, drawings	Items were mostly large, some medium-sized posters	Located near nurse (most), near staff lounge, and some classrooms

Table 4-4 Results from School Inventory Form used to Assess Environment of Both Schools (continued)

School	Date	Food/Nutrition-related item	Item-type	Size	Location
FFVP school	March 20, 2015	20 items: Items related to fruit day and vegetable day, eating smart, and USDA themes regarding trying new foods and powering up	Most were posters and small decals	Items ranged from small to very large	Near main office and hallways
Non-FFVP school	March 20, 2015	23 items: Items related to sugar shockers, getting up and moving; healthy eating from head to toe	Mostly posters and small decals of FV	Small, medium, mostly large/medium posters	Nurse's office and some classrooms and hallways
FFVP school	April 17, 2015	19 items: Same posters and items; powering up with foods	Posters and name tags; decals	Mostly large and small	Near some classrooms; office
Non-FFVP school	April 17, 2015	23 items: Posters related to making a plate half FV, sugar shockers, Rethinking the drink, MyPlate	Many posters and student art	Mostly small, medium sized items	Near nurse's office

Table 4-5 Summary of School Observations Collected from 2 Elementary Schools Using the Classroom Nutrition Environment Observation Form

Item number	Non-FFVP school	FFVP school
1) Door and door frame	0 to 1 items on door: <i>Welcome</i> sign with apples, apple decorations (spelling out 'Manners')	0-1 items: One apple on list of names, <i>Welcome</i> sign with an apple
2) Ceiling	Only 1 classroom had 1 item: Student drawings (only 1 apple)	One classroom had hanging apples
3) Windows	Poster of the alphabet (in Spanish); some food posters (ice cream, jam, apple, orange, yogurt); one poster with a lunch bag/apple; word posters (i.e. <i>Ff – Fruit, Qq – Queso</i> [cheese]); little vowel posters (apple, jam, ice cream)	1 <i>Welcome</i> sign with an apple; 1 decal with an apple; poster with colors and different food items
4) Walls (all four walls)	2 to 8 items: Student drawings (fruits and cheese); <i>Pizza Party</i> signs, <i>Time Telling</i> poster [time to eat dinner]; Mostly mini posters about letters, birthday posters, having items like popcorn, cupcakes, meat, apples. Most posters had images of apples, cheese, soup, MyPlate, tasting foods; one wall had border with tomatoes.	3-9 items: some posters on <i>The OrganWise Guys</i> and Foods of the Month; USDA poster on fruits and vegetables, some pictures of cupcakes and cake; policy paper on no gum or candy; USDA poster of trying new foods; bulletin board border with apples; <i>Letters</i> (and foods to represent items like apples, egg, oranges, pineapple); counting with foods
5) Floor	One rug had an apple on it (Letters rug)	Rug with alphabet (eggs, grapes, lollipops, watermelon)
6) Teacher desk/workspace	Date display blocks with an apple; <i>The OrganWise Guys</i> workbooks	Plush toy with apple; apple items; apple figurines
7) Student desks/tables	1 classroom: name tags with apples, eggs, and peas	Name tags with small apple pictures; 1 classroom with apple, egg, peas, watermelon on some name tags
8) Bookshelves (number of bookshelves)	One to 10 bookshelves: some classrooms lacked books related to food but up to more than 6 books; some books in boxes/bins. Some in Spanish (i.e. soup, gingerbread man, plants); books related to cooking, lunch, seeds, an <i>Apple a Day</i> ; few Big Books on food-related items.	Up to 11 bookshelves: more than 6 books and some about topics related to cupcakes, cookies, apple tree; from seeds to pumpkins/plants; contents about food and carrots, apple picking, garden; one book on healthy snacks
9) Other location: _____	Near floor, a poster on "How Apples Grow"; shelf had a game about healthy meals	FV plush toys and grocery tote
Other comments/observations:	One teacher noted she wanted more nutrition education	One teacher described how she would want more FV promotion

Table 4-6 Summary of School Observations Collected from 2 Elementary Schools Using the Lunchroom Environment Observation Form

Item number	Non-FFVP school	FFVP school
BEFORE LUNCH		
1) Number of lunchroom tables	12 benches	17 benches
2) Lunchroom layout	See Figure 4-2	See Figure 4-3
3) Are there any nutrition or health messages displayed in cafeteria?	Yes	Yes
4) If yes, please list the nutrition or food-related messages or policies displayed and in what form:	(14-15 items) Messages such as “Get healthy,” “Try a taste today” with different whole grains; posters related to portion control, Thanksgiving with a healthy school meal, fueling up with fruit and snack examples, food group examples, keeping meals balanced, and how to build healthy meals; most items were in the form of large posters and a painting on a wall (mural)	(21-22 items) “Got milk?” poster; messages related to healthy breakfasts; images of apples, milk, lunch bags; posters on Foods of the Month by <i>The OrganWise Guys</i> [containing different images of foods, and different images of fruits/veggies including grapes, apples, carrots, bananas, orange slices]; poster of what comprises a healthy lunch (with different food groups); most items were medium posters and paintings on the wall (decoration)
5) Are there policies/rules posted in the lunchroom related to food, discipline, etc.?	Yes	Yes
6) If YES, please list the nutrition or food-related policies:	A sign about policies about respecting others, equipment in the lunchroom environment	Policies including thinking before speaking, being respectful, and speaking in a low voice (in Spanish too), and being responsible; and safety procedures
7) Is there a menu posted in the cafeteria?	Yes (but not where students can see); served cheese quesadilla, rainbow bean salad, fresh baby carrots, light Italian dressing, banana, multigrain sun chips, milk, pineapple cup; 2 nd half of lunch: enchilada chicken wrap, soft tortilla, Italian corn salad, grape juice, sun chips, milk	No
8) Are there any nutrition messages or nutrition content included with the menu?	No	No
9) A la carte menu in the cafeteria?	No	No
10) If YES, is there an a la carte menu in the cafeteria?	No	No

Table 4-6 Summary of School Observations Collected from 2 Elementary Schools Using the Lunchroom Environment Observation Form (continued)

Item number	Non-FFVP school	FFVP school
11) If YES, which of the following foods are offered on the a la carte menu in the cafeteria? (check all that apply)	None	None
12) Is there a salad bar (a separate cart where fruits and vegetables are placed)?	Other: fruits and vegetables are within the lunch line	Yes
13) If YES, please list what the salad bar offers:	Line 1: pineapple, bean salad, baby carrots, ranch; line 2: corn salad, grape juice (items offered in cups, bagged, and fresh)	Broccoli, carrots, ranch dressing, apples, and peaches, grapes, and pears canned. The other items were fresh and in bag packets.
14) Choices of main entrees offered for lunch:	1 item (2 total, one at 1 st lunch and 2 nd as it runs out)	1 main (Salisbury steak, wheat bun, and mashed potatoes).
15) In the food line, where are fruits location? (check 1 box)	Front of line (in one line) and end of line (for another line)	End of the line (end of salad bar)
16) In the food line, where are vegetables located? (check 1 box)	Middle of line	Middle of line (but front of the salad bar)
17) Who supervises children during lunch?	Administrators, lunchroom monitors/helpers (2 nd observer noted: classroom teachers, food service staff)	Classroom teachers, lunchroom monitors/helpers, parent volunteers (room parents)
18) Number of lunchroom monitors/helpers:	1-2 (2 nd observer noted: 3-4 at some points)	5 and above monitors (ranged from 7-9 helpers)
DURING LUNCH		
Lunchtime start:	11:21am (2 nd lunch: 12:04pm)	11:32am
Lunchtime end:	11:40am (2 nd lunch: 12:20pm)	12:04pm
19) How long does it take the serve lunch during one lunch period?	5-10 minutes	20-32 minutes (many lunch periods)
20) Are there assigned tables for children to sit according to grade level?	Yes	Yes
21) If yes, are they:	No labels	Labeled, signs on wall by teacher names
22) Number of children per table (approximately):	15-17	10-16
23) How full is the cafeteria seating during the lunch period (at peak capacity)?	76-100% full	76-100% full
24) Other incentives offered during lunchtime:	No physical incentives; vice principal would say that one grade can 'beat' another by being quiet	None

Table 4-6 Summary of School Observations Collected from 2 Elementary Schools Using the Lunchroom Environment Observation Form (continued)

Item number	Non-FFVP school	FFVP school
25) How long does each child have to go through the lunch line (selecting 10 children to observe during the K-2nd grade lunch period):	Approx. 8 seconds to 2 minutes, 7 seconds	Approx. 5 seconds to 3 minutes, 4 seconds
26) How much time do students have to eat after going through the line (observe one child per grade level as they enter)?	Kindergarten – none; 1 st grade: 15 to 20 minutes; 2 nd grade: 11 to 18 minutes	Kindergarten: 22 minutes; 1 st grade: 18 to 20 minutes; 2 nd grade: 19 to 20 minutes
27) Please describe the lunch flow (i.e. children receive hot foods first, then fruits or vegetables; two lines available, waiting period is long, crowded, etc.)	Two lines have different foods offered; children received hot food and were able to pick out FV items themselves. Near the milk station, monitors give children a card (as a measure for headcount) and children obtain chips near end of the line. Sometimes it got crowded; relatively small wait time. A second line had fruits/veggies in the front of the line then hot food was distributed.	Two different lines, hot food first, lunch trays already set up; children got FV from salad bar. There were two separate doors, one door was for kindergarten and 2 nd grade, the other was for 1 st grade. It was crowded near the salad bar and some children could not reach the food (2 nd observer noted: lunchroom was hectic and disorganized, children skipped salad bar because the line was too long)
28) Lunchroom style	Serve some, students serve themselves	Serve some, students serve themselves
29) Number of food components students select (i.e. 1 fruit, 1 vegetable, 1 meat, 1 grain, 1 dairy = 5 components; grain and protein may be combined in a meal but count individually as a separate food component)	4-5 food items; all take different amounts but are encouraged to do 1 fruit/vegetable, a dairy, grain, meat and chips	5; most children take 4 to 5 choices
30) Are fruits and vegetable items in the cafeteria easy for students to see and reach? Please describe food placement, including hot foods, cold foods, fruits, vegetables, and other items (describe how children have access to the food):	Yes, easy to see and reach. In the line, everything was pre-portioned. Hot foods were first in one line, then cold foods. Foods were in plastic containers and on a low table for children to grab the food. The foods were in paper trays and all food can be stacked in there. In a separate line, the fruits were located first, then vegetables, then the entrées, followed by chips/milk at the end of the line	No, hard to see and reach (2 nd observer noted: Yes, easy to see and reach). The children were given their hot food by food service staff; salad bar: more difficult to access the food; many of the children could not grab food with the tongs; stalled salad bar line, causing children to skip line (2 nd observer noted: Many skipped the salad bar due to disorganization and long lines)

Table 4-6 Summary of School Observations Collected from 2 Elementary Schools Using the Lunchroom Environment Observation Form (continued)

Item number	Non-FFVP school	FFVP school
<p>31) Are fruits and vegetables in the cafeteria offered in such a way that they are easy for students to eat? Please describe how the foods are or are not prepared in a way that is age-appropriate for the students:</p>	<p><i>Yes, easy to eat.</i> Everything was bite-sized. Salads were small (beans, corn). Pineapple cups were small and the pineapple was cut into cubes (2nd observer noted: some of the younger children struggled with opening bags and packets but there were older children helpers assisting the younger children)</p>	<p><i>Yes, easy to eat.</i> Food items were cut into small pieces. Children were given slices of apples and cut up pieces of broccoli were available (2nd observer noted: tongs were very hard for the children to use to grab their fruit/broccoli and many children skipped getting them; apples did not have the skin so they lacked color)</p>
<p>32) Describe the disposal of food during lunchtime:</p>	<p>Student helpers (who eat after) have garbage cans and roll through the aisles and dispose of the lunches; other children stay seated and throw the trash away</p>	<p>The children throw away their own food at random times; garbage cans located in the middle of the room</p>
<p>33) Is the noise level controlled by an adult?</p>	<p>Yes, by assistant principal</p>	<p>No</p>
<p>34) Other comments/observations:</p>	<p>Older children walking around, patrolling/helpers; student cleaners throw away food and clean tables—the student cleaners have extra time to eat at the end and they help students open packets of ranch, milk, chips; student works clean spills-- efficient system</p>	<p>Very loud lunchroom; although many of the monitors have whistles, nobody utilizes them; disorderly, no monitoring of children receiving FV at lunch line; many children did not eat the food</p>

FIGURES

Figure 4-1 CDC School Nutrition Environment Model⁸⁴

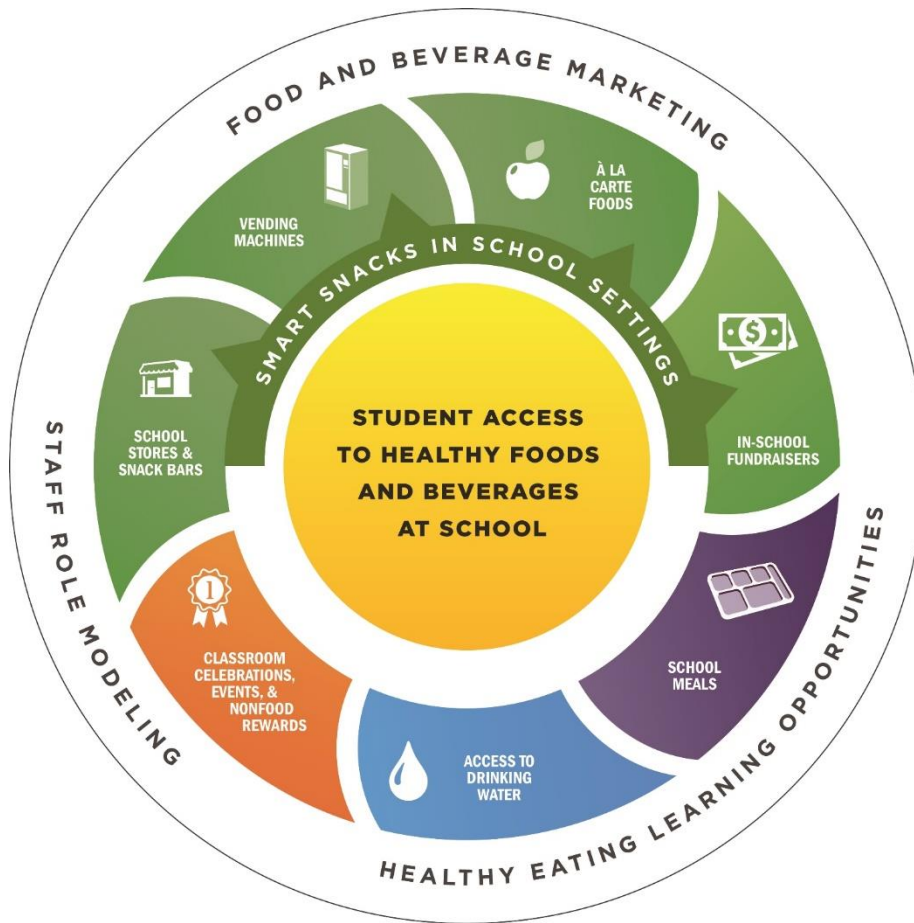


Figure 4-2 Lunchroom Layout for Non-FFVP School

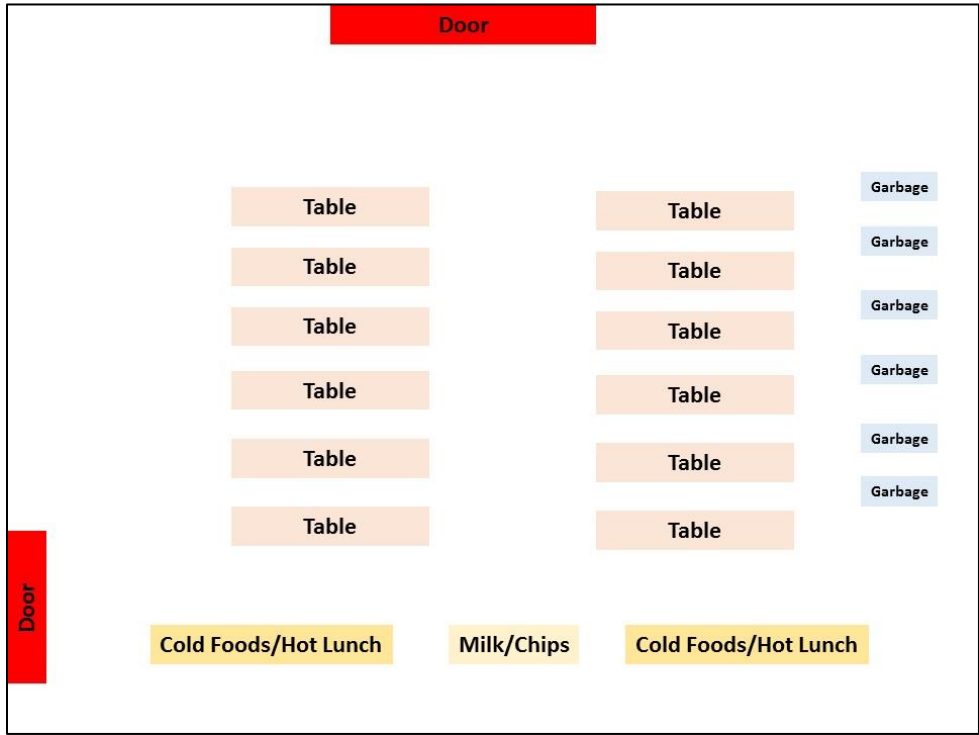
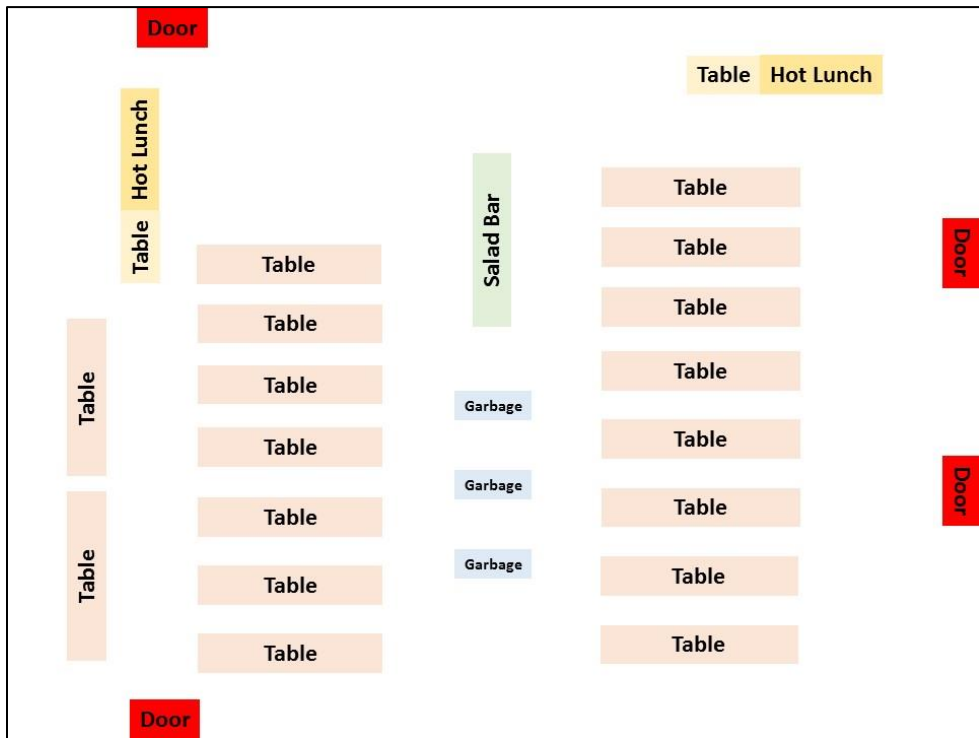


Figure 4-3 Lunchroom Layout for FFVP-School



Chapter 5.

Fruit and Vegetable Preferences and Identification by Kindergarteners through 2nd-Graders with or without the US Department of Agriculture *Fresh Fruit and Vegetable Program*^{3,4}

This article has been accepted for publication in the *Journal of Nutrition Education and Behavior*. The full version of the *Fruit and Vegetable Preference Survey*, IRB approval forms, informational letter for the parents, and the child oral assent script are located in Appendix D.

³ Masis N, Johnson S, McCaffrey J, Chapman-Novakofski K. Fruit and Vegetable Preferences and Identification by K-2nd graders with or without the Fresh Fruit and Vegetable Program. *J Acad Nutr Diet*. 2016;116(9):A53. doi:10.1016/j.jand.2016.06.177.

⁴ This article has been accepted for publication as Masis N, Johnson SL, McCaffrey J, Chapman-Novakofski K. Fruit and Vegetable Preferences and Identification by Kindergarteners through 2nd-Graders With or Without the US Department of Agriculture Fresh Fruit and Vegetable Program. *J Nutr Educ Behav*. 2017. doi:10.1016/j.jneb.2017.05.349. As an Elsevier journal author, authors retain the right to include the article in a dissertation in full or in part, subject to proper acknowledgment.

Fruit and Vegetable Preferences and Identification by Kindergarteners through 2nd-Graders With or Without the US Department of Agriculture *Fresh Fruit and Vegetable Program*^{3,4}

ABSTRACT

Objective: The US Department of Agriculture *Fresh Fruit and Vegetable Program* (FFVP) allows schools to increase fruit and vegetable (FV) exposure by distributing FV as snacks. The objective of this study was to compare kindergarten through second (K-2nd)-graders who were exposed or not to FFVP for preferences and identification.

Design, Setting, Participants: The FV Preference Survey for K-2nd-graders contained 12 fruits and 12 vegetables, a 3-Likert scale (liked it, okay, don't like it), and an I don't know option. Data were collected from K-2nd-graders at 2 elementary schools near Chicago, IL (n = 435, FFVP school, n = 235 with 12 teachers; non-FFVP school, n = 200 with 10 teachers).

Main Outcome Measure(s): Mean preference scores.

Analysis: Chi-square, Mann-Whitney U, and multiple linear regression analyses compared school data (P < .05).

Results: There were significant differences in mean preference scores, with higher fruit scores at the FFVP school (1.8 ± 0.6) than at the non-FFVP school (1.7 ± 0.6). In contrast, there was a higher vegetable score for the non-FFVP school (1.3 ± 0.9) than for the FFVP school (1.2 ± 0.9). The school variable had weak impact on fruit ranking (multivariate coefficient = 0.01; P < .05). For fruits and vegetables and combined, there were fewer I don't know responses in the FFVP ($\chi^2 = 149.080$; P < .01).

Conclusions and Implications: At the FFVP school, fewer I don't know responses suggested better FV identification. Non-FFVP students had higher vegetable preferences than did FFVP students. Tasting a variety of FV may help with identifying FV, but more research is needed to determine the impact on preferences.

Key Words: fruits, vegetables, preferences, school, child, survey

³ Masis N, Johnson S, McCaffrey J, Chapman-Novakofski K. Fruit and Vegetable Preferences and Identification by K-2nd graders with or without the Fresh Fruit and Vegetable Program. *J Acad Nutr Diet*. 2016;116(9):A53. doi:10.1016/j.jand.2016.06.177.

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INTRODUCTION

The benefits of fruits and vegetables (FV) on health are well known because they aid in preventing weight gain by causing satiety and reducing energy intake,¹⁵ and lowering the risk of cancer and coronary heart disease.^{108,109} Whereas all age groups can benefit from FV, the health benefits for children may have the longest impact, because food preferences and habits established in childhood may predict higher FV consumption as adults.¹⁰⁸ Given that neophobia increases during the preschool years, increasing FV exposure at a younger age at school or at home may facilitate more positive preferences for FV.^{28,110} Because many students consume at least one-third their total food intake from school meals, schools serve as an opportunity to introduce more FV to increase intake.⁵ School interventions to increase FV consumption focused on repeating taste exposures and modeling healthy behaviors.^{70,111,112}

The US Department of Agriculture (USDA) enacted the *Fresh Fruit and Vegetable Program (FFVP)* in schools to increase exposure and intake of FV for children to establish healthier eating patterns.⁵ Funds are allocated to schools with the highest percentage of low-income students and to those that agree to distribute FV as snacks during times of the day that do not include lunchtime.⁵ There are no requirements for frequency of distribution or rules about what can be distributed; however, there is a limit of funds that are allocated to each student per year, ranging from \$50 to \$75.⁵ Because of the potential impact of this program and the need for fiscal responsibility, it is important to evaluate the FFVP's outcomes. As a mediator of food intake, preferences for vegetables may be the strongest predictor of actual vegetable consumption.¹¹³⁻¹¹⁵ However, most studies that evaluated the FFVP did not assess younger children or their preferences.^{5,23,116}

The objective of this study was to assess if the FFVP had an effect on children's FV preferences and identification. It was hypothesized that students who participated in the FFVP would report greater preferences and have higher identification of FV than students at a non-FFVP school.

METHODS

Study design and school selection

Two schools were selected for this cross-sectional study based on their affiliation with the University of Illinois Extension because that institution provided nutrition education for the 2 schools. In addition, the 2 schools were selected based on their similar demographic profile: Both had a predominantly Hispanic/Latino population and a similar percentage of children receiving free/reduced-

price lunches. One school had the FFVP in place, with FV distributions beginning in August, 2014 and ending in the spring, 2015.

Instruments

The *Fruit and Vegetable Preference Survey* developed for this study included 12 fruits and 12 vegetables (Figure 5-1) and was based on valid and reliable surveys used in previous studies with similar objectives and age groups ranging from preschool to high school.^{110,117,118} The researchers selected FV based on previous surveys and tools provided by Team Nutrition,¹¹⁹ proposed FV that would be served at the FFVP school, and inclusion of both commonly consumed and uncommonly consumed FV options. The *Fruit and Vegetable Preference Survey* included a pictorial 3-point Likert scale along with a question mark for students to select if they did not know what the FV was, for preference and implied identification, respectively.¹²⁰ Survey scores ranged from 0 to 2 (0 for “I don’t like it,” 1 for “It’s ok,” and 2 for “I like it”). The survey was reviewed for content accuracy and readability by experts in the field of nutrition. The kindergarten through second (K-2nd)-grade teachers from each school received the surveys and administered the surveys at the end of the school year.

Participants

Participants were 235 students at the FFVP school and 200 students at the non-FFVP school in K-2nd grade. It was the first year that the FFVP-school had the program in place. Informational letters were sent to parents, and children provided verbal assent. The study protocol was approved by the Institutional Review Board of the University of Illinois. There were no identifiers on the survey. Teachers were instructed to read the name of each FV aloud in both English and Spanish and show a color FV card to the class, and to instruct their students to circle how much they liked each fruit or vegetable. If the students did not know what the FV was or had never tried it, teachers were asked to instruct students to circle the question mark as the response.

Data Analyses

Descriptive statistics were used to determine frequencies of grade levels and gender characteristics of the K-2nd-grade students. Chi-square test of homogeneity evaluated differences between the 2 schools and children’s preferences for the FV. Mann-Whitney U tests determined if there were higher rankings in preference scores for the FV among the students and between the schools. The researchers conducted Kruskal-Wallis H tests to assess differences in preferences among grade levels. The question mark and *I don’t know* responses were excluded from analyses that included preference

scores. Mean preference scores were determined for each individual FV item and also across all 12 items aggregated for FV preferences of the students.^{110,118} Results were considered significant with $P < .05$. A Bonferroni correction was used for multiple comparisons since there were 12 comparisons conducted for fruits and 12 comparisons for vegetables; results were considered significant at $P < .002$. A multiple linear regression was used to evaluate predictive factors such as school and grade for FV preferences (IBM SPSS Statistics, version 23.0, Released 2015, IBM Corporation, Somers, NY).

RESULTS

A total of 435 surveys were collected from students at the FFVP and non-FFVP school ($n=235$ and 200 ; 94 and 72.2% participation, respectively) at the end of the school year. Table 5-1 presents the characteristics of the students.

There were significant differences in mean preference scores ($P < 0.05$), with higher fruit scores at the FFVP-school (1.8 ± 0.6) than the non-FFVP school (1.7 ± 0.6). In contrast, there was a statistically higher vegetable score for the non-FFVP school (1.3 ± 0.9) than the FFVP-school (1.2 ± 0.9). Overall, students at both schools rated fruits with higher mean preference scores than vegetables, and this was statistically significant ($P < .05$) (Table 5-1). Statistically significant differences in FV identification were found; more non-FFVP children selected *I don't know* for FV than did children at the FFVP school ($P < .05$) (Table 5-2). Overall, the percentage of *I don't know* for fruit ranged from 0 to 25.9% of children selecting this option (data not shown). The fruit that had the highest percentage of *I don't know* selected were plums (non-FFVP= 25.9%; FFVP=3.1%), grapefruit (non-FFVP=17%; FFVP=6.3%), and kiwis (non-FFVP=13.5%; FFVP=2.6%). For all vegetables, the percentage range for children selecting the *I don't know* option was from 0 to 36.7%. Vegetables with the highest percentage of *I don't know* were cauliflower (non-FFVP=36.7%; FFVP=12.6%), jicama (non-FFVP=35.5%; FFVP=6.8%), zucchini (non-FFVP=25.4%; FFVP=13.6%), and spinach (non-FFVP=21.9%; FFVP=7.8%).

Mean preference scores for individual FV are presented in Table 5-3. The least liked fruits were for grapefruit and kiwis and the least liked vegetable was zucchini. Overall, frequencies for fruit with the *I like it* rating ranged from 51% to 97%, and frequencies for vegetables with the *I like it* rating ranged from 23 to 86% (data not shown). Effect sizes were negative and small for all fruits and vegetables.

When comparing gender in both schools, boys at the FFVP school had significantly higher mean preference scores for fruit (1.7 ± 0.6) compared to those at the non-FFVP school (1.7 ± 0.7 , $P = .001$). There were no significant differences in mean fruit preference scores for fruits between girls at both schools.

However, there were statistically significant higher preference scores for vegetables for both boys and girls at the non-FFVP school compared with the FFVP school ($P < 0.05$). Overall, when combining results from both schools, girls exhibited higher mean preference scores for fruits (1.8 vs 1.7, $P = .003$) and vegetables (1.2 vs 1.2, $P = .016$).

There were significant differences among grade levels for mean preference scores for fruit at both schools ($P < .05$), but only for vegetables at the non-FFVP school. When evaluating overall differences between grade levels, factoring both children at the FFVP and non-FFVP schools, for fruits, the first-graders had the highest mean preference scores (1.8 ± 0.6), and the lowest mean preference scores were among the 2nd graders (1.7 ± 0.7). For vegetables, the highest mean preference scores were among the kindergarteners at 1.3 ± 0.9 , and the lowest were among second-graders at 1.2 ± 0.9 . There were statistically significant differences between grade levels in mean preference scores for fruits ($P = .001$) and vegetables ($P = .044$) when both school data were combined.

There were no significant results using multiple regression for vegetable preferences. However, there was a weak impact of the school variable for predicting fruit preferences among children, which indicated that attending the FFVP or non-FFVP school may not have influenced fruit preferences, ($F_{1,433} = 4.242$, $P = .04$, multivariate coefficient = 0.01; 95% confidence interval, -8.81 to -0.206).

DISCUSSION

Significantly higher preferences were found for fruit for the FFVP school, whereas students from the non-FFVP school exhibited higher preferences for vegetables (Table 5-1). This was similar to another study assessing the FFVP among 2 Houston high schools which showed that there were statistically higher vegetable preferences at the comparison school scores than at the intervention school.¹¹⁸

When comparing the mean preference scores for FV, there were also statistically higher mean preference scores for fruits vs vegetables. This result was expected because children tend to rank vegetables as their least liked foods.¹²¹ The preference frequencies in the current study had a range different from those in another study¹¹⁷ that assessed preferences among younger children from Head Start. Children reported “yummy” preference for fruit ranging from 48 to 66% (the current study ranged from 51 to 97%).¹¹⁷ Preferences for vegetables ranged from 37 to 63% (the current study ranged from 23 to 86%) even though children included French fries in that evaluation.¹¹⁷ Children typically prefer fruits over vegetables; this may be attributed to fruits being sweeter and more aromatic and refreshing.¹²¹ The

results of the current study showed that exposure to FV through the FFVP did not make a difference in FV preferences, but it may have attributed to children having higher identification of the FV.

The FFVP in the current study used 3 methods to increase FV exposure and identification: FV distribution as snacks, teacher reading informational cards, and cards sent home to parents. This may have contributed to students in the FFVP school having a higher frequency of being able to identify FV than students at the non-FFVP school. Identification of FV can be a predictor of consumption and was the target of interventions providing tailored nutrition education.¹²² The current study found significant differences in identification between the FFVP and non-FFVP school for both fruits and vegetables; Students in the FFVP school identified fruits and vegetables at a higher frequency. In comparison, 1 study that identified differences in identification of FV focused on the effects of a 12-week nutrition, cooking, and gardening trial called *LA Sprouts*, which was tailored for third- to fifth-grade participants in a school setting.¹²⁰ The researchers found that less well-known vegetables, such as cactus, cauliflower, kale, bell peppers, radishes, sweet potato, and spinach had improved identification after the intervention.¹²⁰ These vegetables were highlighted in the culturally-tailored lesson plans that may have led to improved identification after the intervention.¹²⁰ Similar to the current study, cauliflower, bell peppers, and spinach were also among the less well-known vegetables. Other less well-known vegetables in the current study included zucchini and jicama; these less well-known vegetables were likely to be novel to the FFVP students and non-FFVP alike. Another study noted that generally, children were able to recognize 80% of the fruit presented to them and had more varied identification frequencies for vegetables, in which fewer children correctly identified the vegetables.¹⁹ Compared to the current study, fewer children correctly identified the vegetables.

Assessing baseline preferences for FV, and subsequent changes in preferences may be helpful in implementing programs such as the FFVP, which were limitations of the current study. Food preferences may be affected by a variety of things such as the tastes, flavors, textures of the foods, as well as exposure to food, but also by characteristics of the individual and parents, such as the child's age and gender, socio-economic status, parental body mass index, and parenting practices.¹²³

When comparing gender differences in the current study, there were significant differences: Girls showed a higher preference for both fruits and vegetables. This result was also found in studies showing that girls had a significantly higher preference for FV than boys.^{123,124} Furthermore, in another study, the preferences of young boys and girls were evaluated for individual FV, and it was found that boys had a lower preferences than girls for certain vegetables such as mashed potatoes and green beans.¹¹⁷ Results such as these may be attributed to a form of social desirability bias, in which

differences were shown between gender among adults and children alike, with females exhibiting higher social desirability responses than males.^{125,126}

When evaluating grade-level differences, it was found that first-graders tended to have a higher mean preference score for fruit compared with children in other grades, whereas for vegetables, the highest mean preference scores were found among kindergarteners. Social desirability bias may also come into play with age, because younger children had a tendency of having higher social desirability scores compared with older children.¹²⁵ Significant differences in preference scores for FV were found between FFVP and non-FFVP school students for all grades except for kindergarteners and first graders, who did not exhibit significant differences in their mean preference scores for fruits and vegetables, respectively. Preference scores of FV for a study assessing the impact of a *Cooking with Children* curriculum did not differ between fourth- and fifth-grade students.¹²⁷ Few studies examined differences in preferences among younger children, which made it difficult to identify factors that may influence children's preferences at various grade levels.

The current study did not assess changes in preferences for each of the grade levels. An evaluation of FFVP in Mississippi sought to assess changes in preferences among students from fifth, eighth, and 10th grade.²⁶ The researchers found that the preference for fruit significantly increased among eighth and 10th-graders but decreased significantly among fifth-grade students. Change in vegetable preference decreased among fifth-grade students but also eighth-grade students and remained unchanged among 10th-grade students.²⁶ The researchers noted that this may have occurred because younger children tend to prefer sweeter, more energy-dense foods (such as butter) over energy-dilute foods (such as vegetables).²⁶

As with any study, this evaluation had several limitations. First, the images on the survey may have been difficult to interpret, although teachers were given color images to hold up when students took the survey. In addition, survey items were not randomly assorted in the survey as they were grouped as either fruits or vegetables on 1 page. This may have influenced how students rated their preferences on a single page if they noticed that all the items on 1 page were either fruits or vegetables. Unfortunately, cognitive interviewing, reliability, or validity testing was not completed, although the survey was adapted from a validated survey.¹⁴⁻¹⁷ In addition, process evaluation was not conducted on how the FFVP was administered in the school, which would make it difficult to understand how the children's FV preferences differences relate to implementation of the program. Some survey items were culturally-specific (i.e. jicama), which could affect the generalizability of the survey tool to be used with other children who may not identify as Hispanic. Another limitation of the study was that the students

rated FV items by survey instead of after tasting. The FV preference surveys validated have been compared with capturing children's FV intake or have them conducted while doing taste-and-rate, but no known study compared taste-and-rate methods to validate the reliability of a fruit and vegetable preference survey. ^{110,115}

On the other hand, this survey provided a range of FV that can gauge the acceptability and preferences of FV distributed via the FFVP. The survey format also allows for adaptability for online versions; it may be readily used for classrooms equipped with mobile technology, which can also increase the ease of using the surveys to evaluate FV distribution programs and potential FV interventions. Importantly, this study was completed in an age group that had not been previously investigated for the FFVP, which is beneficial in understanding how preferences may differ among younger children. In addition, it demonstrated the feasibility of conducting preference and identification surveys within the FFVP for young children.

IMPLICATIONS FOR RESEARCH AND PRACTICE

Although they were statistically significant, the preference differences in this study were not large. Future research evaluating the reliability and validity of the survey is warranted, especially for this age group. With feasibility established, additional studies evaluating the FFVP's impact on FV preference is warranted. There is a continued need to increase the acceptability of vegetables through experience and exposure, to increase the likelihood that children will eat them weekly. It would be beneficial to assess differences in identification and preferences over time if this program was implemented >1 year. In addition, it would be beneficial to assess changes in preferences among grade levels of younger children to examine the effects of the FFVP, because a previous study of the FFVP examined these changes for young adults. It may be important to evaluate the younger age group to determine the subtle differences of the grade levels and what may affect and influence elementary school student preferences.

The higher *I don't know* responses among non-FFVP students suggests that the FFVP had an impact on FV identification. The 3 strategies used to increase FV identification could be replicated in other schools. It would be worthwhile to assess culture, home environment, school lunch availability, and other factors that may have a potential impact on FV preference and identification.

TABLES

Table 5-1 Demographic Characteristics and Fruit and Vegetable Preferences for FFVP (n=235) and Non-FFVP (n=200) Students.

Characteristics	FFVP			Non-FFVP		
	N	%		N	%	
Gender (n[%])						
Male	101	43.0		95	47.5	
Female	131	55.7		83	41.5	
Missing	3	1.3		22	11.0	
Grade						
Kindergarten	82	34.9		40	20.0	
1 st grade	72	30.6		68	34.0	
2 nd grade	81	34.5		92	46.0	
Preference Scores^a	N	Mean	(SD)	N	Mean	(SD)
Fruit* ^b	2658	1.75	0.62	2199	1.72	0.64
Vegetables*	2505	1.15	0.91	1980	1.29	0.87

FFVP indicates *Fresh Fruit and Vegetable Program*

^a Mean item response for 12-fruit items and 12-vegetable items where response are *I like it (2), It's ok (1), and I don't like it (0)*;

^bFruit has statistically higher ranking of mean preference scores compared to vegetables ($P<0.05$).

*Significant at $P<0.05$, using Mann-Whitney U tests.

Table 5-2 Frequency of *I Don't Know* Responses for Fruits and Vegetables Among FFVP and Non-FFVP Students.

Type of Food Item	FFVP (%[n])	Non-FFVP(%[n])	χ^2
Fruit (n=5,092)			
Selected ?	2.5 (68)	7.1 (167)	59.93*
Vegetable (n=5,067)			
Selected ?	7.5 (202)	16.1 (380)	92.57*
Fruits and vegetables (n=10,159)			
Selected ?	5.0 (270)	11.6 (547)	149.08*

FFVP indicates *Fresh Fruit and Vegetable Program*

*Significant at $P<0.05$.

Table 5-3 Preferences of Fruit and Vegetables of FFVP- and Non-FFVP Students (Means [SD])

Item	FFVP		Non-FFVP		Standardized Effect Size
	Preferences ^a	M(SD)	N	M(SD)	
Fruit					
Apple	223	1.92 (0.36)	199	1.93 (0.34)	-0.02
Blueberries	226	1.76 (0.62)	189	1.70 (0.63)	-0.06
Cantaloupe	216	1.63 (0.74)	181	1.53 (0.81)	-0.06
Grapefruit*^	210	1.31 (0.89)	166	1.61 (0.74)	-0.18
Grapes	226	1.97 (0.21)	195	1.90 (0.40)	-0.11
Kiwi*^	223	1.67 (0.68)	167	1.32 (0.91)	-0.20
Orange	224	1.89 (0.44)	199	1.92 (0.33)	-0.03
Peach	219	1.76 (0.59)	185	1.81 (0.56)	-0.05
Pear*^	219	1.76 (0.61)	195	1.58 (0.72)	-0.15
Plum	220	1.67 (0.70)	146	1.52 (0.77)	-0.12
Raspberries	225	1.72 (0.63)	181	1.74 (0.59)	-0.0047
Strawberries	227	1.91 (0.39)	196	1.89 (0.42)	-0.02
Vegetables					
Broccoli	224	1.33 (0.87)	190	1.57 (0.72)	-0.13
Carrot^	228	1.62 (0.69)	198	1.80 (0.53)	-0.15
Cauliflower	201	1.11 (0.92)	124	1.17 (0.91)	-0.03
Celery	219	0.92 (0.92)	163	1.01 (0.90)	-0.05
Cucumber	214	1.63 (0.72)	192	1.70 (0.64)	-0.04
Green beans	200	1.00 (0.91)	165	1.09 (0.92)	-0.05
Green pepper	208	0.84 (0.89)	159	0.81 (0.86)	-0.02
Jicama	205	1.39 (0.84)	127	1.54 (0.76)	-0.09
Peas	194	1.04 (0.91)	173	1.24 (0.87)	-0.11
Spinach	202	1.11 (0.87)	153	1.18 (0.88)	-0.04
Tomato	219	0.92 (0.92)	189	1.06 (0.86)	-0.08
Zucchini^	191	0.78 (0.88)	147	1.09 (0.92)	-0.17


^aPreferences (2=I like it; 1=It's ok; 0=I don't like it); standardized effect size: small (0.20), moderate (0.50), large (0.80).

*Significant at $P < 0.002$ for Chi-Square distribution (Bonferroni correction: alpha of 0.05/12 tests for fruit and vegetables).

^Significant at $P < 0.002$ for Mann-Whitney U tests

FIGURE































Figure 5-1 Fruit and Vegetable Preference Survey for 6 of the 24 Fruits and Vegetables.



DATE: _____

Fruit and Vegetable Preference Survey

*Look at each fruit and vegetable and circle a face on how much you like it.
If you don't know what it is, circle the ?*

 Broccoli	 I like it	 It's ok	 I don't like it	
 Green pepper	 I like it	 It's ok	 I don't like it	
 Carrot	 I like it	 It's ok	 I don't like it	
 Tomato	 I like it	 It's ok	 I don't like it	
 Celery	 I like it	 It's ok	 I don't like it	
 Cauliflower	 I like it	 It's ok	 I don't like it	

Child ID	Pre	Post	Grade	Gender
	✓			

page 1

Chapter 6.

Design and Evaluation of a Training Protocol for a Photographic Method of Visual Estimation of Fruit and Vegetable Intake among Kindergarten through Second-Grade Students^{5,6}

The supplementary material, IRB approval forms, informational letter for the parents, and the child oral assent script are located in Appendix D and E. In addition, the copyright approval form is located in Appendix E.

⁵ Masis N, Chapman-Novakofski K, McCaffrey J, Johnson S. Designing and Evaluating a Training Protocol for Visual Estimation of Fruits and Vegetable Intake Among K-2nd Grade Students. *J Nutr Educ Behav.* 2016;48(7):S65-S66. doi:10.1016/j.jneb.2016.04.175.

⁶ This article appeared in its entirety as Masis N, McCaffrey J, Johnson SL, Chapman-Novakofski K. Design and Evaluation of a Training Protocol for a Photographic Method of Visual Estimation of Fruit and Vegetable Intake among Kindergarten Through Second-Grade Students. *J Nutr Educ Behav.* February 2017. doi:10.1016/j.jneb.2017.01.004. As an Elsevier journal author, authors retain the right to include the article in a dissertation in full or in part, subject to proper acknowledgment.

Design and Evaluation of a Training Protocol for a Photographic Method of Visual Estimation of Fruit and Vegetable Intake among Kindergarten Through Second-Grade Students^{5,6}

ABSTRACT

Objective: To design a replicable training protocol for visual estimation of fruit and vegetable (FV) intake of kindergarten through second-grade students through digital photography of lunch trays that results in reliable data for FV served and consumed.

Methods: Protocol development through literature and researcher input was followed by 3 laboratory-based trainings of 3 trainees. Lunchroom data collection sessions were done at 2 elementary schools for kindergarten through second-graders. Intraclass correlation coefficients (ICCs) were used.

Results: By training 3, ICC was substantial for amount of FV served and consumed (0.86 and 0.95, respectively; $P < .05$). The ICC was moderate for percentage of fruits consumed (0.67; $P = .06$). In-school estimates for ICCs were all significant for amounts served at school 1 and percentage of FV consumed at both schools.

Conclusions and Implications: The protocol resulted in reliable estimation of combined FV served and consumed using digital photography. The ability to estimate FV intake accurately will benefit intervention development and evaluation.

Key Words: food intake; digital photography; reliability; fruits and vegetables; school nutrition; dietary assessment

⁵ Masis N, Chapman-Novakofski K, McCaffrey J, Johnson S. Designing and Evaluating a Training Protocol for Visual Estimation of Fruits and Vegetable Intake Among K-2nd Grade Students. *J Nutr Educ Behav.* 2016;48(7):S65-S66. doi:10.1016/j.jneb.2016.04.175.

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INTRODUCTION

Schools have the ability to impact children's food intake because 80% of children who are enrolled in schools may consume 2 meals and a snack a day while in school.²³ In addition, more than 30 million children consume meals provided from the federally regulated National School Lunch Program.^{128–130} However, evaluating fruit and vegetable (FV) intake from school lunch data can be challenging and several methods were used to assess child consumption, including both direct and indirect methods. These food intake methods were used in US schools to assess meal acceptance and performance for food service concerns, effectiveness of nutrition programs, and changes in food waste, with programs such as the National School Lunch Program, which updated its nutrition standards in 2012.^{129–131} The most direct and accurate method of food intake determination is plate weighing, which involves weighing a plate before and after meals. This presents challenges because it can be time disruptive to food services and may delay delivery of lunch trays to children, which consequently may influence a child's intake.^{131,132} Other food intake estimation methods have been used as an alternative to direct weighing protocols to mitigate these issues.

Indirect methods include food consumption recalled by children,¹³³ visual estimation methods,^{132,134} and digital photography of food trays.^{132,134} Determining food consumption recalled by children relies on children's memory, and children may accurately recall what they consumed, overestimate or underestimate their consumption, or have variation owing to social desirability bias.^{135,136} Literature also showed children being able to self-capture food intake with the use of phone applications.¹³⁷ Visual estimation methods are conducted by trained observers who visually estimate, in real-time, portions of foods served from a child's lunch tray and later determine how much was consumed.^{138,139} In addition, visual estimations of food consumption have been evaluated using photographs of children's lunch trays.⁷⁰ A study by Williamson et al¹³⁸ tested the validity of both visual estimation and digital photography methods for measuring food portions and found that FV, dessert, and beverage portions were highly correlated with the weighed foods method ($r = 0.82–0.98$). Bland-Altman regression used to compare results from the 2 estimation methods also showed that the methods were comparable and had low bias ($P > .30$).¹³⁸ These types of indirect methods are well-suited for public eating settings such as cafeterias.^{132,138,140} Visual estimates of food intake with and without the use of digital photography were frequently employed because they are less time intensive, costly, and disruptive than weighing foods before and after eating.^{138,141} In particular, digital photography is advantageous because it requires less in-school data collection than other methods: one can observe

digital images off-site, has a less rushed experience when comparing the image of a consumed meal plate with a reference image, and has a reduced dependency on memory recall.^{70,132} This method may include a fiducial marker or standard to help with calculating accurate measurements.¹⁴² Digital photography can allow multiple raters to assess the same images independently. However, to ensure that raters have consistent and reliable estimates, it is important to both create a training protocol to have consistent estimates and assess the reliability of estimates among raters.

Articles assessing various visual estimation techniques using real-time visual estimates and photographic methods did not detail the training techniques involved. One study by Taylor et al⁷⁰ described how a 12-hour training program was developed and implemented, and that a final training session had a lunch observation in a controlled laboratory setting. However, that article did not detail what was involved in the training session. Although the effectiveness of training for portion size estimation was discussed previously,¹⁴³ current articles did not detail what methods were used in portion size estimation trainings to collect data in school settings. To the authors' knowledge, no replicable training procedures accurately detailed how to estimate FV portions served and consumed from lunch trays that were photographed in an elementary school lunchroom setting. In addition to creating a training protocol, it is important to conduct reliability measures of the protocol itself, because reliability quantifies how consistently raters observe particular items during data collection.¹⁴⁴

Therefore, the first objective of the current study was to develop training procedures for visual estimates of FV consumption of elementary schoolchildren through digital photographs of lunch trays. The intent was to develop a training protocol that assessed FV consumption that could be replicated and offered reliable results in various lunch settings. The second objective was to determine whether the training protocol was successful, by using the learned training techniques in 2 elementary schools near Chicago, IL.

METHODS

The training protocol was created to help guide facilitation of a training on visual estimation of FV consumption. The training sessions and topics (Table 6-1) were based on past studies that worked to identify methods of visually estimating test meals.^{132,138,140,145} Trainee mastery within these topics was graded, with the exception of topic 6, Consistency of Photography. Feedback was given to each trainee, with suggestions for additional practice outside the training session when performance was low. Three sessions allowed topics to be repeated to achieve mastery and allowed new topics to be introduced.

The first 3 training sessions took place in a laboratory that had a kitchen facility, work area, and computers. Stations were set up within the laboratory so the trainees could move through the training at their own pace. Photography methods varied throughout the trainings and trainees practiced using various digital media such as a Panasonic Lumix digital camera (Kadoma, Osaka, Japan) and Apple iPads (Cupertino, CA). Various digital media were employed based on trial and error using the different digital cameras and the input of trainees regarding their ease of use. The Apple iPads were ultimately selected for the images of the third training and last training session at the school. Trainees also practiced taking images of lunch trays using a tripod and then a free-form method in which, rather than a tripod, the camera was held by the trainee.⁷⁰ Specific instructions regarding the height at which to hold the camera and the camera angle were provided to trainees. They were told that a 45° angle was appropriate for food depth, as was chosen in another study.¹³⁸ Before the trainings, the doctoral student for the project took images of sample lunch trays with various servings of FV that would typically be served in a school setting. Trays were made to represent both what was served and a typical amount that would be consumed by an elementary school student. The researchers did not use fiducial markers in the first 3 training sessions but employed them in the school session by placing a ruler near the lunch trays. Reference plates measuring 1 cup of fruits or vegetables were taken before the training session so that trainees could use them as a reference. In training sessions, trainees visually estimated FV consumption from photographs; these were scheduled individually to allow trainees to develop unbiased interpretation of images. The Figure 6-1 shows the lunchroom form that was used for coding during the trainings.

The FV used in this training included those found in elementary school menus: baby carrots, apple sauce, broccoli, bananas, romaine salad, corn, apple slices, peas, broccoli florets, orange slices, cucumber slices, mashed potatoes, tomatoes, peaches, and whole apples. Topic 1 included identifying these foods, estimating portion sizes, and measuring food items on a digital food scale. For topics 2–5 (Table 6-1), trainees recorded amounts served and consumed using a modified 6-point Comstock scale for percentage consumed: none eaten (0%), 1 bite eaten (about 10%), some eaten (about 25%), half eaten (50%), most eaten (75%), and all eaten (100%).⁷⁰ Scores were determined for various topics covered in the sessions and raters were evaluated based on the scores. Additional feedback was provided to improve scores among raters. After the 3 training sessions, trainees practiced taking images of lunch trays at a local elementary school in Champaign, IL. The researchers obtained permission from the school principal to take images of the lunch trays; children were not obligated to provide their trays. Practicing the skills learned in a lunchroom environment helped trainees understand how a lunchroom

flows in an actual school setting, possible interactions with staff or children, and how to manage food-related accidents involving the trays.

The 3 trainees selected were undergraduate students in the nutritional sciences field who were selected by the principal investigator. Trainings were conducted by the doctoral researcher and the principal investigator for this project. The number of training sessions needed was based on skills mastery of the previous sessions, which allowed flexibility within the protocol. The total training time, including the local elementary school training session, was 5–7 hours. Trainees were encouraged to practice the skills at home as well, but this time was not taken into consideration of total training time.

After the 3 formal trainings and 1 practice session at a local elementary school, all lunch tray images from kindergarten through second-grade students were collected from the 2 elementary schools to achieve a medium effect size for FV intake (effect = 0.32 cups)⁵ between the 2 schools (version 3.1.9.2; G*Power statistical software, Kiel, Germany; 1992).¹⁴⁶ School 1 included a salad bar during lunchtime where children served themselves FV, distribution of weekly FV via the Fresh Fruit and Vegetable Program (FFVP), and nutrition education through a classroom curriculum called The OrganWise Guys.⁸⁹ School 2 had the same nutrition education as school 1, but students were served their meals during lunchtime and there was no FFVP. Items they served for lunch included strawberry applesauce; pears; salad mix; celery; deep-fried, grated potatoes; cherry tomatoes; apple cherry juice; and whole apples. These 2 schools were selected based on previous participation with the University of Illinois Extension for the nutrition education program. One lunch period was selected because of the time commitment of the schools and the project. The 3 trained raters then analyzed the lunch tray photographs. The Institutional Review Board of University of Illinois approved all study protocols, and all trainees and children provided written informed consent and child assent, respectively.

Interrater reliability was determined from intraclass correlation coefficients (ICCs). The ICCs were determined for data collected from the raters in trainings 1–3. Specifically, the model used was ICC model 3, which specifies a 2-way mixed model as a single measure because each subject, or lunch tray, was assessed by each of the 3 raters. Trays that did not have an image indicating what was consumed from the initial lunch tray were labeled as missing data. The ICCs were considered fair if they were 0.41–0.60, moderate if 0.61–0.80, and substantial if 0.81–1.00.⁷⁰ Results were considered significant at $P < .05$. Statistical analyses were performed with IBM SPSS Statistics (version 23.0, IBM Corporation, Somers, NY).

RESULTS

The 3 raters' observation estimates for the portions of FV served and consumed were assessed for reliability (ICCs in Table 6-2). In training 1, for the measurement variable of amount of FV served (in cups), the ICC was 0.43 (fair) ($P < .05$); for the percentage of FV consumed, the ICC was 0.88 (substantial) ($P < .05$). By training 3, there were significant ICC values for both amount of FV served (ICC = 0.86 [substantial]) ($P < .05$) and percentage of FV consumed (ICC = 0.95 [substantial]) ($P < .05$). A high ICC suggests strong agreement across observers, which consequently suggest high reliability of the training protocol.¹⁴⁷ Future users of the protocol would continue trainings until strong ICCs were achieved.

Interrater reliability was also assessed in the school setting with collection of lunch tray data. For school 1, the ICC calculated for the amount of FV served was significant (data not shown) (ICC = 0.81 [substantial]) ($P < .05$) and the ICC was significant for the percentage of FV consumed (data not shown) (ICC = 0.96 [substantial]) ($P < .05$). At school 2, the ICC for amounts served of fruits, vegetables, and FV combined could not be determined because there was no variance; there were only 5 different responses among raters for the amount served, out of the total 207 ratings (data not shown). Significant and substantial ICCs were found for percentage consumed of fruits, vegetables, and FV combined (data not shown) (ICC = 0.81, 0.91, and 0.85 respectively [substantial]) ($P < .05$). This indicated that for the observation at school 2, the raters had high interrater reliability assessing the amount of FV served as well as how much FV was consumed. When the rated observations were aggregated from both schools (Table 6-2), the ICCs were significant for both the FV amount served and consumed (ICC = 0.81 and 0.91, respectively; $P < .05$). The authors found a low ICC for the amount of fruits served (ICC = 0.35; $P < .05$). Comparing the first training session and the final assessment at the school setting, the confidence intervals (CIs) ($\alpha = .05$) did not overlap among the ICCs for the amounts of FV served, which indicated that they were different from each other. However, the CIs of the amount of FV consumed overlapped, which indicated that they did not differ from each other. Thus, the authors found that the ICC for the amount served differed from the first training and the last; however, the ICC for the amount consumed did not differ.

DISCUSSION

The results indicated that the training protocol supported improvements in the interrater reliability of the assessment of both amounts of FV served and FV percentage consumed in the progression of the 3 training sessions. However, the ICC for the amount of fruit served was low; this

could potentially be explained by variations in the size of fruit served at the schools, compared with the less variable vegetable portions, because most vegetables were pre-portioned or children did not serve themselves as many vegetables compared to fruit at the salad bar. The 3 training sessions seemed sufficient to produce a favorable interrater reliability, but additional or fewer trainings could be used depending on the raters.

It is difficult to compare the training protocol of this project with others, because publications contained few details. However, Adams et al¹⁴⁵ reported that 6 research assistants underwent 10 hours of training on student selection of lunch items and measurement of items before collecting data from student lunches. This time was more than the amount for the current training, which ranged from 5 to 7 hours. For the current trainings, the final ICC for training 3 was 0.95 for the percentage of FV consumed, which was similar to results found in another study that identified an ICC of 0.92 among raters (95% CI, 0.90–0.94).⁷⁰

Rigorous observational training is important for direct observation because often it can affect the accuracy and reliability of data collected.¹⁴⁸ A study by Gittelsohn et al¹⁴⁹ noted the lack of studies that examined procedure standardization and how observers are trained. Those authors noted that it was essential to know this information to understand how dietary assessment techniques may vary and how to validate these techniques when they are to be used in less controllable settings.¹⁴⁹ The importance of reporting more details of interventions was stressed in a paper by Hoffman et al,¹⁵⁰ which focused on developing a guide and checklist for authors to structure the accounts of their interventions. Those authors noted that key features of interventions should include duration, dose, or intensity; mode of delivery; essential processes; and monitoring, because these can influence efficacy and replicability but are not often described in published articles.¹⁵⁰ This can similarly be applied to methodology of training protocols. Creating a training protocol is as necessary as the outcomes it is measuring because it is essentially the backbone of a procedure for how information and data will be collected in the field setting.

The second objective was to determine whether training techniques produced high interrater reliability among raters of the visual estimation of photographs of lunch tray data from 2 elementary schools. When combining observations from the 3 raters on the lunch portions of 2 elementary schools, interrater reliability was high and significant for the ratings of the amounts of FV served to the children and determination of the percentage of FV consumed. This indicated that the training techniques were reliable among the raters and could be used for future observations. Another study found that there

were significant differences only in the school where some of the FV were self-served from a salad bar, not where all FV were pre-portioned; this suggested that it may be more challenging to estimate foods served in variable portion sizes using digital methods.⁷⁰ The researchers did not encounter this problem in the current study. Instead, there were significant and substantial observations from the 3 raters in school 1, where variable portions of FV were served.

As with any study, there were limitations to the training protocol. For instance, raters were not trained in more than 1 school environment. A training session at a local school allowed trainees to obtain a better perspective of the school environment; however, having training sessions at more than 1 school could better prepare trainees on how to photograph trays in different school environments. In addition, the researchers did not standardize the equipment but found that they were still able to have reliable ICCs using various photographic devices. Furthermore, an Apple iPad was easy to use and accessible and may provide a more convenient way to take real-time photographs in a lunchroom setting compared with a digital camera. Future training sessions can include various methods of collecting all lunch trays within the lunchroom setting, and finding methods that do not disrupt the lunch line, a challenge also found in another study.⁷⁰

The strength of this study was that the protocol was documented and evaluated at several stages, which allows other researchers to use and modify the protocol for their needs in various future studies. For instance, the training included instructions and suggestions about materials needed for each part, with objectives, duration, and appropriate printable materials. An additional strength is that this training provided a training score for the trainer regarding how each section should be scored, and also what parts of the training needed to be repeated if the score was below 90% passing for each section.

IMPLICATIONS FOR RESEARCH AND PRACTICE

This training protocol was intended to be used in a laboratory setting and for practice and implementation in elementary school settings. Although studies are focusing on using phone applications among children,¹³⁷ this can be costly and challenging in the school setting. The current study offers an adaptable way to evaluate school intake data. Trainings can be implemented with minimal resources and less technical equipment and can be completed with trainees who have had minimal or no experience with portion size estimation. These trainings prepared observers to identify amounts of FV served and amounts consumed in 2 distinct lunchroom settings. The training techniques provide reliable results for FV visual estimation and can be useful in research implementation studies.

Practical applications of this training protocol include use by schools or FFVP collaborators who want to demonstrate the impact of school programs.

ACKNOWLEDGMENTS

The authors would like to thank the University of Illinois Extension for funding support and the schools that participated.

TABLES

Table 6-1 Training Topics for Visual Estimation of Fruit and Vegetable Consumption

Item	Topics
1	Familiarization of weights and portions of foods
2	Food and portion identification of foods served
3	Food and portion identification of foods consumed
4	Food and portion identification of photos of foods served
5	Food and portion identification of photos of foods consumed
6	Consistency of photography

Note: Session 1 included topics 1-6; session 2 included topics 1 and 4-6; session 3 included topics 4-6.


Table 6-2 Intraclass Correlation Coefficients For Training 1-3 Reflecting Measurements of Amount Served and Amount Consumed of Fruits and Vegetables

Variable	Intraclass Correlation Coefficient (95% Confidence Interval)			
	Training 1	Training 2	Training 3	Training at Schools
Amount of fruits and vegetables served (cups)	0.43* (0.10 to 0.74)	0.89* (0.79 to 0.95)	0.86* (0.61 to 0.98)	0.81* (0.79 to 0.84)
Fruits and vegetables consumed (%)	0.88* (0.73 to 0.96)	0.97* (0.95 to 0.99)	0.95* (0.85 to 0.99)	0.91* (0.89 to 0.92)
Amount of fruits served (cups)	-0.06 (-0.39 to 0.68)	0.96* (0.84 to 0.99)	0.97* (0.60 to 1.00)	0.35* (0.27 to 0.42)
Fruits consumed (%)	0.98* (0.93 to 1.00)	1.00 (1.00 to 1.00)	0.67 (-0.14 to 1.00)	0.86* (0.82 to 0.89)
Amount of vegetables served (cups)	0.48* (0.06 to 0.83)	0.85* (0.69 to 0.94)	0.81* (0.38 to 0.99)	0.86* (0.83 to 0.88)
Vegetables consumed (%)	0.97* (0.85 to 1.00)	0.97* (0.93 to 0.99)	0.98* (0.92 to 1.00)	0.96* (0.94 to 0.97)

*Significant at P<0.05.

FIGURE

Figure 6-1 Lunchroom Visual Estimation of Fruit and Vegetable Consumption Form Developed and Used During Training to Assess Fruit and Vegetable Portions Served and Consumed



The FOODWISE Project

Training #3: Visual Estimation of Fruit and Vegetable Consumption Training







Observer name	Date of observation
Time start	Time end

Use the form below and note the items on each tray found in the photograph images and write down the portions you see for each fruit and vegetable item. Please also write down the information found on the sticker ID cards on the tray to indicate Child ID and gender.

Lunchroom Visual Estimation of Fruit and Vegetable Consumption Form – Real-time items

Fruit/vegetables served and in what form (i.e. apple – whole, peaches – diced, canned)

1. _____ 4. _____
 2. _____ 5. _____
 3. _____ 6. _____

Child ID	Gender	Meal item 1- Fruit 2- Veggie	Amount served (cups/quantity if possible)	None eaten (0%)	1 bite eaten (~10%)	Some eaten (~25%)	Half eaten (50%)	Most eaten (75%)	All eaten (100%)
									
Ex. 123	M	1 – apple	½ cup			X			

Note: 1 – Fruit, 2 – Vegetable. If more than 1 fruit or vegetable consumed, continue on another line and use same Child ID.

Supplementary Information for Chapter 6.

Visual Estimation of Fruit and Vegetable Consumption using Digital Photography: Results from Data Collection in Two Schools

BACKGROUND

The beginning of Chapter 6 describes the training methods for visual estimation of FV consumption among K-2nd grade children. Although raters observed images of lunch trays to assess reliability, the accuracy of the measurements was difficult to determine due to limitations of the current study further described later in this supplementary section. The intent of the training was to use visual estimation to compare FV intake of the students at the FFVP and non-FFVP school. Using the methods of the trained techniques, data for visual estimation of fruit and vegetable (FV) intake were collected and analyzed from the two schools.

METHODS

Prior to collecting images of children's lunch trays at the two schools, school staff were informed of the data collection procedures. They were informed that images of the children's lunch trays would be taken before and after lunch consumption. Lunch trays were labeled with different colored stickers per grade level and each tray had an identification number to allow researchers to match trays that were taken before and after lunch consumption. The lunch tray images did not contain identifiers of the children to ensure confidentiality. A station was placed at the end of the lunch line where children's lunch trays were to be photographed. A fiducial marker was used to help with portion size estimation, and an outline of a lunch tray using colored tape was used to inform children where to place their lunch trays to be photographed. Reference trays and plates were photographed, and items were measured and weighed to the nearest 10th of a gram. The FFVP school served apples in whole form, cherry tomatoes (whole), apple cherry juice (packaged), and tater tots. The non-FFVP school served raw baby carrots (packaged), lettuce salad (in foam container), pear (whole), and fruit juice. Measurements and weights of the items are in Table 6-3. Lunch tray containers differed between both schools where the FFVP school used a compartmentalized Styrofoam tray (25.5 x 20.5 x 3 cm), and the non-FFVP school used a cardboard food tray (25 x 17.5 x 5 cm).

Images were collected from the two schools with methods previously described in Chapter 6. Three raters assessed all images obtained from the data collection. The raters' observations and visual estimates were aggregated and mean FV served and consumed were calculated. Mann-Whitney U tests

were performed to assess differences between the two mean measures for FV served and the percentage of FV consumed. Statistical analyses were performed with IBM SPSS Statistics, version 23.0 (IBM Corporation, Somers, NY).

RESULTS

When utilizing the observations determined by the raters, it was found that students were served roughly $\frac{1}{2}$ cup (0.50 to 0.55 cups) of fruits at both the FFVP and non-FFVP school, and less than $\frac{1}{4}$ cup (0.22 cups) of vegetables at the FFVP school and almost $\frac{1}{2}$ cup (0.50 cups) at the non-FFVP school (Figure 6-2). When comparing the mean amount of FV served between the two schools, using a Mann-Whitney U test, it was found that there was a statistically higher amount of fruit served at the FFVP school than at the non-FFVP school (511.8 vs 426.7 mean rank; $U=90697$, $P<.01$); however, there was a statistically higher amount of vegetables served at the non-FFVP school than at the FFVP school (598.8 vs 249.4 mean rank; $U=2171$, $P<.01$).

There was a higher percentage of FV consumption at the FFVP school than at the non-FFVP school, ranging from 67.1% to 76.9% consumption, compared to 17.6 to 42.2% consumption at the non-FFVP school (Figure 6-3). These differences between the two schools were also considered statistically significant (338.8 vs 190.5 mean rank; $U=17277.5$, $P<.01$). Finally, when data were transformed and total consumption was calculated at the two schools (percentage consumed multiplied by amount served), there was a statistically higher consumption overall by the FFVP school (716.3 vs 554.7 mean rank; $U=147008$, $P<.01$).

CONCLUSIONS AND DISCUSSION

It was found that the students at the FFVP school had an overall greater consumption of both FV than the students at the non-FFVP school. However, these data are taken with precaution because of the study's limitations. Numerous limitations were discovered throughout the process, including communication with stakeholders and working with a big enough data collection team to obtain data from over 400 students. In the current study, it was found that it is essential to let the lunchroom staff know the data collection procedures in a timely manner. Providing the staff members written instructions and a flow chart of how the data collection procedures would occur would help ensure a smoother process for data collection. Because of the small size of the data collection team in the current study, there were issues with ensuring that children were obtaining the correct lunch trays and that

children were not participating in food swaps. Noting food swaps would also be essential in ensuring that measurements of FV consumed were accurate.

Because of the addition of a salad bar at the FFVP school and the photography station, the lunch line was much slower than anticipated and delayed the lunch line, a limitation of the current study. Overall, the data collection at the two schools enabled the current research team to conduct reliability analyses from the three raters, however, because of the numerous limitations, the actual data collection may have imparted inaccurate information about children's FV consumption as there were no strict measures to control for food swapping, or children throwing their lunch tray contents away before pictures were taken of their lunch trays.

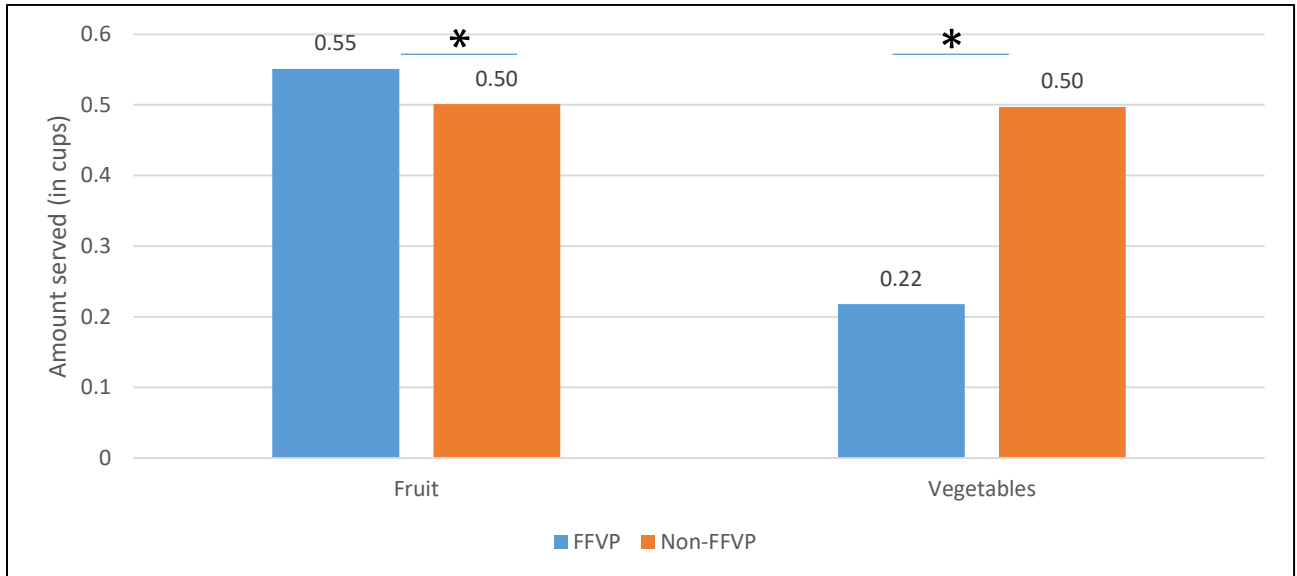
TABLE

Table 6-3 Lunchroom Items Available at Both Schools during Data Collection

Fruit/vegetable	Form	Weight (grams)	Portion (cups)
FFVP school			
Apples	Whole, raw, with peel	130	$\frac{3}{4}$
Cherry tomatoes	Whole, raw	80	$\frac{1}{2}$
Apple cherry juice	Sealed package	135	$\frac{1}{2}$, 118mL
Tater tots	Frozen—baked	70	$\frac{1}{2}$
Non-FFVP school			
Baby carrots	Raw, sealed	60	$\frac{1}{2}$
Pear	Whole, raw, with peel	135	$\frac{1}{2}$
Romaine lettuce salad	Raw, pre-portioned	25	$\frac{1}{2}$
Strawberry applesauce	Packaged	125	$\frac{1}{2}$
Celery	Pre-cut, raw, packaged	40	$\frac{1}{2}$

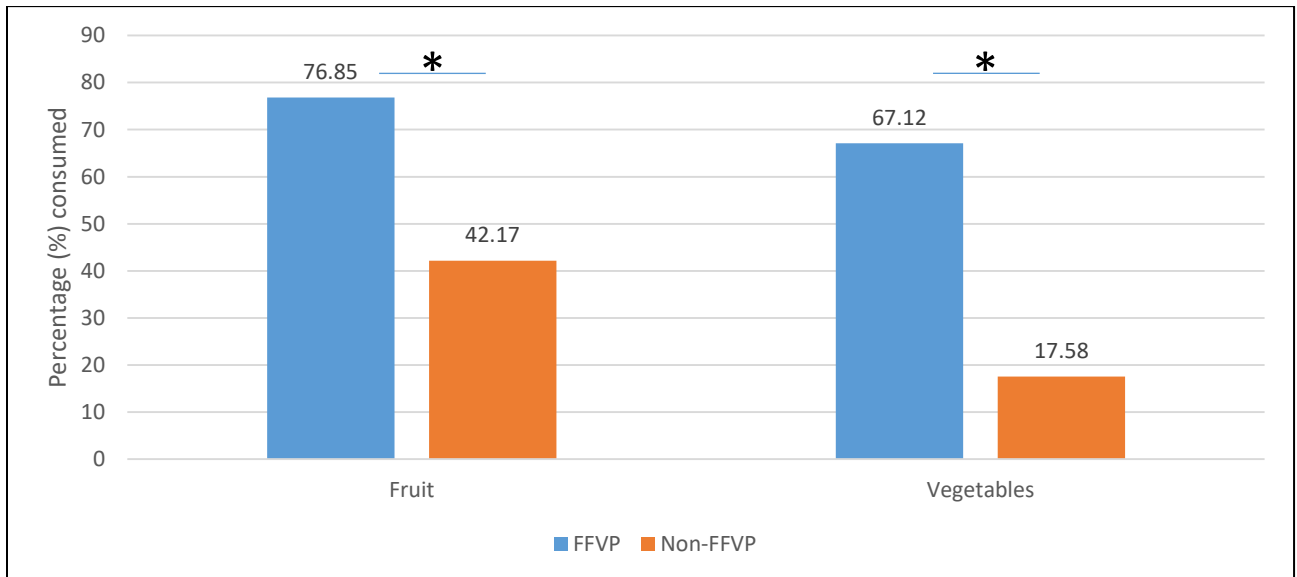
FIGURES

Figure 6-2 Amount of Fruits and Vegetables Served at Both FFVP and Non-FFVP School



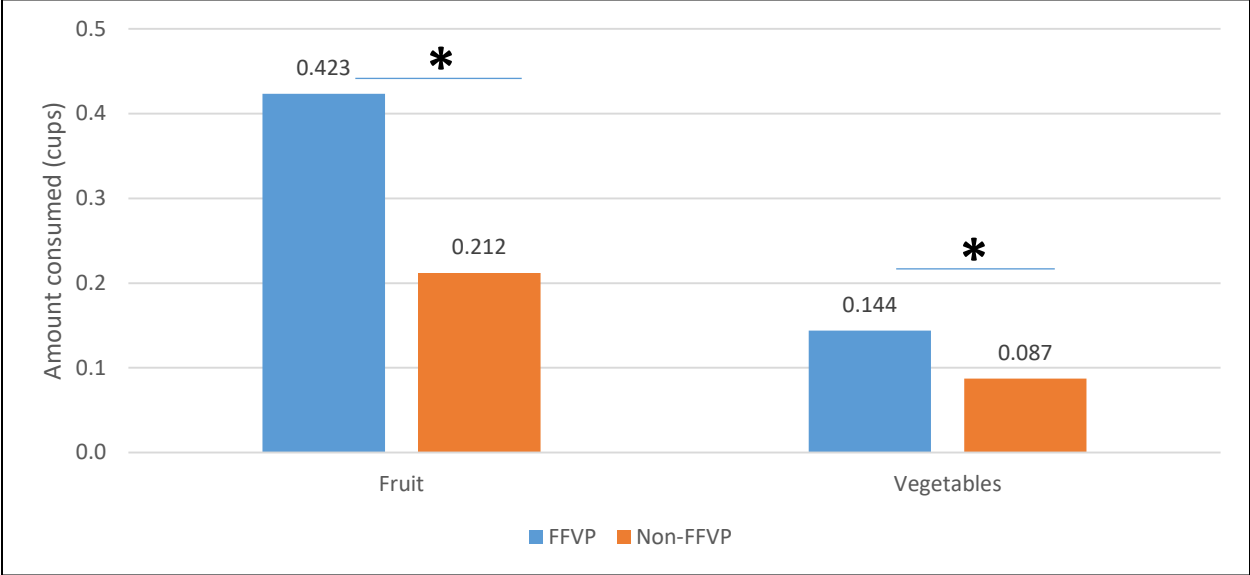
*P<0.05; FFVP school (n= 246 to 324 list wise); Non-FFVP school (n=229 to 441 list wise); rater observed values were combined for analyses

Figure 6-3 Percentage of Fruits and Vegetables Consumed at Both FFVP and Non-FFVP School



*P<0.05; rater observed values were combined for analyses

Figure 6-4 Amount of Fruits and Vegetables Consumed at Both FFVP and Non-FFVP School



*P<0.05; FFVP school (n=173); Non-FFVP school (n=157)

Chapter 7.

Longitudinal Evaluation of Fruit and Vegetable Preferences among K-2nd Grade Students Participating in the USDA Fresh Fruit and Vegetable Program⁷

INTRODUCTION

Fruit and vegetable (FV) consumption among school-aged children is below the recommended amounts, with only 15% meeting the recommendation.²⁸ Children's FV preferences may be impacted by a variety of factors including appearance, flavor and textures, the familiarity of taste, and exposure to FV.^{4,7,151-153} Taste exposure, in particular, has been found to be more effective than visual exposure in increasing preferences among children.¹⁵⁴ Because of the link between taste exposure and preferences among children, schools have served as an avenue for interventions that increase FV exposure.^{4,11}

Assessing children's preferences are important as it can predict their consumption patterns,^{155,156} however, it is also important to understand changes over time. Past studies evaluating children's preference changes over time have been conducted¹⁵⁶⁻¹⁵⁸ and it has been shown that repeated exposures upwards from 8 to 15 exposures have helped with inducing behavior change,¹⁵⁸ and have even been shown to lessen issues of neophobia.¹⁵⁴ One study showed that after trying disliked vegetables 8 to 9 times, children reported liking these particular vegetables, showing that repeated exposure may positively impact tastes even for foods once disliked.¹¹³ A school program that aims to increase antecedents such as preferences is the USDA Fresh Fruit and Vegetable Program (FFVP) which provides FV as snacks to children outside of the lunch period.¹⁵⁹ The program aims to impact children's consumption of FV and attitudes towards FV.¹⁵⁹ Past evaluations of this program have included evaluating its feasibility and satisfaction among staff and students,²¹ its impact on children's increased willingness to try FV,^{27,28} and evaluating consumption of FV among adolescents participating in the program and those who did not participate in the program.^{5,116} Because the program provides FV over time, it would be essential to identify if frequent exposure impacts FV preferences over time.

⁷ Masis N, McCaffrey J, Johnson SL, Chapman-Novakofski K. Longitudinal Evaluation of Fruit and Vegetable Preferences among K-2nd Grade Students Participating in the Fresh Fruit and Vegetable Program (FFVP). *Society for Nutrition Education and Behavior Annual Conference*. 2017.

To our knowledge, there has been no evaluation of this program's impact of preferences over time as evaluated by taste-and-rate. The objective of this study was to evaluate FV preferences over time, with repeated experience, as part of the FFVP.

METHODS

Fruits (F=28) and vegetables (V=29) were distributed twice a week, over 35 weeks, at a participating FFVP school (n= 236 students, 12 teachers, K-2nd grade). Though analyses were only conducted for children from K-2nd grade, all students from K-5th grade received one fruit and one vegetable per week. Fruits were portioned out and allocated in bins for each classroom. Each classroom received a bin with the fruit or vegetable snacks along with slips of paper that had a 3-point Likert-scale rating scale. This rating scale used smiley faces (i.e. 😊 😐 😞) to indicate the preferences, *I like it*, *It's ok*, and *I don't like it* for the FV tasted.^{110,160,161} The taste rating slips were only delivered to classrooms in K-2nd grade and were to be completed anonymously. Ranch dressing was provided with certain vegetables: carrot, cucumber, celery, broccoli, spinach, and bibb lettuce. Fruit and vegetable information note cards, created by the University of Illinois Extension, were also provided in the bins to distribute to the children to share with their family. These cards included information about the fruit or vegetable, a fun fact, and a recipe tip. Teachers were instructed to collect the taste rating slips and indicate how many students did not try the snack that day on an envelope that was collected weekly by a University of Illinois Extension worker. Taste rating slips that contained more than one rating or with unclear ratings were not counted as part of our analysis. The study protocol #15066 was approved by the Institutional Review Board at the University of Illinois at Urbana-Champaign.

Data analyses

Descriptive statistics were used to determine the frequency of preference ratings for the FV distributed weekly. Ratings were scored as follows: *I like it* was given a score of a 2, *It's ok* was given a score of a 1, and *I don't like it* was scored as 0.¹¹⁸ Skewness and kurtosis analyses were determined to find if data were normally distributed to which nonparametric data were evaluated using the Kolmogorov-Smirnov test. Thus, Mann-Whitney U tests were performed to identify differences between FV ratings. Chi-square test for homogeneity was performed to evaluate differences in the distribution of preferences ratings between FV. Spearman's rho correlation analyses were conducted to explore correlations between preference ratings and the variables of grade level, fruit or vegetable served, and time in which FV were served. A multiple linear regression analysis was conducted to assess the

relationship between the predictive and outcome variable (Equation 1). Normality of residuals, multicollinearity, and homoscedasticity were examined.

$$Y = b_0 + b_1x_1 + b_2x_2 + \dots + b_px_p \quad (\text{Equation 1})$$

Where,

$Y =$ Preference rating

$b_0, b_1,$ and $b_p =$ estimate regression coefficients

$x_1, x_2,$ and $x_p =$ p predictors (grade level, fruit or vegetable served, time [week])

The hypotheses for the analyses are further described.

Correlation analysis:

- i) H_0 : There is no relationship between preference ratings and grade level, if fruit or vegetables are served, or the time that fruits and vegetables are distributed

Multiple linear regression:

- ii) H_0 : Grade level is not a predictor for preference ratings of FV
- iii) H_0 : Fruit or vegetable served during week is not a predictor for preference ratings of FV
- iv) H_0 : Time (week) is not a predictor for preference ratings of FV

As described in Chapter 5, a *Fruit and Vegetable Preference Survey* was distributed to students at the FFVP school and non-FFVP school. Correlation analyses were conducted to assess the concurrent validity of the survey results at the FFVP school with the taste rating slips collected at the FFVP school. Items were not paired with individual child taste ratings as identifiers were not used in either the survey distribution or the distribution of the taste rating slips. Chi-square tests for homogeneity and correlation statistics were determined for the individual FV items and aggregate FV. All items of the survey were offered to children except peas, which were not included in the data. Statistical analyses were performed with IBM SPSS Statistics, version 23.0 (IBM Corporation, Somers, NY).

RESULTS

A total of 10,488 slips were collected and measured for 35 weeks for the FV distributions at the FFVP school. From those slips, 10,335 were included in our analyses (i.e., slips were excluded if more than one rating was chosen). Fruits and vegetables varied week by week with selections such as raspberries, celery, cantaloupe and strawberries (Table 7-1). For the 57 different FV rated for preference, ratings ($n=10,335$, $F=5,121$; $V=5,214$) revealed that fruits had higher frequency of children choosing *I like it* than for vegetables (77.8% F; 38.2% V; Figure 7-3). The fruits that were most preferred, determined from the highest frequency of students who selected the *I like it* rating, were red grapes, cherries, green grapes, apples, and oranges with frequencies of 94.8 to 97.3% of students selecting that they liked it. The lowest rated fruits were grapefruit, papaya, pomegranate, raspberries, and kiwi with ratings ranging from 38.4 to 78.9% of children having a favorable preference for the fruit (Table 7-1). The most preferred vegetables included romaine lettuce, cucumber, bibb lettuce, and carrot (62.9 to 76.8% selecting “☺” rating). The least preferred vegetables were rutabaga, Brussels sprouts, mushrooms, and beets (9.4 to 17.0% of students selecting “☹” rating).

Graphs were made to depict percentage of children who selected “☺” as their preference rating for FV. Figure 7-1 focuses on the frequency of children who selected *I like it* on the slip for fruits. Generally, the percentage of children who liked the fruits was above 30% for all weeks, and this percentage generally ranged from 70 to 90% for most weeks. The frequencies for vegetables were concentrated at the lower spectrum of frequencies with none of the vegetables exhibiting more than 80% of students choosing the *I like it* preference rating (Figure 7-2).

When combining all ratings among K-2nd grade, 77.8% of children chose the *I like it* after they consumed a fruit versus the 38.2% who chose this rating after a vegetable was consumed (Figure 7-3). There were statistically significant differences of distributions of the preference ratings between the fruit and vegetable ratings ($\chi^2=1725.02$, $P<.05$). Additionally, when Mann-Whitney U tests were performed, it was found that the fruit preference ratings had significantly higher rankings than the vegetable rankings (6250.4 vs 4104.9, $U=7807456.5$, $P<.05$). Frequencies of preference ratings were then determined per grade level and are presented in Table 7-2. For example, for the vegetable ratings, 42.7% of the kindergarten students rated the vegetables with *I like it* versus the 33.0% of the second graders who chose this option indicating a higher percentage of students from the younger grade level preferring the vegetables. Chi-square analyses showed that there were statistically significant differences between the three grade levels and their frequency distributions for preferences of fruits,

vegetables, and when ratings for fruits and vegetables were combined. Cramer's V was used to find an association between a nominal variable and a nominal variable or ordinal variable. Therefore, we used Cramer's V to find the strength of association between grade level and FV preference frequencies. The two variables generally displayed a weak association (Table 7-2).

Kruskal-Wallis H tests were done to determine if there were differences between the grade levels (Table 7-3). There were significant differences among all grade levels ($X^2(2)=19.953$, $P<.05$). Mean rank levels varied from the lowest mean rank of 5033.27 among 2nd graders to the highest mean rank of 5311.68 among 1st graders. Post hoc analyses were performed, and differences were found among K and 2nd grade, K and 1st grade, and 1st and 2nd grade. Post hoc corrections for up to 4 comparisons were made without adjusting alpha levels.¹⁶²

Correlation analyses were performed to assess if the week a fruit or vegetable was offered or grade level were correlated with preference ratings for K-2nd grade students (Table 7-4). Significant relations were found between liking and: 1) grade ($r=-0.02$, $P=.02$), and 2) time ($r=-0.09$, $P<.001$). Regression analyses were then performed to assess if the week a fruit or vegetable was offered or grade level could predict preference ratings for K-2nd grade students (Table 7-5). A significant regression equation was found with $F(3, 10331)=699.9$, $P<.01$, with an $R^2=0.169$. Children's predicted preference is equal to $1.762 - 0.725$ (Vegetable) $- 0.007$ (Week) $- 0.022$ (Grade) when vegetable is selected, week is week number, and grade is input. Preference ratings decreased when vegetables were introduced, and as more weeks went by, and by an increase in grade level as well. When modeled independently, this remained true for vegetable preferences ($R^2=0.007$, $P<.001$), but only time remained significant in the fruit preference model ($R^2=0.008$, $P<.001$).

Frequencies of the liking for the taste rating slips and the *Fruit and Vegetable Preference Survey* among K-2nd graders at the FFVP school are listed in Table 7-6. The *Not Counted/I don't know* section correspond to the taste rating slips that were not counted due to exclusion criteria, and the *I don't know* corresponds to a child selecting the ? from the survey meaning that the child was unsure of the identification of the fruit or vegetable. Associations between the survey and taste rating slip data were assessed to identify whether the survey had concurrent validity as compared to real time taste-and-rate data (Table 7-7). Chi-square test of homogeneity showed that there were no differences in the frequency distributions for the survey and slip data among 17 out of the 23 FV (Table 7-7). These 17 FV had $P>.05$, indicating that there was no relationship between the type of test presented to children (taste rating slip vs. survey) and their liking scale. However, there were differences between the

frequency distributions overall, and when FV were aggregated ($P < .01$). Spearman's rho correlations indicated that there were statistically significant negative associations for pear, blueberries, and grapefruit. There were statistically significant positive associations for broccoli. All relationships were considered weak. Lastly, when identifying associations between overall survey versus slip data (FV aggregated), there was a weak negative associations between the two testing types (Spearman's rho = -0.054, $P < .01$), and for fruit and vegetable separated, there were also weak negative associations between the two testing types ($P = .001$ for fruits; $P = .001$ for vegetables).

DISCUSSION

Overall, fruits were preferred over vegetables which is not an uncommon finding as this has been previously reported with children exhibiting higher preferences for fruits than vegetables.⁷ The FV in the current study that most children liked included grapes, cherries, apples, oranges, cucumbers, lettuce, and carrots. This is similar to another study, in which students wrote in apples and carrots as their favorite fruit and vegetable.¹¹⁰ In the current study, the frequency of children selecting *I like it* for fruits ranged from 38.4 to 97.3%, and for vegetables ranged from 9.4% to 76.8%. The frequency of preschoolers in another study that selected the 'yummy' preference for fruits ranged from 48% to 66% and for vegetables, the range was from 37% to 63% of preschoolers who selected the 'yummy' preference rating.¹⁶⁰ That particular study included 11 fruits and 15 vegetables, and the preference assessment was done using a computer where children selected different emoticons for their preference in response to the FV option.¹⁶⁰ Another study assessing children's preferences of various foods found that of the top 24 disliked foods, 17 were vegetables which included raw onions, mushrooms, summer squash, and raw tomatoes.¹⁵⁶ In the current study, preference ratings from children were collected for 28 different fruits and 29 different vegetables. The novel aspect of the current study was continuously taking preference measurements at each tasting point, rather than through a cumulative survey of all FV listed at one time and without tasting the FV.

Preference ratings were found to be negatively impacted by time, grade level, and vegetables served. Though previous studies have shown that taste exposure may be beneficial, many of these analyses have evaluated exposing children to the same fruit or vegetable over time.^{154,156,158} Students at the FFVP school were exposed to different FV over time, and these FV were not repeated over time, a limitation of the current study. However, it has been previously described that there may be benefits in increasing exposure for increasing variety.¹⁶³ Because the same FV were not continuously exposed to children, with considerably less than the 8 to 15 exposures previously shown to induce change,¹⁵⁸ it is

difficult to assess the impact of time on children's preferences when a variety of FV were introduced instead of repeated exposure. The fact that time would cause preference ratings to decrease is interesting as repeated exposure has been found to be beneficial in impacting change.¹⁶⁴ One study among preschoolers found that repeated exposures of a novel vegetable was sufficient in increasing impact compared to flavor-nutrient and flavor-flavor learning which entails introducing a novel flavor and adding a high-energy ingredient, or providing a novel food with a familiar food, respectively.¹⁶⁴ In the case of the current study, FV were served individually and fresh, though there were occasions where vegetables were offered with low-fat dips, as allowed by the FFVP. To our knowledge, liking has not been evaluated continuously in the span of a school year. However, one study assessed the effects of the *Food Dudes* multi-component school-based intervention on reducing food neophobia and food liking among the students over 6 months.¹¹² Data for this study were only collected at four time points and were not collected continuously.¹¹² In their study, it was found that over time, FV exposure alone, without participation in the intervention components which included letters, rewards, and videos, had little effect on increasing liking among students.¹¹² They attributed this result to potential boredom expressed to having just exposure alone and being exposed to the same stimuli over a short time, which was potentially the case in their study as they introduced the same FV over time.¹¹² This approach differed from the current study where children were not exposed to the same FV over time.

Specific to grade level, it was shown that older children had higher preferences than younger students, and this may be due to issues of social desirability bias where younger children may be more complacent to showing higher scores.^{125,126} In a longitudinal study assessing changes in child's food preferences, the authors did not find that the number of foods liked by the children increase with age; showing the difficulty of improving children's food intake with time.¹⁵⁶ Studies assessing differences among grade levels are limited. One study assessing preference differences between 4th and 5th graders found no differences between the two grade levels.¹²⁷ In addition, studies evaluating the FFVP are limited and make it difficult to compare preferences among younger grade levels as preferences, to the researcher's knowledge, have only been assessed with older adolescents.¹¹⁸ Though not evaluating preference ratings specifically, one study did find a significant difference between four age classes (6, 7, 8, and 9 years old), with a reduction of neophobic attitudes observed with increasing age.¹¹² In addition, the 9-year old children in that study had significantly lower liking scores than the children in all other groups.¹¹²

When assessing the concurrent validity of the *Fruit and Vegetable Survey* by using the taste rating slip data, it was found that there significant weak negative correlations between the survey and the taste rating slip data when all FV items were aggregated. However, there were items in the survey that were statistically correlated, but the relationships were weak. The chi-square analyses showed that for almost 74% of the items on the survey, there was no relationship found between the types of test administered (survey vs. slip) and liking scores, indicating that the liking distributions were not different. Although taste-and-rate would be considered the gold standard in these analyses as children are rating their preferences as they are tasting it, it is difficult to compare to an overall survey as exact surveys from the children were not linked to their specific taste rating slips and results were aggregated for both testing tools. It would have been beneficial to assess individual children's ratings of the FV at the point of tasting and later conducting the survey to assess specific similarities and differences in the ratings between the two tools. To our knowledge, there has not been an assessment done to validate a FV preference survey with taste-and-rate. It would be beneficial to do this type of assessment in the future to assess the validity of preference surveys with taste-and-rate.

A limitation of the current study was that FV were not repeated throughout the year. More investigation is needed to assess if exposing children to the same fruits and vegetables through the FFVP may positively impact vegetable preferences among children over time. Additionally, monitoring of fidelity indicators was not conducted at the FFVP school, and it was difficult to determine variations in FV distribution at the classroom level or other factors that may impact FV preferences among children. The current study shows that being exposed to a variety of FV, generally, did not improve ratings for vegetables. Further research is needed to understand how different forms of implementation of the FFVP may impact children's FV outcomes.

TABLES

Table 7-1 Frequencies of Fruit and Vegetable Preferences from Taste Rating Slips Distributed at the FFVP School

Week	Fruit/vegetable	N	Preference ratings (%)		
			<i>I like it</i> 😊	<i>It's ok</i> 😐	<i>I don't like it</i> ☹️
1	Apple	37	97.3	2.7	0
1	Carrot*	35	62.9	11.4	25.7
2	Green pepper	189	43.4	11.6	45.0
2	Red grapes	187	97.3	1.1	1.6
3	Cauliflower*	190	41.4	13.2	45.8
3	Pear	180	73.9	13.3	12.8
4	Cucumber*	215	72.1	13.5	14.4
4	Strawberries	209	90.9	2.4	6.7
5	Celery*	187	35.8	14.4	49.7
5	Cantaloupe	223	80.3	7.2	10.3
6	Broccoli*	199	48.2	15.6	36.2
6	Granny smith apple	22	90.9	9.1	0
7	Zucchini	193	31.6	20.2	48.2
7	Banana	232	93.1	3.4	3.4
8	Spinach*	191	56.5	13.1	30.4
8	Blueberries	225	70.2	12.9	16.9
9	Yellow squash	224	36.6	15.2	48.2
9	Orange	230	94.8	2.2	3.0
10	Edamame	211	28.9	11.8	59.2
10	Peach	170	82.4	10.6	7.1
11	Mushroom	214	11.2	8.9	79.9
11	Star fruit	232	69.0	12.5	18.5
12	Green beans	196	31.1	15.3	53.6
13	Raspberries	178	77.5	10.1	12.4
14	Tomato	203	34.5	16.7	48.8
14	Pineapple	191	79.1	10.5	10.5
15	Kiwi	213	78.9	8.5	12.7
16	Red pepper	191	38.7	13.6	47.4
16	Green grapes	202	95.5	3.0	1.5
17	Sweet potato	130	33.8	10.8	55.4
17	Grapefruit	151	38.4	13.2	48.3
18	Butternut squash	108	38.0	20.4	41.7
18	Dragon fruit	200	45.0	18.5	36.5
19	Watermelon	234	94.0	3.0	3.0
20	Romaine lettuce	190	76.8	12.1	11.1
20	Papaya	178	39.9	15.7	44.4
21	Asparagus	181	23.8	16.6	59.7
21	Plum	163	84.0	6.1	9.8
22	Ugli fruit	176	48.3	16.5	35.2
22	Beets	159	17.0	14.5	68.6
23	Kale	144	29.9	16.7	53.5
23	Blackberries	201	80.1	10.0	10.0
24	Tomatillo	183	38.8	14.2	47.0

Table 7-1 Frequencies of Fruit and Vegetable Preferences from Taste Rating Slips Distributed at the FFVP School (continued)

Week	Fruit/vegetable	N	<i>I like it</i> 😊	<i>It's ok</i> 😐	<i>I don't like it</i> ☹️
25	Red cabbage	181	48.1	20.4	31.5
26	Clementine	209	93.8	2.9	3.3
26	Jicama	195	54.4	17.4	28.2
27	Patty pan squash	192	27.1	15.6	57.3
27	Mango	212	86.3	4.7	9.0
28	Nectarine	113	81.4	6.2	12.4
28	Yam	216	41.2	17.2	41.7
29	Bok choy	197	27.9	17.8	54.3
31	Rutabaga	192	9.4	8.9	81.8
31	Pomegranate	219	70.3	13.9	18.7
32	Brussel sprouts	144	11.1	13.9	75.0
33	Quince	179	62.0	13.4	24.6
33	Bibb lettuce*	183	65.0	18.0	16.9
35	Cherries	141	96.5	2.8	0.7

*Dressing was offered along with fruit/vegetable

Table 7-2 Grade Distribution and Frequencies of Preference Ratings for Fruits and Vegetables

Grade	N	Preference ratings (%)			Chi-square	Cramer's V
		<i>I like it</i> 😊	<i>It's ok</i> 😐	<i>I don't like it</i> ☹️		
Fruit						
Kindergarten	1579	76.4	6.5	17.1	34.1*	0.058*
1 st grade	1668	80.3	8.7	11.0		
2 nd grade	1874	76.8	9.7	13.6		
Vegetable						
Kindergarten	1626	42.7	9.0	48.2	100.3*	0.098*
1 st grade	1741	39.4	19.1	41.5		
2 nd grade	1847	33.0	15.9	51.1		
Total						
Kindergarten	3205	59.3	7.8	32.9	94.96*	0.068*
1 st grade	3409	59.4	14.0	26.6		
2 nd grade	3721	55.0	12.8	32.2		

*P<.05

Table 7-3 Grade Levels and Mean Rank of Preference Scores Determined by Kruskal-Wallis H Test and Mann-Whitney U Tests for Post Hoc Analyses

	N	Mean rank	Kruskal-Wallis H (P-value)	Mann-Whitney U (P-value)
Kindergarten	3205	5171.59	19.953 (P<.05)	
1 st grade	3409	5311.68		
2 nd grade	3721	5033.27		
Kindergarten	3205	3262.94		5320110.5 (P=.035)
1 st grade	3409	3349.39		
1 st grade	3409	3667.29		59954437.5 (P<.01)
2 nd grade	3721	3472.24		
Kindergarten	3205	3511.65		5808587 (P=0035)
2 nd grade	3721	3422.03		

Table 7-4 Correlation Analyses for Week or Grade versus Preference Ratings for K-2nd Grade Students

Variables	Spearman's rho (P-value)
FV Preference vs Week	Fruit: rho = -0.103 (P<.01) Vegetable: rho = -0.075 (P<.01) Overall FV: rho = -0.090 (P<.01)
FV Preference vs Grade	Fruit: rho = 0.08 (P=.579) Vegetable: rho = -0.057 (P<.01) Overall FV: rho = -0.024 (P=.015)

Table 7-5 Regression Analyses for Week versus Preference Ratings for K-2nd Grade Students

Model	Variables	R ²	B (SE)	F
1	Preference Rating (Constant)	0.169	1.762 (0.020)	699.895*
	FV		- 0.725(0.016)	
	Grade		-0.007 (0.001)	
	Week		-0.022 (0.010)	
2	Preference Rating (Constant)	0.168	1.740	1047.036*
	FV		-0.724 (0.016)	
	Week		-0.007 (0.001)	
3	Preference Rating (Constant)	0.164	1.64 (0.011)	2022.94*
	FV		-0.728 (0.016)	

*P<.05

Table 7-6 Frequencies of Fruit and Vegetable Preferences from the *Fruit and Vegetable Preference Survey* and Taste Rating Slips Distributed at the FFVP School

Fruit/vegetable	Test type	N	Preference ratings (%)			
			<i>I like it</i> 😊	<i>It's ok</i> 😐	<i>I don't like it</i> ☹️	Not counted/ <i>I don't know</i>
Apple	Slip	38	94.7	2.6	0	2.6
	Survey	224	94.2	2.7	2.7	0.4
Carrot	Slip	36	61.1	11.1	25	2.8
	Survey	231	73.2	13.9	11.7	1.3
Green pepper	Slip	192	42.7	11.5	44.3	1.6
	Survey	231	29.9	16.0	44.2	10.0
Red grapes	Slip	198	95.8	1.1	1.6	1.6
	Survey	230	96.5	0.9	0.9	1.7
Cauliflower	Slip	198	39.4	12.6	43.9	4.0
	Survey	230	42.2	12.6	32.6	12.6
Pear	Slip	181	73.5	13.3	12.7	0.6
	Survey	225	83.1	4.9	9.3	2.7
Cucumber	Slip	217	71.4	13.4	14.3	0.9
	Survey	220	75.0	8.6	13.6	2.7
Strawberries	Slip	213	89.2	2.3	6.6	1.9
	Survey	230	93.0	2.2	3.5	1.3
Celery	Slip	196	34.2	13.8	47.4	4.6
	Survey	230	36.1	18.3	36.1	9.6
Cantaloupe	Slip	223	80.3	7.2	10.3	2.2
	Survey	224	75.9	5.4	15.2	3.6
Broccoli	Slip	205	46.8	15.1	35.1	2.9
	Survey	230	58.3	13.5	25.7	2.6
Zucchini	Slip	200	30.5	19.5	46.5	3.5
	Survey	221	25.8	15.8	44.8	13.6
Spinach	Slip	195	55.4	12.8	29.7	2.1
	Survey	219	40.6	21.0	30.6	7.8
Blueberries	Slip	229	69.0	12.7	16.6	1.7
	Survey	230	83.9	4.8	9.6	1.7
Orange	Slip	232	94.0	2.2	3.0	0.9
	Survey	227	92.1	2.2	4.4	1.3
Peach	Slip	171	81.9	10.5	7.0	0.6
	Survey	226	81.4	7.5	8.0	3.1
Green beans	Slip	200	30.5	15.0	52.5	2.0
	Survey	223	36.8	16.1	36.8	10.3
Raspberries	Slip	178	77.5	10.1	12.4	0
	Survey	230	80.0	8.3	9.6	2.2
Tomato	Slip	204	34.3	16.7	48.5	0.5
	Survey	231	35.9	15.2	43.7	5.2
Kiwi	Slip	214	78.5	8.4	12.6	0.5
	Survey	229	77.3	8.3	11.8	2.6
Grapefruit	Slip	153	37.9	13.1	47.7	1.3
	Survey	224	56.3	10.7	26.8	6.3
Plum	Slip	163	84.0	6.1	9.8	0
	Survey	227	78.4	5.3	13.2	3.1
Jicama	Slip	198	53.5	17.2	27.8	1.5
	Survey	220	57.7	13.6	21.8	6.8

Table 7-7 Concurrent Validity Tests Comparing Taste Rating Slip Data with *Fruit and Vegetable Preference Survey Results*

Item	Slip (N)	Survey (N)	Chi-square (P-value)	Spearman's rho (P-value)
Apple	37	223	1.02 (0.601)	0.04 (0.479)
Carrot	35	228	4.95 (0.084)	-0.10 (0.100)
Green pepper	189	208	5.58 (0.061)	0.08 (0.136)
Red grapes	187	226	0.48 (0.786)	-0.03 (0.530)
Cauliflower	190	201	2.94 (0.230)	-0.08 (0.096)
Pear	180	219	10.32 (0.006)*	-0.14 (0.007)*
Cucumber	215	214	2.41 (0.300)	-0.05 (0.302)
Strawberries	209	227	2.32 (0.313)	-0.07 (0.171)
Cantaloupe	218	216	2.92 (0.233)	0.05 (0.300)
Broccoli	199	224	6.11 (0.047)*	0.12 (0.013)*
Zucchini	193	191	0.53 (0.768)	0.03 (0.529)
Spinach	191	202	8.39 (0.015)*	0.09 (0.063)
Blueberries	225	226	15.86 (<0.01)*	-0.02 (<0.01)*
Orange	230	224	0.64 (0.726)	0.03 (0.498)
Peach	170	219	1.05 (0.592)	-0.02 (0.727)
Green beans	196	200	6.42 (0.040)*	-0.13 (0.013)
Raspberries	178	225	1.13 (0.568)	-0.05 (0.288)
Kiwi	213	223	0.03 (0.984)	-0.01 (0.888)
Celery	187	219	0.55 (0.760)	-0.03 (0.524)
Grapefruit	151	210	17.60 (<0.01)*	-0.22 (<0.01)*
Tomato	203	219	0.53 (0.766)	-0.03 (0.50)
Plum	137	220	1.33 (0.515)	0.04 (0.387)
Jicama	195	205	2.37 (0.306)	-0.08 (0.135)
Peas	-	194	-	-
Overall FV	4154	4969	26.42 (<0.01)*	-0.05 (<0.01)*
Fruit	2161	2658	17.87 (<0.01)*	-0.06 (<0.01)*
Vegetable	1993	2311	13.02 (0.001)*	-0.05 (0.001)*

*P<0.05

FIGURES

Figure 7-1 Percentage of Children Who Selected / Like It Versus Week They Consumed Fruit (n=5121)

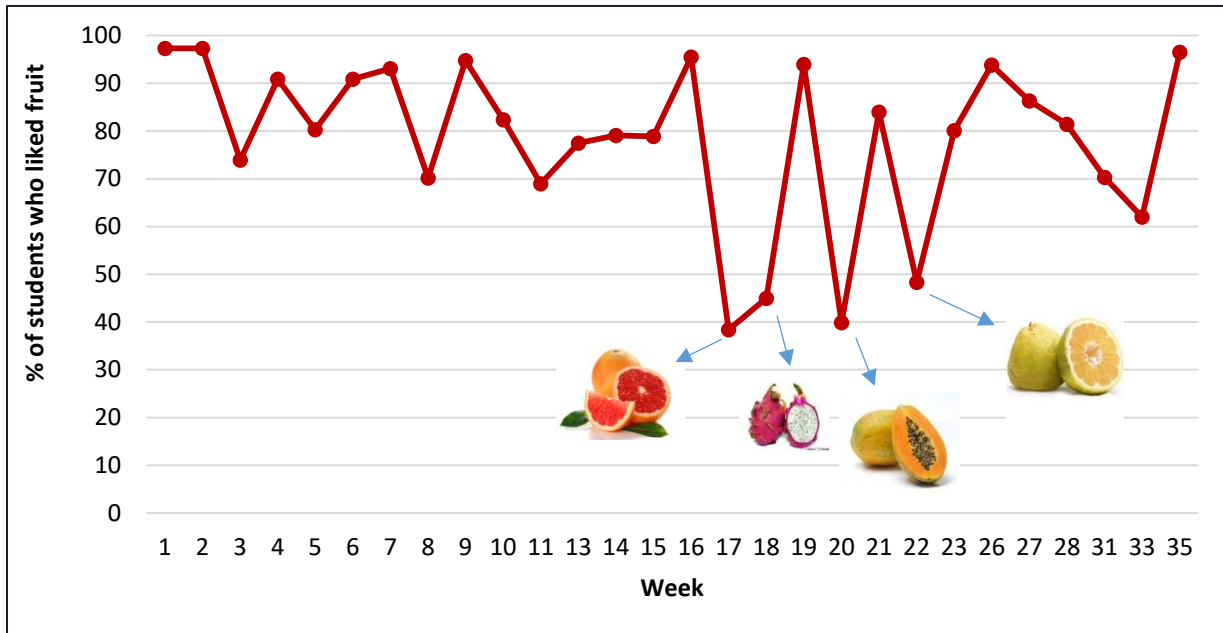


Figure 7-2 Percentage of Children Who Selected / Like It Versus Week They Consumed Vegetable (n=5214)

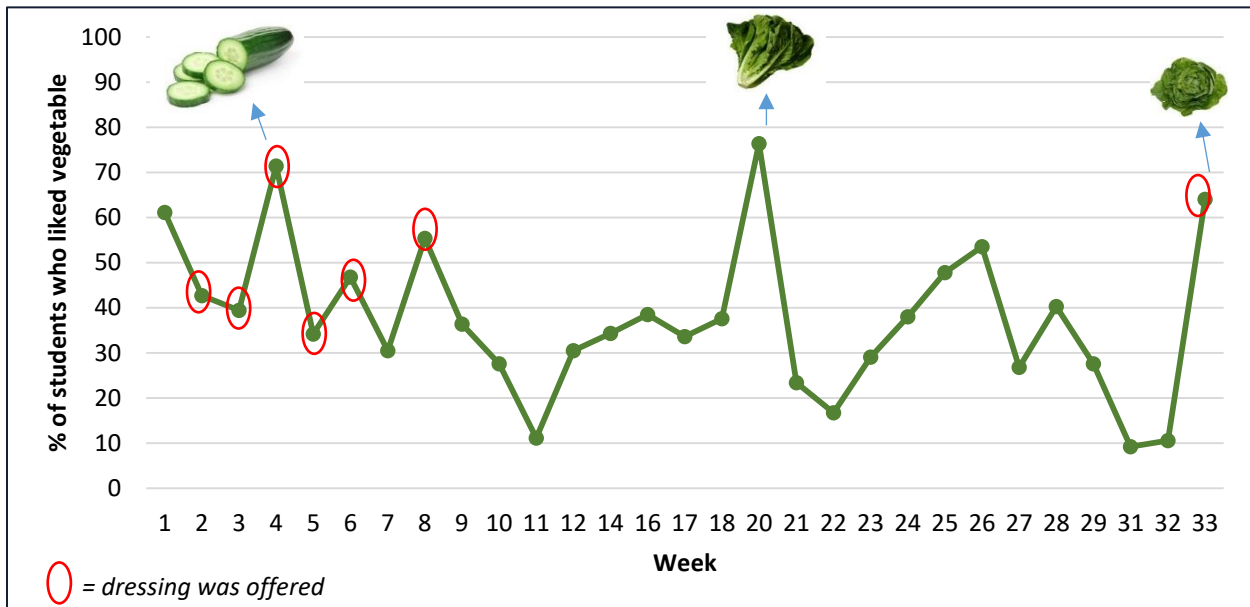
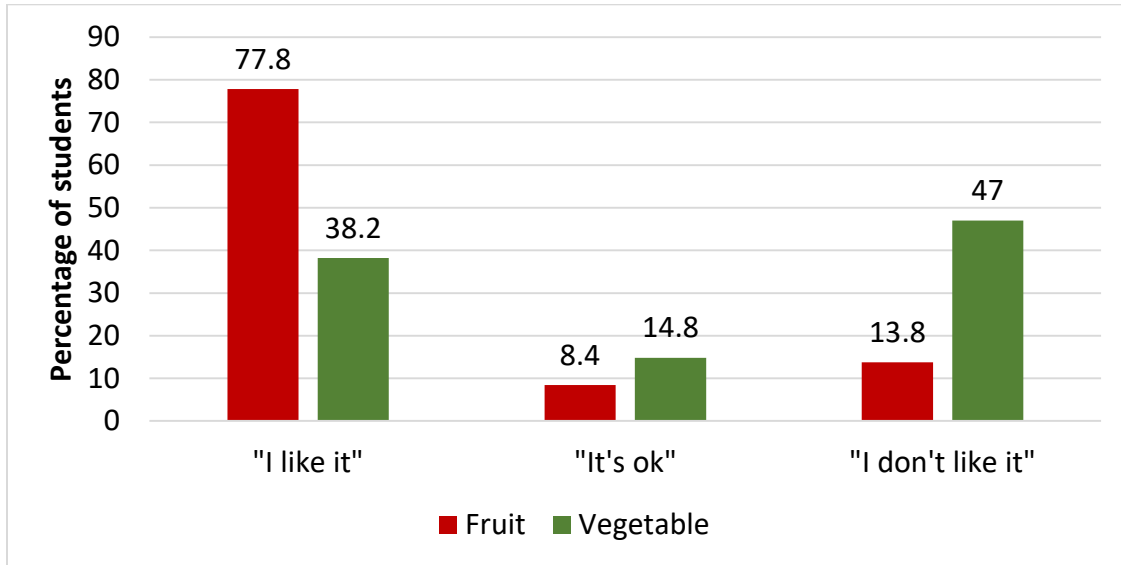


Figure 7-3 Preference Ratings for Fruits (n=5121) and Vegetables (n=5214) among K-2nd Grade Students at the FFVP School



*Chi-square shows statistically significant differences in distribution of preferences ratings between fruits and vegetables ($\chi^2 = 1725.02$, $p < 0.05$)

**Fruit liking has higher mean rank (6250.4 vs 4104.9); Mann Whitney: $U = 7807456.5$ ($p < 0.05$)

Chapter 8.

Determination of Implementation of the USDA Fresh Fruit and Vegetable Program in Illinois Schools

INTRODUCTION

Less than 15% of children between 4-8 years old in the United States consume the recommended amounts of fruits and vegetables (FV),²⁸ and the consumption of FV has been associated with a reduction in long-term risk of obesity, risk of heart disease, and some cancers.⁴⁻⁶ Dietary behaviors related to FV consumption established during childhood can determine eating behaviors later into adolescence and adulthood.^{7,165} As described in *Chapter 1*, the USDA Fresh Fruit and Vegetable Program (FFVP) can impact and influence healthful eating habits in young children nationwide attending low-income elementary schools.^{5,159} In a 2013 Evaluation Report of the FFVP, authors concluded that knowing more about variations in implementation could potentially enhance the one-third cup FV increase they found.¹⁵⁹ Indeed, Implementation Science has emerged as a new paradigm of translational science since we have realized that how something is done can vary widely and cause also produce inconsistent results. While it is known that the FFVP has the potential to increase FV intake in school and outside of school, little is known about K-2nd grade students, as most past process and impact evaluation of the program focused on grades of fourth grade and above, with only one study evaluating kindergartener's ability to identify and try FV.^{23,26-28,32,40}

Funding for this program has increased each year, from \$177 million in 2015-2016 to \$184.5 million in the 2016-2017 school year; but there has been relatively little recent evaluation of its impact.^{1,5,35} Process evaluation measures are lacking in the available studies; which is unfortunate because process evaluation is used to help understand the mechanisms and possible pathways to specific behavior changes.^{37,38} Specifically, diagramming how an intervention is expected to work and including quantifiable measures in these diagrams can provide an outlook on how effective interventions can be and may be critical for interventions that may have limited resources.³⁷

A past evaluation of the FFVP focused on evaluating the impact of the program on FV consumption in children from grades 4 to 6, but did not take into account the process evaluation of the different schools evaluated.⁵ Additionally, the program had been operating nationwide for only 3 years when the data were collected and some schools were in their first year of participation.⁵ One study reported the importance of understanding why children may not take FFVP snacks and other studies

were not able to draw conclusions about student intake in relation to the use of the FFVP.^{5,23} A past study showed the importance of evaluating the allocation of appropriate resources and evaluating process evaluation as it can be useful in other multi-site studies.⁴¹ Additionally, it is important to understand the synergy of using various resources to help with improving school food environments.²³ Implementation research had focused on urging researchers to have a better understanding of the program dissemination process, particularly as levels of treatment integrity are not highly reported.¹⁶⁶ In this case, it may be important to also focus on different levels of implementation of school interventions to assess potential effects on outcome measures. Therefore, our objective was to fully explore implementation procedures of the FFVP in Illinois and create an index for determining low and high levels of implementation.

METHODS

Logic model development

A logic model was developed for the FFVP to assess inputs, outputs, and outcomes of the program and was created with guidance of a previous conceptual model shown in Figure 8-1,¹⁵⁹ a logic model development guide,¹⁶⁷ and guidance from the process evaluation development procedures used for the 'Choice, Control, and Change' curriculum intervention.¹⁶⁸ The current study's logic model includes different elements with both process evaluation and short-, medium-, and long-term outcomes. The elements incorporated in the model were also based on past process evaluation elements determined from a first-year implementation of the Mississippi Fruit and Vegetable Pilot (MFVP) Program and their process evaluation instruments.³² The current model was then assessed by experts in nutrition to ensure the adequate components were included. Figure 8-2 displays the model used in the current study. This model also served as a basis to create surveys that would assess the implementation of the FFVP in Illinois schools, details later described.

Survey development

Three web-based surveys were developed to evaluate the implementation of the FFVP using Qualtrics (Qualtrics, Provo, UT, 2016). Surveys were developed for the school principal, K-2nd grade teachers, and the FFVP coordinator of the school. The FFVP coordinator of the school would be the individual who would understand the implementation of the program at the level of knowing the dosage of the FV distributed, types of FV distributed, and other relevant information about the FFVP implementation. Survey questions were based on the current study's logic model, school nutrition

environment surveys developed for the project described in Chapter 4,¹⁶⁹ survey tools from a previous FFVP evaluation report,¹⁵⁹ a school staff questionnaire that was developed for the pilot program of the FFVP in Mississippi³² in order to directly assess fruit and vegetable snack program dosage, fidelity, acceptability, and cost, as well as partnering practices, collaborations, nutrition education (NE), school wellness policies and nutrition environment of the schools,¹⁷⁰ and a FFVP Handbook for Schools.²² The surveys captured elements such as 1) school personnel characteristics 2) methods of distributing FV 3) variety of FV served, frequency, time of day 4) NE accompanying FFVP 5) partnerships established to implement the FFVP 6) attitudes, perceptions and satisfaction with the FFVP, and 7) produce quality.

Cognitive interviews were used with the modified surveys to ensure appropriateness. The technique of cognitive interviewing was used to gain more insight about the appropriateness of the survey tools and survey takers' perceptions of the items in the surveys.¹⁷¹ In particular, cognitive interviewing is a technique used in formative evaluation and survey tool development as it has been shown to be valuable in the process of survey development.^{172,173} Cognitive interviewing was conducted with school staff who were part of schools that had the FFVP before but did not have the program in place for the 2016-2017 year. Participants were recruited via phone calls. Participants that agreed to cognitive interviewing were sent an informational letter describing the study. They were then sent online links to the survey to be able to participate in the cognitive interviews while they observed the survey in real-time on their personal computer/tablet. There were 2 principals, 3 teachers, and 3 FFVP coordinators who agreed to participate in the cognitive interviewing process. The participants were interviewed for each survey, and probing techniques were used¹⁷³ per question to ensure that the surveys were understandable, appropriate, and that the content was applicable to the program. A sample probing script for the current study's cognitive interviewing process is located in Appendix F. Participants were encouraged to think aloud when they answered the questions of the survey.¹⁷⁴ Cognitive interviews were audio recorded with the agreement of the participant.

The cognitive interviews varied in length from 15 minutes to an hour. Comments and responses from the cognitive interviews were categorized (Table 8-1 to Table 8-3). Certain comments made during the interviews included clarification of the survey questions, length or burden of the question, or item-specific recommendations of changing certain answer choices. The categories for the response were chosen based on the cognitive interviewing procedures outlined by Gordon Willis' book *Cognitive Interviewing*.¹⁷³ Changes were made to the surveys accordingly, with a discussion with an expert in nutrition. Additional rounds of interviews were conducted until no further changes were needed for the

surveys (Table 8-1 to Table 8-3). The Institutional Review Board (IRB) from the University of Illinois #17386 approved the protocol for the cognitive interviewing procedures.

Recruitment of schools in Illinois participating in the FFVP for the 2016-2017 year

A list of schools (n=260) awarded the FFVP for the 2016-2017 school year was found on the Illinois State Board of Education website, reflecting that \$5.42 million total would be distributed to the listed schools.¹⁷⁵ Figure 8-3 displays a map of Illinois detailing the locations of the schools in Illinois that had received FFVP funding for the 2016-2017 school year. Additionally, Table 8-4 shows a list of school districts that were funded for FFVP for 2016-2017. The current study did not conduct research in Chicago Public Schools (CPS), and these schools were excluded from the initial list of 260 schools. Other schools that were excluded from the contact list included schools that were no longer enrolled in the program or schools that were not within the age group of this current study. The remaining elementary schools were included in our contact list (n=128; Table 8-5). The contact information of the appropriate staff who would be taking the surveys (i.e. school principal, the K-2nd grade teachers, and the FFVP coordinator at the school) were obtained by either phone, e-mail to the school principal, contact with the school district, or through the school website. If the school did not provide information, survey links were provided to districts to have the option of distributing the survey links to the appropriate staff. One school district required an additional review board approval process and granted permission for the project to distribute survey links to school staff. Overall, 87 out of the 128 schools were included in the distribution via the Qualtrics survey platform, and the other 41 schools were contacted through the school district by sending the school district the survey links to distribute to the appropriate school staff. Table 8-6 describes the survey distributions to the schools. The IRB of the University of Illinois approved this protocol (IRB #17722).

Survey links of the final surveys developed (Appendix G) were sent to the school staff via e-mail and participants were informed that their participation was completely voluntary. Survey length varied from 15-31 questions. Questions assessing characteristics of the staff taking the survey such as information about their educational level, years they worked at the school district, and race/ethnicity were also included in the surveys. Incentives were included in the survey indicating that the first 300 people to take the survey would receive a \$5 Starbucks gift card. Survey reminders were sent twice for completion of the surveys.

Development of index to assess low and high implementation schools

An index assessing levels of FFVP implementation was created to understand variations of the FFVP implementation in Illinois schools. Experts in nutrition, education, and child development were contacted through review of relevant research on the College of Education and Human Development websites of the University of Illinois at Urbana-Champaign, and through consultation with current committee members in the current dissertation project. Additionally, FFVP experts from the Illinois State Board of Education were also contacted to determine if they were willing to provide an evaluation of the FFVP surveys to help in creating the index of program implementation. Two nutrition experts, 5 education and human development experts, and 3 FFVP experts were contacted via e-mail to ask for their evaluation expertise. From those contacted, 1 nutrition expert and 1 child development expert agreed to help in assessing the survey items for determinants of low and high implementation of the FFVP. The expert panel members were provided with an informational letter about the objectives of the project, a copy of the 3 surveys created for the project, a logic model of the FFVP, and the FFVP Handbook for Schools²² for their reference. The IRB of the University of Illinois approved this protocol (IRB #17777) and approval letter along with the informational letter for this aspect of the study are in Appendix H.

Interviews were conducted with the expert panel members to assess which questions from the surveys would help in determining high and low implementation of the FFVP and potential impact on children's FV outcomes. The expert panels were asked whether they found the questions were vital and important in determining various levels of program implementation. Individual questions were assessed, and questions were retained in the scoring strategy when there was agreement among the expert panel members' comments. Table 8-7 displays a summary of the comments and justifications for the questions included in creating the survey index score. From the comments of the expert panel and agreement with the principal investigator, a survey score was determined for each survey type. Further justification of the scoring strategy and questions retained for the scoring strategy, including justifications from the FFVP Handbook for Schools²² and literature findings are presented in Table 8-8 to Table 8-10. Questions were excluded from the survey point distribution if there were disagreements between the expert panel members, if the question was site-specific and would deem unfeasible to give a fair scoring for a school, or if no known literature was found noting impact the variable or item has on children's FV consumption. One point was allocated to each question that would indicate high implementation, and no points were awarded for that particular question that would denote low implementation. Raw point

scores were allocated as follows: 9 points for the principal survey, 11 points for the teacher survey, and 20 points for the FFVP coordinator survey. High implementation was noted as survey scores that were above 50% of the items selected from the surveys (i.e. 5 points or greater for the principal survey, 6 points or greater for the teacher survey, and 11 points or greater for the coordinator survey), and low implementation were denoted for the schools below this cut-off mark. There are no known indexes for FFVP implementation; thus, a scoring strategy was developed based on another study that integrated implementation-related items from surveys to develop their index score for an obesity prevention program,¹⁷⁶ and a review evaluating the impact of implementation levels and on program outcomes that noted that implementation levels have been categorized in a dichotomous (i.e. low/high implementation) or continuous fashion (i.e. scores on a continuous scale).¹⁷⁷ Thus, the current study's index was developed using implementation-based items from the three surveys and analyses were conducted with implementation as both a dichotomous and continuous variable, analyses further described.

Data analyses of FFVP surveys

Descriptive statistics were determined for the FFVP surveys for the school staff members. Additional analyses of the survey included cross tabulation evaluation to assess comparison of survey question choices and outcomes regarding fidelity of the program, levels of satisfaction of the program, and children's FV outcomes. Chi-square tests of associations were used to compare relationships between categorical variables of the surveys. Finally, individual survey types were scored according to the responses to the questions based on the survey scoring strategy developed and composite scores were created for the schools that had the three surveys completed. Multiple linear regression analyses were conducted to assess the relationship between the predictive and outcome variable from the principal, teacher, and FFVP coordinator surveys (Equation 1). Normality of residuals, multicollinearity, and homoscedasticity were examined for models. Covariates such as race/ethnicity, educational background, and years working at the school were incorporated in models when appropriate. Nominal variables included if nutrition displays were available at the school, and if the FFVP coordinator had training the FFVP. Ordinal and continuous variables included the number of times a month a school had school-wide NE, number of times a teacher taught NE a week, amount of FV children consumed, number of times a week FV were distributed, the FFVP coordinator's favorability of the FFVP, how often low-fat dips were used with vegetables, number of times the same FV were served throughout the year, student's preferences of FV, the FFVP implementation score, the FFVP coordinator's favorability of the

FFVP, FFVP coordinator's level of verbal encourage in the FFVP. Statistical analyses were performed with IBM SPSS Statistics, version 23.0 (IBM Corporation, Somers, NY). Variations of Equation 1 were examined and variables are further described below:

$$Y = b_0 + b_1x_1 + b_2x_2 + \dots + b_px_p \quad (\text{Equation 1})$$

Where,

$Y =$ number of times a month school had school-wide NE; if nutrition displays available at the school; number of times a teacher taught NE a week; amount of FV children consumed [from teacher's and FFVP coordinator's perspective]; number of times a week FV are distributed; FFVP coordinator's favorability of the FFVP; how often low-fat dips were used with vegetables; number of times the same FV were served throughout the year; student's preferences of FV [from FFVP coordinator's perspective]

$b_0, b_1,$ and $b_p =$ estimate regression coefficients

$x_1, x_2,$ and $x_p =$ p predictors (FFVP implementation score; FFVP coordinator's favorability of the FFVP; if FFVP coordinator had training in FFVP; FFVP coordinator's level verbal encouragement in FFVP)

The hypotheses for the analyses are listed below:

Multiple linear regression:

- i) H_0 : FFVP implementation score is not a predictor for the number of times a month a school participated in school-wide NE
- ii) H_0 : FFVP implementation score is not a predictor for the number of times a teacher taught NE a week
- iii) H_0 : FFVP implementation score is not a predictor for the amount of fruit children consumed (teacher's perspective of consumption patterns)
- iv) H_0 : FFVP implementation score is not a predictor for the amount of vegetable children consumed (teacher's perspective of consumption patterns)
- v) H_0 : The FFVP coordinator's favorability of the FFVP is not a predictor for the number of times a week FV are distributed at a school

- vi) H₀: The FFVP coordinator having training in the FFVP is not a predictor for the number of times a week FV are distributed at a school
- vii) H₀: The FFVP coordinator level of encouragement in the FFVP is not a predictor for the number of times a week FV are distributed at a school
- viii) H₀: The FFVP coordinator having training in the FFVP is not a predictor of the FFVP coordinator's favorability levels in the program
- ix) H₀: The FFVP coordinator's years working at the school, race/ethnicity, and educational background are not predictors for how often low-fat dips were used with vegetables
- x) H₀: FFVP implementation score is not a predictor for the number of days per week that FV are served
- xi) H₀: FFVP implementation score is not a predictor for the number of times the same FV are offered throughout the school year
- xii) H₀: FFVP implementation score is not a predictor for the amount of FV consumed by children
- xiii) H₀: FFVP implementation score is not a predictor of children's FV preferences

RESULTS

The results of this current study are divided into two parts: the first part of the results are from the development of the FFVP surveys and the second part of the results focus on the findings from the distribution of the FFVP surveys.

Development of the FFVP surveys

The cognitive interviewing procedures for the principal survey revealed that most changes recommended for the questions were within the categories of *Item-specific recommendations*, where specific items from questions were changed, and *Respecification of objectives*, where questions or answer choices needed clarification to adhere to the objectives they intended to capture. Options were added to answer choices to improve the accuracy of collecting information and when there were issues of *Respecification of objectives*, clarifications to questions and answer choices were provided. One question, in particular, was reworded to clarify the meaning of 'sponsor training' as this was ambiguous to both principals who were part of the cognitive interviewing process. A portion of the changes made to the teacher survey included adding more answer choices to increase the accuracy of data collection

and changing answer choices that noted specific time points (i.e. 15-20 minutes for a lesson plan) to time points that would capture more accurate time points that would be used in a classroom setting. Finally, changes to the coordinator survey included clarifying a question by adding bolded terms within the question to specify important words, and modifying a question about partnerships to ease the burden of the length of the question. The full listing of the changes made and the implications for the changes made are in Tables 8-1 to 8-3.

After changes were made to the surveys, a survey index score was created to classify schools as low or high implementers of the FFVP. Two expert panels discussed questions from the surveys to include in the scoring strategy that would help with identifying different levels of implementation of the FFVP. The specific questions chosen and the comments made by the panel members are in Table 8-7. The panel members' comments for whether survey questions were retained or excluded for the scoring strategy included whether the survey question could be used to differentiate between a low and high implementer of the FFVP, the survey question could demonstrate how the implementation could positively impact FV outcomes in children, and whether the survey question would not encounter issues of responses that were site-specific to particular schools (i.e. barriers with produce quality may differ among schools but this would not necessarily classify a school as being a low implementer of the FFVP). Final questions were selected based on the panel members' comments, the FFVP Handbook for Schools,²² and literature findings that capture the importance of retaining the particular question for understanding appropriate approaches in school intervention programs. Table 8-8 to Table 8-10 outline the questions retained in the final scoring strategy, the point distribution for the scoring strategy per question, and the justifications from the handbook and literature findings as to why the questions were included in the scoring strategy. Justifications from literature including a study showing that having a school committee enhanced communication among those involved in a school intervention, indicating the importance of having a committee for programs such as the FFVP,¹⁷⁸ and another study noting that communication media (i.e. posters) was important in encouraging the consumption of low-fat foods among children indicating the importance of publicizing positive behavior changes.¹⁷⁹ Thus having these attributes would be helpful in the implementation of the FFVP.

Distribution of the FFVP surveys

Demographic characteristics of the principals, teachers, and coordinators surveyed are in Table 8-11. There were 38 principals who responded, and more than half of them had been working at their school for more than 6 years. Almost all of the principals (92.1%) had a Master's degree and almost 90%

of them identified as non-Hispanic and 78.4% identified as White. There were 317 teachers that completed the survey, and 74.2% had monolingual classrooms. From those surveyed, 64.8% noted that they had more than 6 years of teaching experience and the majority had Master's degrees (60.4%). There were 80.1% of the teachers who identified as non-Hispanic, and 83.0% identified as White. Lastly, there were 67 respondents for the FFVP coordinator, and from those respondents, almost half noted that they had more than 6 years working at the school. The roles that the coordinators had at the school were as food service directors (37.3%) or other occupations (35.8%) such as administrative assistant, campus manager, or nurse. The primary educational level of the FFVP coordinators were at the Master's degree level (32.8%) followed by the college degree level (29.9%). The FFVP coordinators were primarily non-Hispanic (95.6%) and 80.6% identified as White.

There was a total of 108 schools (from 128 schools that were contacted) that were represented in the survey distributions in Illinois schools. Using the survey index scoring developed to identify low/high implementation of the FFVP (i.e. principal survey – 9 points, teacher survey – 11 points, FFVP coordinator survey –20 points), specific scores were determined for the individual surveys. Including all the surveys assessed in aggregate, 86.8% of the principal surveys were scored as high implementer schools (Table 8-12). These scores were similar among other survey types where the teacher and coordinator surveys scored 89 to 91% as high implementers, respectively (Table 8-12). The scores for the principal survey ranged from 3 to 8 points (out of 9 points), teacher survey ranged from 2 to 9 points (out of 11 points), and the coordinator survey points ranged from 8 to 20 points (out of 20 points). The average principal survey score was 6.17 (68.6% score), the teacher survey score was 6.978 (63.4% score), and the average coordinator survey score was 14.122 points (64.2% score). From the 108 schools, there were 20 schools that had all three types of surveys completed by staff (i.e. principal, teacher, and FFVP coordinator surveys were completed), 52 schools that had two types of surveys completed by staff, and 34 schools that had one type of survey completed by their staff. Of the 20 schools that had all three types of surveys completed (Table 8-13), 14 out of the 20 (70%) had scores that were consistent among the three survey types (i.e. high implementer scores among the three types of surveys). Four of the 20 schools had agreements between 2 of the survey types where they were low implementers and one survey type scored as a high implementer, and 2 had only one survey that scored as a low implementer while the other 2 survey types were scored as high implementers (Table 8-13).

The results of the principal survey (n=38) revealed that more than half of the principals had their school coordinate specific FV offered during the FFVP with information discussed in school-wide NE and

promotion activities (Table 8-14). Additionally, the majority of the principals (78.9%) noted that they had a committee in place for the FFVP and that it consisted primarily of the principal, FFVP coordinator, school food authority (SFA), and teachers. Overall, most principals (73.7%) strongly agreed with the statement that they had a favorable opinion of the FFVP. In terms of school-wide NE, 50% of principals noted that their school had NE 1 to 2 times per month, and 13.2% noted that their school did not have school-wide activities regarding nutrition. The common messages conveyed in these activities included trying new fruits and vegetables (73.7%), role of fresh fruits and vegetables in a complete diet (63.2%), and eating a variety of fruits and vegetables (60.5%). All school principals surveyed noted that they had displays around the schools that conveyed NE or promotion messages. Almost all principals (94.7%) noted that the displays were in the cafeteria. Principals noted that the main professionals or volunteers that lead school-wide NE were classroom teachers (71.1%) and lunchroom managers (44.7%).

Common policies of the school regarding food included that healthy food choices are offered to students during school parties (55.3%) and that healthy food choices are offered on special occasions during school (36.8%). Principals noted that the primary way of communicating nutrition material to parents was through the form of newsletters (68.4%). More information was provided noting that training in nutrition is offered to staff including lunchroom staff (36.8%) and teachers (21.1%); however, 50% of the principals noted that no training in nutrition is offered to staff.

When comparing principals' responses of *Somewhat agree* versus *Strongly agree* for their favorability of the FFVP, there were no statistically significant relationships between these favorability ratings and whether the principal had noted that the school coordinated school-wide NE with the FV served through the FFVP ($P=0.976$), if the school had an FFVP committee ($P=0.687$), and how many times a month the school offered NE ($P=0.173$). Analyses were then conducted to assess if whether a school had a committee or not impacted several implementation factors of the FFVP. There were no statistical differences of whether having a committee influenced the effect that a school coordinated school-wide NE with the FV offered for the FFVP ($P=0.074$) and how many times per month the school may have had NE ($P=0.322$). The frequencies and regression analyses results are in Table 8-15, showing that 78.6% of the principals who noted that their school had a FFVP committee in place also coordinated NE activities with the FV handed out in the FFVP program, whereas 40% of principals who noted that there was no FFVP committee in place also noted efforts of coordinating NE activities with the FV handed out in the FFVP program. Regression analyses were not significant for any of the items (Table 8-15).

Using the step-wise linear regression analyses (Table 8-16), it was found that levels of FFVP implementation explained a significant amount of variance in the number of times a month a school participated in school-wide NE and promotion activities ($F(1,31)=7.38$, $P=0.011$, $R^2=0.192$). These results suggest that 19.2% of the variance in the number of times NE is taught in the schools can be explained by a schools' level of implementation. The model indicates that the number of times a month NE was offered at schools increased by 0.37 if a school had a higher score for FFVP implementation. Analyses were adjusted for the years the principal worked at the school and the principal's educational background.

When asked if there was one thing that could be changed about the FFVP, principals revealed comments such as not having the ability to choose what FV was provided, issues with serving vegetables raw, wastefulness, preparation of FV, inconsistent drop off times, and having the ability to give students bigger portions. Feedback quotes received from the principals included the following:

"Allow the individual schools to choose the fruit or vegetable that could be served each week."

"Be careful about what vegetables are served raw—if they are not normally eaten raw, why ask the kids to try them that way? Examples: rhubarb, Brussel sprouts, okra."

"Being able to purchase foods that may or may not be grown in the US."

"Variety that is appealing to students."

The teaching survey (n=318) revealed that almost 40% of the teachers were very familiar with the implementation of the FFVP at their school (Table 8-17). A very high percentage of teachers (93.1%) noted that the FV for the FFVP were passed out in the classroom and there were only 2 who noted that FV were passed out in a kiosk or at the gym. When the FV were distributed, 97.8% of teachers noted that they were present during this time and only 23.2% noted that they always ate the FV distributed alongside their students. There were 14.1% of teachers who noted that they never ate the FV provided during the time it was distributed. Of the FV provided to students, teachers (75.2%) noted that children consumed all or most of the fruits but not as many teachers (29.6%) noted that children consumed all or most of the vegetables. This roughly is in agreeance with the teachers' perception of whether students like the FFVP fruits, with 80.8% noting that they strongly agree that students like the FFVP fruits. However, only 19.8% of the teachers noted that they strongly agree that students like the FFVP vegetables. The majority of the teachers (81.8%) strongly encouraged the students to eat the FFVP snacks and most had an overall favorable opinion of the FFVP (71.1%). Despite the favorability for the

program, only 4.4% of the teachers had training for the FFVP and of those who were trained, the majority (78.6%) had specific training on implementing the FFVP. The most common implementation activities that teachers helped with included distributing the FV for the FFVP (43.4%) and being a positive role model to children during the FFVP (46.9%). When it came to teaching nutrition in the classroom, only 28.6% of the teachers taught nutrition as part of the FFVP and taught it at least 1 time per week (59.3%). Common tools for teaching nutrition included class discussions (21.1%) and supplementary materials (16.4%). The most common topic discussed was trying new fruits and vegetables (24.8%) and the type of curriculum used with the most frequency was *The OrganWise Guys* (10.7%).

Teachers were asked about common issues on implementing the FFVP (Table 8-18). Teachers noted that the most common major problem with implementation of the FFVP was that students wasted too much (16.0%). A most common minor problem of the FFVP was of students not liking the FV (50.3%). There were higher frequencies of teachers selecting *Not a problem* as their responses for the issues listed in the survey including issues with student behavior (91.2% selecting *Not a problem*) and class time being interrupted or taken away from student learning because of the FFVP (75.2% selecting *Not a problem*).

When using chi-square test of independence to assess if a teacher's familiarity with the FFVP is associated with their favorability of the FFVP, the chi-square test revealed that there was a significant association between these two variables ($\chi^2(12) = 47.379$, $P < 0.01$). Nonparametric correlations also revealed a positive and significant association between the two variables (Spearman's rho = 0.040, $P = 0.006$ [one-tailed]). Both chi-square tests of independence and correlation statistics were determined for teacher's favorability of the FFVP and other variables regarding teaching nutrition, encouraging FV consumption, training in FFVP, and role modeling behaviors (Table 8-19). The most significant positive associations were found between teacher's favorability of the FFVP and how often they provided verbal encouragement for students to consume the FV snacks (Spearman's rho = 0.38, $P < 0.01$) and how often the teachers consumed the FV snacks to role model (Spearman's rho = 0.227, $P < 0.01$). A statistically negative association was found with the teacher's favorability in the FFVP and whether the teacher taught nutrition (Spearman's rho = -0.24, $P < 0.01$). Further, it was found that a teacher's level of verbal encouragement to students and whether they taught nutrition were positively associated and statistically significant ($\chi^2 = 16.8$, $P = 0.002$; Spearman's rho = 0.23, $P < 0.01$). However, the association

between how often the teachers ate the FV along with the children and if they taught nutrition was negative and statistically significant ($X^2=5.37$, $P=0.251$; Spearman's rho = -0.124, $P<0.01$).

Step-wise linear regression analyses were used to assess if implementation levels at the school could explain the number of times a teacher taught NE a week and the amount of FV children consume, according to teachers' perspectives (Table 8-20). There was a significant model showing that a school's level of FFVP implementation, explained 8.5% of the variance in the number of times a teacher taught NE a week ($F(1,89)=8.216$, $P=0.005$, $R^2=0.085$). It was also found that a school's level of implementation explained a significant amount of variance in the amount of fruit consumed by children, ($F(1,309)=31.751$, $P<0.01$, $R^2=0.093$). The regression analysis suggests that almost 9.3% of the variance in the amount of fruit consumed by children is impacted or explained by the FFVP implementation score of the school. A significant regression model was found for the variable determining the amount of vegetables consumed by children and the school's level of FFVP implementation (Table 8-21), showing that the FFVP implementation score is a significant predictor for the amount of vegetables consumed by children ($F(1,307)=53.816$, $P<0.01$, $R^2=0.149$).

When teachers were asked what they could change about the FFVP, comments included issues with vegetables being served raw, having more variety in the produce, having child friendly fact sheets for K-2nd grade, offering dips for vegetables, offering FV daily, and issues with wastefulness of the food. A portion of the quotes are included below:

“actually knowing what was coming in so we could discuss and learn a little about the things students are eating.”

“An activity sheet to go with fruit or veggie that day would be great! Love the program-so many kids tried things they have never even seen!”

“Do veggies first in the week and then the fruits later in the week.”

“For them to send ‘normal’ fruits & veggies. What child eats cabbage and zucchini? Most of the food sent gets throw away!”

When the FFVP coordinators were surveyed ($n=67$), most FFVP coordinators reported that the FFVP was offered to students 2 times per week (83.6%) and once per day (85.1%) (Table 8-22). FFVP distributions occurred primarily in classrooms (89.6%). Typically, students consumed the FV at the same location it was served (85.1%). FV distribution also occurred more often during the morning before

lunch (62.7%) than in the afternoon after lunch (56.3%). The preparation that was most commonly done for the FV served included slicing (58.2%) and peeling the FV (46.3%). The most common fruits that were distributed were apples (91.0%), grapes (91.0%), watermelon (88.1%), oranges (82.1%), blueberries (85.1%), and cantaloupe/honeydew (88.1%). Over half of the coordinators noted that their schools served exotic fruit options. Other fruit options that were passed out included dragon fruit, grapefruit, blood oranges, uchuva, and cranberries. The same types of fruits were typically offered three or more times throughout the year (38.8%) with the most common distribution sizes being $\frac{1}{4}$ to $\frac{1}{2}$ cups of fruit. The most common vegetables that were distributed included broccoli (92.5%), carrots (91.0%), cauliflower (86.6%), peppers (86.6%), tomatoes (85.1%), and cucumber (83.6%). More than half of the coordinators (56.7%) noted that their schools served exotic vegetable. The same type of vegetable was offered up to two times throughout the year (34.3%) and the most common amounts of vegetables served were $\frac{1}{4}$ to $\frac{1}{2}$ cups. FFVP coordinators reported that they primarily never used full-fat dipping sauces (86.6%) and 56.7% noted that they never used fat-free or low-fat dipping sauces. When asked if there was a relationship between the FV served through the FFVP and the FV served during lunch, more than half of the FFVP coordinators (58.2%) noted that no attempt was made to coordinate the FV served for both programs. Of the school coordinators surveyed, it was found that 22.4% of the schools were in their first year of implementation in 2016-2017. However, more than half of the coordinators (52.2%) reported that their school had the program before the 2014-2015 school year. FFVP coordinators reported that the major changes made in the FFVP compared to the prior years included offering more variety of FV in the FFVP (31.3%) and having more FFVP NE and promotion activities (20.9%). When asked if they were present during any of the times the FFVP was distributed, 79.1% of the FFVP coordinators noted that they had been present. With those who responded that they were present during the times the FV were passed out as a snack, 60.4% of the coordinators noted that children consumed all or most of the fruits handed out to students, and only 30.2% noted that children consumed all or most of the vegetables handed out. More than 70% of the FFVP coordinators noted that they verbally encouraged students to eat the FFVP snacks. There were differences in responses when asked whether students like the FFVP fruits or vegetables where 74.6% of the coordinators noted that they strongly agreed that children liked the FFVP fruits and only 29.9% strongly agreed that children liked the FFVP vegetables. Of the FFVP coordinators surveyed, there were more who did not have training (55.2%) in the FFVP than those who did have training for the program. The most common type of training was training that was specific on how to implement the FFVP (32.8%). The most common implementation activities that the FFVP coordinators took part in were distributing the FV for the FFVP

(44.8%), being a positive role model to children during the FFVP (46.3%), and planning activities for the FFVP (32.8%). There were 82.1% that noted *Strongly agree* for the option asking if they had an overall favorable opinion of the FFVP.

Lastly, when coordinators were asked for factors influencing the implementation the FFVP, one major problem the coordinators noted (17.9%) was the high prices of the FFVP produce (Table 8-23). The minor problems that were identified with most frequency among the FFVP coordinators were the perishability of FFVP produce (50.7%) and students wasting too much of the FV (47.8%). The issues of cost of preparing FFVP produce, lack of storage space/facilities, rules of purchasing produce for FFVP, and restrictions on administrative cost were not seen as common problems to the FFVP coordinators survey as 80.6 to 89.6% noted *Not a problem* for these identified issues.

Spearman's rho tests were conducted to assess the strength of associations between how many times a week FV were offered to students at schools and other variables throughout the survey (Table 8-24). There were significant positive associations with times a week FV were served and whether all grades were offered FV at the school (Spearman's rho = 0.272, P=0.03), number of times same fruits were offered in the school year (Spearman's rho = 0.368, P=0.01), and students liking of the vegetables (Spearman's rho = 0.28, P=0.02). Further analyses were conducted to assess correlations between how favorable the FFVP coordinator viewed the FFVP and other variables within the survey. There were significant associations between the FFVP coordinator's level of favorability and whether they were involved in any training for the FFVP (Spearman's rho = -0.291, P=0.02), whether they were present during the times FV were passed out (Spearman's rho = 0.361, P=0.003), and students liking the vegetables (Spearman's rho = 0.501, P<0.01).

There were significant correlations between if an FFVP coordinator had training in the FFVP and if they were present during when FV were distributed (Spearman's rho = 0.241, P=0.049), when the school first participated in the FFVP (Spearman's rho = 0.258, P=0.035), the coordinator's overall opinion of the program (Spearman's rho = 0.291, P=0.02), and how much fruit the students' consumed (Spearman's rho = -0.332, P=0.017). When doing a step-wise linear regression analysis to assess whether the number of times a week FV are distributed can be predicted by the FFVP coordinator's favorability of the program, whether they had training or not, their levels of verbal encouragement, and accounting for the coordinator's race/ethnicity, educational background, and their years working at the school, none of the variables were significant. There were significant negative correlations between the favorability

the coordinator had with the FFVP and how many partnerships the school had for implementing the FFVP (Spearman's rho = -0.383, P=0.025).

Step-wise linear regression analyses were determined to find whether a FFVP coordinator having training in the FFVP could predict the coordinator's favorability levels in the program, accounting for the coordinator's educational background, race/ethnicity, and years at the school. For these analyses, none of the variables were significant. For the step-wise regression analysis determining if whether the number of years the coordinator had worked at the school, their race/ethnicity, and their educational background could predict how often low-fat dips were offered with vegetables, only training and educational background were significant variables in the model ($F(2,51)=5.429$, $P=0.007$, $R^2=0.176$).

When using linear regression to assess if levels of FFVP implementation could predict days per week FV are served, there was no significant model found in the analysis. Linear regression analyses were used to assess associations between the number of times the same fruits were offered throughout the year for the FFVP and a school's implementation score for the FFVP, according to the FFVP coordinator survey (Table 8-25). Adjusting for the coordinator's race/ethnicity, educational background, and years working at the school, the variables for the school's level of implementation and the coordinator's race/ethnicity were significant along with if the coordinator had training in the FFVP, $F(3,34)=8.207$, $P<0.01$, $R^2=0.42$. Specifically, the model shows that 42% of the variance in the number of times the same fruits are offered throughout the year in a school could be explained by the schools level of FFVP implementation, along with the coordinator's race/ethnicity and educational level. Similar analyses were conducted to assess significant variables predicting the number of times the same vegetables were offered in 2016-2017, and it was found that the school's level of implementation of the FFVP and the coordinator's race/ethnicity were significant variables, with the variables explaining 25.4% of the variance ($F(1,38)=6.289$, $P=0.004$, $R^2=0.254$).

Linear regression analyses were used to examine the relationship between the amount of fruit consumed by children and the school's score for level of implementation of the FFVP. The regression analysis produced $R^2=0.091$, $F(1,49)=4.905$, $P=0.031$. The model shows that a high implementer for the FFVP is a positive predictor of more consumption of fruit, and this variable was statistically significant, accounting for 9.1% of the variance of the model. For consumption of vegetables, there was a significant model with a school's classification of high implementer of the FFVP explaining 26.9% of the variance in the amount that children consume of the vegetables ($F(1,48)=17.655$, $P<0.01$, $R^2=0.269$). For assessing the relationship between students' preferences of the fruits and vegetables, it was found that 15.7% of

the variance in students' liking of the vegetables could be explained by the school's level of FFVP implementation ($F(1,63)=11.762$, $P=0.001$, $R^2=0.157$). The model was insignificant for fruits ($F(1,64)=1.988$, $P=0.163$, $R^2=0.03$).

Using ordinal regression, an analysis was conducted to assess the relationship between how often full-fat dipping sauce were offered to students with vegetables and a school's level of implementation of the FFVP. Ordinal regression analyses showed a significant model ($P=0.029$), and that 11.7% of the variance in the outcome is explained by the school's level of implementation of the FFVP (Nagelkerke=0.117). If the school was to have low implementation, their ordered log-odds of being in a more favorable compliance would decrease by -2.009 points ($SE=0.932$, $P=0.031$) while the other variables in the model are held constant.

Coordinators of the program were asked what aspects of the program they would change, and responses varied but included having parents to participate with students at times, allowing after school distribution of FV, having better vegetables, offering exotic FV, and having a larger variety of FV to distribute to students. Some quotes include:

"Don't have two periods when they distribute the money. They don't release enough money during the first period (Aug-Sept), and then we have too much money for the second period."

"I wish I could serve it EVERY day!"

"I would like to see the packaging more uniform. Some packages were empty, some would have a tiny quantity of food, and some were very full of the food. The staff and students love the program!"

"Increase the labor to total amount spent ratio to a higher amount. It is current at 25%"

DISCUSSION

The findings of this evaluation provide an overview of some of the factors that may influence implementation of the FFVP in Illinois schools. Such factors were outlined in the logic model developed for the current study and were further examined in the surveys distributed to the Illinois schools. More than half of the principals who participated in the surveys revealed that their school coordinated school-wide NE to align with the specific FV offered for the FFVP, and the majority of the principals also noted that there was a committee in place for the program. Factors, such as having a committee in place, are important when implementing the FFVP as having a committee at the school can reinforce and strengthen the messages sent to children.^{32,178,180} Principals who had a committee in place had higher

frequencies of noting that the school aimed to coordinate school-wide NE activities with the FV distributed in the FFVP (78.6% vs. 40%), potentially showing the importance of having a committee in planning this coordination and ensuring FV exposure. Further exploration using regression analyses showed that 13.1% of the variance in the number of times a school had NE activities could be explained by whether the school was determined to have high implementation of the FFVP per the scoring developed for the current study. The use of an index to classify schools has also been used in another study that created an index, assigned scores to schools based on the index, and assessed various elements of program implementation.¹⁸¹ Their study explored low and high implementing programs and the impact of different levels of implementation on healthy eating and physical activity outcomes, and found schools labeled as high implementers had more positive outcomes such as staff delivering more healthy eating education than schools labeled as low implementers.¹⁸¹

Favorability in the program among the principals showed that 73.7% of them strongly agreed that they had a favorable view of the FFVP. However, no principals selected *Strongly disagree* or *Somewhat disagree* for this item. A previous evaluation of the FFVP in 2013 surveying principals noted that 91.8% of them strongly agreed that they had a favorable view of the program.¹⁵⁹ The 2013 evaluation was conducted on a selected sample of states and a certain number of schools per state.¹⁵⁹ Within the surveys, it was noted that professionals who conducted the NE activities for the FFVP were primarily classroom teachers and the lunchroom managers (44.7 to 71.1%), but around half of the principals noted that training was not provided to these staff members. Providing training and more resources to staff may be helpful and imperative when conducting an intervention or a program as it can improve the delivery of the program as it facilitates the process of delivering material.¹⁸² In a project evaluating schoolwide positive behavior support, an evaluation of facilitators and barriers of the program¹⁸³ led to revisions being made to improve the training, technical support, and resources provided to the schools to create a more successful implementation of the program.¹⁸⁴ Identifying concerns among staff and providing resources to teachers or school administrators of the FFVP can be helpful in facilitating the program.

From the teacher perspective, the survey data revealed that almost all teachers were present when the FV were distributed and that generally, children consumed all or most of the fruits compared to the vegetables (75% vs. 30%) which also coincides with the children's preferences of the FV, with a higher percentage of teachers noting that they strongly agreed that the children liked the fruits than the vegetables (81% vs. 20%). Children tend to prefer fruits over vegetables.¹⁸⁵ The regression analyses of

the current study showed that a school classified as a high implementer (according to the FFVP teacher surveys), was a predictor for the amount of FV consumed by children ($P < 0.01$). This suggests that higher levels of implementation of the FFVP may influence the amounts of FV consumed by the children; thus encouraging higher implementation of the program.

There were 71.1% of teachers who had an overall favorable opinion of the FFVP, and this is similar to the percentage found in the previous FFVP Evaluation where 78.3% of teachers noted that they strongly agreed to having a favorable view of the program.¹⁵⁹ This favorability frequency is similar to the favorability of the principals. Determining favorability levels may be important, as another study found that dissatisfied teachers for a nutrition intervention used the curriculum provided to them the least.¹⁸² Having higher satisfaction in the FFVP may lead to more successful implementation of the program. Despite the principals revealing that most classroom teachers and lunchroom managers provided NE activities in the school, only 4.4% of the teachers reported having training for the program. More information is needed in understanding the training teachers may have as training can help with facilitating the NE and activities for the program. Additionally, it was found that teachers familiarity of the program was positively and significantly associated with their favorability in the program. In an evaluation of a gardening program, it was noted that having a variety of stakeholders would be beneficial in an intervention planning process¹⁸⁰ and another study found that it would be helpful to improve communication among school staff regarding the education component in order to send a stronger, consistent message to students regarding the FFVP.³² This reiterates the importance of having school staff familiar with a program to ensure the program's successful implementation. In the current study, positive associations were found between teachers' level of encouragement and how often they ate the snack and practiced role modeling. The psychosocial environment of a school, such as role modeling by school staff, can help support health-enhancing nutrition choices.¹⁸⁶ In this sense, role modeling behaviors such as the teachers passing out the FV for the FFVP or consuming the FV may be helpful in encouraging students to also consume the FV.

Of the teachers surveyed, less than 30% taught nutrition as part of the FFVP. Understanding barriers of teaching nutrition for the FFVP may be important for seeking better strategies to help teachers integrate this type of education in their classrooms. Encouraging NE alongside FV tastings in the classroom may be helpful for FV intake among children. The importance of teaching NE along classroom education with taste testing has been shown to be beneficial in improving FV intake.¹⁸⁷ Associations between teacher's level of encouragement in the classroom and whether they taught

nutrition were positive and statistically significant, which could be an indicator that levels of engagement in the program can lead to more engagement through the form of NE. A past cafeteria-based intervention showed that verbal encouragement through food service staff was statistically significant in its association with outcomes in FV intake.⁸³ Verbal encouragement from teachers and other parties involved in implementing the FFVP may be helpful in influencing FV intake among children.

Final results from the coordinator survey revealed information about how the program was implemented in various school settings in Illinois. The FFVP Handbook for Schools²² notes that students should be offered FV at minimum two times per week, and most coordinators in the current study noted that their school reached this recommendation. Only 13.5% of schools offered FV more than 2 times per week. Repeated exposure of FV has been shown to be beneficial,¹⁸⁸ but the feasibility of repeated exposure of more than two times per week through the FFVP may be more difficult. In the current study, it was found that slicing and peeling were the most common methods of preparation for the FV. These types of preparation may be helpful in enhancing the presentation of the vegetables. A study evaluating vegetables cut or served with more advanced serving styles (i.e. figures) found that children preferred having their vegetables cut.¹⁸⁹ The FFVP suggests offering a variety of FV, and from the survey, it appeared that over half of the coordinators noted serving exotic FV varieties. Serving novel foods may be helpful with reducing issues of food neophobia.¹⁹⁰ Almost 40% of the coordinators noted serving the same types of fruits 3 or more times a year, compared to 34.3% of the coordinators noting that they serve the same types of vegetables 2 or more times a year. This question was incorporated because of the importance of repeated exposure to help mitigate food neophobia.¹⁵⁴ Most common serving amounts were $\frac{1}{4}$ to $\frac{1}{2}$ cup, and this is imperative to know as small portions in the past have been associative with positive associations with consumption by preschoolers when they were introduced a new food.¹⁹¹ Slightly more than half of the coordinators noted that their school never served low-fat dips. The FFVP allows low-fat dipping sauces to be served with vegetables. Nonetheless, low-fat dips should be offered over full-fat dips because of concerns of excess energy intake in children.¹⁹² More fat does not seem necessary. A study evaluating dip use among bitter-sensitive and bitter-insensitive children did not see any differences in broccoli intake for bitter insensitive children but did see increased intake in broccoli for bitter-sensitive children with the use of dip.¹⁹² Dips may be helpful in promoting the preferences of some vegetables but further research is needed to determine the implication of dip, FV intake, and overall energy intake.

Regarding FV consumption, 60% of the coordinators noted that children consumed all or most of the fruits and 30% noted that children consumed all or most of the vegetables. The frequencies among coordinators and teachers were comparable for the vegetable consumption but differed in the fruit consumption where 75% of teachers noted that children ate all or most of the fruits (compared to the 60% noted by the coordinators). The regression analyses in the current study indicated that a school being a high implementer of the FFVP was a positive predictor of more FV consumption among children. Positive and significant associations were found between the number of times a week FV was offered and the number of times the same fruits were offered to children. Offering FV more times a week allows more opportunities for schools to offer the same types of FV to children for repeated exposure. Having FV distribution schemes in schools, such as the FFVP, can positively improve fruit intake,⁸ though further research is needed in understanding methods of improving vegetable intake.

The current study aimed to find a predictive model to assess whether a school's level of FFVP implementation would affect the number of times FV were served, but the model did not show FFVP implementation level as a predictive variable. However, the linear regression analysis for the current study showed that a school's level of FFVP implementation did show that a higher level of FFVP implementation within a school could positively predict students' vegetable preferences ($P < 0.05$). It would be interesting to compare student's actual FV intake from the FFVP and the intake predicted by the teachers and coordinators surveys to identify if the amounts are comparable. From the FFVP coordinator survey in the current study, it was found that 44.8% of the coordinators received training for the FFVP. Training may help with better implementation of the FFVP, and within the FFVP Handbook for Schools, it is stated that school staff participating in the program must do training provided by the state.²² Training for the FFVP was one of the predictive variables to determine how often low-fat dips were offered with vegetables indicating that if a coordinator had training in the FFVP, they would least likely serve low-fat dips along with the vegetables.

Minor problems noted in the FFVP coordinator survey was the perishability of the produce and students wasting too much of the FV. Food waste is a common issue that is sought to be addressed as effectively lowering food waste can result in efficient program management.¹⁹³ Some FFVP coordinators noted that their schools had partnerships with agencies such as *Produce for Better Health*, healthcare providers, government agencies, cooperative extension services, and universities that provided aid in the form of NE, free instruction and demos to children, and free fresh FV. Pilot implementation of the FFVP revealed positive support from partners for NE and other activities.²¹ Schools along with

community involvement opportunities can produce modest improvements in behavior among children and adolescents.^{194,195}

A limitation of the current study includes not having the feasibility of obtaining outcome measures in the schools surveyed. Having outcome measures could help in linking implementation factors to measured outcomes. Further exploration of linking process evaluation and outcome measures, such as FV intake among children or preferences, can be used to identify how levels of implementation impact these outcomes. A past study linking process evaluation and outcome measures for a middle school obesity prevention program noted that linking these two factors may be helpful in intervention studies as there is a deeper understanding of the implementation process and its relationship to the outcome measures.¹⁶⁸ A second limitation of the current study was the limited amount of schools that participated in the study. The schools contacted may not be representative of the whole state of Illinois as schools in Chicago located in more urban areas were not included in our study sample. Future studies may try to evaluate all schools to have a more generalizable sample.

In conclusion, the current study reveals various factors for the implementation of the FFVP. More information is needed in order to improve vegetable preferences and to address the concerns of school staff who help in implementing the program. School levels of implementation vary, but further understanding is needed on how to help schools that may be low implementers of the program reach a higher level of implementation. Additionally, it would deepen the understanding and effectiveness of the program to see how different levels of implementation can be linked to FV outcomes and general health outcomes in children.

TABLES

Table 8-1 Cognitive Interviewing Procedures and Changes Made to FFVP Principal Surveys for Round 1 and Round 2

Question	Problems uncovered by cognitive interviews	Response category	Action taken	Implications
Round 1				
<i>Q2A. Who is involved in the FFVP committee?</i>	There was no lunchroom manager option.	Item-specific recommendation	Added lunchroom manager to answer options	Collect more accurate information
<i>Q5. Please check off all the grades that participated in school-wide nutrition education or promotion activities at your school.</i>	There was no option for preschool	Item-specific recommendation	Added 'Preschool' to answer options	Collect more accurate information
<i>Q6. How many times per month does your school have school-wide nutrition education and nutrition promotion activities?</i>	Issues with time point distributions in the answer choices	Item-specific recommendation	Time points changed to: 0 time, 1-2 times, 3-4 times, more than 4 times, I don't know	Allows for more realistic time points to be selected
<i>Q7. What message(s) were conveyed by the nutrition education or promotion activities at your school? (check all that apply)</i>	Comprehension issues with answer choice option 'trying foods'	Respecification of objectives	Changed 'trying' to 'eating' a variety of foods	Clarifies the main objective of the answer choice to re-affirm
<i>Q8. Does your school have any displays, such as posters or banners that conveyed nutrition education or promotion messages?</i>	Noted that examples would be helpful but not necessary	Item-specific recommendations	Added "(such as posters, banners, student work, other material) in parentheses as examples in answer choices	Lessens ambiguity of answer choices

Table 8-1 Cognitive Interviewing Procedures and Changes Made to FFVP Principal Surveys for Round 1 and Round 2 (continued)

Question	Problems uncovered by cognitive interviews	Response category	Action taken	Implications
Q9. Where are these nutrition displays around your school?	Noted that some locations where these may be displayed include the locker, library, common areas	Item-specific recommendations	Added library, gym, other common areas (lobby)	Provides further answer choices
Q10. What message(s) were conveyed by the posters, displays, or similar media? (check all that apply)	Comprehension issues with answer choice option 'trying foods'	Respecification of objectives	Changed 'trying' to 'eating' a variety of foods	Clarifies the main objective of the answer choice to re-affirm
Q11. What types of professionals or volunteers conduct or lead nutrition education or promotion activities in your school? (check all that apply)	Noted that other volunteers or workers would also include the lunchroom manager	Item-specific recommendation	Added lunchroom manager to answer choices	Provides further answer choices
Q12. Please indicate if a policy exists at your school regarding the availability of healthy food choices when foods are offered to students outside of school meals or policies regarding food in general.	Noted issues with the words 'sold' in the answer choices since some schools may not sell foods and may offer them instead	Item-specific recommendations Respecification of objectives	Answer: changed and indicated "offered/sold" for all the options	Provides clarification of answer choices and includes answer choices for offering foods (if not sold)
Q13. How is nutrition material communicated or distributed to parents? (check all that apply)	Some options not listed included PTO and school website.	Item-specific recommendation	Answer: also added "or Parent-teacher Organization (PTO)" to option. Also added "school website"	Provides further answer choices

Table 8-1 Cognitive Interviewing Procedures and Changes Made to FFVP Principal Surveys for Round 1 and Round 2 (continued)

Question	Problems uncovered by cognitive interviews	Response category	Action taken	Implications
Q14. Does your school sponsor training in nutrition (formal or informal) for any of the following positions at least once a year? (check all that apply)	Uncertainty of what sponsor training may mean. Interpretation of question was whether the school sponsored a training. Uncertain of objectives of question.	Respecification of objectives	Question change: (or an outside source provided by the school) - added; 'sponsor' replaced with 'provide'. Answer choices added: Lunchroom staff, teaching/classroom assistants, office staff	Changed wording of the question to specify that all types of training were wanting to be considered. Added additional answer choices to widen selection of answer choices.
Q15. Please indicate whether the following staff work at your school (including staff shared among multiple schools in you district):	Answer choice 'physical education coordinator' was unknown	Item-specific recommendation	Eliminated PE coordinator; added athletic director	Removed answer choice as it was unknown as to what the role was
Round 2				
Q7. What message(s) were conveyed by the nutrition education or promotion activities at your school? (check all that apply)	-	-	Changed 'foods' in answer choices to 'fruits and vegetables' Deleted 'health benefits of foods' answer choice	Wanted to ensure consistency with FFVP teacher survey wording of the answer choices. Deleted health benefits of foods because it was not part of the objectives of the question
Q10. What message(s) were conveyed by the posters, displays, or similar media? (check all that apply)	-	-	Changed 'foods' in answer choices to 'fruits and vegetables' Deleted 'health benefits of foods' answer choice Changed from 2 to 1 column	Wanted to ensure consistency with FFVP teacher survey wording of the answer choices. Deleted health benefits of foods because it was not part of the objectives of the question. Also changed question format for ease of viewing on webpage and mobile device.

Table 8-2 Cognitive Interviewing Procedures and Changes Made to FFVP Teacher Surveys for Round 1 and Round 2

Question	Problems uncovered by cognitive interviews	Response category	Action taken	Implications
Round 1				
Q1. How familiar are you with the FFVP at your school?	Noted that adding the word 'implementation of the FFVP' for the FFVP would help clarify since some people may think it means general FFVP implementation, and not specific to their school setting.	Respecification of objectives	Added the word 'implementation' to the sentence	Adds to clarity
Q2. Were fruits and vegetables passed out in the classroom, lunchroom, hallway, or other location as part of the FFVP? (check all that apply)	Noted that sometimes fruits and vegetables are passed out in the gym.	Item-specific recommendations	Added 'gym' as an answer choices	Provides further answer choices
Q3. Were you present during any of the FFVP distribution sessions?	Confusion as to what the question was asking. There was uncertainty whether it meant the general distribution sessions to the teachers, or during class time.	Respecification of objectives.	Changed to: "Q3. Were you present during any of the times the FFVP was passed out as a snack?"	Provides clarity to question and reduces ambiguity of what the question is asking
Q4. When the FFVP was distributed, how often did you eat the fruit and vegetable provided by the FFVP?	Question is clear, but answer choice 'sometimes' may be changed to 'less than half the time' to be consistent with the other answer choices	Item-specific recommendations	Changed 'sometimes' to 'less than half the time'	Provided answer choices more consistent with the language of the other answer choices
Q12. Which of the following factors is a challenge in the FFVP?	Uncertainty of what 'inadequate teacher time' means	Item-specific recommendations	Changed 'inadequate teacher time' to 'inadequate time to distribute fruits and vegetables'	Provides clarity to answer choice

Table 8-2 Cognitive Interviewing Procedures and Changes Made to FFVP Teacher Surveys for Round 1 and Round 2 (continued)

Question	Problems uncovered by cognitive interviews	Response category	Action taken	Implications
<p>Q15. Did you take part in any of the following FFVP implementation activities during the school year? (check all that apply)</p>	<p>Some noted that class discussion are sometimes used for the FFVP and one teacher noted that they did taste testings too in the classroom. There were two committee options in the answer choices and this was noted to be redundant. One concern noted was that role modeling should be clarified as being positive as teachers can exhibit both positive and negative role modeling.</p>	<p>Item-specific recommendations</p>	<p>Added 'class discussion' to option 'I added new lessons, class discussions, nutrition education, or activities that addressed nutrition'</p> <p>Added 'I did taste testings in my classroom (not as part of FFVP)'</p> <p>Deleted 'I attended committee meetings as part of the FFVP' option</p> <p>Added the word 'positive' to role modeling</p>	<p>Provides clarity to answer choices</p>
<p>Q17. What tools do you use to teach nutrition as part of the FFVP?</p>	<p>Unsure as to what 'culturally-sensitive resources' were in the answer choice. Noted that sometimes teacher partake in field trips</p>	<p>Item-specific recommendations</p>	<p>Deleted 'Culturally-sensitive resources' option</p> <p>Added: 'Field trips (i.e. grocery trips, farm, apple orchard, etc.)' last</p>	<p>Provides more answer choices</p>
<p>Q18. What topics did you discuss in the classrooms about nutrition as part of the FFVP?</p>	<p>Noted that sometimes teachers talk about the health benefits of foods</p>	<p>Item-specific recommendations</p>	<p>Added 'Health benefits of foods'</p>	<p>Provides more answer choices</p>
<p>Q19. If nutrition education was provided in the classroom for the FFVP, what type of curriculum did you provide?</p>	<p>Unsure what 'CATCH' stood for and noted that some schools also used The OrganWise Guys curriculum</p>	<p>Item-specific recommendations</p>	<p>Spelled out 'Coordinated Approach to Child Health [CATCH]'</p> <p>Added 'The OrganWise Guys'</p>	<p>Clarifies answer choice and spelled out acronym</p>

Table 8-2 Cognitive Interviewing Procedures and Changes Made to FFVP Teacher Surveys for Round 1 and Round 2 (continued)

Question	Problems uncovered by cognitive interviews	Response category	Action taken	Implications
Q20. How many times per school year did you teach nutrition (i.e. nutrition education or nutrition activities) as part of the FFVP?	Time points are difficult to determine as it is per year. Per year seems excessive and it should be per week.	Item-specific recommendations Length or burden	Changed question to 'How many times per week did you teach nutrition...' Added: 0 times At least 1 time per week 2 times per week 3-4 times per week 4 times per week More than 4 times per week	This helps teacher reduce burden of how many time points they would teach in a year as it was changed to a 'week' basis.
Q21. How long do you teach per lesson or activity?	One noted the concern that the time points seem too long.	Item-specific recommendations Length or burden	Added options 'Less than 15 minutes', '15-20 minutes', '20-30 minutes', '30-45 minutes', '45 min to an hour' and 'more than 1 hour'	Changed time points for more accurate responses of time points
Round 2				
Q12. Which of the following factors is a challenge in the FFVP?	No issues with word choice change of 'challenge' to 'problem'	No issues	Changed 'challenge' to 'problem' to be consistent with FFVP coordinator survey	Changed answer choice to be consistent with FFVP coordinator survey
Q15. Did you take part in any of the following FFVP implementation activities during the school year? (check all that apply)	Clarity on what type of taste testings; some may do it with crackers or other food.	Item-specific recommendations	Changed to "I did fruit and vegetable taste testings in my classroom (not as part of FFVP)"	Provided clarity to answer choices
Q16. Did you teach nutrition as part of the FFVP?	No issues with clarifying the question.	No issues	Added '(i.e. nutrition education or nutrition activities)' to clarify as in question 20	Changed question to follow format of Q20.
Q17. What tools do you use to teach nutrition as part of the FFVP?	Noted that class discussions are sometimes used to teach nutrition	Item-specific recommendations	Added 'Class discussions' to answer choices	Provided further answer choices for participant

Table 8-2 Cognitive Interviewing Procedures and Changes Made to FFVP Teacher Surveys for Round 1 and Round 2 (continued)

Question	Problems uncovered by cognitive interviews	Response category	Action taken	Implications
Q18. What topics did you discuss in the classrooms about nutrition as part of the FFVP?	Changing 'foods' to 'fruits and vegetables' in answer choices would provide more clarity and would keep answer choices more uniform.	Item-specific recommendations Ordering	<p>Changed to "Trying new fruits and vegetables' and 'Eating a variety of fruits and vegetables' (like Principal survey) and "Health benefits of fruits and vegetables"</p> <p>Changed to "Role of fresh fruits and vegetables in a complete diet (i.e. health benefits, recommendations)"</p> <p>Re-arranged to follow principal survey</p> <p>Changed 'USDA MyPlate Food Guidance System' to 'USDA MyPlate</p> <p>Changed 'other message' to 'other topic'</p> <p>Deleted 'health benefits of foods'</p>	Clarified answer choices to lessen ambiguity and re-arranged to be similar the Principal survey.
Q20. How many times per school year did you teach nutrition (i.e. nutrition education or nutrition activities) as part of the FFVP?	Incorrect answer choice format with having '3-4 times a week' and '4 times per week'	Item-specific recommendation	Changed to '3 times per week' from 3-4 times per week	Changed answer choice to have more accurate responses
Q21. How long do you teach per lesson or activity?	It is rare for teachers to teach more than 45 minutes in a lesson. Changing time increments to 15 minutes would be more beneficial.	Item-specific recommendation Length or burden	Changed to 'Less than 15 minutes' '15-30 minutes' '30-45 minutes' 'More than 45 minutes'	Changed time formatting for ease in answering question

Table 8-3 Cognitive Interviewing Procedures and Changes Made to FFVP Coordinator Surveys for Round 1 and Round 2

Question	Problems uncovered by cognitive interviews	Response category	Action taken	Implications
Round 1				
Q1. How many days per week is FFVP offered to students?	Problems with understanding that the question means that the FFVP is offered at the school in particular, not to schools in general.	Respecification of objectives	Added 'at your school' to question	It helps clarify the question that the FFVP is offered at the school in particular, not in general.
Q2. How many times per day is FFVP offered to students?	Problems with understanding that the question pertains to the school in question. There was also an issue noting that there was not an answer choice for 'three times'	Respecification of objectives Item-specific recommendation	Added 'at your school' Added 'Three times'	It helps clarify the question that the FFVP is offered at the school in particular, not in general. Provides further answer choices
Q3. Where is FFVP served to students? (check all that apply)	Problems with understanding that the question means that the FFVP is offered at the school in particular, not to schools in general.	Respecification of objectives	Added 'at your school' to question	It helps clarify the question that the FFVP is offered at the school in particular, not in general.
Q4. Do the students consume the fruits or vegetables at the same location as where it is served?	A coordinator noted that this option may vary among coordinators	Item-specific recommendation	Added 'Varies. How so?' option.	Added the 'Varies' option to allow more flexibility in answering the question
Q4A. If not, where do the children consume their fruits and vegetables served from the FFVP? (check all that apply)	Choices were appropriate but added an additional choice for when children take the FV home.	Item-specific recommendation	Added 'Home (i.e. students take fruit or vegetable home with them)'	This provides more answer choices

Table 8-3 Cognitive Interviewing Procedures and Changes Made to FFVP Coordinator Surveys for Round 1 and Round 2 (continued)

Question	Problems uncovered by cognitive interviews	Response category	Action taken	Implications
Q5A. Which grades are offered fruits or vegetables as part of the FFVP? (check all that apply)	No issues with grade selection	No issues with grade selection	Added 'Preschool' option as some schools have this (as noted in the Principal survey'	Added this additional option to ensure consistency with Principal survey
Q6. At what time were fruits and vegetables distributed for the FFVP? (check all that apply)	Had similar options for 'Other' and for 'Varies' which can be interpreted similarly.	Item-specific recommendation	Deleted 'Varies. How so?' as 'Other (please specify):' can be used to imply the same information.	Deleted redundant option
Q8. What preparation is done with the fruits or vegetables served as part of the FFVP? (check all that apply)	Some of these options may not be known to coordinator if they did not prepare it at the school.	Item-specific recommendation	Added 'I don't know. We do not do preparation at our school.'	Added an additional option if they do not know
Q9. Which fresh fruits (if any) were distributed to students as part of the FFVP? (check all that apply)	Coordinator noted that exotic fruits should be included.	Item-specific recommendation	Added 'Other exotic fruit options (i.e. dragonfruit)'	Adding the additional option can expand
Q10. Up to how many times were the same fruits offered throughout 2016-2017?	Clarification needed for indicating that the same fruits were offered at the school in question	Respecification of objectives	Added ' as part of the FFVP' to the question	Clarification of question enables more accurate responses
Q11. How much fruit is offered to children as a snack as part of the FFVP?	A 'check all that apply' option is helpful as it may vary.	Item-specific recommendation	Added 'check all that apply' and changed to Multiple Answer' option.	Enables more choices to be selected if there is a varied type of fruit served (grapes versus apple for example)
Q12. Which fresh vegetables (if any) were distributed to students as part of the FFVP?	Coordinator noted that exotic vegetables should be included	Item-specific recommendation	Added 'check all that apply' to question Added 'Other exotic vegetables (i.e. jicama, bok choy)' option	Enables more choices to be selected and expands options

Table 8-3 Cognitive Interviewing Procedures and Changes Made to FFVP Coordinator Surveys for Round 1 and Round 2 (continued)

Question	Problems uncovered by cognitive interviews	Response category	Action taken	Implications
Q13. Up to how many times were the same vegetables offered throughout 2016-2017?	Clarification needed for indicating that the same vegetables were offered at the school in question	Respecification of objectives	Added ' as part of the FFVP' to the question	Clarification of question enables more accurate responses
Q14. How much vegetable is offered to children as a snack as part of the FFVP?	A 'check all that apply' option is helpful as it may vary.	Item-specific recommendation	Added 'check all that apply' and changed to Multiple Answer' option.	Enables more choices to be selected if there is a varied type of vegetables served
Q15. How many times were low-fat dipping sauces such as yogurt or ranch dressing used for some vegetables in the 2016-2017 year?	Clarification on fat-free options needed. Also noted that some schools may use full-fat dressings as well.	Item-specific recommendation	Added 'fat-free' to question. Added question for full-fat options as well, per suggestion.	Allows for a broader range of responses and to capture if full-fat dressings are used
Q16. Does your school on its own maintain relationships with any outside partners as part of the FFVP? For each type of partner, please indicate the role that partner played in implementing the FFVP in your school. Also, please do not include suppliers from whom you purchase fresh fruits or vegetable or other supplies for the FFVP, unless they also separately donate items to the program for free.	Noted that question may not look well in a mobile version of the survey. It was noted that it may be helpful to have people write-in options instead and then select a role for each.	Length or burden	Divided into TWO questions. Removed 'For each type of partner, please indicate the role that partner played in implementing the FFVP in your school. ' and added this to second question Carry-forward logic type question added: if participant selects Partner Type, it carries forward to next question and they can select roles.	Dividing it into two questions lessens the burden of completing the entire question as it carries forward the information from what partners were selected as opposed to having all options listed.

Table 8-3 Cognitive Interviewing Procedures and Changes Made to FFVP Coordinator Surveys for Round 1 and Round 2 (continued)

Question	Problems uncovered by cognitive interviews	Response category	Action taken	Implications
Q17. In a typical week, which of the following statements best describes the relationship of the fresh fruits or vegetables offered to students in this school through the FFVP and the fruits or vegetables offered through the USDA National School Lunch Program? (please choose one)	The question was confusing and coordinators were not sure what was being asked. The question is long and the options are lengthy as well.	Length or burden	Highlighted 'FFVP' in the question. Added 'The specific fruits or vegetables offered by the FFVP each week are also:' to question Deleted phrases 'The specific fruits or vegetables offered by the FFVP each week are also:' from options	Lessened the length of the question to reduce burden on survey taker. Additionally, highlighted phrases to help with interpretation of the question to improve response comprehension.
Q18. In what school year did this school first participate in the FFVP?	Question is straightforward but it may be helpful to bold 'first participate'	Item-specific recommendation Respecification of objectives	Bolded 'first participate'	This helps clarify question.
Q19. What changes have been made in FFVP implementation in the current school year as compared to prior years? (check all that apply)	Answer options are appropriate though adding an 'Other' option is helpful for answer options that are not listed	Item-specific recommendation	Added 'Other' option	This allows flexibility of answer choices
Q20. Were you present during any of the FFVP distribution sessions?	Question can be interpreted differently by someone taking the survey	Respecification of objectives	Changed to 'Were you present during any of the times the FFVP was passed out as a snack?' as teacher survey	Changed question to reflect that it was passed out during classroom; to obtain more accurate results.
Q27. Did you take part in any of the following FFVP implementation activities during the school year? (check all that apply)	The committee meeting answer choices can be reduced into one option.	Item-specific recommendation	Deleted 'I attended committee meetings as part of the FFVP' option Added the word 'positive' to role modeling	Changes were made to lessen redundancy

Table 8-3 Cognitive Interviewing Procedures and Changes Made to FFVP Coordinator Surveys for Round 1 and Round 2 (continued)

Question	Problems uncovered by cognitive interviews	Response category	Action taken	Implications
Round 2				
Question added. Q15. How many times were full-fat dipping sauces such as yogurt or ranch dressing used for some vegetables in the 2016-2017 year?	Question added per suggestion of coordinator in previous round	Item-specific recommendation	Additional question added	This question can be used to catch compliance
Question added: Q16A. For each type of partner, please indicate the role that partner played in implementing the FFVP in your school.	Question divided per suggestion of coordinators	Length or burden	Question divided into two questions	These changes lessen the burden of the question
Q16B. Please explain what role this partner played, if selected 'Other.'	Question divided per suggestion of coordinators	Length or burden	Question divided into two questions	These changes lessen the burden of the question
Q30. Which of the following factors is a challenge or barrier to implementing the FFVP in your school?	Interpretation of question can vary; reading level among coordinators may vary	Item-specific recommendation	Changed to 'problem' instead of 'challenge/barrier'	This simplifies the reading level of the question
Question added: Q31. Do you have any other comments, suggestions, or thoughts about the FFVP?	Previous round suggestion by coordinator to include final thoughts of the program	Item-specific recommendation	Added question at the end of the survey	This allows the survey taker to express their final thoughts about the FFVP

Table 8-4 List of School Districts Selected for FFVP in Illinois, 2016-2017 School Year¹⁷⁵

Names of the school districts	
Jacksonville SD 117	Cairo USD 1
Rockford SD 205	Egyptian CUSD 5
Bellwood SD 88	Tri-County Sp Ed Jnt Agreement
Maywood-Melrose Park-Broadview 89	Aurora West USD 129
Lindop SD 92	Aurora East USD 131
Berwyn South SD 100	CUSD 300
Summit SD 104	Kankakee SD 111
Calumet Public SD 132	Pembroke CCSD 259
Prairie-Hills ESD 144	Waukegan CUSD 60
Dolton SD 149	Round Lake CUSD 116
Hoover-Schrum Memorial SD 157	Streator ESD 44
Ludlow CCSD 142	Decatur SD 61
Shiloh CUSD 1	Madison CUSD 12
North Wamac SD 186	East Alton SD 13
Mount Vernon SD 80	Harvard CUSD 50
Bethel SD 82	Pleasant Valley SD 62
Central City SD 133	Pleasant Hill SD 69
Centralia SD 135	Peoria Heights CUSD 325
Archdiocese of Chicago-Nw Hwy	Silvis SD 34
City of Chicago SD 299	East Moline SD 37
Shabazz International Charter Sch	Rock Island SD 41
Galapagos Charter School	Adolescent Adjustment Ctr NFP
Community Education Network	Brooklyn UD 188
Tri Point CUSD 6-J	East St Louis SD 189
Lincoln ESD 27	Springfield SD 186
CCSD 180	Laraway CCSD 70C
Hardin County CUSD 1	Concept Schools Inc

Abbreviations: SD – School District, CUSD – Community Unit School District, CCSD—Community Consolidated School District, Ctr – Center, NFP – not for profit

Numbers after school district denote district number

Table 8-5 Illinois Schools Included to Participate in the FFVP Implementation Study

Criteria	Number of schools
Total schools	260
Schools excluded because age group did not match criteria	22
Schools excluded due to being a CPS school	105
Schools that opted out of program	4
Schools that no longer exist	1
Total schools contacted	128

Table 8-6 Distribution of Surveys to Schools that have the FFVP in Illinois for 2016-2017

Criteria	Number of schools
Schools contacted via Qualtrics	87
Schools contacted via e-mail through school district or via other school staff member	41
Principal	
Emails sent through Qualtrics	105
Surveys started (of those invited over Qualtrics)	51
Surveys finished (of those invited over Qualtrics)	34
Emails bounced (of those invited over Qualtrics)	4
Teacher	
Emails sent through Qualtrics	818
Surveys started (of those invited over Qualtrics)	360
Surveys finished (of those invited over Qualtrics)	291
Emails bounced (of those invited over Qualtrics)	18
FFVP coordinator	
Emails sent through Qualtrics	87
Surveys started (of those invited over Qualtrics)	59
Surveys finished (of those invited over Qualtrics)	54
Emails bounced (of those invited over Qualtrics)	3

Table 8-7 Survey Questions Chosen by Panel Members for Scoring Strategy to Create Index for FFVP Implementation

Question retained for scoring strategy	Justifications from expert panel	
	Panel member 1	Panel member 2
Principal survey		
Q1. Does your school coordinate the specific fruits and vegetable offered during the USDA Fresh Fruit and Vegetable Program (FFVP) distribution with specific information discussed in school-wide	<i>Yes, would keep because having this coordination would enhance the program</i>	<i>Yes, it would be a high implementer if they also coordinated NE activities</i>
Q2. Does your school have a committee or personnel involved in the Fresh Fruit and Vegetable Program (FFVP)?	<i>Important to know if there was a committee, but less essential to know who was involved</i>	<i>Yes, more buy-in from the program if there is a committee with a shared vision and having multiple stakeholders</i>
Q3. My overall opinion of FFVP is favorable.	<i>Probably vital because the odds of it being implemented well varies if there were more favorable views of the program</i>	<i>Strongly agree and somewhat agree, would indicate high implementation from experience as a program administrator; if their opinion was lower, then they struggled and may have had low implementation</i>
Q5. Please check off all grades that participated in school-wide nutrition education or promotion activities at your school.	<i>If they had NE, it would be indicative of high or low implementation of the program</i>	<i>Having all grade levels would be indicative of high implementation; it says that the site reinforces the cyclical nature of education; however, if it is only specific to certain grade levels, the site may not see the benefit of that</i>
Q6. How many times per month does your school have school-wide nutrition education and nutrition promotion activities?	<i>Did not comment</i>	<i>More than 0 times would be indicative of high implementation; it shows that they are trying; 'I don't know' response may show that they may not be implementing it highly</i>
Q8. Does your school have any displays (such as posters, banners, student work, other material) that conveyed nutrition education or promotion messages?	<i>This would be helpful</i>	<i>Yes, would be indicative of good implementation because of exposure</i>
Q12. Please indicate if a policy exists at your school regarding the availability of healthy food choices when foods are offered (or sold) to students outside of school meals or policies regarding food in general.	<i>Did not comment</i>	<i>Selecting all of the choices showing that they all may be important for implementation that is high; the last selection may not be important (the one about rewards)</i>

Table 8-7 Survey Questions Chosen by Panel Members for Scoring Strategy to Create Index for FFVP Implementation (continued)

Question retained for scoring strategy	Justifications from expert panel	
	Panel member 1	Panel member 2
Q13: How is nutrition material communicated or distributed to parents?	<i>This could be helpful to see if none was communicated or many of the others (could use a 0 scoring for 'None' and 1 point for the others)</i>	Did not comment
Q14: Does your school (or an outside source provided by the school) provide training in nutrition (formal or informal) for any of the following positions at least once a year?	<i>Could be important and could use a 0 or 1 scoring. Having training can enhance the program; you can score whether they had training or not</i>	<i>All of them may be important; just as important and it shows that somebody may have a plan in place for the FFVP</i>
Teacher survey		
Q1. How familiar are you with the Fresh Fruit and Vegetable Program (FFVP) implementation at your school?	<i>Kind of yes, highly implemented if familiar with the program</i>	<i>Yes important; 'Extremely familiar', 'very familiar' and 'moderately familiar' would be indicative of high implementation</i>
Q2. Were fruits or vegetables passed out in the classroom, lunchroom, hallway, or other locations part of the FFVP?	Did not comment	<i>All locations would be high implementation if they FV were passed out at all</i>
Q3. Were you present during any of the times the FFVP was passed out as a snack?	<i>No, coordinator or teacher can be present but it does not indicate high or low implementation</i>	<i>High implementation if they are present because of modeling</i>
Q4. When the FFVP was distributed, how often did you eat the fruit or vegetable provided by the FFVP?	<i>Yes, this would be important</i>	<i>Yes, would be important for modeling. More specifically if they selected 'Always' 'Most of the time' or 'About half the time' this would be indicative of high implementation</i>
Q5. How much of the fruits provided in the FFVP do students usually eat? (i.e. per child, how much of the fruit is typically consumed?)	Yes	<i>Yes this would be indicative. 'All or most', 'Much' or 'Some' would be high implementation</i>
Q6. How much of the vegetables provided in the FFVP do students usually eat? (i.e. per child, how much of the vegetable is typically consumed?)	<i>Yes, for same reason above</i>	<i>Yes this would be indicative. 'All or most', 'Much' or 'Some' would be high implementation</i>
Q7. I verbally encourage the students to eat the FFVP snacks.	Yes	<i>Yes, this would be high. 'Always' 'Most of the time' and 'Sometimes' would be high implementation</i>
Q10. My overall opinion of FFVP is favorable.	<i>Same reason as principal survey</i>	<i>Yes, but proceed cautiously because it may depend on how it was implemented. Though 'Strongly agree' and 'Somewhat agree' may be indicative of high implementation. Depending on how it was implemented, you may get different or opposite responses</i>

Table 8-7 Survey Questions Chosen by Panel Members for Scoring Strategy to Create Index for FFVP Implementation (continued)

Question retained for scoring strategy	Justifications from expert panel	
	Panel member 1	Panel member 2
Q12. Which of the following factors is a problem of the FFVP?	Yes, same reasons as coordinator survey (see below)	Site-specific, so this would not be included for low and high implementation
Q13. Were you involved in any training for the FFVP?	Yes	Yes, being involved in training may be helpful for the FFVP implementation
Q14. If yes, what type of training was provided for the FFVP?	Yes	Yes, the type of training is important, if both are provided that is important
Q16. Did you teach nutrition (i.e. nutrition education or nutrition activities) as part of the FFVP?	Yes	Yes, if they taught they found it important and it would be high implementation
Q17. What tools do you use to teach nutrition as part of the FFVP?	Did not comment	If they used all of it, it would be considered high.
Q18. What topics did you discuss in the classrooms about nutrition as part of the FFVP?	Yes; if you choose 1 or if you choose 5 topics; 5 topics would be better than just 1	No; would depend on the school and teacher; it's difficult to rate them differently
Q20. How many times per school week did you teach nutrition (i.e. nutrition education or nutrition activities) as part of the FFVP?	Yes, though answers may vary for Fall/Spring	Yes, all above 0 times would be considered high implementation
Q21. How long is each lesson or activity?	Did not comment	Yes, any above 15 minutes. If less than 15 minutes, not capturing or engaging students and the students may forget what they have learned
FFVP coordinator survey		
Q1. How many days per week is FFVP offered to students at your school? -	Yes would be important to know how many times a week	Yes, above 1 time were week would be considered high because of guidelines. The 1 time per week or 'I don't know' option would be considered low.
Q2. How many times per day is FFVP offered to students at your school?	Yes this would be important and interesting; however, interpretation may differ	Low is once per day, and anything above once per day would be considered high.
Q3. Where is FFVP served to students at your school?	Did not comment	Yes, if they selected classroom, playground (because of the didactic teaching mode), vending machine, kiosks, hallways, school store, and gym that would be considered high. But the school store, snack bar, office, and cafeteria would not be.

Table 8-7 Survey Questions Chosen by Panel Members for Scoring Strategy to Create Index for FFVP Implementation (continued)

Question retained for scoring strategy	Justifications from expert panel	
	Panel member 1	Panel member 2
Q4. Do the students consume the fruits or vegetables at the same locations where it is served?	Did not comment	<i>Yes, it would be considered high if they said 'yes' because a two-step process may delay consumption or there would be more opportunities for children not to eat the food</i>
Q5. Are all grades at your school offered the FFVP?	<i>Yes, if all grades offered, this is important</i>	<i>Yes, it would be high if all of the grades were offered</i>
Q8. What preparation is done with the fruits or vegetables served as part of the FFVP? (check all that apply)	<i>Yes because this is important indicator of implementation; can use dichotomous scale (Yes/No). Extra preparation, more implementation</i>	<i>It being sliced, peeled, or if they were served whole would be indicative of high implementation. Herbs and spices or cooked, at least for younger children, are not helpful in terms of the experiences children have with their foods. Children love the whole fruits as well.</i>
Q9. Which fresh fruits (if any) were distributed to students as part of the FFVP?	Did not comment	<i>All are important and it's important that they are trying</i>
Q10. Up to how many times were the same fruits offered throughout 2016-2017 as part of the FFVP?	Did not comment	<i>Three or more times would be considered high implementation. Though not high enough.</i>
Q11. How much fruit is offered to children as a snack as part of the FFVP?	Did not comment	<i>More than a bite-size amount would make a difference; the portion size may send a message to children of the level of its importance. A bite-size amount would send a message to children that it's not very important.</i>
Q12. Which fresh vegetables (if any) were distributed to students as part of the FFVP?	Did not comment	<i>All of them would be important.</i>
Q13. Up to how many times were the same vegetables offered throughout 2016-2017	Did not comment	Same comment for fruits
Q14. How much vegetable is offered to children as a snack as part of the FFVP?	Did not comment	Same comment for fruits
Q15. How many times were full-fat dipping sauces such as yogurt or ranch dressing used for some vegetables in the 2016-2017 year?	<i>Would be important for compliance</i>	<i>Yes, if they select 'Rarely' or 'Never' this would be high implementation; because dips are not very healthy</i>

Table 8-7 Survey Questions Chosen by Panel Members for Scoring Strategy to Create Index for FFVP Implementation (continued)

Question retained for scoring strategy	Justifications from expert panel	
	Panel member 1	Panel member 2
Q15. How many times were fat-free or low-fat dipping sauces such as yogurt or ranch dressing used for some vegetables in the 2016-2017 year	Did not comment	Yes, if they select 'Rarely' or 'Never' this would be high implementation; because dips are not very healthy. The children would be exposed to the flavor of the source, and not the vegetable
Q17. Does your school on its own maintain relationships with any outside partners as part of the FFVP?	Yes, the extra efforts to be engaging is important for implementation	No, this is site-specific
Q17A. For each type of partner, please indicate the role that partner played in implementing the FFVP in your school.	Yes important. The different roles may differ in importance.	No, this may be site-specific. They may not have availability of University Extension or other sources as another school.
Q20. Were you present during any of the times the FFVP was passed out as a snack?	Would be important to know if they helped at least once (low/high) to observe the program implementation	Decentralized setting; and may not be important that they are there but they know the specifics of the program
Q21. How much of the fruits provided in the FFVP do students usually eat? (i.e. per child, how much of the fruit is typically consumed?)	Yes important because if they serve things that the children are actually consuming, this is important	Yes, it would be important. 'All or most' or 'Much' and 'Some' would all be indicative of high implementation
Q22. How much of the vegetables provided in the FFVP do students usually eat? (i.e. per child, how much of the vegetable is typically consumed?)	Yes, same reason as above	Yes, it would be important. 'All or most' or 'Much' and 'Some' would all be indicative of high implementation
Q23. I verbally encourage the students to eat the FFVP snacks.	Helpful and another step to have successful implementation	Yes, this would be important for high implementation. 'Always' or 'Very often' or 'Sometimes' would be important for high implementation.
Q26. Were you involved in any training for the FFVP?	Yes, important for implementation	Yes, training would be important.
Q26A. If yes, what type of training was provided for the FFVP?	Yes, important to know which type; and perhaps doing a point for each. The fact that training was sought out adds to a high motivation	Yes, the type of training is important. Both selected would be good.
Q28. My overall opinion of FFVP is favorable.	Yes, similar reason as to Principal survey	Yes, important. 'Strongly agree' or 'Somewhat agree' would be indicative of high implementation.
Q30. Which of the following factors is a problem of the FFVP?	Yes, more barriers may be less inclined to be a high implementer	This can be site-specific and it's hard to say what would constitute high or low.

Table 8-8 Survey Questions Retained for FFVP Principal Survey Scoring Strategy to Create Index for FFVP Implementation

Question retained for scoring strategy	Scoring strategy ^a	Justification from FFVP Handbook for Schools ²²	Justification from literature findings
<p><i>Q1. Does your school coordinate the specific fruits and vegetable offered during the USDA Fresh Fruit and Vegetable Program (FFVP) distribution with specific information discussed in school-wide nutrition education and promotion activities?</i></p>	<p>Yes – 1 No – 0 I don't know – 0 1 point</p>	<p>Page 3: All schools that participate in the FFVP are required to widely publicize within the school the availability of free fresh fruits and vegetables</p>	<p>Some intervention components that are particularly important to the success of an intervention include school-wide intervention components to increase exposure to FV among the whole school community.¹⁹⁶</p> <p>A whole-school approach has been endorsed as an effective way to promote nutrition and health in the school setting.³⁸</p> <p>A past study by Potter et al (2011), found that schools held “kick-off” assemblies or health fairs to build enthusiasm for the FFVP.³²</p>
<p><i>Q2. Does your school have a committee or personnel involved in the Fresh Fruit and Vegetable Program (FFVP)?</i></p>	<p>Yes – 1 No – 0 I don't know – 0 1 point</p>	<p>Page 29: Encourage Cooperation and Commitment from Partners, Administrators, Teachers, Food service staff, School nurses, Custodial staff, Parents, Parent Teacher Association, Student government</p>	<p>A middle school intervention aiming to improve a la carte items to change food environment in school found that the training session for staff and follow up site visits with the school’s policymakers were well received and stimulated numerous improvements in a la carte foods offered. The goals of their in-services were to enhance cooperation and communication among school administrators, students, and parents for this particular project¹⁷⁸</p> <p>Evaluating garden nutrition interventions to improve FV preferences and intake found that having a variety of stakeholders would be beneficial in an intervention planning process.¹⁸⁰</p> <p>A study noted that it would be helpful to improve communication among school staff regarding the education component in order to send a stronger, consistent message to students regarding the FFVP.³²</p>

Table 8-8 Survey Questions Retained for FFVP Principal Survey Scoring Strategy to Create Index for FFVP Implementation (continued)

Question retained for scoring strategy	Scoring strategy ^a	Justification from FFVP Handbook for Schools ²²	Justification from literature findings
Q3. My overall opinion of FFVP is favorable.	Strongly agree – 1 Somewhat agree – 1 Neither agree nor disagree – 0 Somewhat disagree – 0 Strongly disagree – 0 1 point	Page 29: Encourage Cooperation and Commitment from Partners, Administrators, Teachers, Food service staff, School nurses, Custodial staff, Parents, Parent Teacher Association, Student government	A past study evaluating the FFVP found that school staff rated the program very positively. ³²
Q5. Please check off all grades that participated in school-wide nutrition education or promotion activities at your school.	All grades receive nutrition education – 1 Grades taught/Grades available at school = % of grades taught Max Points x % = Total Point distribution Preschool taught – 1 additional point 1 point	Page 3: All schools that participate in the FFVP are required to widely publicize within the school the availability of free fresh fruits and vegetables Page 8: Encouraged: complementary nutrition education Page 21: Include nutrition education whenever possible, especially during the service of fresh fruits and vegetables and even on days when the Program is not offered	A study noted that it would be helpful to improve communication among school staff regarding the education component in order to send a stronger, consistent message to students regarding the FFVP. ³² Nutrition education during the preschool years may provide a foundation for lifelong healthy eating habits. ¹⁹⁷ Nutrition education is important to introduce at an early age. ¹⁹⁴

Table 8-8 Survey Questions Retained for FFVP Principal Survey Scoring Strategy to Create Index for FFVP Implementation (continued)

Question retained for scoring strategy	Scoring strategy ^a	Justification from FFVP Handbook for Schools ²²	Justification from literature findings
<i>Q6. How many times per month does your school have school-wide nutrition education and nutrition promotion activities?</i>	0 times – 0 1-2 times – 1 3-4 times –1 More than 4 times –1 I don’t know – 0 1 point	Page 3: All schools that participate in the FFVP are required to widely publicize within the school the availability of free fresh fruits and vegetables Page 8: Encouraged: complementary nutrition education Page 21: Include nutrition education whenever possible, especially during the service of fresh fruits and vegetables and even on days when the Program is not offered	Schools may consider educational strategies as a core component in the FV distribution programs; these activities helping to keep an ongoing emphasis on nutrition. ³²
<i>Q8. Does your school have any displays (such as posters, banners, student work, other material) that conveyed nutrition education or promotion messages?</i>	Yes – 1 No – 0 I don’t know – 0 1 point	Page 3: All schools that participate in the FFVP are required to widely publicize within the school the availability of free fresh fruits and vegetables Page 8: Encouraged: complementary nutrition education	Communication media (such as posters, and public address announcements) had been used in another study to encourage selection of low-fat foods. ¹⁷⁹ Environmental influences on behavior change include media and cultural messages, as identified in Cohen’s pragmatic model. ¹⁹⁸

Table 8-8 Survey Questions Retained for FFVP Principal Survey Scoring Strategy to Create Index for FFVP Implementation (continued)

Question retained for scoring strategy	Scoring strategy ^a	Justification from FFVP Handbook for Schools ²²	Justification from literature findings
Q12. Please indicate if a policy exists at your school regarding the availability of healthy food choices when foods are offered (or sold) to students outside of school meals or policies regarding food in general.	Selection of any policy, except last one – 1 No policies selected – 0 1 point	Page 13: Develop guidelines to remind children of good manners when they receive and eat their FV; setting policies on trash disposal and cleanup will improve FV service Page 20: NE: school’s wellness policy	The school’s psychosocial environment can support health-enhancing nutrition choices by also incorporating messages through school policies. ¹⁸⁶ Having school policies reinforces commitment from school leadership and provides guidance for school staff on the nutrition policies at schools. ¹⁸⁶
Q13: How is nutrition material communicated or distributed to parents?	Selection of one choice –1 None selected – 0 1 point	Page 29: Encourage Cooperation and Commitment from Partners, Administrators, Teachers, Food service staff, School nurses, Custodial staff, Parents, Parent Teacher Association, Student government	Another study noted that inclusion of a parent component in FFVP implementation may help boost fruit and vegetable consumption outside of school. ³² They also noted that if they want to increase parent participation, they may need more frequent notifications and may need to identify other mechanisms for reaching out to parents (tasting events or providing healthy recipes with FV in newsletters). ³² Coordinating NE for parents may also be beneficial and was seen as favorable by teachers incorporating a new nutrition curriculum in their classroom. ¹⁸² More studies needed to understand comparison of school-based interventions and those with or without a parent component. ¹⁹⁹

Table 8-8 Survey Questions Retained for FFVP Principal Survey Scoring Strategy to Create Index for FFVP Implementation (continued)

Question retained for scoring strategy	Scoring strategy ^a	Justification from FFVP Handbook for Schools ²²	Justification from literature findings
<p><i>Q14: Does your school (or an outside source provided by the school) provide training in nutrition (formal or informal) for any of the following positions at least once a year?</i></p>	<p>Position selected – 1 None selected – 0</p> <p>1 point</p>	<p>Page 25: Participate in training provided by State agency: school staff must be trained on FFVP requirements and report forms before each new year</p> <p>Page 30: Develop New Partnerships; State and National affiliates of the American Cancer, Diabetes, Dietetic and Heart Associations and School Nutrition Association; Community Health Agencies; County and State health and agriculture departments; Dieticians and dietetic interns; Extension agents; Hospitals; Local grocers and stores; Vocational clubs; Produce associations/commodity groups; Nutrition trade associations; Health associations; Food distributors</p>	<p>In a study investigating incorporating a nutrition curriculum in a school, interviews with staff noted that facilitators of incorporating the curriculum was the support of school administration and financial and human support provided by the project to attain supplies.¹⁸²</p>
<p>Raw score: 9 points</p>			
<p><5 points: Low implementation ≥5 points: High implementation</p>			

^a1 – high implementation, 0 – low implementation

Table 8-9 Survey Questions Retained for FFVP Teacher Survey Scoring Strategy to Create Index for FFVP Implementation

Question retained for scoring strategy	Scoring strategy	Justification from FFVP Handbook ²²	Justification from literature findings
Q1. How familiar are you with the Fresh Fruit and Vegetable Program (FFVP) implementation at your school?	Extremely familiar – 1 Very familiar – 1 Moderately familiar – 1 Slightly familiar – 0 Not familiar at all – 0 1 point	Page 9: Coordinate efforts to inform principals, teachers, school staff, children, and parents about the Fresh Fruit and Vegetable Program Page 29: Encourage Cooperation and Commitment from Partners, Administrators, Teachers, Food service staff, School nurses, Custodial staff, Parents, Parent Teacher Association, Student government	Evaluating garden nutrition interventions to improve FV preferences and intake found that having a variety of stakeholders would be beneficial in an intervention planning process. ¹⁸⁰ A study noted that it would be helpful to improve communication among school staff regarding the education component in order to send a stronger, consistent message to students regarding the FFVP. ³²
Q3. Were you present during any of the times the FFVP was passed out as a snack?	Yes – 1 No – 0 1 point	Page 10: ...teachers can play a valuable role in modeling positive eating habits by consuming fruits and vegetables along with their students. Page 10: Only teachers who are directly responsible for serving the fruit or vegetable to their students in a classroom setting may partake of the fruit and/or vegetable	The school’s psychosocial environment can support health-enhancing nutrition choices can be enhanced by role modeling by school staff. ¹⁸⁶
Q4. When the FFVP was distributed, how often did you eat the fruit or vegetable provided by the FFVP?	Always – 1 Most of the time – 1 About half the time – 1 Less than half the time – 0 Never – 0 1 point	Page 10: ...teachers can play a valuable role in modeling positive eating habits by consuming fruits and vegetables along with their students. Page 10: Only teachers who are directly responsible for serving the fruit or vegetable to their students in a classroom setting may partake of the fruit and/or vegetable	The school’s psychosocial environment can support health-enhancing nutrition choices can be enhanced by role modeling by school staff. ¹⁸⁶

Table 8-9 Survey Questions Retained for FFVP Teacher Survey Scoring Strategy to Create Index for FFVP Implementation (continued)

Question retained for scoring strategy	Scoring strategy	Justification from FFVP Handbook ²²	Justification from literature findings
Q5. How much of the fruits provided in the FFVP do students usually eat? (i.e. per child, how much of the fruit is typically consumed?)	All or most – 1 Much – 1 Some – 1 Little or none – 0 Don’t know or not applicable – 0 1 point	Page 18: As with other school meal programs, plan to reduce waste.	More FV consumption available using distribution schemes in schools and improvements of increased intake can lead to positive health outcomes. ⁸
Q6. How much of the vegetables provided in the FFVP do students usually eat? (i.e. per child, how much of the vegetable is typically consumed?)	All or most – 1 Much – 1 Some – 1 Little or none – 0 Don’t know or not applicable – 0 1 point	Page 18: As with other school meal programs, plan to reduce waste.	More FV consumption available using distribution schemes in schools and improvements of increased intake can lead to positive health outcomes. ⁸
Q7. I verbally encourage the students to eat the FFVP snacks.	Always – 1 Most of the time – 1 Sometimes – 1 Rarely – 0 Never – 0 1 point	Page 10: ...teachers can play a valuable role in modeling positive eating habits by consuming fruits and vegetables along with their students. Page 10: Only teachers who are directly responsible for serving the fruit or vegetable to their students in a classroom setting may partake of the fruit and/or vegetable	A cafeteria-based intervention showed that verbal encouragement from food-service staff was statistically significant in its association with outcomes in FV intake. ⁸³

Table 8-9 Survey Questions Retained for FFVP Teacher Survey Scoring Strategy to Create Index for FFVP Implementation (continued)

Question retained for scoring strategy	Scoring strategy	Justification from FFVP Handbook ²²	Justification from literature findings
Q10. My overall opinion of FFVP is favorable.	Strongly agree – 1 Somewhat agree – 1 Somewhat disagree – 0 Strongly disagree – 0 Don't know or not applicable – 0 1 point	Page 29: Encourage Cooperation and Commitment from Partners, Administrators, Teachers, Food service staff, School nurses, Custodial staff, Parents, Parent Teacher Association, Student government	Another study noted that dissatisfied teachers for a nutrition intervention used the curriculum the least. ¹⁸²
Q13. Were you involved in any training for the FFVP?	Yes – 1 No – 0 1 point	Page 25: Participate in training provided by State agency: school staff must be trained on FFVP requirements and report forms before each new year Page 30: Develop New Partnerships; State and National affiliates of the American Cancer, Diabetes, Dietetic and Heart Associations and School Nutrition Association; Community Health Agencies; County and State health and agriculture departments; Dieticians and dietetic interns; Extension agents; Hospitals; Local grocers and stores; Vocational clubs; Produce associations/commodity groups; Nutrition trade associations; Health associations; Food distributors	In a study investigating incorporating a nutrition curriculum in a school, interviews with staff noted that facilitators of incorporating the curriculum was the support of school administration and financial and human support provided by the project to attain supplies. ¹⁸²

Table 8-9 Survey Questions Retained for FFVP Teacher Survey Scoring Strategy to Create Index for FFVP Implementation (continued)

Question retained for scoring strategy	Scoring strategy	Justification from FFVP Handbook ²²	Justification from literature findings
Q14. If yes, what type of training was provided for the FFVP?	1 – Nutrition education 1 – Training on implementing the FFVP 1 – Other 0 – None selected 1 point	Page 25: Participate in training provided by State agency: school staff must be trained on FFVP requirements and report forms before each new year Page 30: Develop New Partnerships; State and National affiliates of the American Cancer, Diabetes, Dietetic and Heart Associations and School Nutrition Association; Community Health Agencies; County and State health and agriculture departments; Dieticians and dietetic interns; Extension agents; Hospitals; Local grocers and stores; Vocational clubs; Produce associations/commodity groups; Nutrition trade associations; Health associations; Food distributors	In a study investigating incorporating a nutrition curriculum in a school, interviews with staff noted that facilitators of incorporating the curriculum was the support of school administration and financial and human support provided by the project to attain supplies. ¹⁸² If teachers are to teach nutrition, they must have adequate training. ²⁰⁰
Q16. Did you teach nutrition (i.e. nutrition education or nutrition activities) as part of the FFVP?	Yes – 1 No – 0 1 point	Page 8: Encouraged: complementary nutrition education Page 8: To ensure the FFVP runs smoothly, incorporate NE into the daily curriculum, preferably during the service of fresh fruits and vegetables Page 19: Teachers choosing to participate with their students are strongly encouraged to include a nutrition education component to enhance their positive role modeling	Having classroom education with taste testing can be beneficial in improving FV intake. ¹⁸⁷

Table 8-9 Survey Questions Retained for FFVP Teacher Survey Scoring Strategy to Create Index for FFVP Implementation (continued)

Question retained for scoring strategy	Scoring strategy	Justification from FFVP Handbook ²²	Justification from literature findings
Q20. How many times per school week did you teach nutrition (i.e. nutrition education or nutrition activities) as part of the FFVP?	0 times – 0 At least 1 time per week – 1 2 times per week – 1 3 times per week – 1 4 times per week – 1 More than 4 times per week 1 1 point	Page 8: Encouraged: complementary nutrition education Page 8: To ensure the FFVP runs smoothly, incorporate NE into the daily curriculum, preferably during the service of fresh fruits and vegetables Page 19: Teachers choosing to participate with their students are strongly encouraged to include a nutrition education component to enhance their positive role modeling	One study noted that shorter dose may impact FV intake; however, more studies needed to evaluate this (only 7 studies assessed). ²⁰¹ Nutrition education is important to introduce at an early age. ¹⁹⁴
Raw score: 11 points			
<6 points: Low implementation ≥6 points: High implementation			

^a1 – high implementation, 0 – low implementation

Table 8-10 Survey Questions Retained for FFVP Coordinator Survey Scoring Strategy to Create Index for FFVP Implementation

Question retained for scoring strategy	Scoring strategy ^a	Justification from FFVP Handbook ²²	Justification from literature findings
Q1. How many days per week is FFVP offered to students at your school? -	Daily – 1 4 times per week – 1 3 times per week – 1 2 times per week – 1 1 time per week – 1 I don't know – 0 1 point	Page 8: Encouraged: Effort to provide FV a minimum of twice a week as repeated exposure to new foods is a key to acceptance.	A study with repeated taste exposures helped increase vegetable liking among children. ¹¹³ Increased taste exposure can help with food neophobia. ¹⁵⁴
Q2. How many times per day is FFVP offered to students at your school?	Once per day – 1 2x per day – 1 3x per day – 1 More than 3 times per day – 1 1 point)	Page 12: Many schools serve fruits and vegetables multiple times during the school day so students have more access to fruits and vegetables. Page 12: Multiple distribution times may be used and may be the best way to maximize participation.	A study with repeated taste exposures helped increase vegetable liking among children. ¹¹³ Increased taste exposure can help with food neophobia. ¹⁵⁴
Q4. Do the students consume the fruits or vegetables at the same locations where it is served?	Yes - 1 No – 1 or 0 if 4A Home is selected I don't know – 0 1 point	Page 12: The most successful distribution areas for the FFVP will be places where children can easily consume the fruits and vegetables Page 13: Distribution methods including Inside classrooms; In hallways; At kiosks; In free vending machines; As part of nutrition education activities	There is a relationship between the availability and accessibility of FV at schools is related to FV consumption in schoolchildren. ²⁰²

Table 8-10 Survey Questions Retained for FFVP Coordinator Survey Scoring Strategy to Create Index for FFVP Implementation (continued)

Question retained for scoring strategy	Scoring strategy ^a	Justification from FFVP Handbook ²²	Justification from literature findings
Q4. Do the students consume the fruits or vegetables at the same locations where it is served? (continued)	See previous page	<p>Page 13: Most schools use classrooms or a combination of classrooms and kiosks to deliver fruits and vegetables to children. Offering in classrooms reduces messes, deal more effectively with disruptive behavior, makes the most of learning time</p> <p>Page 13: Kiosks allow you to offer more choices and provide easy access. Consider staggering access to lessen confusion in hallways. Be sure to serve fruits and vegetables in a manner that can be handled easily. Vending machines may also optimize distribution of fruits and vegetables. Select fruits and vegetables that are suitable for vending machine distribution and allow adequate time and staff for restocking.</p>	See previous page
Q5. Are all grades at your school offered the FFVP?	<p>Yes – 1 No – 0 I don't know – 0</p> <p>1 point</p>	Page 10: The Fresh Fruit and Vegetable Program is for all the children who normally attend your school.	Availability and accessibility are important to children's FV consumption. ¹⁸⁵
Q8. What preparation is done with the fruits or vegetables served as part of the FFVP? (check all that apply)	<p>Sliced – 1 Peeled – 1 Herbs added – 0 Spices added – 0 Cooked some vegetables – 0 None – 1</p> <p>1 point</p>	<p>Page 14: The produce you serve should be presented in such a way that it will be easily identified or recognized for what it is</p> <p>Page 14: Serve a variety of fresh FV in their natural state and without additives</p>	Children may want their vegetables cut or more advanced serving styles (i.e. figures). Additionally, children may prefer ordinary sized vegetables and this was seen when children were served whole or chunks of vegetables, in a study evaluating serving styles. ²⁰³

Table 8-10 Survey Questions Retained for FFVP Coordinator Survey Scoring Strategy to Create Index for FFVP Implementation (continued)

Question retained for scoring strategy	Scoring strategy ^a	Justification from FFVP Handbook ²²	Justification from literature findings
Q8. What preparation is done with the fruits or vegetables served as part of the FFVP? (check all that apply) (continued)	See previous page	Page 14: Dicing and slicing into smaller pieces for ease of service, as well as the addition of ascorbic acid is acceptable.	See previous page
Q10. Up to how many times were the same fruits offered throughout 2016-2017 as part of the FFVP?	Offered it just once – 0 Two times – 1 Three or more times – 1 1 point	Page 16: Purchase and serve more of your students’ favorites, but continue efforts to introduce new items Page 16: Introduce children to different varieties of a fruit (e.g., Bartlett, Bosc, and Seckel pears) or a vegetable (bell, sweet banana, and Poblano peppers) Page 16: One goal of the FFVP is to expand the variety of fruits and vegetables your students consume. Page 16: To the extent possible, you should not limit the choices you offer	Exposing children to new foods (5-10 times), increased the liking for new foods in a study, leading to greater intake. ¹⁸⁸ School meal modifications that have targeted FV have focused on improved taste and portion-size. ¹⁸⁵ The use of role models, and preparations that maximize preferred sensory qualities such as juiciness, color, bite-sized portions, and accompanied by dip or sauce are advocated by one study. ¹⁸⁵
Q11. How much fruit is offered to children as a snack as part of the FFVP?	A bite-size amount – 0 ¼ cup – 1 ½ cup – 1 1 cup – 1 I don’t know – 0 Varies – 1 1 point	Page 9: Determine the appropriate types of produce to serve and the appropriate portion sizes	In determining positive associations between number of food servings consumed by preschoolers and authoritative parenting behaviors, positive associations were seen when small portions were given when introducing a new food. ¹⁹¹

Table 8-10 Survey Questions Retained for FFVP Coordinator Survey Scoring Strategy to Create Index for FFVP Implementation (continued)

Question retained for scoring strategy	Scoring strategy ^a	Justification from FFVP Handbook ²²	Justification from literature findings
Q13. Up to how many times were the same vegetables offered throughout 2016-2017	Offered it just once – 0 Two times – 1 Three or more times – 1 1 point	Page 16: Purchase and serve more of your students’ favorites, but continue efforts to introduce new items Page 16: Introduce children to different varieties of a fruit (e.g., Bartlett, Bosc, and Seckel pears) or a vegetable (bell, sweet banana, and Poblano peppers) Page 16: One goal of the FFVP is to expand the variety of fruits and vegetables your students consume. Page 16: To the extent possible, you should not limit the choices you offer	Exposing children to new foods (5-10 times), increased the liking for new foods in a study, leading to greater intake. ¹⁸⁸
Q14. How much vegetable is offered to children as a snack as part of the FFVP?	A bite-size amount – 0 ¼ cup – 1 ½ cup – 1 1 cup – 1 I don’t know – 0 Varies – 1 1 point	Page 9: Determine the appropriate types of produce to serve and the appropriate portion sizes	In determining positive associations between number of food servings consumed by preschoolers and authoritative parenting behaviors, positive associations were seen when small portions were given when introducing a new food. ¹⁹¹
Q15. How many times were full-fat dipping sauces such as yogurt or ranch dressing used for some vegetables in the 2016-2017 year?	Always – 0 Most of the time – 0 Sometimes – 0 Rarely – 0 Never – 1 I don’t know – 0 1 point	Page 15: If you choose to serve dip with vegetables, make sure to only offer low-fat yogurt-based or other low-fat or non-fat dips	Low-fat dips should be offered over full-fat dips because of concerns of excess energy intake in children. ¹⁹²

Table 8-10 Survey Questions Retained for FFVP Coordinator Survey Scoring Strategy to Create Index for FFVP Implementation (continued)

Question retained for scoring strategy	Scoring strategy ^a	Justification from FFVP Handbook ²²	Justification from literature findings
Q15. How many times were fat-free or low-fat dipping sauces such as yogurt or ranch dressing used for some vegetables in the 2016-2017 year	Always – 0 Most of the time – 0 Sometimes – 0 Rarely – 1 Never – 1 I don't know – 0 1 point	Page 15: If you choose to serve dip with vegetables, make sure to only offer low-fat yogurt-based or other low-fat or non-fat dips	Study evaluating dip use for bitter-sensitive and bitter-insensitive children found no differences in broccoli intake for bitter insensitive children. ¹⁹²
Q17. Does your school on its own maintain relationships with any outside partners as part of the FFVP?	At least one selected – 1 None selected – 0 1 point	Page 3: All schools that participate in the FFVP are required to widely publicize within the school the availability of free fresh fruits and vegetables Page 6: Schools are encouraged to develop partnerships with one or more entities that will provide non-Federal resources, including entities representing the fruit and vegetable industry and entities working to promote children's health in the community. Page 17: Collaborate with State and Local Affiliates; State Fruit and Vegetable Coordinators (formerly 5-A-Day); Produce for Better Health	Pilot implementation of the FFVP revealed positive support from partners for nutrition education and other activities. ²¹ Schools along with community involvement opportunities can produce modest improvements in behavior among adolescents. ¹⁹⁴

Table 8-10 Survey Questions Retained for FFVP Coordinator Survey Scoring Strategy to Create Index for FFVP Implementation (continued)

Question retained for scoring strategy	Scoring strategy ^a	Justification from FFVP Handbook ²²	Justification from literature findings
<i>Q17. Does your school on its own maintain relationships with any outside partners as part of the FFVP? (continued)</i>	See previous page	<p>Page 19: Support farm-to-school projects by purchasing fresh fruits and vegetables from growers and farmers in your community; farm to school projects are collaborations between farmers and schools that increase your access to fresh, local farm products, and expand market opportunities for family farms</p> <p>Page 21: Consult with FFVP partners to obtain no cost promotional items such as informational fliers, pamphlets, posters, banners, buttons</p> <p>Page 29: Encourage Cooperation and Commitment from Partners, Administrators, Teachers, Food service staff, School nurses, Custodial staff, Parents, Parent Teacher Association, Student government</p> <p>Page 30: Develop New Partnerships; State and National affiliates of the American Cancer, Diabetes, Dietetic and Heart Associations and School Nutrition Association; Community Health Agencies; County and State health and agriculture departments; Dieticians and dietetic interns; Extension agents; Hospitals; Local grocers and stores; Vocational clubs; Produce associations/commodity groups; Nutrition trade associations; Health associations; Food distributors</p>	See previous page

Table 8-10 Survey Questions Retained for FFVP Coordinator Survey Scoring Strategy to Create Index for FFVP Implementation (continued)

Question retained for scoring strategy	Scoring strategy ^a	Justification from FFVP Handbook ²²	Justification from literature findings
Q17A. For each type of partner, please indicate the role that partner played in implementing the FFVP in your school.	At least one selected – 1 None selected – 0 1 point	Page 6: Schools are encouraged to develop partnerships with one or more entities that will provide non-Federal resources, including entities representing the fruit and vegetable industry and entities working to promote children’s health in the community.	See Q17 justification
Q20. Were you present during any of the times the FFVP was passed out as a snack?	Yes – 1 No – 0 1 point	Page 10: ...teachers can play a valuable role in modeling positive eating habits by consuming fruits and vegetables along with their students. Page 10: Only teachers who are directly responsible for serving the fruit or vegetable to their students in a classroom setting may partake of the fruit and/or vegetable	The school’s psychosocial environment can support health-enhancing nutrition choices can be enhanced by role modeling by school staff. ¹⁸⁶
Q21. How much of the fruits provided in the FFVP do students usually eat? (i.e. per child, how much of the fruit is typically consumed?)	All or most – 1 Much – 1 Some – 1 Little or none – 0 Don’t know or not applicable – 0 1 point	Page 21: As with other school meal programs, plan to reduce waste.	More FV consumption available using distribution schemes in schools and improvements of increased intake can lead to positive health outcomes. ⁸
Q22. How much of the vegetables provided in the FFVP do students usually eat? (i.e. per child, how much of the vegetable is typically consumed?)	All or most – 1 Much – 1 Some – 1 Little or none – 0 Don’t know or not applicable – 0 1 point	Page 21: As with other school meal programs, plan to reduce waste.	More FV consumption available using distribution schemes in schools and improvements of increased intake can lead to positive health outcomes. ⁸

Table 8-10 Survey Questions Retained for FFVP Coordinator Survey Scoring Strategy to Create Index for FFVP Implementation (continued)

Question retained for scoring strategy	Scoring strategy ^a	Justification from FFVP Handbook ²²	Justification from literature findings
Q23. I verbally encourage the students to eat the FFVP snacks.	Always – 1 Most of the time – 1 Sometimes – 1 Rarely – 0 Never – 0 1 point	Page 10: ...teachers can play a valuable role in modeling positive eating habits by consuming fruits and vegetables along with their students.	A cafeteria-based intervention showed that verbal encouragement from food-service staff was statistically significant in its association with outcomes in FV intake. ⁸³
Q26. Were you involved in any training for the FFVP?	Yes – 1 No – 0 1 point	Page 25: Participate in training provided by State agency: school staff must be trained on FFVP requirements and report forms before each new year Page 30: Develop New Partnerships; State and National affiliates of the American Cancer, Diabetes, Dietetic and Heart Associations and School Nutrition Association; Community Health Agencies; County and State health and agriculture departments; Dieticians and dietetic interns; Extension agents; Hospitals; Local grocers and stores; Vocational clubs; Produce associations/commodity groups; Nutrition trade associations; Health associations; Food distributors	In a study investigating incorporating a nutrition curriculum in a school, interviews with staff noted that facilitators of incorporating the curriculum was the support of school administration and financial and human support provided by the project to attain supplies. ¹⁸²
Q26A. If yes, what type of training was provided for the FFVP?	1 – Nutrition education 1 – Training on implementing the FFVP 1 – Other 0 – None selected 1 point	Page 25: Participate in training provided by State agency: school staff must be trained on FFVP requirements and report forms before each new year	In a study investigating incorporating a nutrition curriculum in a school, interviews with staff noted that facilitators of incorporating the curriculum was the support of school administration and financial and human support provided by the project to attain supplies. ¹⁸²

Table 8-10 Survey Questions Retained for FFVP Coordinator Survey Scoring Strategy to Create Index for FFVP Implementation (continued)

Question retained for scoring strategy	Scoring strategy ^a	Justification from FFVP Handbook ²²	Justification from literature findings
Q26A. If yes, what type of training was provided for the FFVP? (continued)	See previous page	Page 30: Develop New Partnerships; State and National affiliates of the American Cancer, Diabetes, Dietetic and Heart Associations and School Nutrition Association; Community Health Agencies; County and State health and agriculture departments; Dietitians and dietetic interns; Extension agents; Hospitals; Local grocers and stores; Vocational clubs; Produce associations/commodity groups; Nutrition trade associations; Health associations; Food distributors	See previous page
Q28. My overall opinion of FFVP is favorable.	Strongly agree – 1 Somewhat agree – 1 Neither agree nor disagree – 0 Somewhat disagree – 0 Strongly disagree – 0 1 point	Page 29: Encourage Cooperation and Commitment from Partners, Administrators, Teachers, Food service staff, School nurses, Custodial staff, Parents, Parent Teacher Association, Student government	Another study noted that dissatisfied teachers for a nutrition intervention used the curriculum the least. ¹⁸²

Raw score: 20 points

≤10 points: low implementation

>10 points: high implementation

^a1 – high implementation, 0 – low implementation

Table 8-11 Characteristics of Principals, Teachers, and Coordinators of the FFVP in Illinois Schools

	Principals		Teachers		Coordinators	
	n	%	n	%	n	%
Years working at their school	n=38		-	-	n=67	
Less than one year	4	10.5			4	5.9
1-3 years	9	23.7			18	26.9
4-6 years	4	10.5			11	16.4
More than 6 years	21	55.3			33	49.3
Not applicable	0	0			1	1.5
Role at school	-	-	-	-	n=68	
Principal					6	9.0
Assistant principal					5	7.5
Food service director/manager					25	37.3
Food service staff member					1	1.5
Teacher					6	9.0
Other					24	35.8
Primary format of classroom	-	-	n=318		-	-
Monolingual			236	74.2		
Bilingual			68	21.4		
Other			14	4.4		
Average number of students per class (mean ± SD)	-	-	n=317		-	-
			22.1 ± 3.6			
Grade levels taught	-	-			-	-
Preschool			4	1.3		
Kindergarten			103	32.4		
1st grade			105	33.0		
2nd grade			110	34.3		
3rd grade			1	0.3		
5th grade			1	0.3		
Other (i.e. K-2nd or SPED K-2)			2	0.6		
Years teaching	-	-	n=318		-	-
Less than one year			6	1.9		
1-3 years			50	15.7		
4-6 years			47	14.8		
More than 6 years			206	64.8		
Other (i.e. 9-32 years)			9	2.8		
Educational background	n=38		n=316		n=67	
High school graduate	0	0	0	0	14	20.9
College graduate	1	2.6	123	38.7	20	29.9
Master's degree	35	92.1	192	60.4	22	32.8
Doctoral degree	1	2.6	0	0	2	3.0
Other (i.e. BA in Spanish Education)	1	2.6	1	0.3	9	13.4
Race/ethnicity	n=37		n=316		n=67	
Hispanic	4	10.8	63	19.9	3	4.5
Non-Hispanic	33	89.2	253	80.1	64	95.6
American Indian or Alaska Native	0	0	9	2.8	1	1.5
Asian	0	0	5	1.6	1	1.5
Black	8	21.6	30	9.4	11	16.4
Native Hawaiian or other Pacific Islander	0	0	2	0.6	0	0
White	29	78.4	264	83.0	54	80.6

Table 8-12 Schools Surveys Classified as High and Low Implementation Based on the Survey Index

Survey	Low implementation (%)	High implementation (%)
Principal	5 (13.2)	33 (86.8)
Teacher	35 (11.0)	283 (89.0)
FFVP coordinator	6 (9.0)	61 (91.0)

Table 8-13 Scores for the 20 Schools that Participated in All Three of the FFVP Survey Types

School	Principal score	Teacher score	Coordinator score
1	6	9	18
2	7	8.33	17
3	3*	6.67	10*
4	6	5.83*	16.5
5	4*	9	10*
6	7	7.67	19
7	7	8	15
8	6	6.5	15
9	7	6.8	19
10	7	6	14
11	5	6.33	16
12	4*	5.67*	12
13	6	7.6	17
14	7	6.33	17
15	4*	8.67	15
16	6	6.5	11
17	7	6.5	18
18	6	4.5*	9*
19	7	9	12
20	8	7.17	15

^Principal survey is out of 9 points (≥ 5 points is high implementer); teacher survey is out of 11 points (≥ 6 points is high implementer); FFVP coordinator survey is out of 20 points (> 10 points is high implementer)

*considered low implementer

Table 8-14 Descriptive Results from FFVP Principal Survey (n=38)

Item	N	%	Cum. %
<i>Does your school coordinate the specific fruits and vegetable offered during the USDA Fresh Fruit and Vegetable Program (FFVP) distribution with specific information discussed in school-wide nutrition education and promotion activities?</i>			
Yes	25	65.8	65.8
No	9	23.7	23.7
I don't know	4	10.5	10.5
<i>Does your school have a committee or personnel involved in the Fresh Fruit and Vegetable Program (FFVP)?</i>			
Yes	30	78.9	78.9
No	7	18.4	18.4
I don't know	1	2.6	2.6
<i>Who is involved in this committee?</i>	N=30		
Principal	21	70	55.3
Parents	4	13.3	10.5
FFVP coordinator	16	53.3	42.1
School Food Authority (SFA)	11	36.7	28.9
Teachers	13	43.3	34.2
Stakeholders	2	6.7	5.3
Lunchroom manager	21	70	55.3
Other staff (i.e. health office staff, nurse, secretary)	10	33.3	26.3
<i>My overall opinion of FFVP is favorable.</i>			
Strongly disagree	0	0	0
Somewhat disagree	0	0	0
Neither agree nor disagree	2	5.3	5.3
Somewhat agree	8	21.1	21.1
Strongly agree	28	73.7	73.7
<i>Noted that all grades participated in school-wide nutrition education or promotion activities at the school.</i>	19	50	50
<i>Times per month school has school-wide nutrition education and promotion activities</i>			
0 times	5	13.2	13.2
1-2 times	19	50.0	50.0
3-4 times	4	10.5	10.5
More than 4 times	7	18.4	18.4
I don't know	3	7.9	7.9
<i>Message(s) conveyed by nutrition education or promotion activities</i>			
Role of fresh fruits and vegetables in a complete diet	24	63.2	63.2
Where fresh fruits and vegetables come from	19	50.0	50.0
Trying new fruits and vegetables	28	73.7	73.7
Eating a variety of fruits and vegetables	23	60.5	60.5
USDA MyPlate	14	36.8	36.8
Cooking with fresh fruits and vegetables	6	15.8	15.8
Other messages (i.e. shopping for FV on budget)	1	2.6	2.6
<i>Schools that had displays that conveyed nutrition education or promotion messages</i>	38	100	100

Table 8-14 Descriptive Results from FFVP Principal Survey (n=38) (continued)

Item	N	%	Cum. %
<i>Location of nutrition displays around school</i>			
Hallways	20	52.6	52.6
Cafeteria	36	94.7	94.7
Bulletin boards	21	55.3	55.3
Library	1	2.6	2.6
Gym	9	23.7	23.7
Other common areas (lobby)	4	10.5	10.5
Other (i.e. art room, nurse's office)	3	7.9	7.9
<i>Message(s) conveyed by displays</i>			
Role of fresh fruits and vegetables in a complete diet	28	73.7	73.7
Where fresh fruits and vegetables come from	14	36.8	36.8
Trying new fruits and vegetables	23	60.5	60.5
Eating a variety of fruits and vegetables	27	71.1	71.1
USDA MyPlate	18	47.4	47.4
Cooking with fresh fruits and vegetables	3	7.9	7.9
<i>Type of professionals or volunteers that conduct or lead nutrition education or promotion activities at school</i>			
Classroom teacher	27	71.1	71.1
Principal or administrator	11	28.9	28.9
Nutritionist or dietitian	5	13.2	13.2
Doctor, nurse, or other health professional	12	31.6	31.6
University Extension health educator/other role	13	34.2	34.2
Lunchroom manager	17	44.7	44.7
Other (i.e. nurse, garden club leaders)	4	10.5	10.5
<i>Policies at school regarding the availability of healthy food choices when foods are offered or sold to students outside of school meals or policies regarding food in general.</i>			
Foods offered (or sold) on a regular basis outside of school meals (snack bar, vending machines, school store, etc.)	11	28.9	28.9
Foods offered (or sold) on special occasions during school (fundraisers, festivals, etc.)	14	36.8	36.8
Foods offered (or sold) in school sports events	5	13.2	13.2
Foods offered (or sold) before/after school	7	18.4	18.4
Foods offered free to students during school (parties, etc.) not including snacks, provided by a Federal, State, or district program	21	55.3	55.3
Foods offered (or sold) to individual students as rewards	10	26.3	26.3
Other: n=3 (none; We are a healthy snack school, no junk food; we have a Health and Wellness Policy)	3	7.9	7.9

Table 8-14 Descriptive Results from FFVP Principal Survey (n=38) (continued)

Item	N	%	Cum. %
<i>Method that nutrition material is communicated or distributed to parents</i>			
Newsletters	26	68.4	68.4
Phone calls	1	2.6	2.6
Classes	12	31.6	31.6
Parent-teacher association (PTA) or Parent-teacher Organization (PTO)	8	21.1	21.1
Signs posted around school	20	52.6	52.6
Student orientation	3	7.9	7.9
Student handbook	9	23.7	23.7
Social media	9	23.7	23.7
Announcements at school events	18	47.4	47.4
Other (i.e. coffee with the principal; Family Night; Nutrition Nugget 2 page newsletter about nutrition; Open House Presentation; We also have cooking clubs with U of I Extension program where kids cook up healthy snacks; Weekly Menu)	6	15.8	15.8
School website	10	26.3	26.3
None. Nutrition information is not communicated to parents	1	2.6	2.6
<i>The positions the school (or an outside source provided by the school) provides training in nutrition (formal or informal) once a year</i>			
Lunchroom monitors	7	18.4	18.4
Recess monitors	1	2.6	2.6
Teachers	8	21.1	21.1
Other staff member related to health (i.e. nurse, gym teacher)	3	7.9	7.9
No training is offered	19	50.0	50.0
Lunchroom staff	14	36.8	36.8
Classroom/teaching assistants	5	13.2	13.2
Office staff	5	13.2	13.2
<i>The staff that work at their school (including staff shared among multiple schools in their district)</i>			
Athletic director	3	7.9	7.9
Physical education teacher	34	89.5	89.5
Food service director/manager	21	55.3	55.3
Health educator	5	13.2	13.2
Other staff member related to health (i.e. nurse, PE teacher, cook)	10	26.3	26.3

Table 8-15 Results of Regression Analyses to Predict Coordination of FV and NE Activities, Availability of Nutrition Displays, and Number of School-Wide Nutrition Activities by the Availability of a FFVP Committee

Criteria	%		Odds ratio	95% Confidence interval
	FFVP committee	No FFVP committee		
Coordinating of FV served with school-wide NE	78.6	40.0	5.5	-0.74 to 40.8
Nutrition displays available at the school	100	100	-	-
Taught nutrition more than 4 times a month [^]	21.4	0.0	0.078	-0.69 to 1.07

[^]Linear regression analysis conducted

Table 8-16 Regression Analyses for Number of Times a Month NE was Offered School-Wide and Implementation Level of the School

Model	Variables	R ²	B (SE)	F
1 [^]	Dependent variable: Number of times a month NE offered (constant)	0.192	-0.887 (0.865)	7.377*
	Independent variable: Level of FFVP implementation		0.367 (0.135)	

*P<0.05

[^]Adjusted for years principal worked at school and principal's educational background.

Table 8-17 Descriptive Results from FFVP Teacher Survey (n=318)

Item	N	%	Cum. %
<i>How familiar are you with the Fresh Fruit and Vegetable Program (FFVP) implementation at your school?</i>			
Not familiar at all	6	1.9	1.9
Slightly familiar	23	7.2	7.2
Moderately familiar	88	27.7	27.7
Very familiar	125	39.3	39.3
Extremely familiar	76	23.9	23.9
<i>Were fruits and vegetables passed out in the classroom, lunchroom, hallway, or other location as part of the FFVP?</i>			
Classroom	296	93.1	93.1
Lunchroom	37	11.6	11.6
Hallway	17	5.3	5.3
Kiosk	2	0.6	0.6
Gym	2	0.6	0.6
Other (i.e. cart, teacher's lounge)	5	1.6	1.6
<i>Were you present during any of the times the FFVP was passed out as a snack?</i>			
Yes	311	97.8	97.8
No	7	2.2	2.2
<i>When the FFVP was distributed, how often did you eat the fruit or vegetable provided by the FFVP?</i>			
Never	44	14.1	13.8
Less than half the time	55	17.7	17.3
About half the time	39	12.5	12.3
Most of the time	101	32.5	31.8
Always	72	23.2	22.6
<i>How much of the fruits provided in the FFVP do students usually eat? (i.e. per child, how much of the fruit is typically consumed?)</i>			
Don't know or not applicable	0	0	0
Little or none (<25%)	2	0.6	0.6
Some (25-49%)	9	2.9	2.8
Much (50-75%)	66	21.2	20.8
All or most (>75%)	234	75.2	73.6
<i>How much of the vegetables provided in the FFVP do students usually eat? (i.e. per child, how much of the vegetable is typically consumed?)</i>			
Don't know or not applicable	2	0.6	0.6
Little or none (<25%)	24	7.7	7.5
Some (25-49%)	81	26.0	25.5
Much (50-75%)	112	36.0	35.2
All or most (>75%)	92	29.6	28.9
<i>I verbally encourage the students to eat the FFVP snacks.</i>			
Never	1	0.3	0.3
Rarely	5	1.6	1.6
Sometimes	8	2.5	2.5
Most of the time	44	13.8	13.8
Always	260	81.8	81.8

Table 8-17 Descriptive Results from FFVP Teacher Survey (n=318) (continued)

Item	N	%	Cum. %
<i>Students like the FFVP fruits.</i>			
Don't know or not applicable	0	0	0
Strongly disagree	1	0.3	0.3
Somewhat disagree	6	1.9	1.9
Somewhat agree	54	17.0	17.0
Strongly agree	257	80.8	80.8
<i>Students like the FFVP vegetables.</i>			
Don't know or not applicable	3	0.9	0.9
Strongly disagree	17	5.3	5.3
Somewhat disagree	64	20.1	20.1
Somewhat agree	171	53.8	53.8
Strongly agree	63	19.8	19.8
<i>My overall opinion of FFVP is favorable.</i>			
Strongly disagree	3	0.9	0.9
Somewhat disagree	10	3.1	3.1
Neither agree nor disagree	0	0	0
Somewhat agree	79	24.8	24.8
Strongly agree	226	71.1	71.1
<i>Were you involved in any training for the FFVP?</i>			
Yes	14	4.4	4.4
No	304	95.6	95.6
<i>If yes, what type of training was provided for the FFVP?</i>			
Nutrition education	2	14.3	0.6
Training on implementing the FFVP	11	78.6	3.5
Other (i.e. school training)	1	7.1	0.3
<i>The FFVP implementation activities teachers took part in during the school year</i>			
I helped prepare fruit and/or vegetables for distribution	11	3.5	3.5
I distributed fruit and/or vegetables for the FFVP	138	43.4	43.4
I planned activities for the FFVP	18	5.7	5.7
I helped with classroom promotional activities for FFVP	31	9.7	9.7
I helped with school-wide promotional activities for FFVP	5	1.6	1.6
I taught FFVP lessons that were given to me	22	6.9	6.9
I used more fruit and vegetable examples in my existing classroom lessons	53	16.7	16.7
I added new lessons, class discussions, nutrition education, or activities that addressed nutrition	42	13.2	13.2
I changed how I use foods as rewards or incentives in class so there are more healthful options	29	9.1	9.1

Table 8-17 Descriptive Results from FFVP Teacher Survey (n=318) (continued)

Item	N	%	Cum. %
I changed how healthy foods are offered for classroom celebrations/parties	53	16.7	16.7
I provided nutrition materials for parents	25	7.9	7.9
I was part of a committee involved in the FFVP	3	0.9	0.9
I was a positive role model to children during the FFVP	149	46.9	46.9
I did fruit and vegetable taste testings in my classroom (not as part of the FFVP)	45	14.2	14.2
Other (sample comments: <i>I highly encouraged students to try vegetables; I love this program; I offer healthful benefits of the fruits or vegies and encourage kids to try it; I often do not eat the fruits and vegetables because I am typically setting up for the next lesson while students eat their healthy snack.; I read the information given to me to the students about each fruit and vegetable.; I talked to students about the importance of eating fruits and vegetables; Not part of handing out food</i>)	11	3.5	3.5
Did you teach nutrition (i.e. nutrition education or nutrition activities) as part of the FFVP?			
Yes	91	28.6	28.6
No	227	71.4	71.4
How many times per school week did you teach nutrition (i.e. nutrition education or nutrition activities) as part of the FFVP?			
0 times	7	7.7	2.2
At least 1 time per week	54	59.3	17.0
2 times per week	29	31.9	9.1
More than 4 times per week	1	1.1	0.3
How long is each lesson or activity?			
Less than 15 minutes	71	3.3	22.3
15-30 minutes	17	78.0	5.3
Varies (i.e. very brief, unit on nutrition, snack time)	3	18.7	0.9
What tools do you use to teach nutrition as part of the FFVP?			
Curriculum guides	10	3.1	3.1
Supplementary materials	52	16.4	16.4
Newsletters or magazines	12	3.8	3.8
Textbooks	6	1.9	1.9
Audio and visual aids	38	11.9	11.9
Computer software	13	4.1	4.1
Field trips	12	3.8	3.8
Class discussions	67	21.1	21.1
Other (i.e. cafeteria provides fact sheet, used healthy food for celebrations)	8	2.5	2.5

Table 8-17 Descriptive Results from FFVP Teacher Survey (n=318) (continued)

Item	N	%	Cum. %
<i>What topics did you discuss in the classrooms about nutrition as part of the FFVP?</i>			
Role of fresh fruits and vegetables in a complete diet	71	22.3	22.3
Where fresh fruits and vegetables come from	76	23.9	23.9
Trying new fruits and vegetables	79	24.8	24.8
Eating a variety of fruits and vegetables	69	21.7	21.7
USDA MyPlate	22	6.9	6.9
Cooking with fresh fruits and vegetables	25	7.9	7.9
Other (i.e. how different cultures use the same/different produce)	1	0.3	0.3
<i>If nutrition education was provided in the classroom for the FFVP, what type of curriculum do you provide?</i>			
Team Nutrition	8	2.5	2.5
Choice Coordinator Approach to Child Health (CATCH)	7	2.2	2.2
FFVP resources	27	8.5	8.5
The OrganWise Guys	34	10.7	10.7
Other (i.e. Google, none, prior knowledge, teacher-led)	26	8.2	8.2

Table 8-18 Factors that May Influence Implementation of the FFVP as Noted in the Teacher Survey (n=318)

Item	Major problem		Minor problem		Not a problem	
	N	%	N	%	N	%
<i>Students don't like the fruit and vegetables</i>	15	4.7	160	50.3	143	45.0
<i>Students waste too much</i>	51	16.0	137	43.1	130	40.9
<i>Messy to distribute and clean up</i>	13	4.1	114	35.8	191	60.1
<i>Inadequate teacher training or information</i>	17	5.3	77	24.2	224	70.4
<i>Inadequate time to distribute fruits and vegetables</i>	20	6.3	66	20.8	232	73.0
<i>Class time interrupted or taken away from student learning</i>	14	4.4	65	20.4	239	75.2
<i>Students don't like to try new fruits and vegetables</i>	26	8.2	134	42.1	158	49.7
<i>Inadequate quality of FFVP produce</i>	15	4.7	87	27.4	216	67.9
<i>Inadequate variety of FFVP produce</i>	16	5.0	80	25.2	222	69.8
<i>Inadequate amounts of FFVP produce</i>	13	4.1	69	21.7	236	74.2
<i>Issues with student behavior</i>	6	1.9	22	6.9	290	91.2
<i>Other (i.e. raw vegetables, lopsided supply, having enough serving plates)</i>	8	14.0	7	12.3	42	73.7

Table 8-19 Favorability in the FFVP and its Association with Other Variables Relevant to the Implementation of the FFVP (n=318)

Item	Chi-square (P-value)	Spearman's rho (P-value)
<i>Taught nutrition (yes/no)</i>	17.836 (<0.01)*	-0.236 (<0.01) *
<i>Present during FV distributions (yes/no)</i>	4.1 (0.251)	0.085 (0.13)
<i>Training in FFVP (yes/no)</i>	1.698 (0.637)	0.072 (0.203)
<i>How often they provided verbal encouragement</i>	79.167 (<0.01) *	0.376 (<0.01) *
<i>Times per week they teach nutrition (ordinal scale)</i>	11.644 (0.07)	0.072 (0.498)
<i>How long nutrition lessons are (ordinal scale)</i>	3.01 (0.222)	0.185 (0.085)
<i>How often teachers ate FV along with children (ordinal scale)</i>	26.723 (0.008) *	0.227 (<0.01) *

Table 8-20 Regression Analyses for Amount of Fruit Children Consumed and Implementation Level of the School

Model	Variables	R²	B (SE)	F
1	Dependent variable: Amount of fruit children consume (constant)	0.093	1.838 (0.158)	31.751*
	Independent variable: Level of FFVP implementation		0.123 (0.022)	

*P<0.05

Table 8-21 Regression Analyses for Amount of Vegetables Children Consumed and Implementation Level of the School

Model	Variables	R²	B (SE)	F
1	Dependent variable: Amount of vegetable children consume (constant)	0.149	0.008 (0.260)	53.816*
	Independent variable: High implementation		0.264 (0.036)	

*P<0.05

Table 8-22 Descriptive Results from FFVP Coordinator Survey (n=67)

Item	N	%	Cum. %
How many days per week is FFVP offered to students at your school?			
1 time per week	1	1.5	1.5
2 times per week	56	83.6	83.6
3 times per week	4	6.0	6.0
4 times per week	2	3.0	3.0
Daily (5 times per week)	3	4.5	4.5
Varies (i.e. 2 to 3 times a week)	1	1.2	1.2
How many times per day is FFVP offered to students at your school?			
Once per day			
Twice per day	57	85.1	85.1
More than 3 times per day	2	3.0	3.0
Varies (i.e. each grade level/enrichment cycles between ½ and ¾ quarters; once daily on FFVP days; served in classrooms on FFVP days; students receive FFV two times/week only; twice a week)	3	4.5	4.5
	5	7.5	7.5
Where is FFVP served to students at your school?			
Classroom	60	89.6	89.6
Cafeteria	6	9.0	9.0
Playground	1	1.5	1.5
Hallway	4	6.0	6.0
Food cart	2	3.0	3.0
Gym	3	4.5	4.5
Do the students consume the fruits or vegetables at the same location as where it is served?			
Yes	57	85.1	85.1
No	6	9.0	9.0
Varies (i.e. At food cart or can be taken to alternative location such as classroom or playground; It depends on the time of day; Some students take their own to eat later; Sometimes in cafe and then taken to classrooms; Sometimes they eat it in the classroom, sometimes they take it home)	4	6.0	6.0
If not, where do the children consume their fruits and vegetables served from the FFVP? (check all that apply)			
Classroom	9	13.4	13.4
Cafeteria	1	1.5	1.5
Playground	2	3.0	3.0
Hallway	2	3.0	3.0
Home (i.e. students take fruit or vegetables home with them)	2	3.0	3.0
Are all grades at your school offered the FFVP?			
Yes	65	97.0	97.0
No	2	3.0	3.0
Which grades are offered fruits or vegetables as part of the FFVP? (check all that apply) (IF NOT ALL GRADES)			
Kindergarten	2	3.0	3.0
1 st grade	2	3.0	3.0
2 nd grade	2	3.0	3.0
3 rd grade	2	3.0	3.0
4 th grade	2	3.0	3.0

Table 8-22 Descriptive Results from FFVP Coordinator Survey (n=67) (continued)

Item	N	%	Cum. %
<i>At what time were fruits and vegetables distributed for the FFVP?</i>			
Morning during school time, before lunch	42	62.7	62.7
Afternoon, during school time, after lunch	31	56.3	56.3
Other (i.e. depends on the fruit of the day to be refrigerated; depends on the class scheduled day; during their PE class; sometimes before lunch, sometimes after lunch, throughout the day during a specific enrichment class; throughout the day during their PE class; Tuesday afternoons and Thursday mornings; varies depending on the grade level)	8	11.9	11.9
<i>What is the average minutes per class that fresh fruits/vegetables were available for children to taste?</i>			
Number of minutes (20-360 minutes; 50.8±91 minutes)	32	47.8	
I don't know	35	52.2	
<i>What preparation is done with the fruits or vegetables served as part of the FFVP?</i>			
Sliced	39	58.2	58.2
Peeled	31	46.3	46.3
Cooked some vegetables	2	3.0	3.0
None. Fruits or vegetables were served whole	15	22.4	22.4
Varies	8	11.9	11.9
Other (i.e. bagged; depends on fruit or vegetable; foods are pre-packaged; whole fruits for older kids, etc.)	22	32.8	32.8
I don't know. We do not do preparation at our school	11	16.4	16.4
<i>Which fresh fruits (if any) were distributed to students as part of the FFVP?</i>			
Apples	61	91.0	91.0
Apricots, nectarines or peaches	44	65.7	65.7
Bananas	39	58.2	58.2
Blackberries or raspberries	34	50.7	50.7
Blueberries	57	85.1	85.1
Cantaloupe or honeydew	59	88.1	88.1
Cherries	17	25.4	25.4
Grapefruit	31	46.3	46.3
Grapes	61	91.0	91.0
Kiwis	59	88.1	88.1
Mandarin oranges	42	62.7	62.7
Mangoes	49	73.1	73.1
Oranges	55	82.1	82.1
Pears	54	80.6	80.6
Pineapple	59	88.1	88.1
Plums	33	49.3	49.3
Strawberries	52	77.6	77.6
Tangerines	46	68.7	68.7
Watermelon	59	88.1	88.1
Exotic fruit options (i.e. dragonfruit)	34	50.7	50.7
Other fruit (i.e. kumquats, starfruit, origami melon, goose berries, cranberries, uchuva, pummelo, caracara navel, Texas grapefruit, blood oranges)	25	-	-

Table 8-22 Descriptive Results from FFVP Coordinator Survey (n=67) (continued)

Item	N	%	Cum. %
Up to how many times were the same fruits offered throughout 2016-2017 as part of the FFVP?			
Offered it just once	8	11.9	11.9
Two times	13	19.4	19.4
Three or more times	26	38.8	38.8
Varies (i.e. as per vendor availability-provision; seasonal produce)	12	17.9	17.9
I don't know	8	11.9	11.9
How much fruit is offered to children as a snack as part of the FFVP?			
A bite size amount	6	9.0	9.0
1/4 cup (size of golf ball)	29	43.3	43.3
1/2 cup (1/2 baseball)	29	43.3	43.3
1 cup (baseball)	6	9.0	9.0
I don't know	0	0	0
Varies (i.e. comes packaged in amounts; depends on fruit)	18	26.9	26.9
Which fresh vegetables (if any) were distributed to students as part of the FFVP			
Broccoli	62	92.5	92.5
Carrots	61	91.0	91.0
Cauliflower	58	86.6	86.6
Celery	47	70.1	70.1
Cucumber	56	83.6	83.6
Lettuce or other leafy greens	33	49.3	49.3
Peppers	58	86.6	86.6
Snap peas	53	79.1	79.1
Snow peas	44	65.7	65.7
String/green beans	32	47.8	47.8
Tomatoes	57	85.1	85.1
Yellow summer squash	36	53.7	53.7
Zucchini	38	56.7	56.7
Exotic vegetable options (i.e. jicama, bok choy)	38	56.7	56.7
Other vegetable (i.e. Brussels sprouts, candle corn, parsnips, radicchio, chayote, rutabaga, sweet potato sticks, radicchio, cabbage, turnips)	24	-	-
Up to how many times were the same vegetables offered throughout 2016-2017 as part of the FFVP?			
Offered it just once	6	9.0	9.0
Two times	23	34.3	43.3
Three or more times	21	31.3	74.6
Varies (i.e. some twice, some once, a few have been repeated, varies per vendor product availability)	9	13.4	88.1
I don't know	8	11.9	100.0
How much vegetable is offered to children as a snack as part of the FFVP?			
A bite size amount	5	7.5	7.5
1/4 cup (size of golf ball)	30	44.8	44.8
1/2 cup (1/2 baseball)	30	44.8	44.8
1 cup (baseball)	5	7.5	7.5
I don't know	1	1.5	1.5
Varies (i.e. depends on vegetable)	12	17.9	17.9

Table 8-22 Descriptive Results from FFVP Coordinator Survey (n=67) (continued)

Item	N	%	Cum. %
<i>How many times were full-fat dipping sauces such as yogurt or ranch dressing used for some vegetables in the 2016-2017 year?</i>			
I don't know	1	1.5	1.5
Never	58	86.6	86.6
Rarely	5	7.5	7.5
Sometimes	3	4.5	4.5
Most of the time	0	0	0
Always	0	0	0
<i>How many times were fat-free or low-fat dipping sauces such as yogurt or ranch dressing used for some vegetables in the 2016-2017 year?</i>			
I don't know	3	4.5	4.5
Never	38	56.7	56.7
Rarely	8	11.9	11.9
Sometimes	13	19.4	19.4
Most of the time	2	3.0	3.0
Always	3	4.5	4.5
<i>In a typical week, which of the following statements best describes the relationship of the fresh fruits or vegetables offered to students in this school through the FFVP and the fruits or vegetables offered through the USDA National School Lunch Program? The specific fruits or vegetables offered by the FFVP each week are also:</i>			
...intentionally served in the National School Lunch Program meals in the same week	14	20.9	20.9
...intentionally avoided in the National School Lunch Program meals in the same week	14	20.9	20.9
...No attempt is made to coordinate the specific fruit or vegetables offered by the FFVP each week and those offered through the National School Lunch Program.	39	58.2	58.2
<i>In what school year did this school first participate in the FFVP?</i>			
Before SY 2014-2015	35	52.2	52.2
2014-2015	12	17.9	17.9
2015-2016	5	7.5	7.5
2016-2017	15	22.4	22.4
<i>What changes have been made in FFVP implementation in the current school year as compared to prior years?</i>			
More fruit and vegetable distribution methods (i.e. kiosk, classroom) for FFVP	5	7.5	7.5
More days FFVP is offered	5	7.5	7.5
More FFVP nutrition education and promotion activities	14	20.9	20.9
More involvement of outside partners in FFVP	3	4.5	4.5
More variety of fruits and vegetables offered in FFVP	21	31.3	31.3

Table 8-22 Descriptive Results from FFVP Coordinator Survey (n=67) (continued)

Item	N	%	Cum. %
<i>What changes have been made in FFVP implementation in the current school year as compared to prior years? (continued)</i>			
More total per-student quantity (i.e. serving size) of fruits and vegetables served each month in FFVP	3	4.5	4.5
No changes have been made as compared to prior years	22	32.8	32.8
<i>Were you present during any of the times the FFVP was passed out as a snack?</i>			
Yes	53	79.1	79.1
No	14	20.9	20.9
<i>How much of the fruits provided in the FFVP do students usually eat? (i.e. per child, how much of the fruit is typically consumed?)</i>			
Don't know or not applicable	2	3.8	3.0
Little or none (<25%)	0	0	0
Some (25-49%)	2	3.8	3.0
Much (50-75%)	17	32.1	25.4
All or most (>75%)	32	60.4	47.8
<i>How much of the vegetables provided in the FFVP do students usually eat? (i.e. per child, how much of the vegetable is typically consumed?)</i>			
Don't know or not applicable	3	5.7	5.7
Little or none (<25%)	1	1.9	1.9
Some (25-49%)	6	11.3	11.3
Much (50-75%)	27	50.9	50.9
All or most (>75%)	16	30.2	30.2
<i>I verbally encourage the students to eat the FFVP snacks.</i>			
Never	1	1.5	1.5
Sometimes	3	4.5	4.5
Very often	14	20.9	20.9
Always	49	73.1	73.1
<i>Students like the FFVP fruits.</i>			
Don't know or not applicable	1	1.5	1.5
Strongly disagree	0	0	0
Somewhat disagree	0	0	0
Somewhat agree	16	23.9	23.9
Strongly agree	50	74.6	74.6
<i>Students like the FFVP vegetables.</i>			
Don't know or not applicable	2	3.0	3.0
Strongly disagree	1	1.5	1.5
Somewhat disagree	8	11.9	11.9
Somewhat agree	36	53.7	53.7
Strongly agree	20	29.9	29.9
<i>Were you involved in any training for the FFVP?</i>			
Yes	30	44.8	44.8
No	37	55.2	55.2

Table 8-22 Descriptive Results from FFVP Coordinator Survey (n=67) (continued)

Item	N	%	Cum. %
<i>If yes, what type of training was provided for the FFVP?</i>			
Nutrition education	14	20.9	20.9
Training on implementing the FFVP	22	32.8	32.8
Other (i.e. FFVP webinar, logistics)	3	4.5	4.5
FFVP implementation activities teachers took part in during the school year?			
I helped prepare fruit and/or vegetables for distribution	20	29.9	29.9
I distributed fruit and/or vegetables for the FFVP	30	44.8	44.8
I planned activities for the FFVP	22	32.8	32.8
I helped with classroom promotional activities for FFVP	14	20.9	20.9
I helped with school-wide promotional activities for FFVP	29	43.3	43.3
I taught FFVP lessons that were given to me	2	3.0	3.0
I used more fruit and vegetable examples in my existing classroom lessons	2	3.0	3.0
I added new lessons, class discussions, nutrition education, or activities that addressed nutrition	6	9.0	9.0
I changed how I use foods as rewards or incentives in class so there are more healthful options	4	6.0	6.0
I changed how healthy foods are offered for classroom celebrations/parties	4	6.0	6.0
I provided nutrition materials for parents	18	26.9	26.9
I was part of a committee involved in the FFVP	12	17.9	17.9
I was a positive role model to children during the FFVP	31	46.3	46.3
<i>Other (sample comments: I do all the administration work for this program, I provide nutrition materials for the teachers to use; coordinator for supply/funding and provision)</i>	8	11.9	11.9
<i>My overall opinion of FFVP is favorable.</i>			
Strongly disagree	0	0	0
Somewhat disagree	1	1.5	1.5
Neither agree nor disagree	3	4.5	4.5
Somewhat agree	8	11.9	11.9
Strongly agree	55	82.1	82.1

Table 8-23 Factors that May Influence Implementation of the FFVP as Noted in the FFVP Coordinator Survey (n=67)

Item	Major problem		Minor problem		Not a problem	
	N	%	N	%	N	%
<i>Students don't like the fruit and vegetables</i>	3	4.5	24	35.8	40	59.7
<i>Students waste too much</i>	6	9.0	32	47.8	29	43.3
<i>Messy to distribute and clean up</i>	1	1.5	22	32.8	44	65.7
<i>Students don't like to try new fruits and vegetables</i>	0	0	34	50.7	33	49.3
<i>Inadequate staff training</i>	1	1.5	8	11.9	58	86.6
<i>Inadequate staff time</i>	5	7.5	17	25.4	45	67.2
<i>Perishability of FFVP produce</i>	4	6.0	34	50.7	29	43.3
<i>Inadequate quality of FFVP produce</i>	4	6.0	21	31.3	42	62.7
<i>Inadequate variety of FFVP produce</i>	4	6.0	17	25.4	46	68.7
<i>Inadequate amounts of FFVP produce</i>	4	6.0	13	19.4	50	74.6
<i>High prices for FFVP produce</i>	12	17.9	7	10.4	48	71.6
<i>Effort of preparing FFVP produce</i>	3	4.5	22	32.8	42	62.7
<i>Cost of preparing FFVP produce</i>	4	6.0	9	13.4	54	80.6
<i>Lack of storage space/facilities</i>	4	6.0	17	25.4	46	68.7
<i>Rules of purchasing produce for FFVP</i>	2	3.0	5	7.5	60	89.6
<i>Restrictions on administrative cost</i>	2	3.0	9	13.4	56	83.6
<i>Amount of paperwork/documentation</i>	1	1.5	8	11.9	0	0
<i>Other program requirements/regulations</i>	3	4.5	8	11.9	56	83.6
<i>Other (i.e. 25% restriction on labor to cost ratio; not funding for educational materials)</i>	2	3.0	1	1.5	10	14.9

Table 8-24 Number of Times FV Were Passed out a Week and its Association with Other Variables Relevant to the Implementation of the FFVP (n=67)

Item	Chi-square (P-value)	Spearman's rho (P-value)
Times FV passed out per day	6.892 (0.331)	0.023 (0.862)
Children consuming FV same location it is served	4.474 (0.346)	-0.047 (0.715)
All grades offered FV	32.576 (<0.01)*	0.272 (0.027)*
Number of times same fruits offered in school year	9.633 (0.292)	0.368 (0.012)*
Number of times same vegetables offered in school year	14.233 (0.076)	0.262 (0.068)
How many times full-fat dipping sauces were used	23.054 (0.003)*	-0.237 (0.057)
How many times low-fat dipping sauces were used	16.072 (0.448)	-0.207 (0.104)

Table 8-25 Regression Analyses for Assessing Predictive Variables to Assess Number of Times Same Fruits and Vegetables were Offered in School Year

Model	Variables	R ²	B (SE)	F
Fruit				
1 [^]	Dependent variable: Times same fruit is offered in 2016-2017 (Constant)	0.179	-0.316 (0.631)	7.851*
	Independent variable: Levels of FFVP implementation			
2 [^]	Dependent variable: Times same fruit is offered in 2016-2017 (Constant)	0.300	-0.337 (0.591)	7.503*
	Independent variable: Levels of FFVP implementation			
	Independent variable: Race/ethnicity (Black)			
3 [^]	Dependent variable: Times same fruit is offered in 2016-2017 (Constant)	0.420	-0.711 (0.570)	8.207*
	Independent variable: Levels of FFVP implementation			
	Independent variable: Race/ethnicity (Black)			
	Independent variable: Training for FFVP			
Vegetable				
1 [^]	Dependent variable: Times same vegetable is offered in 2016-2017	0.167	-0.178 (0.545)	7.604*
	Independent variable: Levels of FFVP implementation			
2 [^]	Dependent variable: Times same vegetable is offered in 2016-2017	0.254	-0.178 (0.523)	6.289*
	Independent variable: Levels of FFVP implementation			
	Independent variable: Race/ethnicity (Black)			

*P<0.05

[^]Adjusted for years FFVP coordinator worked at school, educational background, and their race/ethnicity

FIGURES

Figure 8-1 Previous Conceptual Model of FFVP Activities and Impacts for 2010-2011 Evaluation ¹⁵⁹

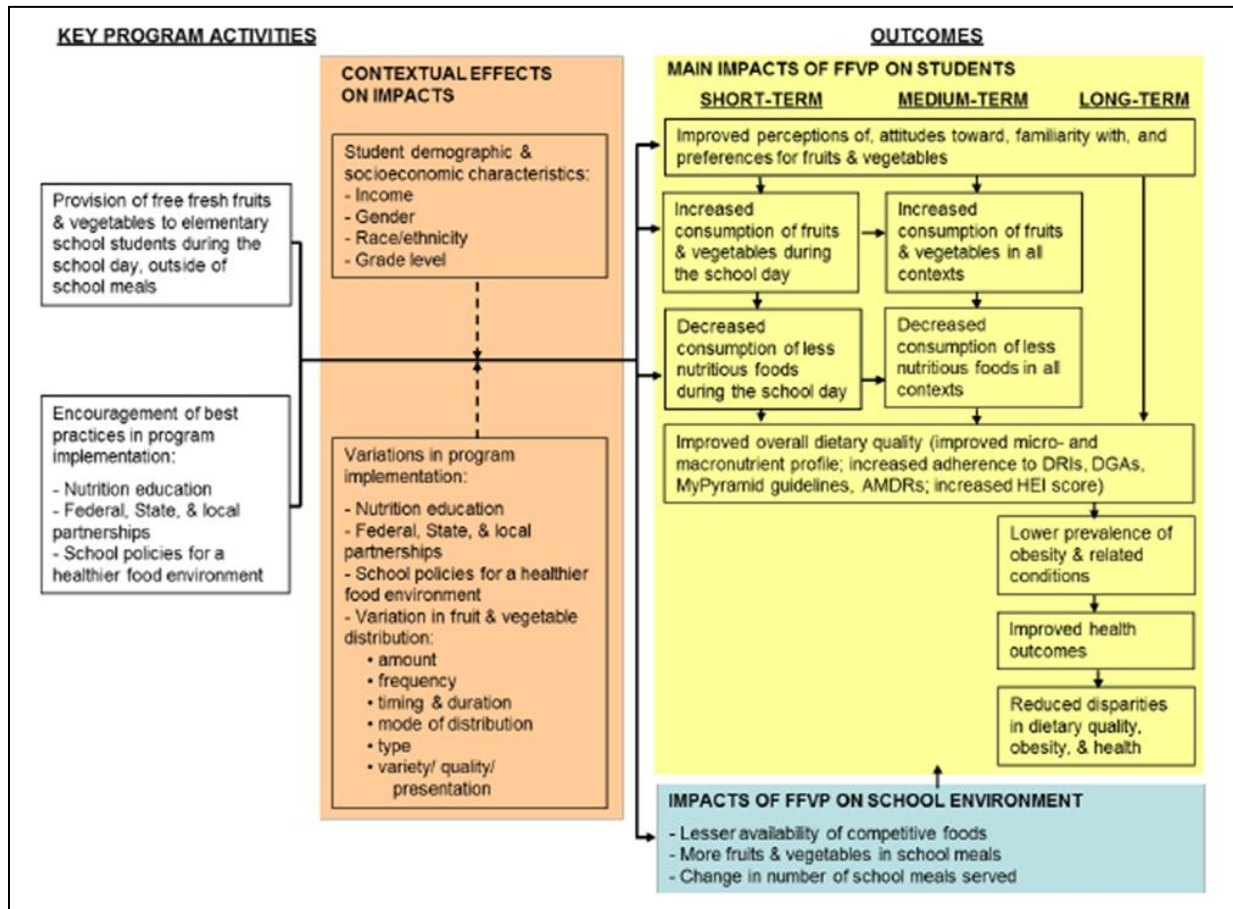


Figure 8-2 Fresh Fruit and Vegetable Program (FFVP) Logic Model Based on Previous Conceptual Model for the Program

FFVP Proposal: Logic Model

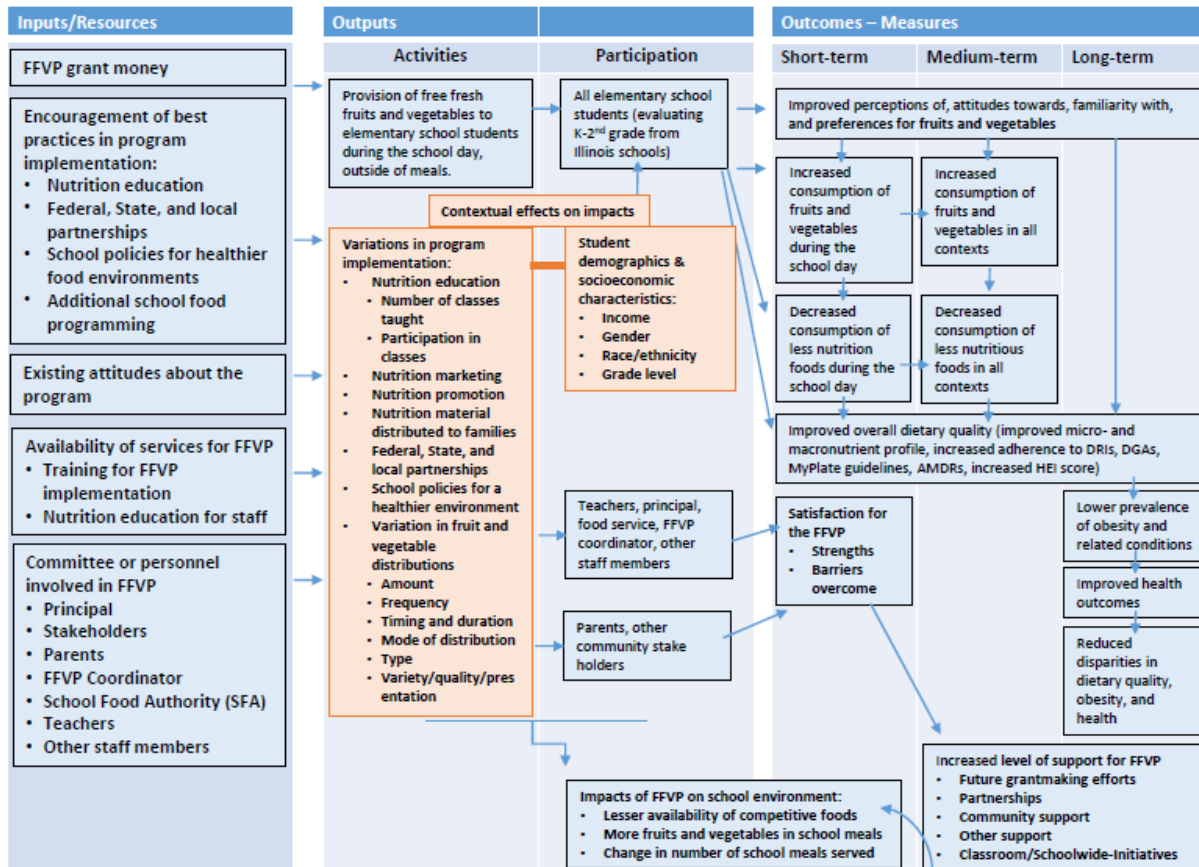
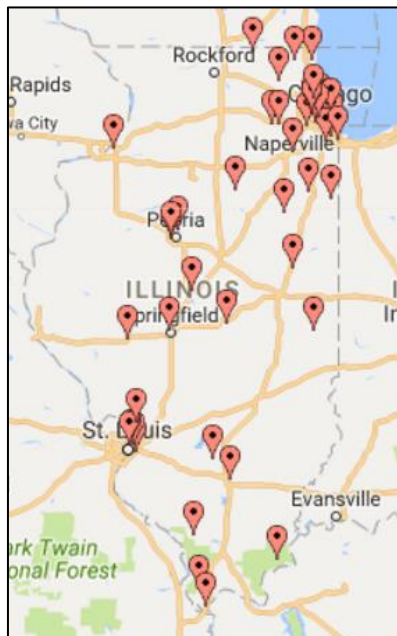


Figure 8-3 Illinois map detailing the locations of the FFVP-sponsored school districts for 2016-2017



Chapter 9.

Conclusions and Directions

Influencing children's fruit and vegetable (FV) consumption may be imperative as children are not consuming the recommended amounts of FV.^{4,5} Risks associated with health issues affecting children, such as overweight and obesity, can be reduced by the consumption of FV, as FV provide the benefits of aiding in satiety and reducing energy intake.^{11,204} Because of the prevalence of childhood obesity, more efforts have focused on introducing more school-based nutrition programs to help mitigate the issue.¹¹ School-based interventions may be multi-component and may include gardening programs, nutrition education (NE), or FV distribution schemes.⁸ The integration of school-based interventions may be essential in influencing children eating behaviors. Further evaluation of such programs and interventions are needed to understand components that may contribute to changes in children's eating behaviors.

This dissertation first aimed to determine existing curricula and intervention components and its potential impact on health outcomes of children from K-2nd grade. Overall results of the review indicated that process evaluation measures in studies were limited. Process evaluation provides identifiable components that reflect how interventions are delivered.³⁷ Tying process evaluation and outcome measures can help with understanding specific elements or mechanisms within interventions that lead to behavior changes.³⁷ To aid in tying these two elements together (process evaluation and outcome measures), a behavior change technique (BCT) taxonomy was used to identify intervention components that were used in the studies.⁵⁷ The review conducted for this intervention concluded that identifying components of interventions, having a process evaluation strategy, and having more consistent outcome measures can help with identifying which type of intervention, programs, and curricula are most impactful in creating positive behavior change in children.

Further aims of the dissertation were to explore a school-based FV distribution scheme called the US Department of Agriculture's Fresh Fruit and Vegetable Program (FFVP). The FFVP aims to increase FV exposure to school-aged children by introducing FV as snacks outside of the lunch period.¹⁵⁹ For this dissertation, an evaluation of the program was conducted in one school that had the program compared to one school that did not have the program. The FFVP school had NE, a salad bar, and additional nutrition-related activities provided by the research team. The non-FFVP school had NE and

no additional activities. Preference and intake outcomes were compared for both school environments and evaluated. Preference data showed that children at the FFVP school had higher fruit preferences, whereas students at the non-FFVP school had higher vegetable preferences. The results were similar to another study assessing FV preferences among high school students who participated in the FFVP and found that the students at the non-FFVP school also had higher vegetable preferences than the FFVP school.²⁴ However, in the current study, FV identification was higher at the FFVP school than at the non-FFVP school. Another study found that children had higher identification of vegetables after exposure to them in an intervention.¹²⁰ Intake differences could not be determined accurately due to the difficulties of obtaining lunchroom data with a small data collection team and communication among stakeholders. Nonetheless, the current study described a training protocol developed for visual estimation of FV consumption that resulted in the reliable determination of FV consumption among raters. This training protocol can be used by other researchers who seek to collect FV intake data in schools in a non-invasive and less time-consuming manner. A limitation of the current dissertation evaluation was that our evaluation was between two schools to assess differences in preferences and intake among FFVP and non-FFVP students. Despite this limitation, this current study explores outcomes in an age group that has not been researched extensively for the FFVP. A more thorough and extensive evaluation is needed with a larger sample size of schools to assess differences in FV outcomes in children, particularly among younger children.

The longitudinal evaluation (35 weeks) of the FFVP in one school of the current dissertation project showed that children's preference ratings went down as time progressed, children were of a higher grade level, or if vegetables were offered. Additionally, in this evaluation it was found that the students had higher preferences for fruits over vegetables. This is a commonality as children have been shown to have a higher preference for fruits over vegetables.¹²¹ Finally, the statewide evaluation of the FFVP in Illinois for the current dissertation project, showed that students liked and consumed more fruits than vegetables. Children's FV preferences are impacted by factors such as appearance, the familiarity of taste, smell, and textures of FV, and these factors may be further enhanced and explored within the classroom and at the school.^{7,8}

School-based nutrition interventions can be complex and presents its challenges as children's preferences for vegetables vary from children's fruit preferences. Having multi-component programs may be beneficial, such as those that incorporate NE, but more research is needed to assess what components of nutrition curricula and elements of interventions are more effective. This warrants the

need to develop process evaluation measures when conducting interventions and programs and linking these process evaluation measures with outcome measures in children. This can be simplified or clarified by first identifying the BCT's used in interventions or programs.

Further evaluation of the FFVP is needed to determine the impact of intervention elements on younger children. As explored in our analyses, more measures are needed to assess this program's impact on vegetable preferences in particular. The statewide evaluation showed the variations of FFVP implementation in Illinois. In addition, a survey index was created to help assess different levels of implementation among the schools. The survey index made in the current project provides a foundation for other state education agencies to assess different levels of implementation among the schools awarded the FFVP in their state. To enhance the understanding of the impact of various levels of implementation on children's outcomes, outcome measures can be collected and measured from participating schools and these results can be linked with a school's FFVP implementation level. Assessing how these different levels of implementation link with children's FV outcomes may be helpful in determining what components of the FFVP are most effective in creating behavior change. Including stakeholders, such as those from the State department, or other experts in education in the development of survey tools and program evaluation may be helpful in the development of appropriate program evaluation tools.

In conclusion, the results of this dissertation provide insight into FFVP outcomes among younger children, a group that has minimally been explored. Moreover, tools developed for this dissertation can be used for other relevant program evaluations. Collecting and evaluating process evaluation and outcome measures from school-based nutrition programs can reveal what components of these programs are most effective in positively impacting children's FV consumption patterns.

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APPENDIX A: The FoodWise Project Activity Booklet

The following pages are from *The FoodWise Project Activity Booklet* that was passed out to teachers at the FFVP school. Further details regarding this aspect of the project are described in Chapter 4.



**Short and Long Activities for
Teachers**

2014-2015

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Recommended grade levels: Kindergarten-2nd grade

Objectives

The purpose of these activities are to increase fruit and vegetable exposure to students through interactive and fun activities. These activities will help students familiarize themselves better with various fruits and vegetables. Each activity has a Common Core standard that it fulfills. These activities can be used in conjunction with other activities in the classroom. Use these activities however you feel might be useful.

There are two distinctions presented in this workbook for the activities:

Short activities are shorter than 5 minutes and are recommended to be completed at the beginning of class.

Long activities are greater than 5 minutes and may take up to 30 minutes to an hour to complete. These range from drawing fruits or vegetables or interactive games within the classroom.

We would appreciate your feedback about any of the activities. If you have questions, concerns, or comments, please feel free to contact us. Our contact information is:

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2014-2015



APPENDIX A: The FoodWise Project Activity Booklet (continued)

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APPENDIX 52



The
FOODWISE
Project

SHORT ACTIVITIES

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #1 Favorite fruits and vegetables

Nutrition objectives:

- Word triggers about fruit and vegetables

Common Core Standard:

CCSS.ELALiteracy.SL.(K,1,2).6: "Speak audibly and express thoughts, feelings, and ideas clearly. Produce complete sentences when appropriate..."

Materials needed:

None

Instructions:

- 1) Ask students what their favorite fruit and vegetable is.

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #2 Fruit and vegetable costume

Nutrition objectives:

- Fruit and vegetable word exposure

Common Core Standard:

CCSS.ELA.Literacy.SL.(K,1,2).4: "Describe familiar people, places, things, and events and, with prompting and support, provide additional detail. Tell a story or recount an experience with appropriate facts..."

Materials needed:

None

Instructions:

- 1) Ask students what fruit and vegetable they want to be or dress up as, and why.

APPENDIX A: The FoodWise Project Activity Booklet (*continued*)

Activity #3 Counting on fruits and vegetables

Nutrition objectives:

- Learn to associate fruits and vegetables with every day things such as counting. Increase exposure to fruits and vegetables

Common Core Standard:

CCSS.Math.Content.K.CC.A.1: Count to 100 by ones and by tens.

CCSS.Math.Content.K.OA.1: "Represent addition and subtraction with objects, fingers, mental images, drawings..."

CCSS.Math.Content.1.OA.1: "Solve word problems that call for addition of three whole numbers..."

CCSS.Math.Content.2.OA.1: "Use addition and subtraction within 100 to solve one..."

Materials needed:

None

Instructions:

- 1) Ask students to name a fruit, vegetable, and a number. Students learn counting, for example "1 apple," "2 cherries," etc.
- 2) Can include addition and subtraction problems as well in relation to fruits and vegetables.



APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #4 Describe favorite fruit and vegetable

Nutrition objectives:

- Increase awareness of fruit and vegetable in their daily lives

Common Core Standard:

CCSS.ELA.Literacy.SL.(K,1,2).4: "Describe familiar people, places, things, and events and, with prompting and support, provide additional detail. Tell a story or recount an experience with appropriate facts..."

Materials needed:

None

Instructions:

- 1) Ask students what their favorite fruit and vegetable are, and why they like them.
- 2) Have them describe it with more detail or to say something about what they remember from a time when they ate the fruit and vegetable.

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #5 Favorite calcium-rich fruits and vegetables

Nutrition objectives:

- Understanding other calcium-rich sources other than dairy

Common Core Standard:

CCSS.ELA.Literacy.SL.(K,1,2).2: "Confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood. Ask and answer questions about key details...Recount or describe key ideas or details from a text read aloud..."

CCSS.ELA.Literacy.W.(K,1,2).8: With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.

Materials needed:

None

Instructions:

- 1) Ask students if they remember what other foods have calcium (hint at fruits or vegetables) that are not dairy.
- 2) Examples:
 - calcium-fortified orange juice (8 oz) = 349 mg
 - collard greens (1 cup) = 84 mg
 - cowpeas (1 cup) = 23 mg
 - green soybeans (1 cup) = 504 mg
 - spinach (1 cup) = 30 mg
 - turnip greens (1 medium) = 37 mg
 - broccoli (1 cup) = 43 mg
 - cabbage (1 cup) = 28 mg
 - kale (1 cup) = 101 mg
 - raisins (1 small box) = 22 mg
 - strawberries (1 cup) = 23 mg
 - sweet potatoes (1 cup) = 40 mg
 - oranges (small) = 38 mg

Reference:

<http://ndb.nal.usda.gov/>



APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #6 How does calcium help me?

Nutrition objectives:

- Learn to identify different foods that contain calcium and how calcium helps our bodies

Common Core Standard:

CCSS.ELALiteracy.SL.(K,1,2).2: "Confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood. Ask and answer questions about key details...Recount or describe key ideas or details from a text read aloud..."

CCSS.ELALiteracy.W.(K,1,2).8: With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.

Materials needed:

None

Instructions:

- 1) Ask students as a class what calcium-rich foods help with in our bodies.
- 2) Have students show where calcium fruits or vegetables helps them on their body.
 - a. Bones
 - i. Calcium stored in bones
 - ii. Calcium helps build and maintain bones
 - b. Nerve conduction
 - i. Calcium helps muscles and blood vessels contract and expand
 - ii. Calcium helps send messages through the nervous system

Reference:

<http://www.nlm.nih.gov/medlineplus/calcium.html>

<http://www.mayoclinic.org/healthy-living/nutrition-and-healthy-eating/in-depth/calcium-supplements/art-20047097>



APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #7 Draw a picture of your favorite fruit and vegetable

Nutrition objectives:

- Visual images of fruits or vegetables
- More recognition of fruits or vegetables

Common Core Standard:

CCSS.ELA.Literacy.W.(K,1,2).2: Uses a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic.

Materials needed:

Paper

Crayons

Instructions:

- 1) Have students draw a picture of their favorite fruit and vegetable.
- 2) Have them explain their picture.
 - a. For first and second grades, have them write explanatory text of their fruit and vegetable underneath their drawing.

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #8 Chant about fruits and vegetables

Nutrition objectives:

- Associate fruits and vegetables with daily life and fun

Common Core Standard:

CCSS.ELA.Literacy.RF.(K,1,2).2,3: Demonstrate understanding of spoken words, syllables, and sounds (phonemes). Know and apply grade-level phonics and word analysis skills in decoding words.

Materials needed:

None

Instructions:

- 1) Have students make a quick chant about fruits or vegetables.
- 2) Examples:
 - "Fruits are fun, fruits are red, fruits are blue. They are yummy and are good for you!"
 - "Fruits and vegetables come in all shapes and sizes. In them you'll find a lot of fun prizes! Apples, carrots, blueberries, and grapes. These are all in a lot of fun shapes!"

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #9 Ask about MyPlate food groups

Nutrition objectives:

- Learn about MyPlate and the different groups with emphasis on fruits and vegetables

Common Core Standard:

CCSS.ELA.Literacy.SL.(K,1,2).6: "Speak audibly and express thoughts, feelings, and ideas clearly. Produce complete sentences when appropriate..."

CCSS.ELA.Literacy.SL.(K,1,2).4: "Describe familiar people, places, things, and events and, with prompting and support, provide additional detail. Tell a story or recount an experience with appropriate facts..."

Materials needed:

None

Instructions:

- 1) Ask children about the MyPlate food groups (see Appendix for larger image)



- 2) Ask them to name one thing they had that day from one of the MyPlate food groups.
- 3) Ask children to identify an item from fruit or vegetable food groups.

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #10 Favorite color with fruits/vegetables

Nutrition objectives:

- Learn about physical colors of fruits and vegetables

Common Core Standard:

CCSS.ELA.Literacy.SL.(K,1,2).4: "Describe familiar people, places, things, and events and, with prompting and support, provide additional detail. Tell a story or recount an experience with appropriate facts..."

Materials needed:

None

Instructions:

- 1) Have students name their favorite color.
- 2) Tell them to name a fruit or vegetable that is that color.

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #11 Fruit and Vegetable groups

Nutrition objectives:

- Learn about portions of fruits and vegetables that should be on plate

Common Core Standard:

CCSS.Math.K.MD.A.1: Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.

CCSS.Math.1.G.3: "Partition circles and rectangles into two and four equal..."

CCSS.Math.2.G.3: "Partition circles and rectangles into two and four equal..."

Materials needed:

Print-out image of MyPlate (see Appendix for larger image)

Instructions:

- 1) Ask how much of MyPlate is fruit or vegetables
 - a. Answer should be half of plate ($\frac{1}{2}$ fruits, $\frac{1}{2}$ vegetables)
- 2) If older children, describe the shares as halves, fourths, etc.

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #12 Food group of the morning

Nutrition objectives:

- Identify what food groups were eaten that morning
- Increase exposure of fruits and vegetables in everyday lives

Common Core Standard:

CCSS.ELA.Literacy.SL.(K,1,2).4: "Describe familiar people, places, things, and events and, with prompting and support, provide additional detail. Tell a story or recount an experience with appropriate facts..."

Materials needed:

None

Instructions:

- 1) Ask children to name a food group they consumed that morning.
- 2) Ask about fruits and vegetables consumed.

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #13 Naming one fruit or vegetable

Nutrition objectives:

- Increase exposure to fruits and vegetables
- Have them describe what they have learned about it

Common Core Standard:

CCSS.ELA.Literacy.SL.(K,1,2).4: "Describe familiar people, places, things, and events and, with prompting and support, provide additional detail. Tell a story or recount an experience with appropriate facts..."

Materials needed:

None

Instructions:

- 1) Ask to name one fruit or vegetable that they've learned about.

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #14 What is it?

Nutrition objectives:

- Identification of fruits and vegetables

Common Core Standard:

CCSS.ELALiteracy.SL.(K,1,2).2: "Confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood. Ask and answer questions about key details in a text read aloud or information presented orally or through other media..."

Materials needed:

Fruit or vegetable plush toy

Instructions:

- 1) Hold one fruit or vegetable plush toy and ask the class what it is to see what they may have learned from previous class lessons.

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #15 What did you have the day before?

Nutrition objectives:

- Identify fruits and vegetables
- Increase exposure to fruits and vegetables in daily life

Common Core Standard:

CCSS.ELA.Literacy.SL.(K,1,2).2: "Confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood. Ask and answer questions about key details in a text read aloud or information presented orally or through other media..."

Materials needed:

None

Instructions:

- 1) Ask class to raise hands for those who had a fruit the day before.
- 2) Ask class to raise hands for those who had a vegetable the day before.
- 3) Can ask to elaborate on what they had the day before, recounting details of their day.

The
FOODWISE
Project

LONG ACTIVITIES

APPENDIX A: The FoodWise Project Activity Booklet (*continued*)

Activity #1 What's in the Bag?

Nutrition objectives:

- Practice identifying and categorizing fruits and vegetables

Common Core Standard:

CCSS.ELA.Literacy.SL.(K,1,2).6: "Speak audibly and express thoughts, feelings, and ideas clearly. Produce complete sentences when appropriate..."

CCSS.ELA.Literacy.L.(K,1,2).5a: With guidance and support from adults, explore word relationships and nuances in word meanings. Sort common objects into categories (e.g., shapes, foods) to gain a sense of the concepts the categories represent.

Materials needed:

Opaque bag

Fruit and vegetable plush toys or pictures

Instructions:

- 1) Put fruit or vegetables in an opaque bag.
- 2) Have students put their hand in the bag and guess what it is by feeling the fruit/vegetable plush toy.
 - a. Note: They are not allowed to look inside the bag. However, if children are having extreme difficulty, allow them to first guess and pull fruit or vegetable out and name the fruit/vegetable.
 - b. If no plush toys available, have child pull out the picture of the fruit/vegetable and try to identify what it is.
- 3) Have them categorize the items as fruits or vegetables.

Reference:

http://www.bced.gov.bc.ca/health/healthy_eating_physical_act_grK.pdf

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #2 Fruit and vegetable tasting day

Nutrition objectives:

- Increase exposure to various fruits or vegetables
- Describe various aspects of fruits and vegetables

Common Core Standard:

CCSS.ELALiteracy.SL.(K,1,2).6: "Speak audibly and express thoughts, feelings, and ideas clearly. Produce complete sentences when appropriate..."

CCSS.ELALiteracy.L.(K,1,2).5a: With guidance and support from adults, explore word relationships and nuances in word meanings. Sort common objects into categories (e.g., shapes, foods) to gain a sense of the concepts the categories represent.

Materials needed:

Plates

Napkins

3-4 fruits, 3-4 vegetables

Instructions:

- 1) Have a tasting day of different fruits and vegetables.
- 2) Buy 3-4 different fruits and 3-4 different vegetables.
 - a. Cut in strips or leave whole.
 - b. Arrange on platter/plates
- 3) Taste and talk about the different fruits and vegetables.

Reference:

http://www.bced.gov.bc.ca/health/healthy_eating_physical_act_grK.pdf



APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #3 Fruit and vegetable alphabet book

Nutrition objectives:

- Increase knowledge of various fruits and vegetables and learn to associate them with everyday words

Common Core Standard:

CCSS.ELA.Literacy.SL.(K,1,2).4: "Describe familiar people, places, things, and events and, with prompting and support, provide additional detail. Tell a story or recount an experience with appropriate facts..."

Materials needed:

Colored Paper

Crayons/markers/paint

String for binding

Hole puncher

Instructions:

- 1) Prior to handing out the colored paper, punch holes in the paper. Distribute colored paper to students.
- 2) Have students make one letter per page. Children can do several alphabet letters or the whole alphabet.
- 3) Help them with developing a colored page that has a letter of the alphabet and a fruit or vegetable it represents.
- 4) After all pages are completed, the teacher can then bind the pages together with string/yarn and have book displayed in classroom.

Reference:

http://www.bced.gov.bc.ca/health/healthy_eating_physical_act_grK.pdf

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #4 Fruit and vegetable placemat

Nutrition objectives:

- Have children creatively showcase fruits and vegetables on placemat to increase fruit and vegetable exposure

Common Core Standard:

CCSS.ELA.Literacy.SL.(K,1,2).4: "Describe familiar people, places, things, and events and, with prompting and support, provide additional detail. Tell a story or recount an experience with appropriate facts..."

Materials needed:

11 x 17" paper

Crayons/markers/paint

Stickers

Laminate sheets (optional)

Laminator (optional)

Instructions:

- 1) Distribute paper to students and have students make a placemat of the different food groups.
- 2) Have students showcase fruit or vegetables on their placemats.
 - a. Can laminate placemats to have children use at home.

Reference:

http://www.bced.gov.bc.ca/health/healthy_eating_physical_act_grK.pdf

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #5 Healthy foods tree

Nutrition objectives:

- Increase exposure to fruits and vegetables through creativity
- Work on identifying fruits and vegetables and classifying items as fruits or vegetables

Common Core Standard:

CCSS.ELALiteracy.SL.(K,1,2).6: "Speak audibly and express thoughts, feelings, and ideas clearly. Produce complete sentences when appropriate..."

CCSS.ELALiteracy.L.(K,1,2).5a: With guidance and support from adults, explore word relationships and nuances in word meanings. Sort common objects into categories (e.g., shapes, foods) to gain a sense of the concepts the categories represent.

Materials needed:

Butcher paper

Crayons/markers/paint

Instructions:

- 1) Help with sketching tree on butcher paper
- 2) Have students work on fruits or vegetables to put on the tree
- 3) Have children describe the different parts of the tree. If possible, ask them to categorize what they have drawn as either a fruit or vegetable.

Reference:

http://www.bced.gov.bc.ca/health/healthy_eating_physical_act_grK.pdf

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #6 What's my food?

Nutrition objectives:

- Have students learn to identify fruits and vegetables
- Learn to describe various fruits and vegetables

Common Core Standard:

CCSS.ELALiteracy.SL.(K,1,2).6: "Speak audibly and express thoughts, feelings, and ideas clearly. Produce complete sentences when appropriate..."

CCSS.ELALiteracy.L.(K,1,2).5a: With guidance and support from adults, explore word relationships and nuances in word meanings. Sort common objects into categories (e.g., shapes, foods) to gain a sense of the concepts the categories represent.

Materials needed:

Pictures or plush toys of various fruits and vegetables

Instructions:

- 1) Play "What's my Food?" game: interactive game that students guess name of food of another student (describe shape, taste, color, smell).
- 2) Tape picture of fruit on the back of another student or have student hold fruit/vegetable plush toy behind them while other student tries to guess what it is.

Reference:

http://www.bced.gov.bc.ca/health/healthy_eating_physical_act_grK.pdf

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #7 Paint with fruits and vegetables

Nutrition objectives:

- Learn about various fruits and vegetables and their characteristics (outside and inside)
- Increase exposure to fruits and vegetables

Common Core Standard:

CCSS.ELA.Literacy.SL.(K,1,2).6: "Speak audibly and express thoughts, feelings, and ideas clearly. Produce complete sentences when appropriate..."

Materials needed:

- Various fruits and vegetables, cut in half
- Paper plates or sheets of paper
- Tempera paint

Instructions:

- 1) Cut fruits and vegetables in various shapes.
- 2) Have students paint with various fruits and vegetables, using them as stamps.
- 3) Paint on paper plates or on a large piece of paper. Have them make designs with their stamps and to be creative.
- 4) Have students describe their artwork and display plates/paper sheets around classroom.

Reference:

<http://www.education.com/activity/kindergarten/arts-and-crafts/>

APPENDIX A: The FoodWise Project Activity Booklet (*continued*)

Activity #8 Paper mâché fruits or vegetables

Nutrition objectives:

- Learn about various fruits and vegetables and their characteristics (outside and inside)
- Increase exposure to fruits and vegetables

Common Core Standard:

CCSS.ELALiteracy.SL.(K,1,2).6: "Speak audibly and express thoughts, feelings, and ideas clearly. Produce complete sentences when appropriate..."

Materials needed:

Option 1: Celluclay

Option 2: Paper mâché art paste (also available for purchase or make your own using recipe)

- Recipe: water and flour, 1 part flour to 2 parts water. Stir and make a paste.

Base: balloon, cardboard, newspaper strips

Paint

Instructions:

- 1) Mix the Celluclay with water to make a 'clay-like' or instant paper mâché material (see instructions on Celluclay packaging).
 - a. If Celluclay is not available, make your own paper mâché art paste with the above recipe. Adhere paper mâché art paste on a base such as a balloon or cardboard. Use newspaper strips along with paste.
- 2) Make paper mâché fruits or vegetables and have children paint them after the paper mâché fruits/vegetables have dried.
- 3) Have children describe their various creations.

Reference:

<http://www.education.com/activity/kindergarten/arts-and-crafts/>
<http://familycrafts.about.com/od/papermache/a/nocookmpaste.htm>

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #9 Memory game with fruits and vegetables

Nutrition objectives:

- Increase exposure to fruits and vegetables
- Work with identifying fruits and vegetables

Common Core Standard:

CCSS.ELA.Literacy.L.(K,1,2).5a: With guidance and support from adults, explore word relationships and nuances in word meanings. Sort common objects into categories (e.g., shapes, foods) to gain a sense of the concepts the categories represent.

Materials needed:

Index cards

Crayons/markers

Glue sticks

Scissors

Old magazines that may contain pictures of fruits and vegetables (example: cooking magazines)

Instructions:

- 1) Have children make memory game pieces of one side having a letter of the alphabet, and the other side have an image of a fruit or vegetable corresponding to that letter
 - a. Alternatively, you can use actual images of fruits and vegetables cut out from old magazine pieces.
- 2) After completion of memory game pieces, arrange groups of children to play the game together.

Reference:

<http://www.education.com/activity/kindergarten/arts-and-crafts/>

<http://www.education.com/activity/article/alphabet-memory-game/>



APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #10 Counting book with fruits and vegetables

Nutrition objectives:

- Increase exposure to fruits and vegetables

Common Core Standard:

CCSS.Math.Content.K.CC.A.3.: Know number names and the count sequence. Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).

Materials needed:

Old newspapers and magazines containing images of fruits or vegetables

Construction paper (3-hole punch papers)

Scissors

Glue

Crayons/markers

Stapler or brass fasteners for binding

Instructions:

- 1) Have children make a counting book with different fruits or vegetables. If they have "3", let them draw these fruits or vegetables, or have them find 3 pictures of fruits and vegetables in old newspapers and magazines to cut out and put on their page.
- 2) After all students are done, have students show their counting book pages. Have students count fruits and vegetables on each page.
- 3) Combine pages together and staple or use brass fasteners to bind it.
- 4) Alternatively, hang counting pages around classroom.

Reference:

<http://www.education.com/activity/kindergarten/arts-and-crafts/>

http://www.education.com/activity/article/countingbook_kindergarten/



APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #11 Class fruit and vegetable bulletin board

Nutrition objectives:

- Increase exposure to fruits and vegetables
- Learn about quantity of fruits and vegetables

Common Core Standard:

CCSS.ELALiteracy.SL.(K,1,2).6: "Speak audibly and express thoughts, feelings, and ideas clearly. Produce complete sentences when appropriate..."

CCSS.ELALiteracy.L.(K,1,2).5a: With guidance and support from adults, explore word relationships and nuances in word meanings. Sort common objects into categories (e.g., shapes, foods) to gain a sense of the concepts the categories represent.

Materials needed:

Bulletin board or large butcher paper to hang on wall

Colored paper

Scissors

Glue

Crayons/markers

Pictures of them being active or pictures from magazines (optional)

Instructions:

- 1) Have students draw or color fruits and vegetables.
- 2) Have them cut and paste them to put on the bulletin board.
- 3) Assign various letters to children to spell out FRUITS AND VEGETABLES
- 4) Talk about what they see on the board

APPENDIX A: The FoodWise Project Activity Booklet (*continued*)

Activity #12 In-class field trip

Nutrition objectives:

- Increase exposure to fruits and vegetables

Common Core Standard:

CCSS.ELA.Literacy.SL.(K,1,2).4: "Describe familiar people, places, things, and events and, with prompting and support, provide additional detail. Tell a story or recount an experience with appropriate facts..."

CCSS.ELA.Literacy.SL.(K,1,2).6: "Speak audibly and express thoughts, feelings, and ideas clearly. Produce complete sentences when appropriate..."

CCSS.Math.Content.K.CC.A.3.: Know number names and the count sequence. Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).

CCSS.Math.Content.K.CC.B.5: Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects.

CCSS.Math.Content.1.OA.1: Solve word problems that call for addition of three whole numbers...

CCSS.Math.Content.2.OA.1: "Use addition and subtraction within 100 to solve one..."

Materials needed:

Cartons/containers of canned fruits and vegetables

Baskets or grocery bags

Instructions:

- 1) Take an in-class field trip where there are cartons/containers of nonperishable fruits and vegetables around the classroom.
- 2) Arrange the desks to be like grocery aisles.
- 3) Have kids carry baskets and put the foods in their basket that they think are the healthiest option
- 4) Have a contest in the end to see whose basket is the healthiest.
- 5) As children to count how many items they have in their bag and to describe them. Can also have addition and subtraction problems with the fruits and vegetables.



APPENDIX A: The FoodWise Project Activity Booklet (continued)

Reference:

<http://letcteachers.wordpress.com/2011/10/22/lets-play-grocery-store-shopping-activities-for-esl-students/>

http://www.bced.gov.bc.ca/health/healthy_eating_physical_act_grK.pdf

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #13 Coloring pages for fruits and vegetables

Nutrition objectives:

- Increase exposure to fruits and vegetables
- Learn to identify fruits and vegetables

Common Core Standard:

CCSS.ELALiteracy.SL.(K,1,2).4: "Describe familiar people, places, things, and events and, with prompting and support, provide additional detail. Tell a story or recount an experience with appropriate facts..."

CCSS.ELALiteracy.SL.(K,1,2).6: "Speak audibly and express thoughts, feelings, and ideas clearly. Produce complete sentences when appropriate..."

Materials needed:

Fruit and vegetable coloring pages *(find online or refer to worksheets in supplemental folder)*

Crayons/markers

Instructions:

- 1) Have children color various coloring pages of fruits and vegetables.
- 2) Discuss and show the different coloring pages.

Reference:

http://www.pbhfoundation.org/pub_sec/edu/kids_act/coloring/

<http://www.foodchamps.org/>



APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #14 Matching color and fruits and vegetables worksheet

Nutrition objectives:

- Identifying fruits and vegetables

Common Core Standard:

CCSS.ELA.Literacy.SL.(K,1,2).4: "Describe familiar people, places, things, and events and, with prompting and support, provide additional detail. Tell a story or recount an experience with appropriate facts..."

CCSS.ELA.Literacy.SL.(K,1,2).6: "Speak audibly and express thoughts, feelings, and ideas clearly. Produce complete sentences when appropriate..."

Materials needed:

Matching color and foods activity worksheet (*find online or refer to worksheets in supplemental folder*)

Pencils

Instructions:

- 1) Have students match the colors of the fruits and vegetables on worksheet.
- 2) Ask them to name a few fruits and vegetables they see.

Reference:

<http://www.nourishinteractive.com/nutrition-education-printables/14-color-fruits-vegetables-matching-activity-kids-free-printable>

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #15 Identify fruits and vegetables

Nutrition objectives:

- Identify various fruits and vegetables

Common Core Standard:

CCSS.ELALiteracy.SL.(K,1,2).4: "Describe familiar people, places, things, and events and, with prompting and support, provide additional detail. Tell a story or recount an experience with appropriate facts..."

CCSS.ELALiteracy.SL.(K,1,2).6: "Speak audibly and express thoughts, feelings, and ideas clearly. Produce complete sentences when appropriate..."

Materials needed:

Kids Explorers love Fruits and Vegetables worksheet (*find online or refer to worksheets in supplemental folder*)

Pencils

Instructions:

- 1) Have children identify and differentiate between fruits and vegetables on worksheet.
- 2) Discuss answers.

Reference:

<http://www.nourishinteractive.com/nutrition-education-printables/105-nutrition-fruit-vegetables-activity-page>

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #16 Fruit and vegetable math

Nutrition objectives:

- Integrating fruits and vegetables in everyday exercises

Common Core Standard:

CCSS.ELA.Literacy.SL.(K,1,2).6: "Speak audibly and express thoughts, feelings, and ideas clearly. Produce complete sentences when appropriate..."

CCSS.Math.Content.K.CC.A.3.: Know number names and the count sequence. Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).

CCSS.Math.Content.K.OA.A.1: Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.

CCSS.Math.Content.1.OA.1-7: "Solve word problems that call for addition of three whole numbers..."

CCSS.Math.Content.2.OA.1-3: "Use addition and subtraction within 100 to solve one..."

Materials needed:

Various fruits and vegetables (plush toys or pictures)

Instructions:

- 1) Do various math skills or counting exercises with fruits and vegetables using the plush toys or pictures.
- 2) Ask how many strawberries there are or do addition/subtraction/multiplication/division exercises depending on age level. Can include even, or odd number of items as well (Grade 2).

Reference:

None



APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #17 Simon Says for food groups

Nutrition objectives:

- Identify various fruits and vegetables

Common Core Standard:

CCSS.ELALiteracy.SL.(K,1,2).2: "Confirm understanding of a text read aloud or information presented orally or through other media by asking and answer questions about key details and requesting clarification if something is not understood. Ask and answer questions about key details in a text...Recount or describe key ideas or details from text read aloud or information presented orally..."

Materials needed:

Paper

Hole puncher

String

Instructions:

- 1) Assign each child a different fruit or vegetable.
- 2) Have them draw the fruit or vegetable on a piece of paper. Tape a piece of string to two corners of the paper and place it around the child's neck.
- 3) Play Simon Says as usual, but make each command specific to a food group or fruit/vegetable. For example, you could command "Fruits, put your hands on your head."

Reference:

http://www.ehow.com/info_7947350_kids-activities-five-food-groups.html

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #18 Fruit and vegetable word search

Nutrition objectives:

- Read and interpret the names of various fruits and vegetables

Common Core Standard:

CCSS.ELA.Literacy.RS.F.(K,1,2).3: Know and apply grade-level phonics and word analysis skills in decoding words.

Materials needed:

Word search (*find online or refer to worksheets in supplemental folder*)

Pencils

Instructions:

- 1) Have students complete fruit and vegetable or food group word search

Reference:

<http://www.nourishinteractive.com/nutrition-education-printables/202-fun-printable-nutrition-word-search-food-groups-children>

<http://choosemyplate.gov/kids/ActivitySheets.html>

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #19 Bringing foods to class and building healthy plates

Nutrition objectives:

- Have children bring some items from home they believe may fit in their healthy plate
- Helps children incorporate more fruits and vegetables

Common Core Standard:

CCSS.ELA.Literacy.SL.(K,1,2).5: "Add drawing or other visual displays to descriptions as desired to provide additional detail. Tell a story or recount an experience..."

Materials needed:

Healthy dinner plate activity worksheet (*find online or refer to worksheets in supplemental folder*)

Children may bring samples from home

Crayons/markers

Instructions:

- 1) Have children bring foods from home (such as canned goods or fruit/vegetable items that are easy to carry in a snack bag, such as carrots, berries, other small fruits/vegetables) that they may add to their plate related to the MyPlate food groups
 - a. They can bring these samples and draw these on their plate.
 - b. Alternatively, students can bring cut out pictures from magazines from home.
- 2) Have children draw these items on their plate.
- 3) Can also instruct children to remember things they have at home and draw them on their plate.
- 4) Talk about fruits and vegetables they may find in their home. Have students recount an experience they had at home with fruits and vegetables.

Reference:

<http://www.nourishinteractive.com/nutrition-education-printables/700-kids-healthy-dinner-fun-nutrition-worksheet-draw-activity>

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #20 Fruit and vegetable cut and paste

Nutrition objectives:

- Identify fruits and vegetables and sort into fruit or vegetable category

Common Core Standard:

CCSS.ELALiteracy.SL.(K,1,2).6: "Speak audibly and express thoughts, feelings, and ideas clearly. Produce complete sentences when appropriate..."

CCSS.ELALiteracy.L.(K,1,2).5a: With guidance and support from adults, explore word relationships and nuances in word meanings. Sort common objects into categories (e.g., shapes, foods) to gain a sense of the concepts the categories represent.

Materials needed:

Scissors

Fruit and vegetable cut and paste worksheet *(find online or refer to worksheets in supplemental folder)*

Crayons/markers

Paper bags with "FRUITS" and "VEGETABLES" written on it (optional)

Instructions:

- 1) Have students cut and paste fruits and vegetables to the appropriate location.
- 2) Can also be done on paper bag and have students draw their own fruits and vegetables separately, and decorate and paste their paper bag with the various cutouts they created.

Reference:

<http://www.tlsbooks.com/fruitandvegetablecutandpaste.pdf>

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #21 MyPlate handouts

Nutrition objectives:

- Identify the food categories of MyPlate

Common Core Standard:

CCSS.ELALiteracy.SL.(K,1,2).6: "Speak audibly and express thoughts, feelings, and ideas clearly. Produce complete sentences when appropriate..."

CCSS.ELALiteracy.L.(K,1,2).5a: With guidance and support from adults, explore word relationships and nuances in word meanings. Sort common objects into categories (e.g., shapes, foods) to gain a sense of the concepts the categories represent.

Materials needed:

MyPlate handouts on fruits and vegetables (*find online or refer to worksheets in supplemental folder*)

MyPlate handout - general

Instructions:

- 1) Go over MyPlate handouts and talk about what they see.

Reference:

<http://www.nourishinteractive.com/nutrition-education-printables/category/13-myplate-eating-healthy-food-kids-nutrition-printables>

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #22 Healthy foods calendar

Nutrition objectives:

- Increase exposure to fruits and vegetables

Common Core Standard:

CCSS.ELA.Literacy.SL.(K,1,2).5: "Add drawing or other visual displays to descriptions as desired to provide additional detail. Tell a story or recount an experience..."

Materials needed:

Printout of blank calendar (*find online or refer to worksheets in supplemental folder*)

Crayons/markers/stickers

Instructions:

- 1) Have students color and decorate their calendar with fruits and vegetables.
- 2) Each day, you can have them draw in a fruit and vegetable in the appropriate box for the day.
 - a. Bonus: add a sticker on the day that they consume a new fruit or vegetable.

Reference:

<http://www.nourishinteractive.com/nutrition-education-printables/category/57-kids-healthy-daily-tips-monthly-free-calendar-printout>

<http://www.studenthandouts.com/Assortment-01/Graphic-Organizers/Blank-Monthly-Calendar-Directions.html>

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #23 Nutritional

Nutrition objectives:

- Increase fruit and vegetable identification and knowledge

Common Core Standard:

CCSS.ELA.Literacy.SL.(K,1,2).5: "Add drawing or other visual displays to descriptions as desired to provide additional detail. Tell a story or recount an experience..."

CCSS.Math.K.G.B.5: Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.

CCSS.Math.(1,2).G.1: "Distinguish between defining attributes versus non-defining attributes; build and draw shapes to possess defining attributes. Recognize and draw shapes having specific attributes..."

Materials needed:

Fruit and vegetable cards (printouts from health cards distributed at tastings)

Dry erase board and markers or paper and crayons

Stop watch or clock

Modeling clay

Nutritional instructions (*refer to worksheets in supplemental folder*) (optional)

Instructions:

Setup

- 1) Shuffle fruit and vegetable cards
- 2) Lay sculpting and drawing materials on table
- 3) Have two teams and have students at opposite ends of room or table

Playing game

- 1) First player chooses a card from the pile and shows card to the teacher.
- 2) They have 15-30 seconds to draw or sculpt food (more time if students are younger).
- 3) Whoever guesses fruit or vegetable gets a point for the given team.
- 4) Student from opposing team goes and repeats the procedure.

Reference:

http://www.oregondairycouncil.org/resources/free_downloads/downloads/nutritional_game.pdf



APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #24 MyPlate drawing

Nutrition objectives:

- Learn about the MyPlate food groups and understand fruits and vegetables in daily meals

Common Core Standard:

CCSS.ELA.Literacy.SL.(K,1,2).5: "Add drawing or other visual displays to descriptions as desired to provide additional detail. Tell a story or recount an experience..."

Materials needed:

Paper plates

Crayons/markers/stickers

Instructions:

- 1) Distribute paper plates to students.
- 2) Have them draw on plate, emphasizing fruits and vegetables.
- 3) Discuss and show the various plates in the classroom.

Reference:

<http://www.choosemyplate.gov>

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #25 Fruit and vegetable word blanks

Nutrition objectives:

- Understand fruits and vegetables in the context of a story.
- Be able to understand fruits and vegetables in the use of everyday lives/events

Common Core Standard:

CCSS.ELA.Literacy.W.(K,1,2).3: "Use a combination of drawing, dictating, and writing to narrate a single event...Write narratives in which they recount two or more appropriately sequenced events..."

Materials needed:

MyPlate word blanks "Cook-off Craze" or "Winter Feast" (*find online or refer to worksheets in supplemental folder*)

Pencils

Instructions:

- 1) Give each child a word blank and have them fill it out.
- 2) Have a few children from the class read their word blanks.

Reference:

<http://www.choosemyplate.gov/kids/ActivitySheets.html>

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #26 MyPlate coloring sheets

Nutrition objectives:

- Increase fruit and vegetable exposure and discuss the fruits and vegetables they selected and why

Common Core Standard:

CCSS.ELA.Literacy.SL.(K,1,2).5: "Add drawing or other visual displays to descriptions as desired to provide additional detail. Tell a story or recount an experience..."

Materials needed:

MyPlate coloring sheets *(find online or refer to worksheets in supplemental folder)*

Crayons/markers

Instructions:

- 1) Have students draw different things on their plate.
- 2) Discuss what fruits and vegetables they drew on their plate and why they chose those fruits and vegetables.

Reference:

<http://www.choosemyplate.gov/kids/ActivitySheets.html>

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #27 Recipe with fruits and vegetables

Nutrition objectives:

- Increase fruit and vegetable exposure. Increase liking of fruits and vegetables

Common Core Standard:

CCSS.ELALiteracy.SL.(K,1,2).5: "Add drawing or other visual displays to descriptions as desired to provide additional detail. Tell a story or recount an experience..."

Materials needed:

Different pictures of fruits and vegetables or plush toys

Paper plate or plastic bags

OPTIONAL: Have assortment of fruits and vegetables and allow children to select what they want to combine. Examples: baby carrots, apples, bananas, broccoli, jicama, etc.

Instructions:

- 1) Distribute paper plates or plastic bags to children.
- 2) Have them choose fruits and vegetables to make their own "recipe" of a food.
 - a. This can be any combination (example: peas, carrots, and tomatoes) of fruits and vegetables.
- 3) Discuss what everyone chose and why.

Reference:

None

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #28 Fruit and vegetable bookmarks

Nutrition objectives:

- Increase fruit and vegetable exposure

Common Core Standard:

CCSS.ELA.Literacy.SL.(K,1,2).5: "Add drawing or other visual displays to descriptions as desired to provide additional detail. Tell a story or recount an experience..."

Materials needed:

Bookmark printout pages (*find online or refer to worksheets in supplemental folder*)

Plain colored paper, white paper

Crayons/markers/paint

Scissors

Instructions:

- 1) Have students color the bookmark pages or have them create one on their own.
- 2) Carefully have them cut the bookmarks.
- 3) Discuss the various fruits and vegetables they see.

Reference:

<http://www.nourishinteractive.com/nutrition-education-printables/category/72-kids-home-classroom-arts-crafts-nutrition-activities-games>

APPENDIX A: The FoodWise Project Activity Booklet *(continued)*

Activity #29 Classroom Big Book on fruits and vegetables

Nutrition objectives:

- Increase exposure to fruits and vegetables
- Identify fruits and vegetables

Common Core Standard:

CCSS.ELALiteracy.SL.(K,1,2).5: "Add drawing or other visual displays to descriptions as desired to provide additional detail. Tell a story or recount an experience..."

CCSS.ELALiteracy.SL.(K,1,2).6: "Speak audibly and express thoughts, feelings, and ideas clearly. Produce complete sentences when appropriate..."

Materials needed:

Colored paper
Old magazines or pictures of fruits and vegetables
Crayons/markers/paint
Hole puncher
Scissors

Instructions:

- 1) Have students create various pages for a big book including artwork using fruits and vegetables.
- 2) Go around and discuss everyone's pages.
- 3) Combine all pages into a Classroom Big Book

Reference:

http://www.bced.gov.bc.ca/health/healthy_eating_physical_act_grK.pdf

APPENDIX B: School Nutrition Environment Surveys and Consent Forms

The following pages include the IRB approval forms and the informational letter for the expert panel review of the school nutrition environment surveys described in Chapter 4.

Following the above items, the final modified surveys, the IRB approval letters for the survey distribution, and the consent form are attached.

**APPENDIX B: IRB Approval Letters for Expert Panel Review of School Nutrition Environment Surveys
(continued)**

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Office of Vice Chancellor for Research
Institutional Review Board
528 East Green Street
Suite 203
Champaign, IL 61820



March 11, 2014

Karen Chapman-Novakofski
Food Science & Human Nutrition
343 Bevier Hall
905 S Goodwin Ave
M/C 182

RE: *Nutritional Environmental Survey of School - Expert Panel Review of Survey Questions*
IRB Protocol Number: 14549

EXPIRATION DATE: 03/10/2017

Dear Dr. Chapman-Novakofski:

Thank you for submitting the completed IRB application form for your project entitled *Nutritional Environmental Survey of School - Expert Panel Review of Survey Questions*. Your project was assigned Institutional Review Board (IRB) Protocol Number 14549 and reviewed. It has been determined that the research activities described in this application meet the criteria for exemption at 45CFR46.101(b)(2).

This determination of exemption only applies to the research study as submitted. Please note that additional modifications to your project need to be submitted to the IRB for review and exemption determination or approval before the modifications are initiated.

We appreciate your conscientious adherence to the requirements of human subjects research. If you have any questions about the IRB process, or if you need assistance at any time, please feel free to contact me or the IRB Office, or visit our website at <http://www.irb.illinois.edu>.

Sincerely,

A handwritten signature in black ink that reads "Rebecca Van Tine".

Rebecca Van Tine, MS
Assistant Human Subjects Research Specialist, Institutional Review Board

c: Jennifer McCaffrey
Natalie Masis
Susan Johnson;

**APPENDIX B: Informational Letter for Expert Panel Review of School Nutrition Environment Surveys
(continued)**

UNIVERSITY OF ILLINOIS
AT URBANA - CHAMPAIGN

Department of Food Science and Human Nutrition
College of Agricultural, Consumer
and Environmental Sciences
260 Bevier Hall
905 South Goodwin Avenue
Urbana, IL 61801



Information Letter about the Research Entitled: Opinions About School Nutrition Environment

As per federal research requirements and the University of Illinois at Urbana Champaign's Institutional Review Board, you are receiving this informational letter concerning the purpose and procedures for this research project, as well as acknowledgement that your participation is voluntary, your responses will be confidential and who you may contact should you have questions.

Nutrition Environmental Survey of Schools- Expert Panel Review of Survey Questions is a research project under the direction of Dr. Chapman-Novakofski who is a Professor in the Department of Food Science and Human Nutrition.

The purpose of asking you to read and comment on these questions is to develop a better survey relative to the school nutrition environment. We want your opinions on these questions.

Using survey questions or issues from the literature concerning the nutrition environment of schools, a compilation of questions has been developed for school administrators, teaching and dietary staff concerning classes, cafeteria, food, training, policies, and usual practice related to those with the nutrition environment. We are asking you to read and comment on these questions.

The purpose of developing this survey is to determine the usual baseline nutrition environment adequately so that when we work with a school to change nutrition education or foods available or other aspects of the nutrition environment, we have something to compare a post-evaluation with. Before using the survey with a school to evaluate the nutrition environment, we want input from school staff to be sure that questions are phrased in a manner to be understood, that questions cover the issues or areas that are pertinent and that instructions are adequate. That is why we are asking for your input now.

We would like to meet with you briefly to explain what we are looking for and to help us review the survey: your/their input on questions or words that aren't appropriate or understandable; and things we should ask in the survey or other items we may have missed. This should take 15 to 20 minutes and we would come to you/them at a time most convenient for you/them. If it is not convenient to meet with us, you could provide your comments through email or regular mail. You can write your comments directly on the survey, or on a separate communication.

Do not put your name on the survey or any identifiable initials. Your responses will be confidential. You may discuss with me in person, or return comments and survey by email or

telephone 217-244-4498 • fax 217-265-0925

**APPENDIX B: Informational Letter for Expert Panel Review of School Nutrition Environment Surveys
(continued)**

regular mail. If you prefer regular mail, a stamped envelope will be delivered to you at your preferred location. To preserve confidentiality, if you send comments via email, the email will be deleted after saving the attachment separately so that you can remain anonymous. We will not be using any data that the participants answer on the survey, but will be using your verbal or written feedback to help adapt changes to the survey that will later be modified accordingly.

Federal law requires that you understand your participation is voluntary.

If you have questions about this research, please contact Dr. Karen Chapman-Novakofski at 217-244-2852 or kmc@illinois.edu, or the Institutional Research Board chair or Director at irb@illinois.edu or 217-244-7937 or fax 217-333-0405. If you have questions about the Federal Regulations pertaining to human research, please contact the IRB at the previous contacts. The IRB or Dr Chapman-Novakofski will accept a collect call if you identify yourself as a research participant.

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – School Principal Survey
(continued)**



Survey information and confidentiality statement

Dear Elementary School Principal,

The purpose of this research survey is to obtain information about a school to see if there were any changes in opinion from the previous year about the school's nutrition environment. This research is being conducted by Dr. Karen Chapman-Novakofski of the Department of Food Science and Human Nutrition at the University of Illinois.

This survey contains 51 questions and takes about 15-20 minutes to complete. We ask that you complete the survey before June 12, 2015.

Completing this survey is voluntary. You do not need to complete the whole survey if you do not wish to. There is no penalty or discontinuance of participation in any University of Illinois-affiliated programs if you decline. There are no known risks to completing this survey outside those of daily life. Results may be aggregated to be presented at a scientific conference or in a scientific journal.

If you have a question or need assistance in completing the survey, please call Natalie Masis, Dr. Chapman-Novakofski's graduate student, at (650) 296-8197 or e-mail her at masis2@illinois.edu. If you would prefer a paper version of the survey, please let us know below where you would like it to be sent. You can send responses to us at: 238 Bevier Hall, 905 S Goodwin Ave, Urbana, IL 61801. We will provide a stamped envelope.

If you have any questions about your rights as a participant in this study or any concerns or complaints, please contact the University of Illinois Institutional Review Board at (217) 333-2670 (collect calls will be accepted if you identify yourself as a research participant) or via email at irb@illinois.edu.

PLEASE READ CAREFULLY BEFORE PROCEEDING. By clicking the next button, you indicate you have read and understand the above and voluntarily agree to participate in this study.

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – School Principal Survey
(continued)**

If you prefer a paper copy of this survey instead, please write in the address we should send it to below (if NOT, please leave it BLANK):



Instructions

Instructions

- Please be as accurate and honest as possible.
- It is realistic to expect that your school has both strengths and weaknesses in these areas.
- The information you provide will not be used to audit or punish school staff.
- Please answer questions for your current school year unless otherwise noted.
- There will be space at the end for additional comments or questions.

School wellness policy

Q1. Does your district have a written wellness policy that addresses nutrition and physical activity?

- No
- Yes but you haven't read it
- Yes and you have read it
- Yes and you have read it and you were on the committee who put it together
- I don't know

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – School Principal Survey
(continued)**

Q2. Do you know if there is a school wellness policy?

- Yes
- No
- I don't know

Q3. School wellness policies:

Mark all that apply

- Have been implemented at our school
- Are not applied at our school
- Are being revised at our school
- Are incorporating more nutrition into the classroom

Q4. School wellness policies are part of the student handbook which are:

Mark all that apply

- Distributed to families on a yearly basis
- Available on the school/district website
- Discussed with staff or covered at staff training
- None of the above—school wellness policies are not part of the handbook
- I don't know

Q5. Is your school required to report to your district regarding implementation of any of the following components as part of your school wellness policy?

	Yes	No	I don't know
Number of minutes of nutrition education instruction required at each grade level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Student participation in school meal programs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – School Principal Survey
(continued)**

	Yes	No	I don't know
Revenue from sale of food or beverages in school-sponsored fundraisers or other school-sponsored venues outside of school meal program (i.e. vending, school store, a la carte)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CDC's School Health Index	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Body Mass Index (BMI) of students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q6. Does your elementary school have a committee that oversees school wellness policies and programs? (This does NOT include district level committees).

Yes

No

I don't know

Q7. How often did the committee meet in the past twelve months?

None

1 time

2-3 times

4-5 times

6 or more times

I don't know

Q8. Who are the members of the committee?

School administration (principal, assistant principal, or superintendent)

Nutrition services (food service director or manager)

Physical education teacher (PE teacher)

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – School Principal Survey
(continued)**

Health education (health teacher/health educator)

- Family involvement (parent/guardian)
- Health services provider
- Other personnel involved in the school district, etc.
- I don't know

Q9. Does the committee oversee policies and programs regarding:

- Physical activity
- Healthy eating
- Both physical activity and healthy eating
- None of the above
- I don't know

Q10. What is your familiarity with the Child Nutrition and WIC Authorization Act?

It requires all school districts with a federally-funded school meals program to develop and implement wellness polices that address nutrition and physical activity by the start of 2006-2007 school year.

- You've read the act
- You've heard of it but haven't read it
- You have not heard of or read the act

Policies that apply to food at your school

Q11. Does your school have a WRITTEN policy that...

Mark all that apply

- Prohibits use of food as a reward
- States that predominantly healthy foods and

APPENDIX B: Final Versions of School Nutrition Environment Surveys – School Principal Survey
(continued)

- | | |
|--|---|
| <input type="checkbox"/> Prohibits use of food coupons (i.e. free meal after reading 20 books) as a reward | <input type="checkbox"/> beverages are offered in school events (not related to sports) |
| <input type="checkbox"/> Prohibits withholding food as a punishment | <input type="checkbox"/> States that predominantly healthy foods and beverages are offered in school events (related to sports) |
| <input type="checkbox"/> Prohibits the sale of foods with low nutrient value in school fundraising | <input type="checkbox"/> States that predominantly healthy foods and beverages are offered in a la carte lunchroom |
| <input type="checkbox"/> Prohibits the advertising of foods with low nutrient value in school building | <input type="checkbox"/> States that predominantly healthy foods and beverages are offered in fundraising activities |
| <input type="checkbox"/> States that predominantly healthy food/beverages are offered for classroom celebrations/parties | <input type="checkbox"/> States that predominantly healthy foods and beverages are offered in other concessions sold on school campus not mentioned above |
| <input type="checkbox"/> States that predominantly healthy foods and beverages are offered in school store | <input type="checkbox"/> No policies on food exist |
| <input type="checkbox"/> States that predominantly healthy foods and beverages are offered in snacks in classrooms | <input type="checkbox"/> Other <input type="text"/> |

Q12. Does your school have an UNWRITTEN policy that...

Mark all that apply

- | | |
|--|---|
| <input type="checkbox"/> Prohibits use of food as a reward | <input type="checkbox"/> States that predominantly healthy foods and beverages are offered in school events (not related to sports) |
| <input type="checkbox"/> Prohibits use of food coupons (i.e. free meal after reading 20 books) as a reward | <input type="checkbox"/> States that predominantly healthy foods and beverages are offered in school events (related to sports) |
| <input type="checkbox"/> Prohibits withholding food as a punishment | <input type="checkbox"/> States that predominantly healthy foods and beverages are offered in a la carte lunchroom |
| <input type="checkbox"/> Prohibits the sale of foods with low nutrient value in school fundraising | <input type="checkbox"/> States that predominantly healthy foods and beverages are offered in fundraising activities |
| <input type="checkbox"/> Prohibits the advertising of foods with low nutrient value in school building | <input type="checkbox"/> States that predominantly healthy foods and beverages are offered in other concessions sold on school campus not mentioned above |
| <input type="checkbox"/> States that predominantly healthy food/beverages are offered for classroom celebrations/parties | <input type="checkbox"/> No policies on food exist |
| <input type="checkbox"/> States that predominantly healthy foods and beverages are offered in school store | <input type="checkbox"/> Other <input type="text"/> |
| <input type="checkbox"/> States that predominantly healthy foods and | |

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – School Principal Survey
(continued)**

beverages are offered in snacks in classrooms

School recess, lunchroom, and eating environment

Q13. Which of the following is true at your school?

Mark all that apply

- Posters about healthy eating can be found throughout the school
- Bulletin boards feature healthy eating information
- School announcements include messages about healthy eating
- School staff (i.e. principal, teachers, food service workers, etc) provide positive role modeling by hosting events that serve healthy foods
- None of the above

Q14. Does your school participate in Team Nutrition?

- Yes
- No
- I don't know

Q15. Does your school participate in the USDA reimbursable School Breakfast Program?

- Yes
- No
- Other breakfast program

APPENDIX B: Final Versions of School Nutrition Environment Surveys – School Principal Survey
(continued)

Q16. If your school does not participate in the USDA reimbursable School Breakfast Program, please indicate why not.

Mark all that apply

- Too few eligible students
- Lack of interest among students/families
- Programs too costly
- School starts too late to serve breakfast
- Schools lack facilities to serve breakfast
- Schools lack staff to serve breakfast
- Other
- None of the above

Q17. Where do the children eat their school breakfast?

- In cafeteria
- In classroom
- Varies, if so, how so?

Q18. After eating school breakfast, where do students go?

- Playground
- Classroom
- Other
- Not applicable– school doesn't offer breakfast

APPENDIX B: Final Versions of School Nutrition Environment Surveys – School Principal Survey
(continued)

Q19. This year, when does recess occur?

- Recess occurs before lunch for all students
- Recess occurs before lunch for most students
- Recess occurs after lunch for most students
- Recess occurs after lunch for all students
- Differs among grades. Please explain:

Q20. Not including recess, how many minutes do students have for their lunch period?

Kindergarten: ___ minutes per day

1st grade: ___ minutes per day

2nd grade: ___ minutes per day

Varies from day to day. Please explain:

Q21. On average, how many minutes does it take a student to move through the lunch line?

- minutes

- I don't know

Q22. Which best describes your lunchroom for elementary school students?

- We offer foods (you ask each student if he/she would like each item on the menu)
- We serve foods (items are placed on tray)

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – School Principal Survey
(continued)**

- We serve some foods, students serve themselves some foods
- Students serve all foods
- I don't know

Q23. Are students required to stay in the lunchroom for a certain number of minutes before they can go out to recess?

- Yes, students are required to stay in the lunchroom for ___ minutes. Please specify minutes:
- Not applicable – recess occurs before lunch.
- I don't know

Q24. Lunchroom monitors/staff encourage children to eat fruits and vegetables.

- This never happens.
- This happens 1-2 times per year
- This happens 1-2 times per month
- This happens 1-2 times per week
- This happens daily or almost daily
- Varies among staff. Please explain:
- I don't know

Q25. Lunchroom monitors/staff praise children when they eat fruits and vegetables

- This never happens.
- This happens 1-2 times per year
- This happens 1-2 times per month
- This happens 1-2 times per week

APPENDIX B: Final Versions of School Nutrition Environment Surveys – School Principal Survey
(continued)

- This happens daily or almost daily
- Varies among staff. Please explain:
- I don't know

Q26. The USDA's Fresh Fruit and Vegetable Program (FFVP) provides reimbursement to selected elementary schools for providing fresh fruits and vegetables to students during the school day separately from the lunch or breakfast meal.

Does your school participate in the FFVP?

- Yes
- No
- I don't know

Q27. During the school day, do students have access to working drinking fountains in any of the following locations?

Mark all that apply

- Cafeteria
- Gymnasium/locker rooms
- Elsewhere at school
- No drinking fountains

Q28. Does your school currently incorporate any locally-produced food (i.e. fruits, vegetables, meat, and/or dairy) into the meals offered at school (through, for example, a "farm-to-cafeteria," "farm-to-school," or other program)?

- Yes
- No
- I don't know

APPENDIX B: Final Versions of School Nutrition Environment Surveys – School Principal Survey
(continued)

Q29. Does your school currently have a garden (fruit and/or vegetable) that students participate in?

- Yes
- No

Q30. Please indicate all garden-related activities that your students have the opportunity to participate in:

Mark all that apply

- Garden club (i.e. planting, tending, or harvesting from the garden)
- Kitchen classroom (i.e. cooking or eating food grown in garden)
- Curriculum (use of garden to teach different subjects)
- Other
- Not applicable

Availability of foods and beverages other than school meals

Q31. Where are the following food items available at your school?

	School store	Classroom parties or celebrations	School events	A la carte lunchroom	Fundraising activities	Any other place in school	Not applicable, this food is not available	I don't know
Baked, low fat chips	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Regular chips (includes Cheetos, Doritos, Potato Chips, etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – School Principal Survey
(continued)**

	School store	Classroom parties or celebrations	School events	A la carte lunchroom	Fundraising activities	Any other place in school	Not applicable, this food is not available	I don't know
Candy bars/chocolate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Candy-other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cookies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cupcakes or cakes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Donuts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ice cream	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pretzels	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fruits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vegetables	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nuts and seed, trail mix	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Yogurt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q32. Where are the following beverage items available at your school?

	School store	Classroom parties or celebrations	School events	A la carte lunchroom	Fundraising activities	Any other place in school	Not applicable, this beverage is not available	I don't know
100% fruit juice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other fruit juice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bottled water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electrolyte replacement beverage (i.e. Gatorade)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Soda pop	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chocolate or other flavored milk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nonfat milk (0%) or skim	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lowfat milk (1% or 2%)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Whole milk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – School Principal Survey
(continued)**

Nutrition information

Q33. Do you communicate food and nutrition information to parents?

- Yes
- No

Q34. How do you communicate this information to parents?

Mark all that apply

- Newsletters
- Phone calls
- Classes
- Parent-teacher association (PTA)
- Signs posted around school
- Student orientation
- Student handbook
- Announcements at school events
- Other

Nutrition environment

Q35. Has your school done any of the following?

Mark all that apply

- Completed the School Health Index
- Applied for a mini grant through Illinois Nutrition and Physical Activity Program
-

APPENDIX B: Final Versions of School Nutrition Environment Surveys – School Principal Survey
(continued)

Applied for a mini grant through the Illinois State Board of Education related to nutrition or physical activity

- Participated in any other formal program to make changes related to physical activity or nutrition. Please specify:

- None of the above

Q36. As far as you know, which, if any, of the following does your school do to support a healthy nutrition environment?

Mark all that you are aware of

- | | |
|--|--|
| <input type="checkbox"/> Offer USDA school breakfast program | <input type="checkbox"/> Healthy foods at parent, teacher, and staff meetings |
| <input type="checkbox"/> Offer USDA school lunch program | <input type="checkbox"/> Food/candy not given as a reward |
| <input type="checkbox"/> Provide low-fat or fat-free milk every day | <input type="checkbox"/> Fundraisers do not involve limited nutritional value foods (i.e. candy) |
| <input type="checkbox"/> Students have at least 20 minutes to eat lunch after obtaining food | <input type="checkbox"/> Vending machines have healthy options |
| <input type="checkbox"/> Meals include a variety of foods | <input type="checkbox"/> Connection with a farm for local fruits and vegetables |
| <input type="checkbox"/> Offer healthy a la carte choices | <input type="checkbox"/> Implementation of the school wellness policy |
| <input type="checkbox"/> Healthy foods at school parties | <input type="checkbox"/> Other <input type="text"/> |
| <input type="checkbox"/> Healthy foods at school concessions | |

Q37. The TOP ways you think would work best in creating a healthier nutrition environment in your school are (you can include both things your school is doing AND things you hope your school can do to promote a healthier nutrition environment):

Mark all that apply

- | | |
|---|--|
| <input type="checkbox"/> Offer USDA school breakfast program | <input type="checkbox"/> Healthy foods at parent, teacher, and staff meetings |
| <input type="checkbox"/> Offer USDA school lunch program | <input type="checkbox"/> Food/candy not given as a reward |
| <input type="checkbox"/> Provide low-fat or fat-free milk every day | <input type="checkbox"/> Fundraisers do not involve limited nutritional value foods (i.e. candy) |

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – School Principal Survey
(continued)**

- Students have at least 20 minutes to eat lunch after obtaining food
- Vending machines have healthy options
- Meals include a variety of foods
- Connection with a farm for local fruits and vegetables
- Offer healthy a la carte choices
- Implementation of the school wellness policy
- Healthy foods at school parties
- Other
- Healthy foods at school concessions

Q38. Please choose the TOP barriers you currently see in creating a better nutrition environment in the school in which you currently work:

Mark all that apply

- Our school does not understand the impact of the nutrition environment on food choices our students make
- Lack of school community support (i.e. students and/or parents)
- It is not a priority at our school
- Easy access to unhealthy convenience foods
- Lack of funding
- High costs of healthy snacks
- Lack of planning time
- Limited availability of healthy foods/snacks
- Lack of interest
- Lack of teachers/staff being healthy role models
- PARCC curriculum requirements
- Other
- No one is really enforcing our school wellness policy

Nutrition education

Q39. Does your school require teachers to provide nutrition education in the classroom?

- Yes – if yes, is there a specific curriculum most teachers use? Please specify:
- No

Q40. In your opinion, do the students in your school receive:

APPENDIX B: Final Versions of School Nutrition Environment Surveys – School Principal Survey
(continued)

- Too little nutrition education
- The right amount of nutrition education
- Too much nutrition education
- I don't know

Q41. Some of the ways you've seen nutrition education integrated into your school includes:

Mark all that apply

- Teachers receiving professional development on nutrition education
- Sports programs that include nutrition education
- Foodservice staff providing nutrition education
- Physical education class
- A nutrition module taught within a comprehensive health curriculum (i.e. in Common Core curriculum)
- Health education class
- Partnering with outside organizations/individuals providing nutrition education (i.e. University of Illinois Extension, Health Department, Family Resource Center, local physicians)
- Other
- Family programs which include nutrition education
- None of the above
- Implementing the school wellness policy

Q42. The TOP ways you think would work best in introducing or expanding nutrition education in your school are:

Mark all that apply

- Teachers receiving professional development on nutrition education
- Implementing the school wellness policy
- Foodservice staff providing nutrition education
- Nutrition integrated in the Illinois Learning Standards (ILS)
- A nutrition module taught within a comprehensive health curriculum (i.e. in Common Core curriculum)
- Sports programs that include nutrition education
- Partnering with outside organizations/individuals providing nutrition education (i.e. University of Illinois Extension,
- Other

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – School Principal Survey
(continued)**

Health Department, Family Resource Center,
local physicians)

- Family programs which include nutrition education

Q43. The TOP barriers you see to more fully integrating nutrition education into the school in which you currently work:

Mark all that apply

- | | |
|--|--|
| <input type="checkbox"/> Time within the school day to cover nutrition | <input type="checkbox"/> Lack of time to coordinate between classroom & cafeteria |
| <input type="checkbox"/> It is not a priority at our school | <input type="checkbox"/> No one is really enforcing our school wellness policy |
| <input type="checkbox"/> Lack of funding | <input type="checkbox"/> More training is needed to teach nutrition |
| <input type="checkbox"/> Lack of substitute teachers | <input type="checkbox"/> Nutrition messages are not reinforced at home |
| <input type="checkbox"/> Lack of materials (i.e. curriculum) | <input type="checkbox"/> Too much focus on state-mandated testing to have time to focus on nutrition |
| <input type="checkbox"/> Lack of planning time | <input type="checkbox"/> Lack of nutrition integration in the Illinois Learning Standards (ILS) |
| <input type="checkbox"/> Lack of interest | <input type="checkbox"/> Lack of school community support (i.e. students and/or parents) |
| <input type="checkbox"/> PARCC curriculum requirements | <input type="checkbox"/> Other <input type="text"/> |

Staff training and requirements

Q44. Does your school sponsor training in nutrition (formal or informal) for any of the following positions at least once a year?

Mark all that apply

- Lunchroom monitors receive training
- Recess monitors receive training
- No training is offered or funded for these positions

Information about you and your school

APPENDIX B: Final Versions of School Nutrition Environment Surveys – School Principal Survey
(continued)

Q45. Information about your school

Name of school
Name of your school district
County of school district

Q46. What grades are in this school?

- Kindergarten
- 1st grade
- 2nd grade
- 3rd grade
- 4th grade
- 5th grade
- 6th grade
- Other

Q47. About how many students are enrolled in your school for the 2014-2015 year?

Q48. Please indicate whether the following staff work at your school (including staff shared among multiple schools in your district):

- Physical education coordinator
- Physical education teacher
-

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – School Principal Survey
(continued)**

Food service director/manager

- Dietitian/nutritionist
- Health educator (dedicated specifically to health issues)

Q49. How many years have you been working at this school?

- Less than one year
- 1-3 years
- 4-6 years
- more than 6 years
- Not applicable. Please explain:

Q50. What is your educational background?

- High school graduate
- College graduate, in what area?

- Master's degree, in what area?

- Doctoral degree, in what area?

- Other

Additional comments or questions

Q51. Any additional questions or comments that you would like us to know, please write them below.



Survey information and confidentiality statement

Dear Elementary School Teacher,

The purpose of this research survey is to obtain information about a school to see if there were any changes in opinion from the previous year about the school's nutrition environment. This research is being conducted by Dr. Karen Chapman-Novakofski of the Department of Food Science and Human Nutrition at the University of Illinois.

This survey contains 46 questions and takes about 15-20 minutes to complete. We ask that you complete the survey before June 12, 2015.

Completing this survey is voluntary. You do not need to complete the whole survey if you do not wish to. There is no penalty or discontinuance of participation in any University of Illinois-affiliated programs if you decline. There are no known risks to completing this survey outside those of daily life. Results may be aggregated to be presented at a scientific conference or in a scientific journal.

If you have a question or need assistance in completing the survey, please call Natalie Masis, Dr. Chapman-Novakofski's graduate student, at (650) 296-8197 or e-mail her at masis2@illinois.edu. If you would prefer a paper version of the survey, please let us know below where you would like it to be sent. You can send responses to us at: 238 Bevier Hall, 905 S Goodwin Ave, Urbana, IL 61801. We will provide a stamped envelope.

If you have any questions about your rights as a participant in this study or any concerns or complaints, please contact the University of Illinois Institutional Review Board at (217) 333-2670 (collect calls will be accepted if you identify yourself as a research participant) or via email at irb@illinois.edu.

PLEASE READ CAREFULLY BEFORE PROCEEDING. By clicking the next button, you indicate you have read and understand the above and voluntarily agree to participate in this study.

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Teacher Survey (continued)

If you prefer a paper copy of this survey instead, please write in the address we should send it to below (if NOT, please leave it BLANK):

Instructions

Instructions

- Please be as accurate and honest as possible.
- It is realistic to expect that your school has both strengths and weaknesses in these areas.
- The information you provide will not be used to audit or punish school staff.
- Please answer questions for your current school year unless otherwise noted.
- There will be space at the end for additional comments or questions.

Nutrition education

Q1. Does your school require teachers to provide nutrition education in the classroom?

- Yes – if yes, is there a specific curriculum most teachers use? Please specify:
- No
- I don't know

Q2. In your opinion, do the students in your school receive:

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Teacher Survey (continued)

- Too little nutrition education
- The right amount of nutrition education
- Too much nutrition education
- I don't know

Q3. Do you teach nutrition?

- Yes
- No

Q4. What tools do you use to teach nutrition?

Mark all that apply

- Curriculum Guides
- Supplementary materials
- Newsletters or magazines
- Textbooks
- Audio and visual aids
- Computer software
- Culturally sensitive resources
- Other

Q5. What tools would be helpful to teach nutrition?

Mark all that apply

- Curriculum Guides
- Supplementary materials
- Newsletters or magazines

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Teacher Survey (continued)

- Textbooks
- Audio and visual aids
- Computer software
- Culturally sensitive resources
- Other

Q6. How many times per school year do you teach nutrition?

Times a year

Q7. How long do you teach per lesson?

- Less than 30 minutes
- 30 minutes - 1 hour
- More than 1 hour
- Varies. How so?

Q8. When you teach nutrition, does it correspond with the English-language arts, math or other standards of the Common Core or Illinois Learning Standards (i.e. are there nutrition competencies that you have to teach)?

- Yes
- No
- I don't know

Q9. The statements below are related to the nutrition competencies of the Illinois Learning Standards or Common Core.

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Teacher Survey (continued)

Please select one for each question.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Not applicable	I don't know
I do not have the resources (curriculum, educational materials, funding) needed to adequately teach nutrition competencies to my students.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have the time needed to adequately teach nutrition competencies to my students.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When needed, I have access to professionals to assist in teaching nutrition competencies to my students.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
School administration has provided resources (curriculum, education materials, funding) for teaching nutrition competencies.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Not applicable	I don't know
I know how to integrate nutrition competencies with other subject areas into my lesson plans.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My school administration evaluates how well I incorporate nutrition competencies into my lesson plans.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My immediate supervisor has given me recognition for a job well done on incorporating nutrition competencies into my lesson plans.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Not applicable	I don't know

Q10. Some of the ways you've seen nutrition education integrated into your school includes:

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Teacher Survey (continued)

Mark all that apply

- | | |
|--|---|
| <input type="checkbox"/> Teachers receiving professional development on nutrition education | <input type="checkbox"/> Sports programs that include nutrition education |
| <input type="checkbox"/> Foodservice staff providing nutrition education | <input type="checkbox"/> Physical education class |
| A nutrition module taught within a | |
| <input type="checkbox"/> comprehensive health curriculum (i.e. in Common Core curriculum) | <input type="checkbox"/> Health education class |
| Partnering with outside organizations/individuals providing nutrition education (i.e. University of Illinois Extension, Health Department, Family Resource Center, local physicians) | |
| <input type="checkbox"/> | <input type="checkbox"/> Other <input type="text"/> |
| <input type="checkbox"/> Family programs which include nutrition education | <input type="checkbox"/> None of the above |
| <input type="checkbox"/> Implementing the school wellness policy | |

Q11. The TOP ways you think would work best in introducing or expanding nutrition education in your school are:

Mark all that apply

- | | |
|--|--|
| <input type="checkbox"/> Teachers receiving professional development on nutrition education | <input type="checkbox"/> Implementing the school wellness policy |
| <input type="checkbox"/> Foodservice staff providing nutrition education | <input type="checkbox"/> Nutrition integrated in the Illinois Learning Standards (ILS) |
| A nutrition module taught within a | |
| <input type="checkbox"/> comprehensive health curriculum (i.e. in Common Core curriculum) | <input type="checkbox"/> Sports programs that include nutrition education |
| Partnering with outside organizations/individuals providing nutrition education (i.e. University of Illinois Extension, Health Department, Family Resource Center, local physicians) | |
| <input type="checkbox"/> | <input type="checkbox"/> Other <input type="text"/> |
| <input type="checkbox"/> Family programs which include nutrition education | |

Q12. The TOP barriers you see to more fully integrating nutrition education into the school in which you currently work:

Mark all that apply

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Teacher Survey (continued)

- Time within the school day to cover nutrition
- It is not a priority at our school
- Lack of funding
- Lack of substitute teachers
- Lack of materials (i.e. curriculum)
- Lack of planning time
- Lack of interest
- PARCC curriculum requirements
- Lack of time to coordinate between classroom and cafeteria
- No one is really enforcing our school wellness policy
- More training is needed to teach nutrition
- Nutrition messages are not reinforced at home
- Too much focus on state-mandated testing to have time to focus on nutrition
- Lack of nutrition integration in the Illinois Learning Standards (ILS)
- Lack of administrative support
- Lack of school community support (i.e. students and/or parents)
- Other

Q13. Have you used, or do you plan to use, the following strategies to involve parents in the nutrition education of their children?

	Yes	No	No, but intend to	Not applicable
Sending home educational materials to help parents learn about nutrition or teach their children about nutrition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inviting parents to attend nutrition classes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inviting parents to attend special events, such as School Lunch Week or tasting parties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inviting parents in nutrition-related careers to speak to the class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Asking parents to give in-class demonstrations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Asking parents to send healthful snacks to school	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Offering nutrition workshops or screening services for parents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Communicating nutrition information

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Teacher Survey (continued)

Q14. Do you communicate food and nutrition information to parents?

- Yes
- No

Q15. How do you communicate this information to parents?

Mark all that apply

- Newsletters
- Phone calls
- Classes
- Parent-teacher association (PTA)
- Signs posted around school
- Student orientation
- Student handbook
- Announcements at school events
- Other

Q16. Do you write newsletters to distribute to parents?

- Yes
- No

Q17. What topics do you discuss in your newsletters?

- Classroom updates
- Nutrition information

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Teacher Survey (continued)

Upcoming events

Other

Q18. Where do you get your nutrition information?

Curriculum guides

Internet

Books

Other

Nutrition environment

Q19. Has your school done any of the following?

Mark all that you know of

Completed the School Health Index

Applied for a mini grant through Illinois Nutrition and Physical Activity Program

Applied for a mini grant through the Illinois State Board of Education related to nutrition or physical activity

Participated in any other formal program to make changes related to physical activity or nutrition. Please specify:

None of the above

I don't know

Q20. As far as you know, which, if any, of the following does your school do to support a healthy nutrition environment?

Mark all that you are aware of

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Teacher Survey (continued)

- | | |
|--|---|
| <input type="checkbox"/> Healthy foods at school parties | <input type="checkbox"/> Vending machines have healthy options |
| <input type="checkbox"/> Healthy foods at school concessions | <input type="checkbox"/> Connection with a farm for local fruits and vegetables |
| <input type="checkbox"/> Healthy foods at parent, teacher, and staff meetings | <input type="checkbox"/> Implementation of the school wellness policy |
| <input type="checkbox"/> Food/candy not given as a reward | <input type="checkbox"/> Other <input type="text"/> |
| <input type="checkbox"/> Fundraisers do not involve limited nutritional value foods (i.e. candy) | |

Q21. The TOP ways you think would work best in creating a healthier nutrition environment in your school are (you can include both things your school is doing AND things you hope your school can do to promote a healthier nutrition environment):

Mark all that apply

- | | |
|--|--|
| <input type="checkbox"/> Offer USDA school breakfast program | <input type="checkbox"/> Healthy foods at parent, teacher, and staff meetings |
| <input type="checkbox"/> Offer USDA school lunch program | <input type="checkbox"/> Food/candy not given as a reward |
| <input type="checkbox"/> Provide low-fat or fat-free milk every day | <input type="checkbox"/> Fundraisers do not involve limited nutritional value foods (i.e. candy) |
| <input type="checkbox"/> Students have at least 20 minutes to eat lunch after obtaining food | <input type="checkbox"/> Vending machines have healthy options |
| <input type="checkbox"/> Meals include a variety of foods | <input type="checkbox"/> Connection with a farm for local fruits and vegetables |
| <input type="checkbox"/> Offer healthy a la carte choices | <input type="checkbox"/> Implementation of the school wellness policy |
| <input type="checkbox"/> Healthy foods at school parties | <input type="checkbox"/> Other <input type="text"/> |
| <input type="checkbox"/> Healthy foods at school concessions | |

Q22. Please choose the TOP barriers you currently see in creating a better nutrition environment in the school in which you currently work:

Mark all that apply

- | | |
|---|---|
| <input type="checkbox"/> Our school does not understand the impact of the nutrition environment on food choices our students make | <input type="checkbox"/> Lack of administration support |
| <input type="checkbox"/> It is not a priority at our school | <input type="checkbox"/> Lack of school community support (i.e. students) |

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Teacher Survey (continued)

- | | |
|--|---|
| <input type="checkbox"/> Lack of funding | and/or parents) |
| <input type="checkbox"/> Lack of planning time | <input type="checkbox"/> Easy access to unhealthy convenience foods |
| <input type="checkbox"/> Lack of interest | <input type="checkbox"/> High costs of healthy snacks |
| <input type="checkbox"/> PARCC curriculum requirements | <input type="checkbox"/> Limited availability of healthy foods/snacks |
| <input type="checkbox"/> No one is really enforcing our school wellness policy | <input type="checkbox"/> Lack of teachers/staff being healthy role models |
| | <input type="checkbox"/> Other <input type="text"/> |

School policies that relate to food

Q23. Does your school have a WRITTEN policy that...

Mark all that you know of

- | | |
|--|---|
| <input type="checkbox"/> Prohibits use of food as a reward | <input type="checkbox"/> States that predominantly healthy foods and beverages are offered in school events (not related to sports) |
| <input type="checkbox"/> Prohibits use of food coupons (i.e. free meal after reading 20 books) as a reward | <input type="checkbox"/> States that predominantly healthy foods and beverages are offered in school events (related to sports) |
| <input type="checkbox"/> Prohibits withholding food as a punishment | <input type="checkbox"/> States that predominantly healthy foods and beverages are offered in a la carte lunchroom |
| <input type="checkbox"/> Prohibits the sale of foods with low nutrient value in school fundraising | <input type="checkbox"/> States that predominantly healthy foods and beverages are offered in fundraising activities |
| <input type="checkbox"/> Prohibits the advertising of foods with low nutrient value in school building | <input type="checkbox"/> States that predominantly healthy foods and beverages are offered in other concessions sold on school campus not mentioned above |
| <input type="checkbox"/> States that predominantly healthy food/beverages are offered for classroom celebrations/parties | <input type="checkbox"/> No policies on food exist |
| <input type="checkbox"/> States that predominantly healthy foods and beverages are offered in school store | <input type="checkbox"/> Other <input type="text"/> |
| <input type="checkbox"/> States that predominantly healthy foods and beverages are offered in snacks in classrooms | |

Q24. Does your school have an UNWRITTEN policy that...

Mark all that you know of

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Teacher Survey (continued)

- Prohibits use of food as a reward
- Prohibits use of food coupons (i.e. free meal after reading 20 books) as a reward
- Prohibits withholding food as a punishment
- Prohibits the sale of foods with low nutrient value in school fundraising
- Prohibits the advertising of foods with low nutrient value in school building
- States that predominantly healthy food/beverages are offered for classroom celebrations/parties
- States that predominantly healthy foods and beverages are offered in school store
- States that predominantly healthy foods and beverages are offered in snacks in classrooms

- States that predominantly healthy foods and beverages are offered in school events (not related to sports)
- States that predominantly healthy foods and beverages are offered in school events (related to sports)
- States that predominantly healthy foods and beverages are offered in a la carte lunchroom
- States that predominantly healthy foods and beverages are offered in fundraising activities
- States that predominantly healthy foods and beverages are offered in other concessions sold on school campus not mentioned above
- No policies on food exist
- Other

Q25. Do you have a CLASSROOM policy that...

Mark all that apply

- Prohibits use of food as a reward
- Prohibits use of food coupons (i.e. free meal after reading 20 books) as a reward
- Prohibits withholding food as a punishment
- Prohibits the sale of foods with low nutrient value in school fundraising
- States that predominantly healthy food/beverages are offered for classroom celebrations/parties

- States that predominantly healthy foods and beverages are offered in snacks in classrooms
- States that predominantly healthy foods and beverages are offered in fundraising activities
- No policies on food exist
- Other

School wellness policy

Q26. Do you know if there is a school wellness policy?

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Teacher Survey (continued)

- Yes
- No
- I don't know

Q27. Does your elementary school have a committee that oversees school wellness policies and programs? (This does NOT include district level committees).

- Yes
- No
- I don't know

Q28. How often did the committee meet in the past twelve months?

- None
- 1 time
- 2-3 times
- 4-5 times
- 6 or more times
- I don't know

Q29. Who are the members of the committee?

- School administration (principal, assistant principal, or superintendent)
- Nutrition services (food service director or manager)
- Physical education teacher (PE teacher)
- Health education (health teacher/health educator)
- Family involvement (parent/guardian)
- Health services provider
-

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Teacher Survey (continued)

Other personnel involved in the school district, etc.

I don't know

Q30. Does the committee oversee policies and programs regarding:

- Physical activity
- Healthy eating
- Both physical activity and healthy eating
- None of the above
- I don't know

Q31. The statements below are related to your school wellness policy.

Please select one for each question.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Not applicable	I don't know
I am in favor of the school wellness policy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
School administration has provided me with adequate time to attend in-service training on the school wellness policy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My lesson plans include nutrition competencies supporting the school wellness policy criteria.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If changes are made to the school wellness policy, I will have an opportunity to give input.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In-services/professional developments are provided for me if any changes occur to the school wellness policy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Teacher Survey (continued)

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Not applicable	I don't know
To comply with the school wellness policy, I have been provided examples on how to incorporate nutrition competencies into my lesson plans.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I devote more teaching time to nutrition competencies because of the school wellness policy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have adopted all the school wellness policy's guidelines that apply to teachers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Not applicable	I don't know
All teachers have implemented all the school wellness policy's guidelines that apply to them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The school wellness policy will evolve to meet future health needs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Teachers at my school are in favor of the school wellness policy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My school administration demonstrates support for the school wellness policy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The school wellness policy is providing opportunities for students to practice healthy living while at school.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The school wellness policy is having a positive impact on student health.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My school has successfully implemented the school wellness policy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The school wellness policy will still be part of the school environment in 5 years.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Not applicable	I don't know

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Teacher Survey (continued)

Q32. School wellness policies are part of the student handbook which are:

Mark all that apply

- Distributed to families on a yearly basis
- Available on the school/district website
- Discussed with staff or covered at staff training
- None of the above—school wellness policies are not part of the handbook
- I don't know

School health environment

Q33. Does your school currently incorporate any locally-produced food (i.e. fruits, vegetables, meat, and/or dairy) into the meals offered at school (through, for example, a “farm-to-cafeteria,” “farm-to-school,” or other program)?

- Yes
- No
- I don't know

Q34. Does your school currently have a garden (fruit and/or vegetable) that students participate in?

- Yes
- No

Q35. Please indicate all garden-related activities that your students have the opportunity to participate in:

Mark all that apply

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Teacher Survey (continued)

- Garden club (i.e. planting, tending, or harvesting from the garden)
- Kitchen classroom (i.e. cooking or eating food grown in garden)
- Curriculum (use of garden to teach different subjects)
- Other
- Not applicable

Q36. Which of the following is true at your school?

Mark all that apply

- Posters about healthy eating can be found throughout the school
- Bulletin boards feature healthy eating information
- School announcements include messages about healthy eating
- School staff (i.e. principal, teachers, food service workers, etc) provide positive role modeling by hosting events that serve healthy foods
- None of the above

Q37. During the school day, do students have access to working drinking fountains in any of the following locations?

Mark all that apply

- Cafeteria
- Gymnasium/locker rooms
- Elsewhere at school
- No drinking fountains
- I don't know

Availability of foods and beverages other than school meals

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Teacher Survey (continued)

Q38. Where are the following food items available at your school?

	School store	Classroom parties or celebrations	School events	A la carte lunchroom	Fundraising activities	Any other place in school	Not applicable, this food is not available	I don't know
Baked, low fat chips	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Regular chips (includes Cheetos, Doritos, Potato Chips, etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Candy bars/chocolate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Candy-other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cookies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cupcakes or cakes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Donuts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ice cream	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pretzels	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fruits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vegetables	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nuts and seed, trail mix	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Yogurt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q39. Where are the following beverage items available at your school?

	School store	Classroom parties or celebrations	School events	A la carte lunchroom	Fundraising activities	Any other place in school	Not applicable, this beverage is not available	I don't know
100% fruit juice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other fruit juice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bottled water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Teacher Survey (continued)

	School store	Classroom parties or celebrations	School events	A la carte lunchroom	Fundraising activities	Any other place in school	Not applicable, this beverage is not available	I don't know
Electrolyte replacement beverage (i.e. Gatorade)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Soda pop	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chocolate or other flavored milk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nonfat milk (0% or skim)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lowfat milk (1% or 2%)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Whole milk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Information about you and your school

Q40. Information about your school

Name of school

Name of your school district

County of school district

Q41. What grades are in this school?

- Kindergarten
- 1st grade
- 2nd grade
- 3rd grade
- 4th grade
- 5th grade
- 6th grade

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Teacher Survey (continued)

- Other

Q42. How many years have you been teaching?

- Less than one year
- 1-3 years
- 4-6 years
- More than 6 years
- Other. Please explain:

Q43. What is your educational background?

- High school graduate
- College graduate, in what area?
- Master's degree, in what area?
- Doctoral degree, in what area?
- Other

Q44. What is the primary format of your classroom?

- Monolingual
- Bilingual
- Other

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Teacher Survey (continued)

Q45. Average number of students per class

Additional comments or questions

Q46. Any additional questions or comments that you would like us to know, please write them below.

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – Food Service Director Survey
(continued)**



Survey information and confidentiality statement

Dear Food Service Director or Manager,

The purpose of this research survey is to obtain information about a school to see if there were any changes in opinion from the previous year about the school's nutrition environment. This research is being conducted by Dr. Karen Chapman-Novakofski of the Department of Food Science and Human Nutrition at the University of Illinois.

This survey contains 73 questions and takes about 15-30 minutes to complete. We ask that you complete the survey before June 12, 2015.

Completing this survey is voluntary. You do not need to complete the whole survey if you do not wish to. There is no penalty or discontinuance of participation in any University of Illinois-affiliated programs if you decline. There are no known risks to completing this survey outside those of daily life. Results may be aggregated to be presented at a scientific conference or in a scientific journal.

If you have a question or need assistance in completing the survey, please call Natalie Masis, Dr. Chapman-Novakofski's graduate student, at (650) 296-8197 or e-mail her at masis2@illinois.edu. If you would prefer a paper version of the survey, please let us know below where you would like it to be sent. You can send responses to us at: 238 Bevier Hall, 905 S Goodwin Ave, Urbana, IL 61801. We will provide a stamped envelope.

If you have any questions about your rights as a participant in this study or any concerns or complaints, please contact the University of Illinois Institutional Review Board at (217) 333-2670 (collect calls will be accepted if you identify yourself as a research participant) or via email at irb@illinois.edu.

PLEASE READ CAREFULLY BEFORE PROCEEDING. By clicking the next button, you indicate you have read and understand the above and voluntarily agree to participate in this study.

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – Food Service Director Survey
(continued)**

If you prefer a paper copy of this survey instead, please write in the address we should send it to below (if NOT, please leave it BLANK):

Instructions

Instructions

- Please be as accurate and honest as possible.
- It is realistic to expect that your school has both strengths and weaknesses in these areas.
- The information you provide will not be used to audit or punish school staff.
- Please answer questions for your current school year unless otherwise noted.
- There will be space at the end for additional comments or questions.

School breakfast program

Q1. Does your school offer the USDA School Breakfast Program to elementary school students?

- Yes
- No
- Other breakfast program, please name:

Q2. On a typical school day, how many students eat the school breakfast?

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – Food Service Director Survey
(continued)**

Number of students

Q3. When is breakfast offered?

Before school starts
 After school starts

Q4. Where is breakfast served?

Mark all that apply

Cafeteria
 Classroom
 Other

Q5. How many minutes do students usually have to eat breakfast?

Minutes

Q6. What are the TWO most prevalent types of beverages served during breakfast (not a la carte)?

Please check TWO

<input type="checkbox"/> 2% white milk	<input type="checkbox"/> Skim chocolate or other skim flavored milk
<input type="checkbox"/> 1% white milk	<input type="checkbox"/> 100% pure fruit juice
<input type="checkbox"/> Skim white milk	<input type="checkbox"/> Fruit drinks that are not 100% juice
<input type="checkbox"/> 2% chocolate or other 2% flavored milk	<input type="checkbox"/> Water
<input type="checkbox"/> 1% chocolate or other 1% flavored milk	<input type="checkbox"/> Other <input type="text"/>

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Food Service Director Survey
(continued)

Q7. During a typical school week, list the number of days (0 to 5) that the following foods are offered at breakfast:

List # of days (0-5) that is offered at breakfast:

- Low-sugar breakfast cereal such as Cheerios or Life
- High-sugar breakfast cereal such as Trix or Lucky Charms
- Pancakes, waffles
- Danish, donut, other bakery type item
- Egg dish
- Yogurt
- Breakfast meat (ham, sausage, bacon)
- Fresh fruit
- Frozen fruit
- Canned fruit
- 100% fruit juice
- Fresh vegetables
- Frozen vegetables
- Canned vegetables

School lunch program

The following questions refer to the school lunch program.

Q8. On a typical school day, how many students eat the school lunch?

Number of students

Q9. Which system does your lunchroom follow?

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Food Service Director Survey
(continued)

- Nutrient-based (amount of fat, sugar, sodium, etc)
- Food-based (for example, 1 serving of meat or meat alternative, 2 servings fruit or vegetable, milk, etc)
- I don't know
- Other

Q10. On most days, how many choices of main entrees are offered for lunch?

- 1 type of entree
- 2 types
- 3 or more types
- Other

Q11. Does your school offer a salad bar?

- Yes, it is available every day
- Yes, it is available some days
- No

Q12. Which best describes your lunchroom?

- We offer foods (each student is asked if he/she would like each item on the menu)
- We serve foods (items are placed on tray)
- We serve some foods, students serve themselves some foods
- Students serve themselves all foods

Q13. How many food components must children select for their meals?

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – Food Service Director Survey
(continued)**

- 2 or less
- 3
- 4
- 5
- 6 or more
- None, food components selection is not part of our lunch program

Q14. How many of each food component must the children select?

Please write in a number (0-6). For "Other" please specify component.

- Fruit
- Vegetables
- Grains
- Meat/meat alternatives
- Fluid milk
- Other

Q15. In your food line, where are fruits located?

- Front of line
- Middle of line
- End of line
- Other

Q16. On most days, how many choices of fruits WITHOUT added sugars (fresh, canned, frozen, dried, pre-prepared, or juiced) are offered for lunch?

- 0; on most days, our school doesn't offer fruit without added sugars
- 1 type of fruit

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Food Service Director Survey
(continued)

2 types

- 3 or more types

Q17. On most days, how many choices of fruits WITH added sugars (either canned, frozen, dried, pre-prepared, juiced) are offered for lunch?

- 0; on most days, our school doesn't offer fruits with added sugars
- 1 type of fruit
- 2 types
- 3 or more types

Q18. In your food line, where are vegetables located?

- Front of line
- Middle of line
- End of line
- Other

Q19. On most days, how many choices of vegetables WITHOUT added sugars, salts, or sauces (fresh, canned, frozen, dried, pre-prepared, or juiced) are offered for lunch?

- 0; on most days, our school doesn't offer vegetables without added sugars, salts, or sauces
- 1 type of vegetable
- 2 types
- 3 or more types

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Food Service Director Survey
(continued)

Q20. On most days, how many choices of vegetables WITH added sugars, salts, or sauces (either canned, frozen, dried, pre-prepared, juiced) are offered for lunch?

- 0; on most days, our school doesn't offer vegetables with added sugars, salts, or sauces
- 1 type of vegetable
- 2 types
- 3 or more types

Q21. On most days, how many lunch items are made with whole grains?

- 0; on most days, our school doesn't offer whole grains
- 1 item made with whole grains
- 2 items made with whole grains
- 3 or more items made with whole grains

Q22. At this school, are students able to get butter or margarine?

- Yes, in the serving line or on the table
- Yes, if they ask for it
- No

Q23. Is salt available to students?

- Yes, in the serving line or on the table
- Yes, if they ask for it
- No

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – Food Service Director Survey
(continued)**

Q24. Does your lunchroom offer a la carte items?

- Yes
- No
- I don't know

Q25. Which foods are made available in the a la carte section on most days during lunch?

Mark all that apply

- Candy
- High-fat snacks (cookies, chips, ice cream, etc.)
- High calorie fast foods (french fries, hamburgers, pizza, etc.)
- Fruit
- Vegetables
- Water
- Fruit juice (100%)
- Low-fat milk
- Entree
- Other

Q26. For each of the foods available in the a la carte section, please rank the top 3 best selling items.

Which are the THREE BEST SELLING ITEMS? Place a "1" next to the top selling item, a "2" next to the second best selling item, and a "3" next to the third best selling item.

- Candy
- High-fat snacks (cookies, chips, ice cream, etc.)
- High calorie fast foods (french fries, hamburgers, pizza, etc.)

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Food Service Director Survey
(continued)

- Fruit
- Vegetables
- Water
- Fruit juice (100%)
- Low-fat milk
- Entree
- Other

Q27. Who chooses the a la carte items to sell?

- Foodservice director from the district
- Foodservice supervisor
- Cafeteria/Foodservice Manager
- Other

Q28. Approximately how much revenue is brought in by a la carte sales on an average month? (Only include revenues from elementary school students).

Dollars (\$) per month

Q29. Does your school have lunchroom monitors/helpers (staff that assist children with trays, getting condiments, etc)?

- Yes
- No
- I don't know

Q30. Which of the following instructions are given to lunchroom monitors/helpers:

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – Food Service Director Survey
(continued)**

Mark all that apply

- Encourage students to finish their meal in a timely fashion
- Encourage students to eat their fruits and vegetables
- Encourage students to finish everything on their plate
- Other
- None of the above

New USDA standards for school meals took effect starting at the beginning of the 2012-13 school year, setting requirements about fruit and vegetable availability, whole grain products, fat and sodium content, and other meals characteristics. Please answer the following questions specifically about changes you have seen since the beginning of the 2013-14 school year.

Q31. Among the K-2nd students who purchase lunch through the NSLP, about what percentage of the food on their plates do students typically consume?

- Percentage of food on plates (%)
- I don't know

Q32. Specific to K-2nd grade, compared to last year...

- | | | | | | |
|--|---|-----------------------|---|--|-----------------------|
| Students are eating a lot more of the food | Students are eating slightly more of the food | About the same | Students are eating slightly less of the food | Students are eating a lot less of the food | I don't know |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Q33. Please indicate to what extent you agree with each statement:

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Food Service Director Survey
(continued)

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	I don't know
Students generally seem to like the new school lunch.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
At first, students complained about the new lunches.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Few students complain about the new lunches.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Most students don't seem concerned about the changes in the school lunches.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Food purchasing, storage, and preparation

Q34. Does your school have enough freezer space for storing *frozen* fruits and vegetables?

- Yes, we always have freezer space for frozen fruits and vegetables
- Yes, we usually have freezer space for frozen fruits and vegetables
- Yes, we sometimes have freezer space for frozen fruits and vegetables
- No, we rarely have enough freezer space for frozen fruits and vegetables

Q35. Does your school have adequate space for storing *fresh* fruits and vegetables?

- Yes, we always have space to store fresh fruits and vegetables
- Yes, we usually have space to store fresh fruits and vegetables
- Yes, we sometimes have space to store fresh fruits and vegetables
- No, we rarely have enough space to store fresh fruits and vegetables

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Food Service Director Survey
(continued)

Q36. Do you participate in the fresh fruits and vegetables project with the USDA commodity program?

- Yes
- No
- I don't know

Q37. If yes, what percent of your commodity dollars do you put towards this?

Percentage (%)

Q38. Does your school get fruits and/or vegetables from local farmers?

- Yes, fruits
- Yes, vegetables
- No, we don't get produce from local farmers

Q39. Does your school get fruit and/or vegetable donations?

- Yes, fruits
- Yes, vegetables
- No, we don't get produce donations

Q40. Is any food actually prepared at this school for students' breakfast or lunches?

- Yes
-

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Food Service Director Survey
(continued)

No

Q41. Where are foods prepared? (for breakfast or lunches)

- In school lunchroom
- Off school premise, please specify:
- Other

Q42. Not counting the reheating of prepared foods, which group has primary responsibility for cooking foods for students at this school? Would you say...

- School staff
- Food service management company staff
- Fast food company staff
- Central production kitchen
- No primary group
- I don't know
- Other
- Not applicable (preparation not done at this school)

Q43. When preparing foods, for which of the following recipes do you always or almost always add whole grains?

Whole grains (such as 100% whole wheat, brown rice) are always or almost always added to:

Mark all that apply

- Casseroles
- Soups

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – Food Service Director Survey
(continued)**

- Desserts
- Other
- None of the above

Q44. During the current school year, which of the following has school food service staff consistently (every time or almost every time) done to reduce fat, sugar and calories in meals offered to students such as:

Mark all that apply

Purchasing

- Compare nutrition facts label information on products as one of the factors to determine which product to purchase
- Purchase meat products that include soy or textured vegetable protein

Preparation

- Trim fat from meat
- Thoroughly drain fat from ground meats
- Thoroughly rinse fat from ground meats
- Spoon solid fat from chilled meat or poultry broth
- Skim fat off warm broth, soup, stew, or gravy
- Use ground beef that is 90% or more lean
- Prepare vegetables with minimal fat such as oil or butter
- Reduce the amount of sugar called for in recipes
- Reduce the amount of fat and oils called for in recipes

Substitutions

- Use egg whites or egg substitutes such as Egg Beaters instead of whole eggs
- Use skim milk, low fat milk, or nonfat dry milk instead of whole milk
- Use cooked dried beans, canned beans, or meat extender instead of meat
- Use vegetable oil instead of shortening, butter, or margarine
- Use low fat or non fat real cheese
- Use low-fat or nonfat yogurt, reduced fat mayonnaise, or sour cream instead of regular yogurt, mayonnaise, sour cream, or creamy salad dressings

Cooking methods

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Food Service Director Survey
(continued)

Bake, roasting or broiling meat more often than frying

Cook with non-stick spray or pan liners

Offering/Serving options

Serve skinless poultry

Serve cooked meats in portion sizes of three ounces or less

Offer a meatless entree daily as a choice

Offer low-fat or non-fat options for sauces, dressings or dips

Limit portion size of sauces, dressings or dips to one-ounce servings

Other

Write bid specs that limit the percent of fat in pre-prepared products such as hamburgers, pizza, chicken nuggets, etc.

Training for staff

Q45. In the past 12 months, which of the following has your school done for training staff?

Provided training/education opportunities to foodservice coordinator

Provided training/education opportunities to foodservice staff

Provided training/education opportunities to lunchroom monitors/helpers

Other

None of the above

Q46. Is promoting healthful food choices included in the job descriptions for school site food service personnel?

Yes

No

I don't know

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Food Service Director Survey
(continued)

Q47. During the past 12 months, have the school food service staff talked or taught about good nutrition or healthy eating habits to elementary school students as part of a health education lesson?

- Yes
- No
- I don't know

Healthy food promotion

Q48. Does foodservice staff have a budget for promoting healthful food choices?

- Yes
- No
- I don't know

Q49. In the past 12 months, which of the following has your school offered for students for food participation?

Mark all that apply

- | | |
|--|--|
| <input type="checkbox"/> Offer whole-wheat options from brand name fast foods from companies such as Pizza Hut, Taco Bell, or Subway | <input type="checkbox"/> Offer incentives to participate in school lunch (games, prizes, etc.) |
| <input type="checkbox"/> Offer mini-servings of new healthy foods free to all students and/or hosted taste tests | <input type="checkbox"/> Other <input type="text"/> |
| <input type="checkbox"/> Offer incentives to participate in school breakfast (games, prizes, etc.) | <input type="checkbox"/> None of the above |

Q50. In the past 12 months, which of the following has your school done for food promotion and other food-related events?

Mark all that apply

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – Food Service Director Survey
(continued)**

- Invite parents and other special visitors to lunch
- Highlight healthy items on menus or other posted information
- Announce lunch menu over public address system
- Selected non-damaged produce and discard damaged produce before/during preparation
- Made changes to the lunchroom in order to promote a clean, safe and pleasant environment
- Delivered nutrition education to students
- Hosted cultural/ethnic food events
- Other
- None of the above

Q51. In the past 12 months, which of the following has your school done for displays of healthful messages around the school?

Mark all that apply

- Displayed posters or promoted messages related to eating fruits and vegetables
- Displayed posters or promoted messages related to healthy activities and lifestyles
- Displayed signs with healthy eating messages on the menus
- Displayed signs with healthy eating messages on the tray line
- Displayed MyPlate signs/posters
- Displayed posters in cafeteria with healthy food messages created by students
- Displayed foods in a way that is visually appealing to the students (for example, making a fruit salad colorful with a cherry on top, etc)
- Other
- None of the above

Q52. Has the district utilized the USDA program aid Fruit and Vegetables Galore to plan, prepare and promote healthful food choices?

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Food Service Director Survey
(continued)

- Yes
- No
- I don't know

Q53. During the past 12 months, have the school food service staff worked on school food service or nutrition activities with...

Mark all that apply

- Health education staff from this school
- Physical education staff from this school
- Health services staff from this school
- Mental health or social services staff from this school
- None of the above

Feedback/suggestions from students, parents, or staff

Q54. In the past 12 months, which of the following has your school done for feedback/suggestions from parents/students/other?

Mark all that apply

- Collected suggestions from students about the school food service program
- Collected suggestions from school staff about the school service program
- Collected suggestions from family members of students about the school food service program
- Conducted taste-tests with students
- Conducted taste-tests with family members of students
- Other
- None of the above

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – Food Service Director Survey
(continued)**

Q55. In the past 12 months, has your school conducted a verbal or written survey with students on the following?

Mark all that apply

- Opinions about the foods offered
- Opinions about the beverages offered
- Opinions about the cafeteria atmosphere
- Opinions about students' food preferences
- Amount of time to eat meal
- Opinions about the food service program overall
- Other
- None of the above; we did not do a survey in the past 12 months

Q56. Does this school have a committee that includes students who provide suggestions for the school food service program?

- Yes
- No
- I don't know

Nutrition environment

Q57. As far as you know, which, if any, of the following does your school do to support a healthy nutrition environment?

Mark all that you are aware of

- | | |
|---|---|
| <input type="checkbox"/> Offer USDA school breakfast program | <input type="checkbox"/> Offer healthy a la carte choices |
| <input type="checkbox"/> Offer USDA school lunch program | <input type="checkbox"/> Vending machines have healthy options |
| <input type="checkbox"/> Provide low-fat or fat-free milk every day | <input type="checkbox"/> Connection with a farm for local fruits and vegetables |

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – Food Service Director Survey
(continued)**

<input type="checkbox"/> Students have at least 20 minutes to eat lunch after obtaining food	<input type="checkbox"/> Implementation of the school wellness policy
<input type="checkbox"/> Meals include a variety of foods	<input type="checkbox"/> Other <input type="text"/>
<p>Q58. The TOP ways you think would work best in creating a healthier nutrition environment in your school are (you can include both things your school is doing AND things you hope your school can do to promote a healthier nutrition environment):</p> <p><i>Mark all that apply</i></p>	
<input type="checkbox"/> Offer USDA school breakfast program	<input type="checkbox"/> Healthy foods at parent, teacher, and staff meetings
<input type="checkbox"/> Offer USDA school lunch program	<input type="checkbox"/> Food/candy not given as a reward
<input type="checkbox"/> Provide low-fat or fat-free milk every day	<input type="checkbox"/> Fundraisers do not involve limited nutritional value foods (i.e. candy)
<input type="checkbox"/> Students have at least 20 minutes to eat lunch after obtaining food	<input type="checkbox"/> Vending machines have healthy options
<input type="checkbox"/> Meals include a variety of foods	<input type="checkbox"/> Connection with a farm for local fruits and vegetables
<input type="checkbox"/> Offer healthy a la carte choices	<input type="checkbox"/> Implementation of the school wellness policy
<input type="checkbox"/> Healthy foods at school parties	<input type="checkbox"/> Other <input type="text"/>
<input type="checkbox"/> Healthy foods at school concessions	
<p>Q59. Please choose the TOP barriers you currently see to creating a better nutrition environment in the schools in which you currently work:</p> <p><i>Mark all that apply</i></p>	
<input type="checkbox"/> Our school does not understand the impact of the nutrition environment on food choices our students make	<input type="checkbox"/> Lack of administration support
<input type="checkbox"/> It is not a priority at our school	<input type="checkbox"/> Lack of school community support (i.e. students and/or parents)
<input type="checkbox"/> Lack of funding	<input type="checkbox"/> Easy access to unhealthy convenience foods
<input type="checkbox"/> Lack of planning time	<input type="checkbox"/> High costs of healthy snacks
<input type="checkbox"/> Lack of interest	<input type="checkbox"/> Limited availability of healthy foods/snacks
<input type="checkbox"/> PARCC curriculum requirements	<input type="checkbox"/> Lack of teachers/staff being healthy role models

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – Food Service Director Survey
(continued)**

- No one is really enforcing our school wellness policy Other

Nutrition education

Q60. In your opinion, do the students in your school receive:

- Too little nutrition education
- The right amount of nutrition education
- Too much nutrition education
- I don't know

Q61. Some of the ways you've seen nutrition education integrated into your school includes:

Mark all that apply

- Foodservice staff providing nutrition education Other
 Implementing the school wellness policy None of the above

Q62. The TOP ways you think would work best in introducing or expanding nutrition education in your school are:

Mark all that apply

- Foodservice staff providing nutrition education Implementing the school wellness policy
 Partnering with outside organizations/individuals providing nutrition education (i.e. University of Illinois Extension, Health Department, Family Resource Center, local physicians) More involvement of food service staff in nutrition education in lunchroom
 Family programs which include nutrition education Other

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – Food Service Director Survey
(continued)**

Q63. The TOP barriers you see to more fully integrating nutrition education into the school in which you currently work:

Mark all that apply

- | | |
|--|---|
| <input type="checkbox"/> Time within the school day to cover nutrition | <input type="checkbox"/> Lack of time to coordinate between classroom & cafeteria |
| <input type="checkbox"/> It is not a priority at our school | <input type="checkbox"/> No one is really enforcing our school wellness policy |
| <input type="checkbox"/> Lack of funding | <input type="checkbox"/> More training is needed to teach nutrition |
| <input type="checkbox"/> Lack of planning time | <input type="checkbox"/> Nutrition messages are not reinforced at home |
| <input type="checkbox"/> Lack of interest | <input type="checkbox"/> Other <input type="text"/> |

Information about you and your school

Q64. Information about your school

Name of school	<input type="text"/>
Name of your school district	<input type="text"/>
County of school district	<input type="text"/>

Q65. How many years have you been a cafeteria/foodservice manager (including this school and other schools)?

Q66. How many years have you been working at this school?

- Less than one year
- 1-3 years
- 4-6 years
- More than 6 years

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – Food Service Director Survey
(continued)**

- Not applicable. Please explain:

Q67. What is your educational background?

- High school graduate
- College graduate, in what area?
- Master's degree, in what area?
- Doctoral degree, in what area?
- Other

Q68. Do you have any of the following?

- Nutrition-related degree
- Certification/credentialing from the state other than sanitation license. Please specify:
- Certification/credentialing from the School Nutrition Association
- None of the above

Q69. Do you have a professional license to serve as a certified dietary manager?

- Yes
- No

Q70. Which of the following certifications do you have?

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – Food Service Director Survey
(continued)**

<input type="checkbox"/> ServSafe® Food Protection Manager Certification by the National Restaurant Association Educational Foundation	
<input type="checkbox"/> Certified Professional Food Manager by Experior® Assessments, LLC	
<input type="checkbox"/> Certified Food Safety Manager™ by the National Registry of Food Safety Professionals	
<input type="checkbox"/> State or local health agency Food Handler’s Card	
<input type="checkbox"/> Other <input type="text"/>	
<input type="checkbox"/> Not applicable	
<p>Q71. During the past two years, did you receive staff development on...</p>	
<input type="checkbox"/> Menu planning for healthy meals	<input type="checkbox"/> Competitive food policies to create a healthy food environment
<input type="checkbox"/> Cultural diversity in meal planning	<input type="checkbox"/> Financial management
<input type="checkbox"/> Implementing the Dietary Guidelines for Americans in school meals	<input type="checkbox"/> Personnel management
<input type="checkbox"/> Using the cafeteria for nutrition education	<input type="checkbox"/> Facility design and layout, including equipment selection
<input type="checkbox"/> Food service for students with dietary needs	<input type="checkbox"/> Food safety
<input type="checkbox"/> Selecting and ordering foods	<input type="checkbox"/> Procedures for food-related emergencies such as choking or severe food allergy reactions
<input type="checkbox"/> Healthy food preparation methods	<input type="checkbox"/> Using Hazard Analysis and Critical Control Points or HACCP
<input type="checkbox"/> Increasing the percentage of students participating in school meals	<input type="checkbox"/> Food bio-security, that is, the prevention of intentional contamination of food to cause illness
<input type="checkbox"/> Making school meals more appealing	<input type="checkbox"/> Procedures for responding to food recalls
<input type="checkbox"/> Customer service	<input type="checkbox"/> Personal safety for food service staff
<p>Q72. Which of these topics would you like to receive further staff development on?</p>	
<input type="checkbox"/> Menu planning for healthy meals	<input type="checkbox"/> Competitive food policies to create a healthy food environment
<input type="checkbox"/> Cultural diversity in meal planning	<input type="checkbox"/> Financial management
<input type="checkbox"/> Implementing the Dietary Guidelines for	<input type="checkbox"/> Personnel management

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Food Service Director Survey
(continued)

Americans in school meals

- | | |
|--|---|
| <input type="checkbox"/> Using the cafeteria for nutrition education | <input type="checkbox"/> Facility design and layout, including equipment selection |
| <input type="checkbox"/> Food service for students with dietary needs | <input type="checkbox"/> Food safety |
| <input type="checkbox"/> Selecting and ordering foods | <input type="checkbox"/> Procedures for food-related emergencies such as choking or severe food allergy reactions |
| <input type="checkbox"/> Healthy food preparation methods | <input type="checkbox"/> Using Hazard Analysis and Critical Control Points or HACCP |
| <input type="checkbox"/> Increasing the percentage of students participating in school meals | <input type="checkbox"/> Food bio-security, that is, the prevention of intentional contamination of food to cause illness |
| <input type="checkbox"/> Making school meals more appealing | <input type="checkbox"/> Procedures for responding to food recalls |
| <input type="checkbox"/> Customer service | <input type="checkbox"/> Personal safety for food service staff |

Additional comments or questions

Q73. Any additional questions or comments that you would like us to know, please write them below.

APPENDIX B: Final Versions of School Nutrition Environment Surveys – Community Worker Survey
(continued)



Survey information and confidentiality statement

Dear Community Worker,

The purpose of this research survey is to obtain information about a school to see if there were any changes in opinion from the previous year about the school's nutrition environment. This research is being conducted by Dr. Karen Chapman-Novakofski of the Department of Food Science and Human Nutrition at the University of Illinois.

This survey contains 32 questions and takes about 15-20 minutes to complete. We ask that you complete the survey before June 12, 2015.

Completing this survey is voluntary. You do not need to complete the whole survey if you do not wish to. There is no penalty or discontinuance of participation in any University of Illinois-affiliated programs if you decline. There are no known risks to completing this survey outside those of daily life. Results may be aggregated to be presented at a scientific conference or in a scientific journal.

If you have a question or need assistance in completing the survey, please call Natalie Masis, Dr. Chapman-Novakofski's graduate student, at (650) 296-8197 or e-mail her at masis2@illinois.edu. If you would prefer a paper version of the survey, please let us know below where you would like it to be sent. You can send responses to us at: 238 Bevier Hall, 905 S Goodwin Ave, Urbana, IL 61801. We will provide a stamped envelope.

If you have any questions about your rights as a participant in this study or any concerns or complaints, please contact the University of Illinois Institutional Review Board at (217) 333-2670 (collect calls will be accepted if you identify yourself as a research participant) or via email at irb@illinois.edu.

PLEASE READ CAREFULLY BEFORE PROCEEDING. By clicking the next button, you indicate you have read and understand the above and voluntarily agree to participate in this study.

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – Community Worker Survey
(continued)**

If you prefer a paper copy of this survey instead, please write in the address we should send it to below (if NOT, please leave it BLANK):



Instructions

Instructions

- Please be as accurate and honest as possible.
- It is realistic to expect that your school has both strengths and weaknesses in these areas.
- The information you provide will not be used to audit or punish school staff.
- Please answer questions for your current school year unless otherwise noted.
- There will be space at the end for additional comments or questions.

Nutrition education

Q1. Which of the following is true at your school?

Mark all that apply

- Posters about healthy eating can be found throughout the school
- Bulletin boards feature healthy eating information
- School announcements include messages about healthy eating
- School staff (i.e. principal, teachers, food service workers, etc) provide positive role modeling by hosting events that serve healthy foods
- None of the above

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – Community Worker Survey
(continued)**

Q2. In your opinion, do the students in your school receive:

- Too little nutrition education
- The right amount of nutrition education
- Too much nutrition education
- I don't know

Q3. Do you teach nutrition?

- Yes
- No

Q4. What tools do you use to teach nutrition?

Mark all that apply

- Curriculum guides
- Supplementary materials
- Newsletters or magazines
- Textbooks
- Audio and visual aids
- Computer software
- Culturally sensitive resources
- Other

Q5. What tools would be helpful to teach nutrition?

Mark all that apply

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – Community Worker Survey
(continued)**

- Curriculum guides
- Supplementary materials
- Newsletters or magazines
- Textbooks
- Audio and visual aids
- Computer software
- Culturally sensitive resources
- Other

Q6. How many times per school year do you teach nutrition?

Times per year

Q7. How long do you teach per lesson?

- Less than 30 minutes
- 30 minutes - 1 hour
- More than 1 hour
- Varies. How so?

Q8. Are you required to report to your district the number of minutes that you teach nutrition for each grade level?

- Yes
- No
- I don't know

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – Community Worker Survey
(continued)**

Q9. When you teach nutrition, does it correspond with the English-language arts, math or other standards of the Common Core or Illinois Learning Standards (i.e. are there nutrition competencies that you have to teach)?

- Yes
- No
- I don't know

Q10. The statements below are related to the nutrition competencies of the Illinois Learning Standards or Common Core.

Please select one for each question.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Not applicable	I don't know
I do not have the resources (curriculum, educational materials, funding) needed to adequately teach nutrition competencies to my students.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have the time needed to adequately teach nutrition competencies to my students.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When needed, I have access to professionals to assist in teaching nutrition competencies to my students.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
School administration has provided resources (curriculum, education materials, funding) for teaching nutrition competencies.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Not applicable	I don't know
I know how to integrate nutrition competencies with other subject areas into my lesson plans.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – Community Worker Survey
(continued)**

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Not applicable	I don't know
My school administration evaluates how well I incorporate nutrition competencies into my lesson plans.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My immediate supervisor has given me recognition for a job well done on incorporating nutrition competencies into my lesson plans.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q11. Have you used, or do you plan to use, the following strategies to involve parents in the nutrition education of their children?

	Yes	No	No, but intend to	Not applicable
Sending home educational materials to help parents learn about nutrition or teach their children about nutrition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inviting parents to attend nutrition classes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inviting parents to attend special events, such as School Lunch Week or tasting parties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inviting parents in nutrition-related careers to speak to the class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Asking parents to give in-class demonstrations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Asking parents to send healthful snacks to school	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Offering nutrition workshops or screening services for parents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Communicating nutrition information

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – Community Worker Survey
(continued)**

Q12. Do you communicate food and nutrition information to parents?

- Yes
- No

Q13. How do you communicate this information to parents?

Mark all that apply

- Newsletters
- Phone calls
- Classes
- Parent-teacher association (PTA)
- Signs posted around school
- Student orientation
- Student handbook
- Announcements at school events
- Other

Q14. Do you write newsletters to distribute to parents?

- Yes
- No

Q15. What topics do you discuss in your newsletters?

- Classroom updates
- Nutrition information
-

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – Community Worker Survey
(continued)**

Upcoming events

- Other

Q16. Where do you get your nutrition information?

- Curriculum guides

- Internet

- Books

- Other

School health environment

Q17. During the school day, do students have access to working drinking fountains in any of the following locations?

Mark all that apply

- Cafeteria

- Gymnasium/locker rooms

- Elsewhere at school

- No drinking fountains

- I don't know

Q18. Does your school currently have a garden (fruit and/or vegetable) that students participate in?

- Yes

- No

- I don't know

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – Community Worker Survey
(continued)**

Q19. Please indicate all garden-related activities that your students have the opportunity to participate in:

Mark all that apply

- Garden club (i.e. planting, tending, or harvesting from the garden)
- Kitchen classroom (i.e. cooking or eating food grown in garden)
- Curriculum (use of garden to teach different subjects)
- Other

School policies

Q20. Your school has a policy that...

Mark all that you know of

- Prohibits use of food as a reward
- Prohibits use of food coupons (i.e. free meal after reading 20 books) as a reward
- Prohibits withholding food as a punishment
- States that predominantly healthy food/beverages are offered for classroom celebrations/parties
- Other
- No policies on food exist
- I don't know

Q21. In the classrooms you work in, there are policies that have rules on...

- Snacks in classrooms
- Classroom parties or celebrations
-

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – Community Worker Survey
(continued)**

Other

I don't know

School wellness policy

Q22. Do you know if there is a school wellness policy?

Yes

No

Q23. The statements below are related to your school wellness policy.

Please select one for each question.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Not applicable	I don't know
I am in favor of the school wellness policy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
School administration has provided me with adequate time to attend in-service training on the school wellness policy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My lesson plans include nutrition competencies supporting the school wellness policy criteria.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If changes are made to the school wellness policy, I will have an opportunity to give input.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In-services/professional developments are provided for me if any changes occur to the school wellness policy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To comply with the school wellness policy, I have been provided examples on how to incorporate nutrition competencies into my lesson plans.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – Community Worker Survey
(continued)**

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Not applicable	I don't know
I devote more teaching time to nutrition competencies because of the school wellness policy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have adopted all the school wellness policy's guidelines that apply to community workers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Not applicable	I don't know
All community workers have implemented all the school wellness policy's guidelines that apply to them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The school wellness policy will evolve to meet future health needs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Community workers at my school are in favor of the school wellness policy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My school administration demonstrates support for the school wellness policy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The school wellness policy is providing opportunities for students to practice healthy living while at school.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The school wellness policy is having a positive impact on student health.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My school has successfully implemented the school wellness policy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The school wellness policy will still be part of the school environment in 5 years.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Not applicable	I don't know
Information about you and your school							

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – Community Worker Survey
(continued)**

Q24. Information about your school

Name of school

Name of your school district

County of school district

Q25. What grades are in this school?

Kindergarten

1st grade

2nd grade

3rd grade

4th grade

5th grade

6th grade

Other

Q26. What is your educational background?

High school graduate

College graduate, in what area?

Master's degree, in what area?

Doctoral degree, in what area?

Other

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – Community Worker Survey
(continued)**

Q27. How many years have you been working at this school?

- Less than one year
- 1-3 years
- 4-6 years
- More than 6 years
- Not applicable; please explain:

Q28. Average number of students per class

Q29. Do you receive continuing education credit?

- Yes
- No
- I don't know

Q30. Where do you receive continuing education credit?

Q31. How many hours of continuing education credit do you receive per year?

- 1-5
- 6-20
- 21 or more

**APPENDIX B: Final Versions of School Nutrition Environment Surveys – Community Worker Survey
(continued)**

Additional questions or comments

Q32. Any additional questions or comments that you would like us to know, please write them below.

**APPENDIX B: IRB Approval Letter for Distribution of School Nutrition Environment Surveys
(continued)**

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Office of Vice Chancellor for Research
Institutional Review Board
528 East Green Street
Suite 203
Champaign, IL 61820



May 12, 2014

Karen Chapman-Novakofski
Food Science & Human Nutrition
343 Bevier Hall
905 S Goodwin Ave
M/C 182

RE: *Nutrition Environmental Survey of Schools*
IRB Protocol Number: 14805

EXPIRATION DATE: 05/11/2017

Dear Dr. Chapman-Novakofski:

Thank you for submitting the completed IRB application form for your project entitled *Nutrition Environmental Survey of Schools*. Your project was assigned Institutional Review Board (IRB) Protocol Number 14805 and reviewed. It has been determined that the research activities described in this application meet the criteria for exemption at 45CFR46.101(b)(2).

This determination of exemption only applies to the research study as submitted. Please note that additional modifications to your project need to be submitted to the IRB for review and exemption determination or approval before the modifications are initiated.

We appreciate your conscientious adherence to the requirements of human subjects research. If you have any questions about the IRB process, or if you need assistance at any time, please feel free to contact me or the IRB Office, or visit our website at <http://www.irb.illinois.edu>.

Sincerely,

A handwritten signature in black ink that reads "Rebecca Van Tine".

Rebecca Van Tine, MS
Assistant Human Subjects Research Specialist, Institutional Review Board

c: Jennifer McCaffrey
Natalie Masis
Jessica Gadowski;

APPENDIX B: IRB Approval Letter for Distribution of School Nutrition Environment Surveys
(continued)

4/30/2017

IRB #14805 RA-1 Approval

IRB #14805 RA-1 Approval

Van Tine, Rebecca E

Sent: Friday, May 15, 2015 3:12 PM

To: Masis, Natalie M

Cc: Chapman-Novakofski, Karen Marie; McCaffrey, Jennifer

Good Afternoon:

This message serves to supply UIUC IRB approval for the minor modifications (*Research Amendment # 1*) being made to your exempt application **IRB #14805: Nutrition Environmental Survey of Schools**. This amendment approves the following changes:

- Updating research procedures to run re-send the surveys to compare if there were any changes in views/opinions from the survey sent last year.

EXPIRATION DATE: 05/11/2017

None of the revisions have affected the risk determination for this study. Therefore, the study will remain approved under **Exempt Category 2**. You are now free to continue your study with the above revisions. If you have any questions, please don't hesitate to ask.

Sincerely,

Rebecca Van Tine

Rebecca Van Tine, MS

Human Subjects Research Specialist | Office for the Protection of Research Subjects

University of Illinois, Urbana-Champaign

528 E. Green Street, Suite 203, MC-419 | Champaign, IL 61820

Direct: (217) 244.7937 | Fax: (217) 333.0405 | Email: vantine2@illinois.edu

IRB Email: irb@illinois.edu | IRB Website: <http://irb.illinois.edu/>

From: Masis, Natalie M

Sent: Friday, May 15, 2015 12:49 AM

To: Institutional Review Board

Cc: Chapman-Novakofski, Karen Marie; McCaffrey, Jennifer

Subject: Amendment to IRB #14805

To whom it may concern,

I am submitting an amendment for the IRB submission #14805, along with the previous approval letter and changes to the original IRB Exempt Application.

Please let me know if I need to provide any further information. Thank you!

Best,

Natalie Masis, MS

Doctoral Student

Division of Nutritional Sciences

University of Illinois at Urbana-Champaign

**APPENDIX B: Information Letter to Participants about School Nutrition Environment Surveys
(continued)**

UNIVERSITY OF ILLINOIS
AT URBANA - CHAMPAIGN

Department of Food Science and Human Nutrition
College of Agricultural, Consumer
and Environmental Sciences
260 Bevier Hall
905 South Goodwin Avenue
Urbana, IL 61801



Information Letter about the Research Entitled: Nutrition Environmental Survey of Schools

As per federal research requirements and the University of Illinois at Urbana-Champaign's Institutional Review Board, you are receiving this informational letter concerning the purpose and procedures for this research project, as well as acknowledgment that your participation is voluntary and who you may contact should you have questions.

Nutrition Environmental Survey of Schools is a research project under the direction of Dr. Karen Chapman-Novakofski, who is a Professor in the Department of Food Science and Human Nutrition, as well as Dr. Jennifer McCaffrey, Assistant Dean, Family and Consumer Sciences from the University of Illinois Extension.

The purpose of having you complete our online survey is to develop a better understanding of your school's nutrition environment.

We are asking you to answer the questions as honestly and accurately as possible. These questions have been compiled from past school environmental surveys to assess the school environment regarding nutrition education, breakfast and lunch options, and general school policies. Answering these questions will allow us to have a greater overview of your school's nutrition environment. Once we are able to gauge your school's nutrition environment, we will start developing intervention materials that will better serve your school using the resources available.

We ask that you complete the survey within two weeks. The survey should take between 15-30 minutes. If you prefer a paper-copy of the survey, please let us know and we can provide a paper copy and a stamped envelope for you to return the survey to us.

Federal law requires that you understand your participation is voluntary.

If you have further questions about the survey, please contact Natalie Masis, at (650) 296-8197 or masis2@illinois.edu. If you have questions about this research, please contact Dr. Karen Chapman-Novakofski at (217) 244-2852 or kmc@illinois.edu, or the Institutional Research Board chair or director at irb@illinois.edu or (217) 244-7937 or fax (217) 333-0405. If you have questions about the Federal Regulations pertaining to human research, please contact the IRB at the previous contacts. The IRB or Dr. Chapman-Novakofski will accept a collect call if you identify yourself as a research participant.

telephone 217-244-4498 • fax 217-265-0925



**Classroom Nutrition Environment
Observation**

**Training Procedures
2014-2015**

APPENDIX C: Classroom and Lunchroom Observation Training and Reference Protocols *(continued)*

Objectives

The objective of this training is to go over methods of what to observe in the classroom to better assess its nutrition environment. Trainees will learn where to look for objects in the classroom that are pertinent and related to nutrition. Further, this training session will allow for an opportunity for trainees to ask questions about objects that are related to nutrition and should be account for in their documentation of their observation.

Duration of training: 20 minutes

Materials

- Dry erase board/dry erase board markers/eraser
- Sample image of classroom (see last sheet)
- Printed copy of attached Classroom Nutrition Environment Observation Form Protocol and Form
- Additional copies of Classroom Nutrition Environment Observation Form
- Clipboards for use in observation

List of items to look for:

- Posters
- Bulletin boards (including border decorations on bulletin boards)
- Handmade drawings by children
- Plush toys
- Wall decorations
- Toys
- Big flip books
- Rugs
- Kitchen sets
- Food models
- Fruit-shaped chairs, etc.

Topics to cover

- 1) Overview of project/objectives of classroom environment observation
- 2) Examples of nutrition messages and food policies
- 3) Items that would be observed
- 4) Instructions (on Protocol Sheet)
 - a. When to do observations:
 - i. Classrooms may be observed when no students are in the classroom. This would help prevent disruption in the classroom.
 - b. Please make sure to observe classroom TWICE in case you may have missed something.

page 2

APPENDIX C: Classroom and Lunchroom Observation Training and Reference Protocols *(continued)*

- c. Form information:
 - i. One form must be completed per classroom.
 - ii. Please note time start and time end for each observation
 - iii. Additional comments can be written at the bottom of the page or on the back of the pages.
 - iv. Divide classrooms if there are more than 2 observers. Have overlapped classrooms to assess inter-rater reliability.
 - 1. If only 2 observers, have observers observe same classrooms at different times (not at the same time).
- 5) Etiquette in the classroom:
 - a. Please let teacher know that you are planning to look around the classroom for items related to food/nutrition.
 - b. There may be further objects that are not readily visible. If they are in plain sight but you would like to see if you can access them more clearly, please ask teacher if this would be possible.
- 6) Practice classroom from image (pass out printed sheet or project image on white board if projector is available)
- 7) Questions/concerns

APPENDIX C: Classroom and Lunchroom Observation Training and Reference Protocols *(continued)*



Classroom Nutrition Environment Observation

Sample image of classroom:





**Classroom Nutrition Environment
Observation**

Reference Protocol

2014-2015

APPENDIX C: Classroom and Lunchroom Observation Training and Reference Protocols (continued)



Classroom: Nutrition Environment Observation Protocol

This observation tool serves to identify the nutrition environment of the classroom. It is used to identify any elements that may influence the intervention or consumption of fruits and vegetables. Nutrition-related elements should be identified and may be related to healthy eating, fruits and vegetables, or other nutrition-related topics.

Examples of nutrition-related messages or topics include:

- Eat a variety of foods
- Eat more fruits
- Eat more vegetables
- Eat more whole grains
- Drink more dairy
- Healthy eating

Food policies may include the following:

- Peanut-free classroom
- Snack time rules
- Rules on classroom parties

Some items that may be in the classroom that may have these messages/topics include:

- Posters
- Bulletin boards (including border decorations on bulletin boards)
- Handmade drawings by children
- Plush toys
- Wall decorations/wall borders
- Bookshelves
- Toys
- Teacher/student desks
- Big flip books
- Rugs
- Kitchen sets
- Food models
- Fruit-shaped chairs, etc.

Look around the classroom for any nutrition-related items and write them below. We want to know what is available in the classroom.

We also want this to be systematic and replicable among several observers. It is important to be thorough.

Materials needed:

- Watch
- Clipboard
- Additional Classroom Nutrition Environment Observation Forms

APPENDIX C: Classroom and Lunchroom Observation Training and Reference Protocols *(continued)*



INSTRUCTIONS

As you walk in the classroom,

1. Please write the details on your name, school name, teacher name, room number, and the time you started (and at the end, the time you ended the observation).
2. Notice the door and door frame. Indicate on the form if any messages are there. If not sure whether it is a nutrition or food-related message, record it and indicate this. Look on both sides of the door.
3. Enter the room and look at the ceiling. Is there anything hanging from the ceiling?
4. If there are windows, are any message or pictures on the windows?
5. Walls, start with the wall the door is on; record all four walls, starting towards your left as you walk through the door, facing inside the room. Indicate wall borders near the ceiling, bulletin boards, and chalk boards. Omit bookshelves for now.
6. Look at the floor. Are there any nutrition or food related messages taped to the floor?
7. Teacher desk/workspace. Are there any messages or food models in this area/ on surfaces? Do not open drawers.
8. Student desks/tables. Are there any messages or food models/pictures visible on these surfaces?
9. Bookshelves. Note how many book shelves are in the room. Note each bookshelf my number and whether there are nutrition or food-related books-if so, indicate how many, and titles.
10. Recheck what you have recorded, starting with #1. Note any area or item that does not fit the above categories.

Please check that the following has been observed:

- | | |
|---|---|
| <input type="checkbox"/> Walls (4 walls) | <input type="checkbox"/> Windows (i.e. window decals) |
| <input type="checkbox"/> Doors | <input type="checkbox"/> Desks |
| <input type="checkbox"/> Ceiling (i.e. overhanging objects) | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Bookshelves | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Cabinets/cupboards | |

APPENDIX C: Classroom and Lunchroom Observation Training and Reference Protocols *(continued)*



Classroom: Nutrition Environment Observation Form

Observer name		Date of observation	
School name		Room number	
Teacher name		Grade level	
Time start		Time end	

Please refer to the protocol as a guide of where to look. Indicate what nutrition or food-related message you found at each particular area. If it is a food-policy related message (i.e. policies on classroom parties, rules on snacks) please mark with a **STAR (*)**.

1) Door and door frame

Display type (i.e. poster, bulletin board, drawings)	Nutrition or food-related message/topic
1	
2	
3	
4	
5	
6	

*If more, please add to the back of the sheet.

2) Ceiling

Display type (i.e. poster, bulletin board, drawings)	Nutrition or food-related message/topic
1	
2	
3	
4	
5	
6	

*If more, please add to the back of the sheet.

3) Windows

Display type (i.e. poster, bulletin board, drawings)	Nutrition or food-related message/topic
1	
2	
3	
4	
5	
6	

*If more, please add to the back of the sheet.

APPENDIX C: Classroom and Lunchroom Observation Training and Reference Protocols *(continued)*



4) Walls (all four walls)

Display type (i.e. poster, bulletin board, drawings)	Nutrition or food-related message/topic
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

*If more, please add to the back of the sheet.

5) Floor

Display type (i.e. poster, bulletin board, drawings)	Nutrition or food-related message/topic
1	
2	
3	
4	
5	
6	

*If more, please add to the back of the sheet.

6) Teacher desk/workspace

Display type (i.e. poster, bulletin board, drawings)	Nutrition or food-related message/topic
1	
2	
3	
4	
5	
6	

*If more, please add to the back of the sheet.

7) Student desks/tables

Display type (i.e. poster, bulletin board, drawings)	Nutrition or food-related message/topic
1	
2	
3	
4	
5	
6	

*If more, please add to the back of the sheet.

APPENDIX C: Classroom and Lunchroom Observation Training and Reference Protocols (continued)



8) Bookshelves (number of bookshelves: _____)

Display type (i.e. poster, bulletin board, drawings)	Nutrition or food-related message/topic
1	
2	
3	
4	
5	
6	

*If more, please add to the back of the sheet.

10) Other location: _____

Display type (i.e. poster, bulletin board, drawings)	Nutrition or food-related message/topic
1	
2	
3	
4	
5	
6	

*If more, please add to the back of the sheet.

11) Please check that the following has been observed:

- | | |
|---|---|
| <input type="checkbox"/> Walls (4 walls) | <input type="checkbox"/> Windows (i.e. window decals) |
| <input type="checkbox"/> Doors | <input type="checkbox"/> Desks |
| <input type="checkbox"/> Ceiling (i.e. overhanging objects) | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Bookshelves | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Cabinets/cupboards | |

Other comments or other observations:



**Lunchroom Nutrition Environment
Observation**

**Training Procedures
2014-2015**

APPENDIX C: Classroom and Lunchroom Observation Training and Reference Protocols *(continued)*

Objectives

The objective of this training is to go over methods of observations in the lunchroom to assess its nutrition environment. Topics that will be discussed will be what nutrition marketing to look for within the lunchroom and where, assessing placement of lunchroom items, use of timer for calculation of duration of lunchtime and lunch flow, how to randomly select children to observe during lunch line, and additional comments/concerns.

Duration of training: 20 minutes

Materials

- Dry erase board/dry erase board markers/eraser
- Sample images of lunchroom of schools (see last sheet)
- Printed copy of attached Lunchroom Nutrition Environment Observation Protocol and Form
- Additional copies of Lunchroom Nutrition Environment Observation Form
- Clipboards for use in observation

List of items to look for:

- Posters
- Bulletin boards (including border decorations on bulletin boards)
- Handmade drawings by children
- Wall decorations
- Fruit-shaped chairs, etc.

Topics to cover

- 1) Overview of project/objectives of lunchroom environment observation
- 2) Examples of nutrition messages and food policies
- 3) Items that would be observed
- 4) Instructions (on Protocol Sheet)
 - a. Before lunch please complete the information indicated on the form.
 - i. Tell food service staff that you will be observing.
 - ii. Ask one of the lunchroom monitors if they can inform you when the different grade levels enter the room.
 - iii. Salad bar: If salad bar available in school, please indicate placement of fruits and vegetables according to lunch line as a WHOLE (including salad bar, even if lines are separate).
 - b. During lunch, please position yourself on one side of the lunchroom that is least disruptive.
 - i. If among 3 observers, choose a side where lunchroom is visible but not at the same side of the other observers (one observer per side)

APPENDIX C: Classroom and Lunchroom Observation Training and Reference Protocols (continued)

- c. Form information:
 - i. One form must be completed per observer and lunchroom setting.
 - ii. Please note time start and time end for each observation and the time lunch time started.
 - iii. Things to note:
 - 1. Positioning of observer: Please indicate what side of the lunchroom you are at and indicate this in the lunchroom layout (question #2) by placed a star on the side you are observing, relative to the lunchroom layout you drew in.
 - iv. Additional comments can be written at the bottom of the page or on the back of the pages.
 - v. Make sure to make your notes as detailed as possible.
 - 1. If more helpful, jot down a few phrases (field notes) that can help you remember what you saw if you do not have time to write down detailed sentences.
- 5) Etiquette in the lunchroom (tips for silent observer):
 - a. Know where to stand or sit without being in the way
 - i. Ask food service staff where it be most appropriate to stand. Preferably, one observer at a different location in lunchroom to assess all sides of the lunchroom.
 - b. Child's questions
 - i. If a child asks what you are doing you can say "I'm doing my work" or "I'm taking a few notes so that I can remember what happens" or something else that feels natural and is true but that doesn't make the kids feel uncomfortable.
- 6) Practice using form from lunchroom image of schools or sample schools (pass out printed sheet or project image on white board if projector is available)
 - a. Use of timer to assess lunch line times if possible.
- 7) Questions/concerns

Reference:

Guidelines for Observing Young Children in School" by Margery B. Franklin, 2004.

APPENDIX C: Classroom and Lunchroom Observation Training and Reference Protocols *(continued)*



Lunchroom Nutrition Environment Observation

Sample image of Army Trail Elementary School (Addison, IL):





**Lunchroom Nutrition Environment
Observation**

Reference Protocol

2014-2015

APPENDIX C: Classroom and Lunchroom Observation Training and Reference Protocols (*continued*)



Lunchroom: Nutrition Environment Observation Protocol

This observation tool serves to identify the nutrition environment of the lunchroom. It is used to identify any elements that may influence the intervention or consumption of fruits and vegetables. Nutrition-related elements should be identified and may be related to healthy eating, fruits and vegetables, or other nutrition-related topics.

Examples of nutrition-related messages or topics include:

- Eat a variety of foods
- Eat more fruits
- Eat more vegetables
- Eat more whole grains
- Drink more dairy
- Healthy eating

Food policies may include the following:

- Rules related to fruits and vegetables
- Items to get in the lunch line

Some items that may be in the lunchroom that may have these topics include:

- Posters
- Bulletin boards (including border decorations on bulletin boards)
- Handmade drawings by children
- Wall decorations
- Fruit-shaped chairs, etc.

The observation form is to be filled out according to the time period in which the lunchroom is observed, separated by sections "Before Lunch" and "During Lunch." This makes it simpler to evaluate sections which may be observed before the lunch periods starts, and what to observe during the lunch period.

Some sections require time to be taken in the form of *seconds* or *minutes*. For these sections, please use a stopwatch or a clock.

Materials needed:

- Stopwatch or clock to evaluate time
- Clipboard
- Additional Lunchroom Nutrition Environment Observation Forms

APPENDIX C: Classroom and Lunchroom Observation Training and Reference Protocols (continued)



INSTRUCTIONS

Before Lunch

As you walk into the lunchroom,

1. Tell the food service staff that you will be observing the lunch environment and the lunch lines.
2. If possible, ask one of the lunchroom monitors/helpers to let you know when the students enter the lunchroom depending on the various grade levels (i.e. "first grade has just entered").
3. Please write the details on your name, school name, grade levels of the lunchroom and the time start and time end of the whole observation.
4. Before lunch, please complete the questions on the form.
 - a. Notice the doors, windows, ceilings, tables, and other areas where there may be nutrition marketing.
 - b. Look at the floor if there are any objects painted on the floor about nutrition/food.
 - c. SALAD BAR: If salad bar available in school, please indicate placement of fruits and vegetables according to lunch line as a WHOLE (including salad bar, even if lines are separate).

During Lunch

5. Positioning of observer: During lunch, please position yourself on one side of the lunchroom that is least disruptive.
 - a. Note your position on the observation form (question #2) by indicating a STAR (*) on the side you are observing, relative to the lunchroom layout you drew in.
6. Have timer ready for assessing time it takes for children to go through the line.
7. Please write time start and end of lunch time.
8. Additional comments can be written at the bottom of the page or on the back of the pages.
 - a. Make sure to make your notes as detailed as possible.
 - i. If more helpful, jot down a few phrases (field notes) that can help you remember what you saw if you do not have time to write down detailed sentences.

Etiquette in the lunchroom (tips for silent observer):

9. Know where to stand or sit without being in the way
 - a. Ask food service staff where it be most appropriate to stand. Preferably, one observer at a different location in lunchroom to assess all sides of the lunchroom.
10. Child's questions
 - a. If a child asks what you are doing you can say "I'm doing my work" or "I'm taking a few notes so that I can remember what happens" or something else that feels natural and is true but that doesn't make the kids feel uncomfortable.

APPENDIX C: Classroom and Lunchroom Observation Training and Reference Protocols *(continued)*



Lunchroom Environment Observation Form

Observer name		Date of observation	
School name		Grade levels	
Time start		Time end	

BEFORE LUNCH

- 1) Number of lunchroom tables: _____
 - Seats
 - Benches
 - Other: _____

- 2) Lunchroom layout: Please draw the placement of the cafeteria lunch line below. You do not need to include tables, just the placement of the main lunch line, salad bar, or other offerings, in relation to the entrance. Please label entrance and exit. *Place a STAR (*) of where you will be standing during the observation.*

A large, empty rectangular box with a black border, intended for drawing the cafeteria lunch line layout.

Adapted from Food Service Worker Survey and evaluation tools from Project ReFresh, University of Maryland Extension

APPENDIX C: Classroom and Lunchroom Observation Training and Reference Protocols *(continued)*



- 3) Are there any nutrition or health messages displayed in the cafeteria?
 Yes
 No

- 4) IF YES, please list the nutrition or food-related messages or policies displayed and in what form:

Display type (i.e. poster, bulletin board, food tent)	Nutrition or food-related message
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

*If more, please add to the back of the sheet.

- 5) Are there policies/rules posted in the lunchroom related to food, discipline, etc?
 Yes
 No

- 6) IF YES, please list the nutrition or food-related policies:

Policy/rules (i.e. noise level, running around, throwing food, etc)
1
2
3
4
5
6
7
8
9
10

*If more, please add to the back of the sheet.

- 7) Is there a menu posted in the cafeteria?
 Yes
 No

Adapted from Food Service Worker Survey and evaluation tools from Project ReFresh, University of Maryland Extension

APPENDIX C: Classroom and Lunchroom Observation Training and Reference Protocols *(continued)*



- 8) Are there any nutrition messages or nutrition content included with the menu?
 Yes
 No

- 9) A la cart items offered?
 Yes
 No

- 10) If YES, is there an a la carte menu in the cafeteria?
 Yes
 No

- 11) If YES, which of the following foods are offered on the a la carte menu in the cafeteria? (check all that apply)
 Fruit
 Whole grains
 Water
 Vegetables
 Milk
 Other (please specify): _____
 Other (please specify): _____

- 12) Is there a salad bar (a separate cart where fruits and vegetables are placed)?
 Yes
 No
 Other: fruits and vegetables are within the lunch line
 Other: _____

- 13) If YES, please list what the salad bar offers:

Food item	Fresh/Frozen/Canned?

- 14) Choices of main entrees offered for lunch:
 1 2 3 4 and above

Adapted from Food Service Worker Survey and evaluation tools from Project ReFresh, University of Maryland Extension

APPENDIX C: Classroom and Lunchroom Observation Training and Reference Protocols *(continued)*



15) In the food line, where are fruits located? (check 1 box)

- Front of line
- Middle of line
- End of line
- Other : _____

16) In the food line, where are vegetables located? (check 1 box)

- Front of line
- Middle of line
- End of line
- Other : _____

17) Who supervises children during lunch? (check all that apply)

- Classroom teachers
- Lunchroom monitors/helpers
- Room parents/parent volunteers
- Administrators
- Food service staff
- Other (specify): _____

18) Number of lunchroom monitors/helpers:

- None
- 1-2
- 3-4
- 5 and above

DURING LUNCH

LUNCHTIME START: _____ a.m./p.m.

LUNCHTIME END: _____ a.m./p.m.

19) How long does it take to serve lunch during one lunch period?

_____ minutes

20) Are there assigned tables for children to sit according to grade level?

- Yes
- No

21) If yes, are they:

- Labeled
- No labels
- Other: _____

22) Number of children per table (approximately): _____

23) How full is the cafeteria seating during the lunch period (at peak capacity)? (check 1 box)

- Less than 50% full
- 50-75% full
- 76-100% full
- Over capacity

Adapted from Food Service Worker Survey and evaluation tools from Project ReFresh, University of Maryland Extension

APPENDIX C: Classroom and Lunchroom Observation Training and Reference Protocols (continued)



24) Other incentives offered during lunchtime:

- Stickers Buttons Other: _____ Other: _____

25) How long does each child have to go through the lunch line (please randomly select 10 children to observe during K-2nd grade lunch period):

Time	Time
Seconds/Minutes	Seconds/Minutes
Seconds/Minutes	Seconds/Minutes
Seconds/Minutes	Seconds/Minutes
Seconds/Minutes	Seconds/Minutes
Seconds/Minutes	Seconds/Minutes

26) How much time do students have to eat after going through the line (observe one child per grade level as they enter)?

Grade	Time
Kindergarten	Seconds/Minutes
1 st Grade	Seconds/Minutes
2 nd grade	Seconds/Minutes

27) Please describe the lunch flow (i.e. children receive hot foods first, then fruits or vegetables; two lines available, waiting period is long, crowded, etc)

28) Lunchroom style (check 1 box)

- Serve foods
 Offer foods
 Serve some, students serve themselves
 Students serve all foods

APPENDIX C: Classroom and Lunchroom Observation Training and Reference Protocols (continued)



29) Number of food components students select (i.e. 1 fruit, 1 vegetable, 1 meat, 1 grain, 1 dairy = 5 components; grain and protein may be combined in a meal but count individually as a separate food component)

- 2 or less
- 3
- 4
- 5
- 6 or more
- None

30) Are fruits and vegetable items in the cafeteria easy for students to see and reach?

- YES, easy to see and reach
- NO, hard to see and reach

Please describe food placement, including hot foods, cold foods, fruits, vegetables and other items (describe how children have access to the food):

31) Are fruits and vegetables in the cafeteria offered in such a way that they are easy for students to eat?

- YES, easy to eat
- NO, hard to eat

Please describe how the foods are or are not prepared in a way that is age-appropriate for the students:

APPENDIX C: Classroom and Lunchroom Observation Training and Reference Protocols *(continued)*



32) Describe the disposal of food during lunchtime:

33) Is the noise level controlled by an adult? Check 1 box.

Yes No

Other comments/observations:

APPENDIX C: Classroom and Lunchroom Observation IRB Approval Letter (*continued*)

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Office of the Vice Chancellor for Research

Office for the Protection of Research Subjects
528 East Green Street
Suite 203
Champaign, IL 61820



11/26/14

Karen Chapman-Novakofski
Food Science & Human Nutrition
343 Bevier Hall
905 S Goodwin Ave
M/C 182

RE: *Classroom and lunchroom environment observation of the FoodWise project: nutrition intervention in K-2nd grade*
IRB Protocol Number: 15386

Dear Dr. Chapman-Novakofski:

Thank you for submitting the completed IRB Application form for your project entitled *Classroom and lunchroom environment observation of the FoodWise project: nutrition intervention in K-2nd grade*. Your project was assigned Institutional Review Board (IRB) Protocol Number 15386 and reviewed. Your project as described includes observations of classroom and lunchroom materials as well as classroom and lunchroom environments, but does not include observations of any human interactions. As such, it has been determined that this project as described does not meet the definition of human subjects research as defined in 45CFR46(d)(f) or at 21CFR56.102(c)(e) and does not require IRB approval.

This determination only applies to the research study as submitted. Please note that modifications to your project need to be submitted to the IRB for review and status determination or approval before the modifications are initiated.

We appreciate your commitment to university policies and regulations regarding human research. If you have any questions about the IRB process, or if you need assistance at any time, please feel free to contact me, the OPRS Office, or visit our website at <http://www.irb.illinois.edu>.

Sincerely,


A handwritten signature in cursive script that reads "Rose St. Clair".

Rose St. Clair, BA
Assistant Human Subjects Research Specialist, Office for the Protection of Research Subjects

c: Natalie Masis, Jennifer McCaffrey, Jessica Gadomski

APPENDIX D: Fruit and Vegetable Preference Survey Content































The following pages contain the *Fruit and Vegetable Preference Survey* in its entirety. Following the survey are the IRB approval letters, the child oral assent script, and the parent informational letter.



DATE: _____

Fruit and Vegetable Preference Survey

*Look at each fruit and vegetable and circle a face on how much you like it.
If you don't know what it is, circle the ?*































 Broccoli	 I like it	 It's ok	 I don't like it	
 Green pepper	 I like it	 It's ok	 I don't like it	
 Carrot	 I like it	 It's ok	 I don't like it	
 Tomato	 I like it	 It's ok	 I don't like it	
 Celery	 I like it	 It's ok	 I don't like it	
 Cauliflower	 I like it	 It's ok	 I don't like it	

Child ID	Pre	Post	Grade	Gender
	✓			

page 1

APPENDIX D: Fruit and Vegetable Preference Survey (continued)






































 Green beans	 I like it	 It's ok	 I don't like it	
 Peas	 I like it	 It's ok	 I don't like it	
 Jicama	 I like it	 It's ok	 I don't like it	
 Spinach	 I like it	 It's ok	 I don't like it	
 Zucchini Squash	 I like it	 It's ok	 I don't like it	
 Cucumber	 I like it	 It's ok	 I don't like it	

Child ID	Pre	Post	Grade	Gender
	✓			

APPENDIX D: Fruit and Vegetable Preference Survey (continued)






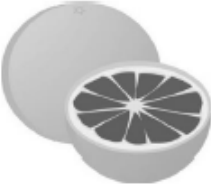



















The
FOODWISE
Project

 Blueberries	 I like it	 It's ok	 I don't like it	
 Kiwi	 I like it	 It's ok	 I don't like it	
 Raspberries	 I like it	 It's ok	 I don't like it	
 Pear	 I like it	 It's ok	 I don't like it	
 Strawberries	 I like it	 It's ok	 I don't like it	
 Grapes	 I like it	 It's ok	 I don't like it	
 Plum	 I like it	 It's ok	 I don't like it	

Child ID	Pre	Post	Grade	Gender
	✓			

APPENDIX D: Fruit and Vegetable Preference Survey (continued)



 Orange	 I like it	 It's ok	 I don't like it	
 Grapefruit	 I like it	 It's ok	 I don't like it	
 Peach	 I like it	 It's ok	 I don't like it	
 Apple	 I like it	 It's ok	 I don't like it	
 Cantaloupe	 I like it	 It's ok	 I don't like it	

Child ID	Pre	Post	Grade	Gender
	✓			

APPENDIX D: IRB Approval Letter for Fruit and Vegetable Preference Survey Distribution and Visual Estimation of FV Intake (*continued*)

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Office of the Vice Chancellor for Research

Office for the Protection of Research Subjects
528 East Green Street
Suite 203
Champaign, IL 61820



February 5, 2015

Karen Chapman-Novakofski
Food Science & Human Nutrition
343 Bevier Hall
905 S Goodwin Ave
Urbana, IL 61801

RE: *Visual estimation of fruit and vegetable consumption and preferences for fruits and vegetables for the FoodWise project: nutrition intervention in K-2nd grade*
IRB Protocol Number: 15533

Dear Dr. Chapman-Novakofski:

This letter authorizes the use of human subjects in your project entitled *Visual estimation of fruit and vegetable consumption and preferences for fruits and vegetables for the FoodWise project: nutrition intervention in K-2nd grade*. The University of Illinois at Urbana-Champaign Institutional Review Board (IRB) approved, by expedited review, the protocol as described in your IRB-1 application. The expiration date for this protocol, IRB number 15533, is 02/01/2016. The risk designation applied to your project is *no more than minimal risk*. Certification of approval is available upon request.

Copies of the attached date-stamped consent form(s) must be used in obtaining informed consent. If there is a need to revise or alter the consent form(s), please submit the revised form(s) for IRB review, approval, and date-stamping prior to use.

Under applicable regulations, no changes to procedures involving human subjects may be made without prior IRB review and approval. The regulations also require that you promptly notify the IRB of any problems involving human subjects, including unanticipated side effects, adverse reactions, and any injuries or complications that arise during the project.

If you have any questions about the IRB process, or if you need assistance at any time, please feel free to contact me at the OPRS office, or visit our Web site at <http://www.irb.illinois.edu>.

Sincerely,

A handwritten signature in blue ink that reads "Ronald A. Buck (for Anita Balgopal)".

Anita Balgopal, PhD
Director, Office for the Protection of Research Subjects

Attachment(s)

c: Jennifer McCaffrey
Natalie Masis

U of Illinois at Urbana-Champaign • IORG0000014 • FWA #00008584
telephone (217) 333-2670 • fax (217) 333-0405 • email IRB@illinois.edu

APPENDIX D: IRB Waiver of Informed Consent for IRB #15533 (continued)



University of Illinois
at Urbana-Champaign

Institutional Review Board Office
528 East Green Street, Suite 203, MC-419
Champaign, IL 61820
tel: 217-333-2670 fax: 217-333-0405
E-mail: irb@illinois.edu Web: www.irb.illinois.edu

WAIVER OR ALTERATION OF INFORMED CONSENT * (45CFR46.116(D))

ALL APPLICATIONS MUST BE TYPEWRITTEN, SIGNED, AND SUBMITTED AS SINGLE-SIDED HARD COPY. PLEASE, NO STAPLES!

Responsible Project Investigator (RPI):

Last Name: Chapman-Novakofski	First Name: Karen	Dept. or Unit: FSHN
Phone: 217-244-2852	Fax:	E-mail: kmc@illinois.edu

Project Title:

Visual estimation of fruit and vegetable consumption and preferences for fruits and vegetables for the FoodWise project: nutrition intervention in K-2nd grade

* FDA regulated research is **not eligible** for a waiver or alteration of informed consent. Research supported by the Department of Defense¹ may not be eligible for this waiver.

A consent procedure which does not include, or which alters, some or all of the elements of informed consent may be approved by the IRB under certain conditions. To request IRB approval of a waiver of the requirement to obtain informed consent completely, or of a consent procedure which does not include, or which alters, some or all of the elements of informed consent, please provide a response to **ALL** of the following questions. Please be specific in explaining why each statement is true for this research.

1. The research involves no more than minimal risk to the subjects.

No more than minimal risk is involved in answering food-related questions or having their trays photographed.. Students will not be forced to complete any activity that they may not want to do, and will be informed that they can skip questions without penalty.

2. The waiver or alteration will not adversely affect the rights and welfare of the subjects.

They can opt out of filling out questionnaires and will be notified that they can skip questions or activities without penalty.

3. The research could not practicably be carried out without the waiver or alteration.

Information is anonymous and will only be evaluated by group. Having consent forms will alter that anonymity.

4. Whenever appropriate, the subjects will be provided with additional pertinent information after participation.

We see no information they will need to know about the evaluation of the food-related questions or their lunch tray information.

- This research is not FDA regulated.
- This research is not funded by the Department of Defense.¹

RPI Signature: *Karen Chapman-Novakofski* Date: 1/25/15

IRB Member Approval: _____ Date: _____

APPROVED
FEB 02 2015

UIUC INST REVIEW BOARD

062010 rev

APPENDIX D: Child Oral Assent Script for Fruit and Vegetable Preference Survey (continued)



RECEIVED
JAN 26 2015
INST REVIEW BOARD

Child Oral Assent Script: Fruit and Vegetable Preference Survey

Hello. My name is _____. We are wanting to learn about how kids feel about fruits and vegetables. We are asking you to help because we don't know very much about what kids your age think about different fruits and vegetables.

If you agree to help us, we are going to ask you some questions about fruits and vegetables. We will be asking you questions about what you think about them. There are no right or wrong answers.

You can ask questions any time. If you decide at any time not to finish, you can ask us to stop.

Do you have any questions about what we will be doing? [If no, move on]

If you don't want to help us, that is okay. It is up to you, and no one will be upset if you don't want to help us in our project or you change your mind.

Would you like to help us in our project about fruits and vegetables?

UNIVERSITY OF ILLINOIS
APPROVED CONTENT
V.1 (12/11/11)

FEB 01 2016

APPENDIX D: Informational Letter for Parent for IRB #15533 (continued)

Dear Parent,

On behalf of the University of Illinois Extension, we would like to introduce you to a project that will try to gather feedback on the school nutrition environment. We plan to look at lunchrooms to see what fruits and vegetables children eat. The Principal, [name], has approved our doing this. On one day, we will be in the cafeteria to take photos of lunch trays after the tray is served and before the tray items are thrown away. We will do this for all kindergarten, first and second grade trays, unless you as a parent do not want your child's tray photographed, or if your child indicates to us not to photograph the tray on the day we are there. Your child's image or name will not be included in the photo. We will do this twice: once in February and again in June.

The Principal [name] has also agreed to give kindergarten, first and second grade teachers forms for their students to fill out about what fruits and vegetables they like. Your child's name will not be on the form. They will not be graded on the form. They do not need to complete the form, and the principal and teachers understand this. Not filling it out or not participating in the observation will not change anything in the classroom or their grade. This form will be given twice: once in February and again in June.

Your child's participation is voluntary. If you would not like your child to participate in this project, please contact Natalie Masis, at (650) 296-8197 or masis2@illinois.edu. If you have questions about this research, please contact Dr. Karen Chapman-Novakofski at (217) 244-2852 or kmc@illinois.edu. If you would prefer, you may also contact your child's teacher or the school administration if you would like to let the researchers know that your child cannot participate.

If you have any questions about your child's rights as a participant in this study or any concerns or complaints, please contact the University of Illinois Institutional Research Board at (217) 333-2670 (collect calls will be accepted if you identify yourself as a research participant) or via e-mail at irb@illinois.edu. This research information sheet is for you to keep.

If you DO NOT choose to have your child participate, please print your name and sign below and return to your child's teacher by xxx, 2015, or at any time you want your child to not be included.

Print Name: _____

Signature: _____ Date: _____

UNIVERSITY OF ILLINOIS
APPROVED CONTENT
5/1/15 (rev)

FEB 01 2016

APPENDIX E: Visual Estimation of Fruit and Vegetable Consumption Training Protocol

Portions of the visual estimation of fruit and vegetable consumption training protocol along with the reference protocol for the data collection proceed this appendix. The IRB letters for the collection of trained rater data and the child oral assent form follow the training protocol pages. The parent information letter is the same letter provided in Appendix D. The copyright approval form is also included in Appendix E.

The supplementary material (training protocol and reference protocol) were previously published in its entirety at:

Masis N, McCaffrey J, Johnson SL, Chapman-Novakofski K. Design and Evaluation of a Training Protocol for a Photographic Method of Visual Estimation of Fruit and Vegetable Intake among Kindergarten Through Second-Grade Students. *J Nutr Educ Behav.* 2017;49(4):346-351.e1.
doi:10.1016/j.jneb.2017.01.004.



**Visual Estimation of Fruits and
Vegetables in the Lunchroom**

Training Procedures

Part 1

2014-2015

APPENDIX E: Visual Estimation of Fruit and Vegetable Consumption Training Protocol (*continued*)

Objectives

The objective of this training is to have a training that is designed for visual estimation of fruits and vegetables in a lunchroom setting, using digital imaging technology. By using this training, observers will have knowledge on how to identify portion sizes and various photographic techniques. The training will include identifying several serving sizes of fruits and vegetables, and determining whether observers are able to accurately define the amounts served and consumed according to a 6-point Comstock scale, a scale previously used in visual estimation techniques.

Duration of training: 1-2 hours

MATERIALS NEEDED FOR SET-UP OF TRAINING

PART 1-3

- Paper trays/plates/napkins/serving utensils/plastic containers
- Portion scoops as reference (1 cup, ½ cup, ¼ cup, 1/3 cup, 1 tbsp, 1 tsp)
- Portion Examples document (to be left at reference table)
- Portion Guide and Fruit/Vegetable Estimates Handout PDF
- Digital scale to weigh food prior (accuracy to nearest gram, SECA model 851, Germany)
- 1.5-2" color coding labels with written ID numbers
- Timer/watch
- Excel document: to randomly sort fruits/vegetables, amount served (cups), and amount consumed
- Common lunchroom fruit and vegetable items (determine these from previous lunch menu to assess what fruit and vegetable items may be available and seen in the lunchroom environment)
 - *Sample items found from elementary school menus*

▪ Petite banana	▪ Baby carrots	▪ Peaches
▪ Red delicious apple	▪ Tiny Tomatoes	▪ Smashed potatoes
▪ Sweet corn	▪ Pears	▪ Cauliflower buds
▪ Zesty salsa	▪ Sweet potato puffs	▪ Pickle chips
▪ Sliced cucumbers	▪ Green beans	▪ Orange halves
▪ Broccoli buds	▪ Garden Peas	▪ Apple sauce
▪ Crunchy celery sticks	▪ Baby carrots	▪ Mixed fruit cup
▪ Pineapple tidbits	▪ Diced peaches	▪ Romaine salad
▪ Fresh apple	▪ Fresh pear	▪ Fresh orange
▪ Broccoli florets	▪ Pickle chips	
▪ Cucumber coins	▪ Fresh banana	

APPENDIX E: Visual Estimation of Fruit and Vegetable Consumption Training Protocol (*continued*)

PART 4a and 4b

- Protractor or Clinometer/Level (may use level on Android (such as *Bubble Level*) or iOs (such as *iHandy*)
 - Clinometer app on Android
 - Smart Measure app on Android
- Ruler, tape measure
- Post-It's to indicate Parts 4a and 4b for trainee to take a photograph for training
- Colored tape
- Panasonic Lumix ZR1 camera, Canon Powershot ELPH 130 IS, or Apple iPads
- Tripod
- Table for stand (table that stands about 20" from the ground)

APPENDIX E: Visual Estimation of Fruit and Vegetable Consumption Training Protocol *(continued)*



Part 1a and 1: Food and serving identification

- 1a: Reference table of various portion sizes (1 cup, ½ cup, ¼ cup, 1/3 cup) including pictures.
- 1b: Arrange several servings of fruits and vegetables on one table as reference (label as REFERENCE TABLE) (appropriate school service servings)
 - If possible, refer to local school to determine appropriate serving size for children of K-5th grade (SEE PORTION SIZE DOCUMENT)
- Have digital scale set up so trainees can measure items.

Part 2: Visual estimation of fruit and vegetable consumption of items on plates

- On a separate table, arrange items of various portion sizes and randomize according to attached Excel sheet
 - Excel sheet will have a column identifying portions consumed based on 6-point Comstock scale
 - 5 points: all food remains, 0%
 - 4 points: 1 bite eaten, 10%
 - 3 points: some eaten, 25%
 - 2 points: half eaten, 50%
 - 1 point: most eaten, 75%
 - 0 points: all eaten, 100%
 - List 6 fruits or vegetables and let Excel randomize. Each trainee should do this on individual basis.

Part 3: Visual estimation of fruit and vegetable consumption of items in photographs

- Another table, arrange photographs of different portion sizes of foods and have trainee complete form.

Part 4a and 4b: Set up camera and tripod

- On the last section of training, have trainee set up camera and tripod, at 45 degrees and take images from the lunch trays identified prior.

DURING TRAINING

- Have trainee go through Part 1-Part 4 and to note their observer ID, date of observation, and time start and time end for each section.
 - Part 1: Food item ID and serving sizes
 - Part 2: Visual estimation of real-time lunch items
 - Part 3: Visual estimation of photographed lunch items
 - Part 4: Set up of camera and camera stand

APPENDIX E: Visual Estimation of Fruit and Vegetable Consumption Training Protocol (continued)



THINGS TO NOTE TO TRAINEES:

- Be familiar with portion amounts (1 cup, ¼ cup, 1/8 cup, etc.)
- 1/8 cup must be served in schools to count for the NSLP program
 - ½ cup portion typical for fruits and ¾ cup of veggies for K-5th grade

TRAINING SCORE

- **PART 1b: Food and serving size identification**
 - Points to pass training for 6 plates:
 - Food item identification (5 points each): 27 points
 - Form served (10 points each): 54 points
 - Weight (g) (5 points each): 27 points
 - Portion (cups) (10 points each): 54 points
 - **Total points to pass: 162 points out of 180 total (90% pass)**
 - **Below 162 points, training for this section needs to be re-done (2-3 days after first training day) and items re-tested with different portion sizes.**
- **PART 2: Visual estimation of real-time lunch items**
 - Points to pass training for 6 plates:
 - Meal item (5 points each): 27 points
 - Amount served (10 points each): 54 points
 - Portion consumed (10 points each): 54 points
 - **Total points to pass: 135 points out of 150 total (90% pass)**
 - **Below 135 points, training for this section needs to be re-done (2-3 days after first training day) and items re-tested with different portion sizes.**
- **PART 3: Visual estimation of photographed lunch items**
 - Points to pass training for 6 plates:
 - Meal item (5 points each): 27 points
 - Amount served (10 points each): 54 points
 - Portion consumed (10 points each): 54 points
 - **Total points to pass: 135 points out of 150 total (90% pass)**
 - **Below 135 points, training for this section needs to be re-done (2-3 days after first training day) and items re-tested with different portion sizes.**
- **PART 4: Set up of camera and tripod**
 - PART 4A: Points are as follows:
 - Check camera angle and position: 10 points
 - Observe images to see if all food components are easily seen: 20 points
 - **Total points to pass: 30 points (100% pass)**
 - **If camera is not positioned correctly, train again.**
 - PART 4B: Points are as follows:
 - Check camera angle and position: 10 points
 - Observe images to see if all food components are easily seen: 20 points
 - **Total points to pass: 30 points (100% pass)**

APPENDIX E: Visual Estimation of Fruit and Vegetable Consumption Training Protocol *(continued)*



Training: Visual Estimation of Fruit and Vegetable Consumption

Observer name		Date of observation	
Time start		Time end	

Part 1: Food and serving identification

Please note the 6 items listed and in what form they are served (i.e. canned, fresh, florets, slices, wedges, etc). Also, please weigh the items using the digital scale in grams. Below the weight line, please indicate portion in cups.

<p>1. Food item: _____</p> <p>Form served: _____</p> <p>Weight (g): _____</p> <p>Portion (cups): _____</p>	<p>2. Food item: _____</p> <p>Form served: _____</p> <p>Weight (g): _____</p> <p>Portion (cups): _____</p>
<p>3. Food item: _____</p> <p>Form served: _____</p> <p>Weight (g): _____</p> <p>Portion (cups): _____</p>	<p>4. Food item: _____</p> <p>Form served: _____</p> <p>Weight (g): _____</p> <p>Portion (cups): _____</p>
<p>5. Food item: _____</p> <p>Form served: _____</p> <p>Weight (g): _____</p> <p>Portion (cups): _____</p>	<p>6. Food item: _____</p> <p>Form served: _____</p> <p>Weight (g): _____</p> <p>Portion (cups): _____</p>

APPENDIX E: Visual Estimation of Fruit and Vegetable Consumption Training Protocol (continued)



Training: Visual Estimation of Fruit and Vegetable Consumption

Observer name	Date of observation
Time start	Time end

Part 2: Visual estimation of fruit and vegetable consumption of items on plates

Use the form below and note the items on each tray and write down the portions you see for each fruit and vegetable item. Please also write down the information found on the sticker ID cards on the tray to indicate Child ID and gender.

Lunchroom Visual Estimation of Fruit and Vegetable Consumption Form – Real-time items

Fruit/vegetables served and in what form (i.e. apple – whole, peaches – diced, canned)

1. _____ 3. _____ 5. _____
 2. _____ 4. _____ 6. _____

Child ID	Gender	Meal item 1- Fruit 2- Veggie	Amount served (cups)	None eaten (0%)	1 bite eaten (~10%)	Some eaten (~25%)	Half eaten (50%)	Most eaten (75%)	All eaten (100%)
Ex. 123	M	1 – apple	½ cup						

Note: 1 – Fruit, 2 – Vegetable. If more than 1 fruit or vegetable consumed, continue on another line and use same Child ID.

APPENDIX E: Visual Estimation of Fruit and Vegetable Consumption Training Protocol (continued)



Training: Visual Estimation of Fruit and Vegetable Consumption

Observer name	Date of observation
Time start	Time end

Part 3: Visual estimation of fruit and vegetable consumption of items in photographs

Use the form below and note the items on each tray found in the photograph images and write down the portions you see for each fruit and vegetable item. Please also write down the information found on the sticker ID cards on the tray to indicate Child ID and gender.

Lunchroom Visual Estimation of Fruit and Vegetable Consumption Form – Photographed items

Fruit/vegetables served and in what form (i.e. apple – whole, peaches – diced, canned)

7. _____ 9. _____ 11. _____
 8. _____ 10. _____ 12. _____

Child ID	Gender	Meal item 1- Fruit 2- Veggie	Amount served (cups)	None eaten (0%) 	1 bite eaten (~10%) 	Some eaten (~25%) 	Half eaten (50%) 	Most eaten (75%) 	All eaten (100%)
Ex. 123	M	1 – apple	½ cup			X			

Note: 1 – Fruit, 2 – Vegetable. If more than 1 fruit or vegetable consumed, continue on another line and use same Child ID.

APPENDIX E: Visual Estimation of Fruit and Vegetable Consumption Training Protocol (continued)



Training: Visual Estimation of Fruit and Vegetable Consumption

Observer name		Date of observation	
Time start		Time end	

Part 4: Set up camera and tripod

Instructions:

PART 4A

- 1) Place camera on tripod and make sure it is set-up at 45 degrees facing the stand as to allow a tray to be photographed directly above the tray.
 - a. If needed, please use protractor, clinometer, or a level app on phone to make sure it is level at 45 degrees (i.e. iHandy Level app on Apple Store or Bubble level, Smart Measure, Clinometer).
- 2) Measure tray length x width x height and fill out the rest of the information below.

- **Lunch tray dimensions:**

Type of lunch tray: _____

Length (cm)	Length (in)	Width (cm)	Width (in)	Height (cm)	Height (in)

- **Positioning of camera and stand**

- Height of desk where stand/tripod is on: _____ cm
- Camera position: _____ degrees
- Height of camera on stand/tripod: _____ cm
- Zoom level: _____ x

- Using colored tape, make an outline of tray on the stand. Use protractor if needed to make exact 90 degree angles, if needed (optional).
- Take 2 images of trays 6 trays from Part 2 using the camera.

PART 4B

- 1) Remove camera from tripod, and take 2 images from the same trays. This time, hold camera approximately 18 to 24 inches above lunch tray, at 75 degrees (or at an angle you specify below)

- **Positioning of camera and stand**

- a. Height picture taken above tray (approx.): _____ in
 - i. Specify cm as well: _____ cm
- b. Camera position (approx.): _____ degrees
- c. Zoom level: _____ x



**Visual Estimation of Fruits and
Vegetables in the Lunchroom**

Training Procedures

Part 2

2014-2015

APPENDIX E: Visual Estimation of Fruit and Vegetable Consumption Training Protocol (*continued*)

Objectives

The objective of the second part of this training is to refine portion size estimates and to determine the feasibility of using a tripod or free-form digital imaging techniques for use in elementary schools. This training will include identifying several portion sizes of fruits and vegetables and determining whether observers are able to accurately define the amounts according to a 6-point Comstock scale, a scale previously used in visual estimation techniques. They will do this by identifying images taken with a camera on both a tripod and free-form.

Duration of training: 1-2 hours (Two-day training)

MATERIALS NEEDED FOR SET-UP OF TRAINING

- Paper trays/plates/napkins/serving utensils/plastic containers
- Portion scoops as reference (1 cup, ½ cup, ¼ cup, ¾ cup, 1/3 cup, 1 tbsp, 1 tsp)
- Additional copies of portion cups
- Digital scale to weigh food prior (accuracy to nearest gram, SECA model 851, Germany)
- 1.5-2" color coding labels with written ID numbers
- Timer/watch
- Excel document: to randomly sort fruits/vegetables, amount served (cups), and amount consumed
- Common lunchroom fruit and vegetable items (determine these from previous lunch menu to assess what fruit and vegetable items may be available and seen in the lunchroom environment)
 - Petite banana
 - Red delicious apple
 - Sweet corn
 - Zesty salsa (veggie?)
 - Baby carrots
 - Tiny Tomatoes
 - Pears
 - Sweet potato puffs
 - Green beans
 - Garden Peas
 - Peaches
 - Smashed potatoes
 - Cauliflower buds
 - Pickle chips
 - Orange halves
 - Apple sauce
 - Crunchy celery sticks
 - Pineapple tidbits
 - Fresh apple
 - Broccoli florets
 - Cucumber coins
 - Diced peaches
 - Fresh pear
 - Pickle chips
 - Fresh banana
 - Mixed fruit cup
 - Romaine salad
 - Fresh orange
- Protractor or Clinometer/Level (may use level on Android (such as *Bubble Level*) or iOS (such as *iHandy*) to measure angle
- Ruler, tape measure
- Post-Its to indicate images taken in free form and using the tripod (use for each participant)
- Colored tape
- Panasonic Lumix ZR1 camera, Canon Powershot ELPH 130 IS, or Apple iPads
- Tripod
- Table for stand (table that stands about 20" from the ground)

APPENDIX E: Visual Estimation of Fruit and Vegetable Consumption Training Protocol (continued)



Day 1

Part 1: Portion size practice

1. Arrange various food items, portion cups and plates for trainees to use and measure various items.
 - a. Practice servings of 1 cup, $\frac{1}{2}$ cup, $\frac{1}{4}$ cup, $\frac{3}{4}$ cup of various items most commonly seen in the lunchroom.
 - b. Practice weighing items using a scale.
2. Have trainees measure serving sizes ($\frac{1}{2}$ cup – $\frac{3}{4}$ cup) of items and label tray with index card REFERENCE, FOOD ITEM, PORTION SIZE, WEIGHT (g), TRIPOD/FREE. This will be placed next to the lunch tray.
 - a. Have them write this information the **PART 1** sheet.
3. Have trainees observe trays with the weight/portions of trays.
 - a. Set trays aside and have trainees take pictures for Part 3 for REFERENCE plates with both tripod/freeform.

Part 2: Preparing fruit/veggie trays for "before" and "after" picture

1. Using the random number generator on Excel sheet, determine the type of 'before' and 'after' plates trainees should prepare.
 - a. Print table on **PART 2** sheet that has assignments for trainees which will include: food item, portion size, portion consumed (%), and blank spaces for the weights (g).
 - i. For example, they can measure 1 cup of carrots, with 75% consumption
4. Have trainees affix a sticker with ID number on the plate for the pictures for Part 3.
 - a. These numbers will be used to compare the portions measured, along with the portions consumed and trainees will practice guessing what the portions are.

Part 3: Picture-taking practice

1. Have trainees prepare index cards that they will take a picture of prior to taking pictures of their plates.
 - a. Have trainees write the following in PEN:
 - i. NAME, ITEM, PORTION SERVED, % CONSUMED, "BEFORE" or "AFTER," and TRIPOD or FREE (depending on how picture was taken), and ID #.
 - b. Make EXAMPLE INDEX CARD. Have trainees fill out the information in pencil the as they proceed the training (to use the same card and save time).
2. NOTE: Trainees will be taking pictures of the 'before' and 'after' images of each portion for each of the items.
3. **PART 3A:** Have trainee set up tripod for use of taking images of the trays they prepared.
 - a. Set tripod at 45 degrees, around 2 feet above the table.

APPENDIX E: Visual Estimation of Fruit and Vegetable Consumption Training Protocol (continued)



- b. Have them fill out information on PART 3 of their sheets.
- c. Have trainees take before/after images of all the plates prepared (before/after).
 - i. BEFORE each picture, have them take a picture of the index card they have written above.
 - ii. Have them take pictures of the REFERENCE plates as well (both tripod/freeform)
4. PART 3B: Have trainee prepare to take freeform pictures of the trays by having them stand over the lunch tray and practice with their positioning (they should be 18-24" above the tray and have the position of the camera from 45-75 degrees).
 - a. Same steps as above.

Day 2

Part 4: Visual estimation of fruit and vegetable consumption in photographs (both freeform and tripod methods)

1. Trainer should set up images on various computers and arranging the images according to before and after.
 - a. If possible, crop out ID number or cover it using picture editor so as to not allow trainee to use previous knowledge of their plates as this may create bias for their own plate estimates.
2. Have trainees set up at various computers with the various pictures. On sheet, have them go through all the images and see if they can determine the portion sizes and classification of each item.
 - a. They should identify the following
 - i. ID number of food
 - ii. Portion size
 - iii. Portion consumed of food (using 6-point Comstock Scale)

APPENDIX E: Visual Estimation of Fruit and Vegetable Consumption Training Protocol *(continued)*



Training: Visual Estimation of Fruit and Vegetable Consumption

Observer name		Date of observation	
Time start		Time end	

Part 1: Portion size practice

Please note the 4 items listed and in what form they are served (i.e. canned, fresh, florets, slices, wedges, etc.). Also, please weigh the items using the digital scale in grams. Below the weight line, please indicate portion in cups.

<p>1. Food item: _____</p> <p>Form served: _____</p> <p>Weight (g): _____</p> <p>Portion (cups): _____</p> <p>Trainee: _____</p>	<p>2. Food item: _____</p> <p>Form served: _____</p> <p>Weight (g): _____</p> <p>Portion (cups): _____</p> <p>Trainee: _____</p>
<p>3. Food item: _____</p> <p>Form served: _____</p> <p>Weight (g): _____</p> <p>Portion (cups): _____</p> <p>Trainee: _____</p>	<p>4. Food item: _____</p> <p>Form served: _____</p> <p>Weight (g): _____</p> <p>Portion (cups): _____</p> <p>Trainee: _____</p>

APPENDIX E: Visual Estimation of Fruit and Vegetable Consumption Training Protocol *(continued)*



Part 2: Preparing fruit/veggie trays for "before" and "after" picture

Observer name		Date of observation	
Time start		Time end	

Trainee	Food ID	Food item	Portion Served	Before Weight (g)	Portion Consumed (%)	After Weight (g)

NOTE: ~10% = bite taken, ~25% =more than a bite taken

APPENDIX E: Visual Estimation of Fruit and Vegetable Consumption Training Protocol (continued)



Training: Visual Estimation of Fruit and Vegetable Consumption

Observer name		Date of observation	
Time start		Time end	

Part 3: Picture-taking practice

Instructions:

PART 3A

- 1) Place camera on tripod and make sure it is set-up at 45 degrees facing the stand as to allow a tray to be photographed directly above the tray.
- 2) Measure tray length x width x height and fill out the rest of the information below.

Lunch tray dimensions:
 Type of lunch tray: _____

Length (cm)	Length (in)	Width (cm)	Width (in)	Height (cm)	Height (in)

Positioning of camera and stand

- Height of desk where stand/tripod is on: _____ cm
- Camera type: _____ Tripod type: _____
- Camera position: _____ degrees
- Height of camera on stand/tripod: _____ cm
- Zoom level: _____ x

- 3) Using colored tape, make an outline of tray on the stand. Use protractor if needed to make exact 90 degree angles, if needed (optional).
- 4) Prior to taking the pictures, show ID PAPER, and take 'before' and 'after' picture of the menu items with the tripod.
- 5) Take pictures of REFERENCE samples.

PART 3B

- 1) Remove camera from tripod, and hold camera approximately 18 to 24 inches above lunch tray, at 75 degrees (or at an angle you specify below)
- 2) **Positioning of camera and stand**
 - a. Height picture taken above tray (approx.): _____ in
 - i. Specify cm as well: _____ cm
 - b. Camera position (approx.): _____ degrees
 - c. Zoom level: _____ x
- 3) Prior to taking the pictures, show ID PAPER and take picture of that then take 'before' and 'after' picture of the trays using this freeform method.
- 4) Take pictures of REFERENCE samples.

APPENDIX E: Visual Estimation of Fruit and Vegetable Consumption Training Protocol *(continued)*



Training #2: Trainee Instructions for Visual Estimates of FV Consumption

Objectives

The objective of the second part of this training is to refine portion size estimates and to determine the feasibility of using a tripod or free-form digital imaging techniques for use in elementary schools. This training will include identifying several portion sizes of fruits and vegetables and determining whether one can accurately define the amounts according to a 6-point Comstock scale previously used in visual estimation techniques. This will be done by identifying images taken with a camera on both a tripod and free-form.

Day 1

Part 1: Portion size practice

1. Practice servings of 1 cup, $\frac{1}{2}$ cup, $\frac{1}{4}$ cup, $\frac{3}{4}$ cup of various items most commonly seen in the lunchroom.
 1. Practice weighing items using a scale.
2. Measure serving sizes ($\frac{1}{2}$ cup – $\frac{3}{4}$ cup) of items and label tray with index card with REFERENCE, FOOD ITEM, PORTION SIZE, WEIGHT (g), TRIPOD/FREE. This will be placed next to the lunch tray.
 1. Write this information on the PART 1 sheet.
3. Observe trays with the weight/portions of trays.
 1. We will take pictures of REFERENCE plates for Part 3 using both a tripod/freeform.

Part 2: Preparing fruit/veggie trays for "before" and "after" picture

4. On PART 2 sheet, please find your name and prepare 'before' and 'after' plates according to the chart.
 1. Please weigh the items and write down the weight of your 'before' and 'after' plate on Part 2 sheet.
 2. Affix a sticker with ID number on your plate. We will be taking images of these plates for part 3.

Part 3: Picture-taking practice

1. Prepare index cards that you will use to take a picture of prior to taking pictures of your plates.
 - a. Write the following:
 - i. NAME, ITEM, PORTION SERVED, % CONSUMED, "BEFORE" or "AFTER," and TRIPOD or FREE (depending on how picture was taken), and ID#
 1. Writing in pencil may save some time. See EXAMPLE INDEX CARD.

APPENDIX E: Visual Estimation of Fruit and Vegetable Consumption Training Protocol (continued)



2. **PART 3A TRIPOD:** Set up tripod for use of taking images of the trays prepared
 - a. Set tripod at 45 degrees, around 2 feet above the table.
 - b. Fill out information on the **PART 3** sheet.
 - c. Take before/after images of all the plates prepared
 - i. **BEFORE** each picture, take a picture of the **index card** you have written above.
 - ii. Take pictures of the **REFERENCE** plates as well.
3. **PART 3B FREE FORM:** Prepare to take freeform pictures of the trays by standing over the lunch tray and practice positioning (you should be between 18-24" above the tray and have the position of the camera from 45-75 degrees).
 - a. Fill out information on the **PART 3** sheet.
 - b. Take before/after images of all the plates prepared
 - i. **BEFORE** each picture, take a picture of the **index card** you have written above.
 - ii. Take pictures of the **REFERENCE** plates as well.

APPENDIX E: Visual Estimation of Fruit and Vegetable Consumption Training Protocol *(continued)*



Training: Visual Estimation of Fruit and Vegetable Consumption

Observer name		Date of observation	
Time start		Time end	

Part 1: Portion size practice

Please note the 4 items listed and in what form they are served (i.e. canned, fresh, florets, slices, wedges, etc). Also, please weigh the items using the digital scale in grams. Below the weight line, please indicate portion in cups.

<p>1. Food item: _____</p> <p>Form served: _____</p> <p>Weight (g): _____</p> <p>Portion (cups): _____</p> <p>Trainee: _____</p>	<p>2. Food item: _____</p> <p>Form served: _____</p> <p>Weight (g): _____</p> <p>Portion (cups): _____</p> <p>Trainee: _____</p>
<p>3. Food item: _____</p> <p>Form served: _____</p> <p>Weight (g): _____</p> <p>Portion (cups): _____</p> <p>Trainee: _____</p>	<p>4. Food item: _____</p> <p>Form served: _____</p> <p>Weight (g): _____</p> <p>Portion (cups): _____</p> <p>Trainee: _____</p>

APPENDIX E: Visual Estimation of Fruit and Vegetable Consumption Training Protocol (continued)



Part 2: Preparing fruit/veggie trays for "before" and "after" picture

Observer name		Date of observation	
Time start		Time end	

Trainee	Food ID	Food item	Portion Served	Before Weight (g)	Portion Consumed (%)	After Weight (g)

NOTE: ~10% = bite taken, ~25% = more than a bite taken

APPENDIX E: Visual Estimation of Fruit and Vegetable Consumption Training Protocol (continued)



Training: Visual Estimation of Fruit and Vegetable Consumption

Observer name		Date of observation	
Time start		Time end	

Part 3: Picture-taking practice

Instructions:

PART 3A

- 1) Place camera on tripod and make sure it is set-up at 45 degrees facing the stand as to allow a tray to be photographed directly above the tray.
- 2) Measure tray length x width x height and fill out the rest of the information below.

Lunch tray dimensions:
 Type of lunch tray: _____

Length (cm)	Length (in)	Width (cm)	Width (in)	Height (cm)	Height (in)

Positioning of camera and stand

- Height of desk where stand/tripod is on: _____ cm
- Camera type: _____ Tripod type: _____
- Camera position: _____ degrees
- Height of camera on stand/tripod: _____ cm
- Zoom level: _____ x

- 3) Using colored tape, make an outline of tray on the stand. Use protractor if needed to make exact 90 degree angles, if needed (optional).
- 4) Prior to taking the pictures, show ID PAPER, and take 'before' and 'after' picture of the menu items with the tripod.
- 5) Take pictures of REFERENCE samples.







PART 3B

- 1) Remove camera from tripod, and hold camera approximately 18 to 24 inches above lunch tray, at 75 degrees (or at an angle you specify below)
- 2) Positioning of camera and stand
 - a. Height picture taken above tray (approx.): _____ in
 - i. Specify cm as well: _____ cm
 - b. Camera position (approx.): _____ degrees
 - c. Zoom level: _____ x
- 3) Prior to taking the pictures, show ID PAPER and take picture of that then take 'before' and 'after' picture of the trays using this freeform method.
- 4) Take pictures of REFERENCE samples.

APPENDIX E: Visual Estimation of Fruit and Vegetable Consumption Training Protocol (continued)



Training #2, Part 4: Lunchroom Visual Estimation of Fruit and Vegetable Consumption Form

		Observer name			Date of observation				
		School name			Grade levels				
		Lunchtime start			Lunchtime end				
Child ID	Gender	Meal item	Amount served (cups/quantity if possible)	None eaten (0%) 	1 bite eaten (~10%) 	Some eaten (~25%) 	Half eaten (50%) 	Most eaten (75%) 	All eaten (100%) 

Adapted from Comstock et al, 1981 and Parent et al, 2012 Visual estimation methods

APPENDIX E: Visual Estimation of Fruit and Vegetable Consumption IRB Approval Letter (continued)

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Office of the Vice Chancellor for Research

Office for the Protection of Research Subjects
528 East Green Street
Suite 203
Champaign, IL 61820



April 29, 2016

Karen Chapman-Novakofski
Food Science & Human Nutrition
343 Bevier Hall
905 S Goodwin Ave

RE: *Visual estimation of fruit and vegetable consumption and preferences for fruits and vegetables for the FoodWise project: nutrition intervention in K-2nd grade*
IRB Protocol Number: 15533

Dear Dr. Chapman-Novakofski:

Thank you very much for forwarding the modifications to the University of Illinois at Urbana-Champaign Institutional Review Board (IRB) office for your project entitled *Visual estimation of fruit and vegetable consumption and preferences for fruits and vegetables for the FoodWise project: nutrition intervention in K-2nd grade*. I will officially note for the record that these major modifications to the original project, as noted in your correspondence received 4/12/2016, changing protocol status from data analysis only to active data collection, adding use of trained observer data to assess reliability of training protocol, have been approved. The expiration date for this protocol, IRB number 15533, is 01/25/2017. The risk designation applied to your project is *no more than minimal risk*.

As your modifications involved changes to consent form(s), I am attaching the revised form(s) with date-stamp approval. Please note that copies of date-stamped consent forms must be used in obtaining informed consent. If modification of the consent form(s) is needed, please submit the revised consent form(s) for IRB review and approval. Upon approval, a date-stamped copy will be returned to you for your use.

Please note that additional modifications to your project need to be submitted to the IRB for review and approval before the modifications are initiated. To submit modifications to your protocol, please complete the IRB Research Amendment Form (see <http://oprs.research.illinois.edu/?q=forms-and-instructions/research-amendments.html>). Unless modifications are made to this project, no further submittals are required to the IRB.

We appreciate your conscientious adherence to the requirements of human subjects research. If you have any questions about the IRB process, or if you need assistance at any time, please feel free to contact me at the OPRS office, or visit our Web site at <http://oprs.research.illinois.edu>.

Sincerely,


LeaAnn Carson, MS
OPRS Specialist

Attachment(s)

c: Jennifer McCaffrey
Natalie Masis

U of Illinois at Urbana-Champaign • IORG0000014 • FWA #00008584
telephone (217) 333-2670 • fax (217) 333-0405 • email IRB@illinois.edu

**APPENDIX E: Visual Estimation of Fruit and Vegetable Consumption Consent Form for Rater Data
(continued)**



Visual Estimation of Fruits and Vegetables: Rater Consent Form

April 29, 2016

Dear Trained Rater:

You are being asked to take part in a research study to assess the reliability of a training protocol for visual estimation. We are asking you to take part because you had completed training last year, in the year 2015. We ask that you read this form and ask any questions that you may have before agreeing to allow us to utilize the information collected from the training.

The purpose of this research is to evaluate the training protocol for visual estimation of fruit and vegetable consumption. If you agree to be part of the study, this consent will allow use of the data and information collected during the training procedures of 2015. The information that was collected as part of the training will be used for research purposes.

There are no known risks for participation of the study. There are no benefits to you. We hope to utilize this information to assist in creating more effective training protocols that can be shared with other research institutions or organizations that may need to train raters on visual estimation of foods.

In general, we will not tell anyone any information about you. When this research is discussed or published, no one will know you were in the study. However, laws and university rules might require us to disclose information about you. For example, if required by laws or University Policy, study information which identifies you and the consent form signed by you may be seen or copied by the following people or groups:

- The university committee and office that reviews and approves research studies, the Institutional Review Board (IRB) and Office for Protection of Research Subjects;
- University and state auditors, and Departments of the university responsible for oversight of research.

Research records will be kept in a locked file; only the researchers will have access to the records. Your participation in this project is completely voluntary. You are free to withdraw information at any time. These decisions will have no affect on your future relationship with the University of Illinois at Urbana-Champaign.

In the space at the bottom of this letter, please indicate whether you give consent and would allow utilization of the data and information collected during the training from last year, 2015.

APPENDIX E: Visual Estimation of Fruit and Vegetable Consumption Consent Form for Rater Data
(continued)



If you have any questions about this project, please contact us using the information below.

You will be given a copy of this form to keep for your records.

Sincerely,

Natalie Masis
(650)296-8197
masis2@illinois.edu

Dr. Karen Chapman-Novakofski
(217) 244-2852
kmc@illinois.edu

Visual Estimation of Fruits and Vegetables: Rater Consent Form

Your signature below indicates that you have consent for this study, and that you have read and understood the information provided above. You will be given a signed and dated copy of this form to keep, along with any other printed materials deemed necessary by the study investigators.

Subject's Name (print): _____

Subject's Signature: _____ Date: _____

Investigator's Signature: _____ Date: _____

**University of Illinois at Urbana-Champaign
Institutional Review Board**

Approved: 4/29/16
Expires: 1/25/17
IRB #: 15533

APPENDIX E: Child Oral Assent Script for Visual Estimation of Fruit and Vegetable Consumption
(continued)



RECEIVED
JAN 26 2015
INST REVIEW BOARD

Child Oral Assent Script: Visual Estimation of Fruit and Vegetable Consumption

Hello. My name is _____. We are wanting to see the fruits and vegetables from your tray.

If you agree to help us, we would put a sticker on your tray for us to check it later. There are no right or wrong answers.

You can ask questions any time. If you do not want to participate, you do not have to.

Do you have any questions about what we will be doing? [If no, move on]

Would you like to help us in our project about fruits and vegetables?

UNIVERSITY OF ILLINOIS
APPROVED CONSENT
VALID UNTIL

FEB 01 2016

APPENDIX E: Copyright Approval Agreement (continued)

RESPONSE REQUIRED for your request to Elsevier

no-reply@copyright.com

To: Masis, Natalie M

Monday, May 29, 2017 6:42 AM



Accept your approved request

Dear Natalie Masis,

Elsevier has approved your recent request described below. Before you can use this content, **you must accept** the license fee and terms set by the publisher.

Use this [link](#) to accept (or decline) the publisher's fee and terms for this order.

Order Summary

Licensee: Natalie M Masis
Order Date: May 13, 2017
Order Number: 501269518
Publication: Journal of Nutrition Education and Behavior
Design and Evaluation of a Training Protocol for a
Photographic Method of Visual Estimation of Fruit and
Vegetable Intake among Kindergarten Through Second-
Grade Students
Title:
Type of Use: reuse in a thesis/dissertation
View or print complete [details](#) of your request.

Sincerely,

Copyright Clearance Center

How was your experience? Fill out this [survey](#) to let us know.

Tel: +1-855-239-3415 / +1-978-646-2777
customer@copyright.com
<https://myaccount.copyright.com>



RightsLink®

APPENDIX F: Cognitive Interviewing Sample Script

Principal survey: cognitive interviewing questions

Script read to participants:

1. Thanks for coming in to test our survey for teachers like yourself.
2. I'll ask you questions and you answer them, just like a regular survey.
3. However, the goal for today is to get a better idea of if the questions are appropriate. So I want you to think aloud as you answer the questions, tell me everything you are thinking about as you go through them.
4. At times, I'll stop you and ask more questions about the terms, phrases in the questions, and what you think the question is asking. I'll also be taking notes.
5. Please keep in mind that I want to hear all of your opinions and reactions. Don't hesitate to speak up whenever things seem unclear, or is hard to answer, or doesn't seem to apply to you.
6. Finally, we will do this for about 30 minutes to an hour, unless I run out of things to ask before then.
7. Do you have any questions before we start?

Practice-session with thinking aloud

1. We are going to begin with practice questions. Remember to think aloud when you answer the question.
2. Practice question 1: How many windows are there in the house or apartment where you live?
 - a. [Probe as necessary]: How did you come up with that answer?
3. Practice question 2: How difficult was it for you to get here to do the interview today? Very difficult, somewhat difficult, a little difficult, or not at all difficult?
 - a. [Probe as necessary]: tell me about that why do you say [answer]?
4. Okay, let's turn to the survey.

Date: _____ Interview # _____ Interviewer: _____

START TIME:

Question	Probe
1	In your own words, what is this question asking? What does it mean to you?
2	What does the term 'committee' mean to you?
2A	What should be clarified?
3	What does 'favorable' mean to you?
4	What is this question stating?
5	What do school-wide nutrition education or promotion activities mean to you? Are there any parts that are unclear?
6	Are these time amounts appropriate?
7	What do you think the question is asking? What options should be included? Which option should be excluded? What does "trying new foods, variety" mean to you? What does "role of fresh fruits and vegetables in a complete diet" mean to you?

APPENDIX F: Cognitive Interviewing Sample Script (continued)

	What arrangement would work best for the options?
8&9	What do "nutrition displays" mean to you? What other options should be included or excluded?
10	What do you think the question is asking? What options should be included? Which option should be excluded? What does "trying new foods, variety" mean to you? What does "role of fresh fruits and vegetables in a complete diet" mean to you? What arrangement would work best for the options?
11	What do the terms 'professionals' or 'volunteers' mean to you? What other ones should be included or excluded? What is a 'trained non-professional' mean to you?
12	In your own words, what is this question asking?
13	What is this question asking? Are there options that should be included?
14	What does 'sponsor training' mean to you? Are there other positions that should be included?
15	What is this question asking? What is the difference 'physical education coordinator' and 'physical education teacher'? Is there anything else that should be included or excluded?

Additional probes:

- 1) In your own words, what is this question asking?
- 2) What does the term "" mean to you in this question?
- 3) What type of things should be included in this question?
- 4) What type of services should be excluded?
- 5) How did you arrive at your answer?
- 6) What time period are you thinking?
- 7) How sure are you of your answer?

Interview notes:

END TIME: _____

APPENDIX F: IRB Approval Letter for Cognitive Interviewing (continued)

Exempt Approval - IRB #17386

Institutional Review Board

Sent: Friday, December 09, 2016 4:21 PM

To: Chapman-Novakofski, Karen Marie

Cc: Masis, Natalie M

Attachments: 17386_Attachments_12092016.pdf (124 KB)

IRB EXEMPT APPROVAL

RPI Name: Karen Chapman-Novakofski

Project Title: Fresh Fruit and Vegetable Program (FFVP) Process Evaluation Survey of Schools - Cognitive Interviewing of Survey Questions

IRB #: 17386

Approval Date: December 9, 2016

Thank you for submitting the completed IRB application form and related materials. Your application was reviewed by the UIUC Office for the Protection of Research Subjects (OPRS). OPRS has determined that the research activities described in this application meet the criteria for exemption at 45CFR46.101(b)(2). This message serves to supply OPRS approval for your IRB application.

Please contact OPRS if you plan to modify your project (change procedures, populations, consent letters, etc.). Otherwise you may conduct the human subjects research as approved for a period of five years. Exempt protocols will be closed and archived at the time of expiration. Researchers will be required to contact our office if the study will continue beyond five years.

Copies of the attached, date-stamped consent form(s) are to be used when obtaining informed consent.

We appreciate your conscientious adherence to the requirements of human subjects research. If you have any questions about the IRB process, or if you need assistance at any time, please feel free to contact me at OPRS, or visit our website at <http://oprs.research.illinois.edu>

Sincerely,



Michelle Lore

Human Subjects Research Specialist, Office for the Protection of Research Subjects

Attachment(s): Waiver of Documentation of Informed Consent, Consent Script

c: Natalie Masis

APPENDIX F: Informational Letter for Cognitive Interviewing (continued)

Dr. Karen Chapman-Novakofski and a research team from the Departments of Food Science and Human Nutrition and Agricultural and Consumer Economics at the University of Illinois are developing a survey to evaluate how the Fresh Fruit and Vegetable Program (FFVP) is being implemented among Illinois schools. Before evaluating different programs in Illinois, we want to have good tools that can help us gauge how the program has been implemented in different schools. We have developed a draft for a survey and are looking for feedback on the survey if it is understandable and is asking the appropriate questions.

If you choose to participate in the study, you will be asked to answer questions about the survey itself. This is to ensure that the survey is easy to understand. During the interview, audio equipment will be used to record your responses. You will be asked to provide more feedback on a revised survey at least once and no more than 4 times. Your participation is voluntary and your name will not be associated with any publication.

You will be compensated with a \$10 gift card for participating in this project after the first interview. The process of cognitive interviewing is expected to take at most 1 hour each time, with an expected follow-up interview. You may decline any time and are not committed to follow-up interviews to determine if changes made the first time help to clarify the survey.

Will my study-related information be kept confidential? Yes, but not always. In general, we will not tell anyone any information about you. When this research is discussed or published, no one will know that you were in the study. However, laws and university rules might require us to disclose information about you. For example, if required by laws or University Policy, study information which identifies you and the consent form signed by you may be seen or copied by the following people or groups:

- The university committee and office that reviews and approves research studies, the Institutional Review Board (IRB) and Office for Protection of Research Subjects;
- University and state auditors, and Departments of the university responsible for oversight of research;

Results may be included in a professional journal or presentation. If you have any questions about your rights as a participant in this study or any concerns or complaints, please contact the University of Illinois Institutional Review Board at 217-333-2670 or via email at irb@illinois.edu. If you have questions or complaints about this study, please contact Dr. Karen Chapman-Novakofski at kmc@illinois.edu or 217-244-2852.


University of Illinois at Urbana-Champaign
Institutional Review Board

Approved: 1-26-17
IRB #: 17386

APPENDIX G: FFVP Surveys Distributed to Illinois Schools

The following pages contain the final surveys distributed to Illinois schools participating in the FFVP, then followed by the IRB approval letters for the survey distribution.

5/30/2017 Qualtrics Survey Software



ILLINOIS

Survey Introduction Page

Dear School Principal,

The purpose of this research survey is to learn about how the USDA Fresh Fruit and Vegetable Program (FFVP) is implemented in various schools in Illinois. This research is being conducted by Dr. Karen Chapman-Novakofski of the Division of Nutritional Sciences at the University of Illinois.

This survey contains 21 questions and takes about 10-15 minutes to complete. We ask that you complete the survey before May 15, 2017. The first 300 participants will receive a \$5 Starbucks gift card that will be e-mailed to them after completion of the survey.

Completing this survey is voluntary. You do not need to complete the whole survey if you do not wish to. There is no penalty or discontinuance of participation in any University of Illinois-affiliated programs if you decline. There are no known risks to completing this survey outside those of daily life. Results may be aggregated to be presented at a scientific conference or in a scientific journal.

In general, we will not tell anyone any information about you. When this research is discussed or published, no one will know that you were in the study. However, laws and university rules might require us to disclose information about you. For example, if required by laws or University Policy, study information which identifies you may be seen or copied by the following people or groups: a) The university committee and office that reviews and approves research studies, the Institutional Review Board (IRB) and Office for Protection of Research Subjects, or b) University and state auditors, and Departments of the university responsible for oversight of research.

If you have a question or need assistance in completing the survey, please call Natalie Masis, Dr. Chapman-Novakofski's graduate student, at (650) 296-8197 or e-mail her at masis2@illinois.edu, or contact Dr. Chapman-Novakofski at kmc@illinois.edu or 217-244-2852.

<https://illinoisaces.co1.qualtrics.com/ControlPanel/Ajax.php?action=GetSurveyPrintPreview> 1/10

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – Principal Survey *(continued)*

5/30/2017

Qualtrics Survey Software

If you have any questions about your rights as a participant in this study or any concerns or complaints, please contact the University of Illinois Institutional Review Board at (217) 333-2670 or via email at irb@illinois.edu.

PLEASE READ CAREFULLY BEFORE PROCEEDING. By clicking the next button, you indicate you have read and understand the above and voluntarily agree to participate in this study.

Survey questions part 1

Instructions:

The **Fresh Fruit and Vegetable Program (FFVP)** provides free fresh fruits and vegetables to students in participating schools in your district, outside of normal school-provided meals. This part of the survey asks you to provide information and opinions about the general administration and implementation of the FFVP in your school.

Q1. Did your school coordinate the specific fruits and vegetables offered during the USDA Fresh Fruit and Vegetable Program (FFVP) distribution with specific information discussed in **school-wide** nutrition education and promotion activities?

For example, dark green vegetables might be featured in a nutrition education class and on the FFVP distribution day.

- Yes
- No
- I don't know

Q2. Does your school have a committee or personnel involved in the Fresh Fruit and Vegetable Program (FFVP)?

- Yes
- No

<https://illinoisaces.co1.qualtrics.com/ControlPanel/Ajax.php?action=GetSurveyPrintPreview>

2/10

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – Principal Survey (continued)

5/30/2017

Qualtrics Survey Software

I don't know

Q2A. Who is involved in this committee?

Principal

Parents

FFVP coordinator

School Food Authority (SFA)

Teachers

Stakeholders

Lunchroom manager

Other staff members (please specify):

Q3. **My overall opinion** of FFVP is favorable.

Strongly agree

Somewhat agree

Neither agree nor disagree

Somewhat disagree

Strongly disagree

Q4. If I could **change one thing** about the FFVP it would be:

The following questions are regarding general nutrition education or promotion activities occurring in your school.

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – Principal Survey (continued)

5/30/2017

Qualtrics Survey Software

Q5. Please check off **all grades** that participated in school-wide nutrition education or promotion activities at your school.

Nutrition education or promotion activities are events such as demonstrations, hands-on learning, special speakers, or showing videos. Please include classroom instruction if nutrition education is required for all classrooms.

Do not count any nutrition education displays, such as posters or banners, or distributing media such as newsletters, etc.

- All grades received nutrition education
- Preschool
- Kindergarten
- 1st grade
- 2nd grade
- 3rd grade
- 4th grade
- 5th grade
- Other:
- Varies. How so?

Q6. How many times per month does your school have **school-wide** nutrition education and nutrition promotion activities?

- 0 times
- 1-2 times
- 3-4 times
- More than 4 times
- I don't know

Q7. What **message(s)** were conveyed by the nutrition education or promotion activities at your school? (check all that apply)

<https://illinoisaces.co1.qualtrics.com/ControlPanel/Ajax.php?action=GetSurveyPrintPreview>

4/10

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – Principal Survey (continued)

5/30/2017

Qualtrics Survey Software

- Role of fresh fruits and vegetables in a complete diet (i.e. health benefits, recommendations)
- Where fresh fruits and vegetables come from (i.e. links to local farms)
- Trying new fruits and vegetables
- Eating a variety of fruits and vegetables
- USDA MyPlate
- Cooking with fresh fruits and vegetables
- Other message (please specify):

Q8. Does your school have any **displays** (such as posters, banners, student work, other material) that conveyed nutrition education or promotion messages?

- Yes
- No
- I don't know

Q9. Where are these nutrition displays around your school?

- Hallways
- Cafeteria
- Bulletin boards
- Library
- Gym
- Other common areas (lobby)
- Other (please specify):

Q10. What **message(s)** were conveyed by the posters, displays, or similar media?
(check all that apply)

- Role of fresh fruits and vegetables in a complete diet (i.e. health benefits, recommendations)
- Where fresh fruits and vegetables come from (i.e. links to local farms)
- Trying new fruits and vegetables

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – Principal Survey (continued)

5/30/2017

Qualtrics Survey Software

- Eating a variety of fruits and vegetables
- USDA MyPlate
- Cooking with fresh fruits and vegetables
- Other message (please specify):

Q11. What types of **professionals** or **volunteers** conduct or lead nutrition education or promotion activities in your school? (check all that apply)

- Classroom teacher
- Principal or administrator
- Nutritionist or dietitian
- Doctor, nurse, or other health professional
- Trained non-professional
- University Extension health educator/other role
- Lunchroom manager
- Other (please specify):

Q12. Please indicate if a **policy** exists at your school regarding the availability of **healthy food choices** when foods are offered (or sold) to students outside of school meals or **policies regarding food in general**.

Healthy food choices are foods that meet school district or state standards for nutrient content, such as limits on fat, salt, or added sweeteners. (check all that apply)

- Foods offered (or sold) on a regular basis outside of school meals (snack bar, vending machines, school store, etc.)
- Foods offered (or sold) on special occasions during school (fundraisers, festivals, etc.)
- Foods offered (or sold) in school sport events
- Foods offered (or sold) before/after school
- Foods offered free to students during school hours (parties, etc) not including snacks provided by a Federal, State, or district program
- Foods offered (or sold) to individual students as rewards
- Other (please specify):

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – Principal Survey (continued)

5/30/2017

Qualtrics Survey Software

Q13. How is nutrition material communicated or distributed to parents? (check all that apply)

- | | |
|--|---|
| <input type="checkbox"/> Newsletters | <input type="checkbox"/> Student handbook |
| <input type="checkbox"/> Phone calls | <input type="checkbox"/> Social media |
| <input type="checkbox"/> Classes | <input type="checkbox"/> Announcements at school events |
| <input type="checkbox"/> Parent-teacher association (PTA) or Parent-teacher Organization (PTO) | <input type="checkbox"/> School website |
| <input type="checkbox"/> Signs posted around school | <input type="checkbox"/> Other (please specify):
<input type="text"/> |
| <input type="checkbox"/> Student orientation | <input type="checkbox"/> None. Nutrition information is not communicated to parents |

Q14. Does your school (or an outside source provided by the school) provide training in nutrition (formal or informal) for any of the following positions at least once a year? (check all that apply)

- Lunchroom monitors
- Lunchroom staff
- Classroom/teaching assistants
- Recess monitors
- Teachers
- Office staff
- Other (please specify):
- No training is offered or funded in these positions

Q15. Please indicate whether the following staff work at your school (including staff shared among multiple schools in you district):

- Athletic director
- Physical education teacher
- Food service director/manager
- Dietitian/nutritionist
- Health educator (dedicated specifically to health issues)

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – Principal Survey (continued)

5/30/2017

Qualtrics Survey Software

Other staff member related to health (please specify):

Information about you and your school

Q16. Information about your school

Name of school

Name of your school district

Q17. What grades are in this school?

- Preschool
- Kindergarten
- 1st grade
- 2nd grade
- 3rd grade
- 4th grade
- 5th grade
- 6th grade
- Other

Q18. How many years have you been working at this school?

- Less than one year
- 1-3 years
- 4-6 years
- more than 6 years
- Not applicable. Please explain:

Q19. What is your educational background?

- High school graduate

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – Principal Survey (continued)

5/30/2017

Qualtrics Survey Software

- College graduate, in what area?
- Master's degree, in what area?
- Doctoral degree, in what area?
- Other

Q20. Are you Hispanic or Latino?

- Yes
- No

Q21. How would you describe your race? (check all that apply)

- American Indian or Alaska Native
- Asian
- Black or African American
- Native Hawaiian or Other Pacific Islander
- White

Email for gift card

To be eligible to receive a \$5 Starbucks gift card, please input the e-mail you would like to receive it at below:

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APPENDIX G: FFVP Surveys Distributed to Illinois Schools – Teacher Survey (continued)

5/30/2017

Qualtrics Survey Software



ILLINOIS

Survey Introduction Page

Dear K-2nd Grade Teacher,

The purpose of this research survey is to learn about how the USDA Fresh Fruit and Vegetable Program (FFVP) is implemented in various schools in Illinois. This research is being conducted by Dr. Karen Chapman-Novakofski of the Division of Nutritional Sciences at the University of Illinois.

This survey contains 29 questions and takes about 10-15 minutes to complete. We ask that you complete the survey before May 15, 2017. The first 300 participants will receive a \$5 Starbucks gift card that will be e-mailed to them after completion of the survey.

Completing this survey is voluntary. You do not need to complete the whole survey if you do not wish to. There is no penalty or discontinuance of participation in any University of Illinois-affiliated programs if you decline. There are no known risks to completing this survey outside those of daily life. Results may be aggregated to be presented at a scientific conference or in a scientific journal.

In general, we will not tell anyone any information about you. When this research is discussed or published, no one will know that you were in the study. However, laws and university rules might require us to disclose information about you. For example, if required by laws or University Policy, study information which identifies you may be seen or copied by the following people or groups: a) The university committee and office that reviews and approves research studies, the Institutional Review Board (IRB) and Office for Protection of Research Subjects, or b) University and state auditors, and Departments of the university responsible for oversight of research.

If you have a question or need assistance in completing the survey, please call Natalie Masís, Dr. Chapman-Novakofski's graduate student, at (650) 296-8197 or e-mail her at masis2@illinois.edu, or contact Dr. Chapman-Novakofski at kmc@illinois.edu or 217-244-2852.

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – Teacher Survey (continued)

5/30/2017

Qualtrics Survey Software

If you have any questions about your rights as a participant in this study or any concerns or complaints, please contact the University of Illinois Institutional Review Board at (217) 333-2670 or via email at irb@illinois.edu.

PLEASE READ CAREFULLY BEFORE PROCEEDING. By clicking the next button, you indicate you have read and understand the above and voluntarily agree to participate in this study.

Default Question Block

Instructions:

The **Fresh Fruit and Vegetable Program (FFVP)** provides free fresh fruits and vegetables to students in participating schools in your district, outside of normal school-provided meals. This part of the survey asks you to provide information and opinions about the general administration and implementation of the FFVP in your school.

Q1. How familiar are you with the Fresh Fruit and Vegetable Program (FFVP) implementation at your school?

- Extremely familiar
- Very familiar
- Moderately familiar
- Slightly familiar
- Not familiar at all

Q2. Were fruits and vegetables passed out in the classroom, lunchroom, hallway, or other location as part of the FFVP? (check all that apply)

- Classroom
- Lunchroom
- Hallway
- Kiosk

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – Teacher Survey (continued)

5/30/2017

Qualtrics Survey Software

Gym

Other:

Q3. Were you present during any of the times the FFVP was passed out as a snack?

Yes

No

Q4. When the FFVP was distributed, how often did you eat the fruit or vegetable provided by the FFVP?

Always

Most of the time

About half the time

Less than half the time

Never

Q5. How much of the **fruits** provided in the FFVP do students usually eat? (i.e. per child, how much of the fruit is typically consumed?)

All or most (>75%)

Much (50-75%)

Some (25-49%)

Little or none (<25%)

Don't know or not applicable

Q6. How much of the **vegetables** provided in the FFVP do students usually eat? (i.e. per child, how much of the vegetable is typically consumed?)

All or most (>75%)

Much (50-75%)

Some (25-49%)

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – Teacher Survey (continued)

5/30/2017

Qualtrics Survey Software

- Little or none (<25%)
- Don't know or not applicable

Q7. I verbally encourage the students to eat the FFVP snacks.

- Always
- Most of the time
- Sometimes
- Rarely
- Never

Q8. Students like the FFVP **fruits**.

- Strongly agree
- Somewhat agree
- Somewhat disagree
- Strongly disagree
- Don't know or not applicable

Q9. Students like the FFVP **vegetables**.

- Strongly agree
- Somewhat agree
- Somewhat disagree
- Strongly disagree
- Don't know or not applicable

Q10. **My overall opinion** of FFVP is favorable.

- Strongly agree
- Somewhat agree
- Somewhat disagree

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – Teacher Survey (continued)

5/30/2017

Qualtrics Survey Software

- Strongly disagree
- Don't know or not applicable

Q11. If I could **change one thing** about the FFVP it would be:

Q12. Which of the following factors is a problem of the FFVP?

	Major problem	Minor problem	Not a problem
Students don't like the fruit and vegetables	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Students waste too much	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Messy to distribute and clean up	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inadequate teacher training or information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inadequate time to distribute fruits and vegetables	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Class time interrupted or taken away from student learning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Students don't like to try new fruits and vegetables	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inadequate quality of FFVP produce	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inadequate variety of FFVP produce	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inadequate amounts of FFVP produce	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Issues with student behavior	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other: <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q13. Were you involved in any training for the FFVP?

- Yes
- No

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – Teacher Survey (continued)

5/30/2017

Qualtrics Survey Software

Q14. If yes, what type of training was provided for the FFVP?

- Nutrition education
- Training on implementing the FFVP
- Other

Q15. Did you take part in any of the following FFVP implementation activities during the school year? (check all that apply)

- I helped prepare fruit and/or vegetables for distribution
- I distributed fruit and/or vegetables for the FFVP
- I did fruit and vegetable taste testings in my classroom (not as part of FFVP)
- I planned activities for the FFVP
- I helped with classroom promotional activities for FFVP
- I helped with school-wide promotional activities for FFVP
- I taught FFVP lessons that were given to me
- I used more fruit and vegetable examples in my existing classroom lessons
- I added new lessons, class discussions, nutrition education, or activities that addressed nutrition
- I changed how I use foods as rewards or incentives in class so there are more healthful options
- I changed how healthy foods are offered for classroom celebrations/parties
- I provided nutrition materials for parents
- I was part of a committee involved in the FFVP
- I was a positive role model to children during FFVP
- Other:

Q16. Did you teach nutrition (i.e. nutrition education or nutrition activities) as part of the FFVP?

- Yes
- No

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – Teacher Survey (continued)

5/30/2017

Qualtrics Survey Software

Q17. What tools do you use to teach nutrition as part of the FFVP?

- Curriculum guides
- Supplementary materials
- Newsletters or magazines
- Textbooks
- Audio and visual aids
- Computer software
- Field trips (i.e. grocery trips, farm, apple orchard, etc)
- Class discussions
- Other:

Q18. What topics did you discuss in the classrooms about nutrition as part of the FFVP?

- Role of fresh fruits and vegetables in a complete diet (i.e. health benefits, recommendations)
- Where fresh fruits and vegetables come from (i.e. links to local farms)
- Trying new fruits and vegetables
- Eating a variety of fruits and vegetables
- USDA MyPlate
- Cooking with fresh fruits and vegetables
- Other topic (please specify):

Q19. If nutrition education was provided in the classroom for the FFVP, what type of curriculum do you provide?

- Team Nutrition
- Coordinated Approach to Child Health (CATCH)
- FFVP resources
- The OrganWise Guys
- Other (please specify):

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – Teacher Survey (continued)

5/30/2017

Qualtrics Survey Software

Q20. How many times per school week did you teach nutrition (i.e. nutrition education or nutrition activities) as part of the FFVP?

- 0 times
- At least 1 time per week
- 2 times per week
- 3 times per week
- 4 times per week
- More than 4 times per week

Q21. How long is each lesson or activity?

- Less than 15 minutes
- 15-30 minutes
- 30-45 minutes
- More than 45 minutes
- Varies. How so?

Information about you and your school

Q22. Information about your school

Name of school

Name of your school district

Q23. What is the primary format of your classroom?

- Monolingual
- Bilingual
- Other

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – Teacher Survey (continued)

5/30/2017

Qualtrics Survey Software

Q24. Average number of students per class

Q25. What grade level(s) do you teach?

Preschool

Kindergarten

1st grade

2nd grade

3rd grade

4th Grade

5th grade

6th grade

7th grade

8th grade

Other (please specify):

Q26. How many years have you been teaching?

Less than one year

1-3 years

4-6 years

More than 6 years

Other. Please explain:

Q27. What is your educational background?

High school graduate

College graduate, in what area?

Master's degree, in what area?

Doctoral degree, in what area?

Other

Q28. Are you Hispanic or Latino?

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – Teacher Survey (continued)

5/30/2017

Qualtrics Survey Software

- Yes
- No

Q29. How would you describe your race? (check all that apply)

- American Indian or Alaska Native
- Asian
- Black or African American
- Native Hawaiian or Other Pacific Islander
- White

Email for gift card

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APPENDIX G: FFVP Surveys Distributed to Illinois Schools – FFVP Coordinator Survey (continued)

5/30/2017

Qualtrics Survey Software



ILLINOIS

Screener questions

The **Fresh Fruit and Vegetable Program (FFVP)** provides free fresh fruits and vegetables to students in participating schools in your district, outside of normal school-provided meals.

Prior to starting the survey:

Were you familiar with the way the Fresh Fruit and Vegetable Program (FFVP) was implemented in $\{m://ExternalDataReference\}$?

- Yes
- No

If not, who would know how the FFVP was implemented at $\{m://ExternalDataReference\}$?

If you do not know, please write in N/A in the 'Name' field.

Name

E-mail

Survey Introduction Page

Dear Coordinator of the FFVP at $\{m://ExternalDataReference\}$,

The purpose of this research survey is to learn about how the USDA Fresh Fruit and Vegetable Program (FFVP) is implemented in various schools in Illinois. This research is being conducted by Dr. Karen Chapman-Novakofski of the Division of Nutritional Sciences at the University of Illinois.

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – FFVP Coordinator Survey (continued)

5/30/2017

Qualtrics Survey Software

This survey contains 37 questions and takes about 10-15 minutes to complete. We ask that you complete the survey before May 15, 2017. The first 300 participants will receive a \$5 Starbucks gift card that will be e-mailed to them after completion of the survey.

Completing this survey is voluntary. You do not need to complete the whole survey if you do not wish to. There is no penalty or discontinuance of participation in any University of Illinois-affiliated programs if you decline. There are no known risks to completing this survey outside those of daily life. Results may be aggregated to be presented at a scientific conference or in a scientific journal.

In general, we will not tell anyone any information about you. When this research is discussed or published, no one will know that you were in the study. However, laws and university rules might require us to disclose information about you. For example, if required by laws or University Policy, study information which identifies you may be seen or copied by the following people or groups: a) The university committee and office that reviews and approves research studies, the Institutional Review Board (IRB) and Office for Protection of Research Subjects, or b) University and state auditors, and Departments of the university responsible for oversight of research.

If you have a question or need assistance in completing the survey, please call Natalie Masís, Dr. Chapman-Novakofski's graduate student, at (650) 296-8197 or e-mail her at masis2@illinois.edu, or contact Dr. Chapman-Novakofski at kmc@illinois.edu or 217-244-2852.

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Default Question Block

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – FFVP Coordinator Survey (continued)

5/30/2017

Qualtrics Survey Software

Instructions:

The **Fresh Fruit and Vegetable Program (FFVP)** provides free fresh fruits and vegetables to students in participating schools in your district, outside of normal school-provided meals. This part of the survey asks you to provide information and opinions about the general administration and implementation of the FFVP in your school.

Q1. How many days per week is FFVP offered to students at your school?

- Daily (5 times per week)
- 4 times per week
- 3 times per week
- 2 times per week
- 1 time per week
- I don't know
- Varies. How so?

Q2. How many times per day is FFVP offered to students at your school?

- Once per day
- Twice per day
- Three times
- More than 3 times per day
- Varies. How so?

Q3. Where is FFVP served to students at your school? (check all that apply)

- | | |
|--|--|
| <input type="checkbox"/> Classroom | <input type="checkbox"/> School store |
| <input type="checkbox"/> Cafeteria | <input type="checkbox"/> Snack bar |
| <input type="checkbox"/> Playground | <input type="checkbox"/> Office |
| <input type="checkbox"/> Vending machine | <input type="checkbox"/> Gym |
| <input type="checkbox"/> Kiosks | <input type="checkbox"/> I don't know |
| <input type="checkbox"/> Hallway | <input type="checkbox"/> Other (please specify): |

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – FFVP Coordinator Survey (continued)

5/30/2017

Qualtrics Survey Software

Food cart

Q4. Do the students consume the fruits or vegetables at the same location as where it is served?

Yes

No

I don't know

Varies. How so?

Q4A. If not, where do the children consume their fruits and vegetables served from the FFVP? (check all that apply)

Classroom

Cafeteria

Playground

Hallway

Office

Gym

Home (i.e. students take fruit or vegetable home with them)

Other (specify location):

Q5. Are all grades at your school offered the FFVP?

Yes

No

I don't know

Q5A. Which grades are offered fruits or vegetables as part of the FFVP? (check all that apply)

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – FFVP Coordinator Survey (continued)

5/30/2017

Qualtrics Survey Software

- Preschool
- Kindergarten
- 1st grade
- 2nd grade
- 3rd grade
- 4th grade
- 5th grade
- Other grades (please specify):
- Varies. How so?

Q6. At what time were fruits and vegetables distributed for the FFVP? (check all that apply)

- Morning during school time, before lunch
- Afternoon during school time, after lunch
- Other (please specify):

Q7. What is the average minutes per class that fresh fruits/vegetables were available for children to taste?

- number of minutes:
- I don't know

Q8. What preparation is done with the fruits or vegetables served as part of the FFVP? (check all that apply)

- Sliced
- Peeled
- Herbs added
- Spices added
- Cooked some vegetables
- None. Fruits or vegetables were served whole.

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – FFVP Coordinator Survey (continued)

5/30/2017

Qualtrics Survey Software

- I don't know. We do not do preparation at our school.
- Varies. How so?
- Other (please specify):
- Other (please specify):

Q9. Which fresh fruits (if any) were distributed to students as part of the FFVP? (check all that apply)

- | | |
|--|--|
| <input type="checkbox"/> Apples | <input type="checkbox"/> Pears |
| <input type="checkbox"/> Apricots, nectarines or peaches | <input type="checkbox"/> Pineapple |
| <input type="checkbox"/> Bananas | <input type="checkbox"/> Plums |
| <input type="checkbox"/> Blackberries or raspberries | <input type="checkbox"/> Strawberries |
| <input type="checkbox"/> Blueberries | <input type="checkbox"/> Tangerines |
| <input type="checkbox"/> Cantaloupe or honeydew | <input type="checkbox"/> Watermelon |
| <input type="checkbox"/> Cherries | <input type="checkbox"/> Exotic fruit options (i.e. dragonfruit) |
| <input type="checkbox"/> Grapefruit | <input type="checkbox"/> Other fruit (please specify):
<input type="text"/> |
| <input type="checkbox"/> Grapes | <input type="checkbox"/> Other fruit (please specify):
<input type="text"/> |
| <input type="checkbox"/> Kiwis | <input type="checkbox"/> Other fruit (please specify):
<input type="text"/> |
| <input type="checkbox"/> Mandarin oranges | <input type="checkbox"/> Other fruit (please specify):
<input type="text"/> |
| <input type="checkbox"/> Mangoes | <input type="checkbox"/> None |
| <input type="checkbox"/> Oranges | |

Q10. Up to how many times were the same fruits offered throughout 2016-2017 as part of the FFVP?

- Offered it just once
- Two times
- Three or more times

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – FFVP Coordinator Survey (continued)

5/30/2017

Qualtrics Survey Software

Varies. How so?

I don't know

Q11. How much fruit is offered to children as a snack as part of the FFVP? (check all that apply)

A bite size amount

1/4 cup (size of golf ball)

1/2 cup (1/2 baseball)

1 cup (baseball)

I don't know

Varies. How so?

Q12. Which fresh vegetables (if any) were distributed to students as part of the FFVP? (check all that apply)

Broccoli

Carrots

Cauliflower

Celery

Cucumber

Lettuce or other leafy greens

Peppers

Snap peas

Snow peas

String/green beans

Tomatoes

Yellow summer squash

Zucchini

Exotic vegetables (i.e. jicama, bok choy)

Other vegetable (please specify):

Other vegetable (please specify):

Other vegetable (please specify):

Other vegetable (please specify):

None

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – FFVP Coordinator Survey (continued)

5/30/2017

Qualtrics Survey Software

Q13. Up to how many times were the same vegetables offered throughout 2016-2017 as part of the FFVP?

- Offered it just once
- Two times
- Three or more times
- Varies. How so?
- I don't know

Q14. How much vegetable is offered to children as a snack as part of the FFVP? (check all that apply)

- A bite size amount
- 1/4 cup (size of golf ball)
- 1/2 cup (1/2 baseball)
- 1 cup (baseball)
- I don't know
- Varies. How so?

Q15. How many times were full-fat dipping sauces such as yogurt or ranch dressing used for some vegetables in the 2016-2017 year?

- Always
- Most of the time
- Sometimes
- Rarely
- Never
- I don't know

Q16. How many times were fat-free or low-fat dipping sauces such as yogurt or ranch dressing used for some vegetables in the 2016-2017 year?

- Always

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – FFVP Coordinator Survey (continued)

5/30/2017

Qualtrics Survey Software

- Most of the time
- Sometimes
- Rarely
- Never
- I don't know

Q17. Does your school **on its own** maintain **relationships** with any outside partners as part of the FFVP?

Also, please do not include suppliers from whom you **purchase** fresh fruits or vegetable or other supplies for the FFVP, unless they also separately donate items to the program for **free**.

- Produce for Better Health
- Healthcare providers, including hospital and clinics; doctors, nurses, nutritionists, dietitians/dietetic interns, or other clinicians
- State, or Tribal government agency (i.e. health departments, agriculture departments, etc)
- Cooperative Extension Service
- Supermarkets, grocery stores, or other retail stores
- Farmers' markets
- Food wholesalers or other food distributors
- Vocational clubs
- Produce associations/commodity groups
- Nutrition trade association (i.e. Academy of Nutrition and Dietetics, School Nutrition Associations)
- Health associations (i.e. State or National affiliates of the American Cancer, Diabetes, or Heart Associations)
- Universities, colleges, or other higher education institutions
- Community action agency, food bank, or other community/faith-based organization
- Other partner type (please specify):
- Other partner type (please specify):
- Other partner type (please specify):

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – FFVP Coordinator Survey (continued)

5/30/2017

Qualtrics Survey Software

Q17A. For each type of partner, please indicate the **role** that partner played in implementing the FFVP in your school.

	Providing free nutrition education or promotion material (print, video, audio, etc.)	Providing free instruction or demonstrations for students	Providing fresh fruits and vegetables for free	Providing other food (i.e. dips, condiments) for free	Providing free supplies
Produce for Better Health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Healthcare providers, including hospital and clinics; doctors, nurses, nutritionists, dietitians/dietetic interns, or other clinicians	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
State, or Tribal government agency (i.e. health departments, agriculture departments, etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cooperative Extension Service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Supermarkets, grocery stores, or other retail stores	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Farmers' markets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Food wholesalers or other food distributors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vocational clubs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Produce associations/commodity groups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nutrition trade association (i.e. Academy of Nutrition and Dietetics, School Nutrition Associations)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Health associations (i.e. State or National affiliates of the American Cancer, Diabetes, or Heart Associations)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Universities, colleges, or other higher education institutions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Community action agency, food bank, or other community/faith-based organization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
#{QID19/ChoiceTextEntryValue/14}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<https://illinoisaces.co1.qualtrics.com/ControlPanel/Ajax.php?action=GetSurveyPrintPreview>

10/19

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – FFVP Coordinator Survey (continued)

5/30/2017

Qualtrics Survey Software

	Providing free nutrition education or promotion material (print, video, audio, etc.)	Providing free instruction or demonstrations for students	Providing fresh fruits and vegetables for free	Providing other food (i.e. dips, condiments) for free	Providing free supplies
\${q://QID19/ChoiceTextEntryValue/15}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
\${q://QID19/ChoiceTextEntryValue/16}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q16B. Please explain what role this partner played, if selected 'Other.'

- » Produce for Better Health
- » Healthcare providers, including hospital and clinics; doctors, nurses, nutritionists, dietitians/dietetic interns, or other clinicians
- » State, or Tribal government agency (i.e. health departments, agriculture departments, etc)
- » Cooperative Extension Service
- » Supermarkets, grocery stores, or other retail stores
- » Farmers' markets
- » Food wholesalers or other food distributors
- » Vocational clubs
- » Produce associations/commodity groups
- » Nutrition trade association (i.e. Academy of Nutrition and Dietetics, School Nutrition Associations)
- » Health associations (i.e. State or National affiliates of the American Cancer, Diabetes, or Heart Associations)
- » Universities, colleges, or other higher education institutions
- » Community action agency, food bank, or other community/faith-based organization
- » \${q://QID19/ChoiceTextEntryValue/14}
- » \${q://QID19/ChoiceTextEntryValue/15}
- » \${q://QID19/ChoiceTextEntryValue/16}

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – FFVP Coordinator Survey (continued)

5/30/2017

Qualtrics Survey Software

Q17. In a typical week, which of the following statements best describes the **relationship** of the fresh fruits or vegetables offered to students in this school through the **FFVP** and the fruits or vegetables offered through the **USDA National School Lunch Program**? (please choose one)

The specific fruits or vegetables offered by the FFVP each week are also:

- intentionally served** in National School Lunch Program meals in the same week
- intentionally avoided** in the National School Lunch Program meals in the same week
- No attempt is made to coordinate** the specific fruit or vegetables offered by the FFVP each week and those offered through the National School – Lunch Program.

Q18. In what school year did this school **first participate** in the FFVP?

- Before SY2014-2015
- 2014-2015
- 2015-2016
- 2016-2017

Q19. What changes have been made in FFVP implementation in the current school year as compared to prior years? (check all that apply).

- | | |
|---|---|
| <input type="checkbox"/> More fruit and vegetable distribution methods (i.e. kiosk, classroom) for FFVP | <input type="checkbox"/> More variety of fruits and vegetables offered in FFVP |
| <input type="checkbox"/> More days FFVP is offered | <input type="checkbox"/> More total per-student quantity (i.e. serving size) of fruits and vegetables served each month in FFVP |
| <input type="checkbox"/> More times per day FFVP is offered on FFVP days | <input type="checkbox"/> No changes have been made as compared to prior years |
| <input type="checkbox"/> More FFVP nutrition education and promotion activities | <input type="checkbox"/> Other (please specify):
<input type="text"/> |
| <input type="checkbox"/> More involvement of outside partners in FFVP | |

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – FFVP Coordinator Survey (continued)

5/30/2017

Qualtrics Survey Software

Q20. Were you present during any of the times the FFVP was passed out as a snack?

- Yes
- No

Q21. How much of the fruits provided in the FFVP do students usually eat? (i.e. per child, how much of the fruit is typically consumed?)

- All or most (>75%)
- Much (50-75%)
- Some (25-49%)
- Little or none (<25%)
- Don't know or not applicable

Q22. How much of the vegetables provided in the FFVP do students usually eat? (i.e. per child, how much of the vegetable is typically consumed?)

- All or most (>75%)
- Much (50-75%)
- Some (25-49%)
- Little or none (<25%)
- Don't know or not applicable

Q23. I verbally encourage the students to eat the FFVP snacks.

- Always
- Very often
- Sometimes
- Rarely
- Never

Q24. Students like the FFVP **fruits**.

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – FFVP Coordinator Survey (continued)

5/30/2017

Qualtrics Survey Software

- Strongly agree
- Somewhat agree
- Somewhat disagree
- Strongly disagree
- Don't know or not applicable

Q25. Students like the FFVP **vegetables**.

- Strongly agree
- Somewhat agree
- Somewhat disagree
- Strongly disagree
- Don't know or not applicable

Q26. Were you involved in any training for the FFVP?

- Yes
- No

Q26A. If yes, what type of training was provided for the FFVP?

- Nutrition education
- Training on implementing the FFVP
- Other

Q27. Did you take part in any of the following FFVP implementation activities during the school year? (check all that apply)

- I helped prepare fruit and/or vegetables for distribution
- I distributed fruit and/or vegetables
- I planned activities for the FFVP
- I helped with classroom promotional activities for FFVP

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – FFVP Coordinator Survey (continued)

5/30/2017

Qualtrics Survey Software

- I helped with school-wide promotional activities for FFVP
- I taught FFVP lessons that were given to me
- I used more fruit and vegetable examples in my existing classroom lessons
- I added new lessons, nutrition education, or activities that addressed nutrition
- I changed how I use foods as rewards or incentives in class so there are more healthful options
- I changed how healthy foods are offered for classroom celebrations/parties
- I provided nutrition materials for parents
- I was part of a committee involved in the FFVP
- I was a positive role model to children during FFVP
- Other:

Q28. **My overall opinion** of FFVP is favorable.

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

Q29. If I could **change one thing** about the FFVP it would be:

Q30. Which of the following factors is a problem to implementing the FFVP in your school?

	Major problem	Minor problem	Not a problem
Students don't like the fruit and vegetables	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Students waste too much	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Messy to distribute and clean up	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – FFVP Coordinator Survey (continued)

5/30/2017		Qualtrics Survey Software		
	Major problem	Minor problem	Not a problem	
Students don't like to try new fruits and vegetables	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Inadequate staff training	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Inadequate staff time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Perishability of FFVP produce	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Inadequate quality of FFVP produce	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Inadequate variety of FFVP produce	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Inadequate amounts of FFVP produce	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
High prices for FFVP produce	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Effort of preparing FFVP produce	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Cost of preparing FFVP produce	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Lack of storage space/facilities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Rules for purchasing produce for FFVP	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Restrictions on administrative cost	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Amount of paperwork/documentation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Other program requirements/regulations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Other: <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Q31. Do you have any other comments, suggestions, or thoughts about the FFVP?

Information about you and your school

Q32. Information about your school

Name of school

Name of your school district

<https://illinoisaces.co1.qualtrics.com/ControlPanel/Ajax.php?action=GetSurveyPrintPreview> 16/19

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – FFVP Coordinator Survey (continued)

5/30/2017

Qualtrics Survey Software

Q33. How many years have you been working at this school or school district?

- Less than one year
- 1-3 years
- 4-6 years
- more than 6 years
- Not applicable. Please explain:

Q34. What is your role at the school?

- Principal
- Assistant principal
- Food service director/manager
- Food service staff member
- University Extension worker
- Teacher
- Other (please specify):

Q35. What is your educational background?

- High school graduate
- College graduate, in what area?
- Master's degree, in what area?
- Doctoral degree, in what area?
- Other

Q36. Are you Hispanic or Latino?

- Yes
- No

APPENDIX G: FFVP Surveys Distributed to Illinois Schools – FFVP Coordinator Survey (continued)

5/30/2017

Qualtrics Survey Software

Q37. How would you describe your race? (check all that apply)

- American Indian or Alaska Native
- Asian
- Black or African American
- Native Hawaiian or Other Pacific Islander
- White

Email for gift card

If you would like to receive a \$5 Starbucks gift card, please input the e-mail you would like to receive it at below:

Powered by Qualtrics

APPENDIX G: IRB Approval Letters for FFVP Surveys Distribution (continued)

4/30/2017

Exempt Approval - IRB #17722

Exempt Approval - IRB #17722

Institutional Review Board

Sent: Monday, April 24, 2017 4:34 PM
To: Chapman-Novakofski, Karen Marie
Cc: Masis, Natalie M
Attachments: 17722_Attachments_04242017.pdf (323 KB)

IRB EXEMPT APPROVAL

RPI Name: Karen Chapman-Novakofski

Project Title: Fresh Fruit and Vegetable Program (FFVP) Implementation Survey of Schools

IRB #: 17722

Approval Date: April 24, 2017

Thank you for submitting the completed IRB application form and related materials. Your application was reviewed by the UIUC Office for the Protection of Research Subjects (OPRS). OPRS has determined that the research activities described in this application meet the criteria for exemption at 45CFR46.101(b)(2). This message serves to supply OPRS approval for your IRB application.

Please contact OPRS if you plan to modify your project (change procedures, populations, consent letters, etc.). Otherwise you may conduct the human subjects research as approved for a period of five years. Exempt protocols will be closed and archived at the time of expiration. Researchers will be required to contact our office if the study will continue beyond five years.

Copies of the attached, date-stamped consent form(s) are to be used when obtaining informed consent.

We appreciate your conscientious adherence to the requirements of human subjects research. If you have any questions about the IRB process, or if you need assistance at any time, please feel free to contact me at OPRS, or visit our website at <http://oprs.research.illinois.edu>

Sincerely,



Michelle Lore

Human Subjects Research Specialist, Office for the Protection of Research Subjects

Attachment(s): Consent Documents, Waiver of Documentation of Consent

c: Natalia Masis

Office of the Vice Chancellor for Research | Office for the Protection of Research Subjects
University of Illinois | Urbana-Champaign
805 West Pennsylvania Avenue, MC-095 | Urbana, IL 61801
Phone: (217) 333-2670 | Email: irb@illinois.edu
Website: <http://oprs.research.illinois.edu>

Office for the Protection of Research Subjects
Providing administrative support, services, and resources to the research community and the IRB

"Under the Illinois Freedom of Information Act (FOIA) any written communication to or from University employees regarding University business is a public record and may be subject to public disclosure."

<https://webmail.illinois.edu/owa/?ae=Item&t=IPM.Note&id=RgAAAAADn8Yja%2fSVHRK48cP948j22BwBRTe%2fHmVsQS5FivxnI0DwAAAAILWvAABRTe%2fH...> 1/2

APPENDIX G: IRB Approval Letters for FFVP Surveys Distribution (continued)

Dear [SCHOOL STAFF MEMBER],

The purpose of this research survey is to learn about how the USDA Fresh Fruit and Vegetable Program (FFVP) is implemented in various schools in Illinois. This research is being conducted by Dr. Karen Chapman-Novakofski of the Division of Nutritional Sciences at the University of Illinois.

This survey contains XX questions and takes about 10-15 minutes to complete. We ask that you complete the survey before May 15, 2017. The first XX participants will receive a \$XX gift card that will be e-mailed to them after completion of the survey.

Completing this survey is voluntary. You do not need to complete the whole survey if you do not wish to. There is no penalty or discontinuance of participation in any University of Illinois-affiliated programs if you decline. There are no known risks to completing this survey outside those of daily life. Results may be aggregated to be presented at a scientific conference or in a scientific journal.

In general, we will not tell anyone any information about you. When this research is discussed or published, no one will know that you were in the study. However, laws and university rules might require us to disclose information about you. For example, if required by laws or University Policy, study information which identifies you may be seen or copied by the following people or groups: a) The university committee and office that reviews and approves research studies, the Institutional Review Board (IRB) and Office for Protection of Research Subjects, or b) University and state auditors, and Departments of the university responsible for oversight of research.

If you have a question or need assistance in completing the survey, please call Natalie Masís, Dr. Chapman-Novakofski's graduate student, at (650) 296-8197 or e-mail her at masis2@illinois.edu. Or Dr. Chapman-Novakofski at kmc@illinois.edu or 217-244-2852.

If you have any questions about your rights as a participant in this study or any concerns or complaints, please contact the University of Illinois Institutional Review Board at (217) 333-2670 or via email at irb@illinois.edu.

PLEASE READ CAREFULLY BEFORE PROCEEDING. By clicking the next button, you indicate you have read and understand the above and voluntarily agree to participate in this study.

University of Illinois at Urbana-Champaign
Institutional Review Board

Approved: 4-24-17
IRB #: 17722

APPENDIX G: IRB Approval Letters for FFVP Surveys Distribution (continued)

FFVP Principal Final_4.20.2017

S1 Dear \${m://FirstName} \${m://LastName}, The purpose of this research survey is to learn about how the USDA Fresh Fruit and Vegetable Program (FFVP) is implemented in various schools in Illinois. This research is being conducted by Dr. Karen Chapman-Novakofski of the Division of Nutritional Sciences at the University of Illinois. This survey contains 21 questions and takes about 10-15 minutes to complete. We ask that you complete the survey before May 15, 2017. The first 300 participants will receive a \$5 Starbucks gift card that will be e-mailed to them after completion of the survey. Completing this survey is voluntary. You do not need to complete the whole survey if you do not wish to. There is no penalty or discontinuance of participation in any University of Illinois-affiliated programs if you decline. There are no known risks to completing this survey outside those of daily life. Results may be aggregated to be presented at a scientific conference or in a scientific journal. In general, we will not tell anyone any information about you. When this research is discussed or published, no one will know that you were in the study. However, laws and university rules might require us to disclose information about you. For example, if required by laws or University Policy, study information which identifies you may be seen or copied by the following people or groups: a) The university committee and office that reviews and approves research studies, the Institutional Review Board (IRB) and Office for Protection of Research Subjects, or b) University and state auditors, and Departments of the university responsible for oversight of research. If you have a question or need assistance in completing the survey, please call Natalie Masís, Dr. Chapman-Novakofski's graduate student, at (650) 296-8197 or e-mail her at masis2@illinois.edu. Or Dr. Chapman-Novakofski at kmc@illinois.edu or 217-244-2852. If you have any questions about your rights as a participant in this study or any concerns or complaints, please contact the University of Illinois Institutional Review Board at (217) 333-2670 or via email at irb@illinois.edu. PLEASE READ CAREFULLY BEFORE PROCEEDING. By clicking the next button, you indicate you have read and understand the above and voluntarily agree to participate in this study.

S2 Instructions: The Fresh Fruit and Vegetable Program (FFVP) provides free fresh fruits and vegetables to students in participating schools in your district, outside of normal school-provided meals. This part of the survey asks you to provide information and opinions about the general administration and implementation of the FFVP in your school.

Q1 Q1. Did your school coordinate the specific fruits and vegetables offered during the USDA Fresh Fruit and Vegetable Program (FFVP) distribution with specific information discussed in school-wide nutrition education and promotion activities? For example, dark green vegetables might be featured in a nutrition education class and on the FFVP distribution day.

- Yes (1)
- No (2)
- I don't know (3)

University of Illinois at Urbana-Champaign
Institutional Review Board

Approved: 4-24-17
IRB #: 17722

APPENDIX G: IRB Approval Letters for FFVP Surveys Distribution (continued)

FFVP Teacher Final_4.20.2017

Q44 Dear \${m://FirstName} \${m://LastName}, The purpose of this research survey is to learn about how the USDA Fresh Fruit and Vegetable Program (FFVP) is implemented in various schools in Illinois. This research is being conducted by Dr. Karen Chapman-Novakofski of the Division of Nutritional Sciences at the University of Illinois. This survey contains 29 questions and takes about 10-15 minutes to complete. We ask that you complete the survey before May 15, 2017. The first 300 participants will receive a \$5 Starbucks gift card that will be e-mailed to them after completion of the survey. Completing this survey is voluntary. You do not need to complete the whole survey if you do not wish to. There is no penalty or discontinuance of participation in any University of Illinois-affiliated programs if you decline. There are no known risks to completing this survey outside those of daily life. Results may be aggregated to be presented at a scientific conference or in a scientific journal. In general, we will not tell anyone any information about you. When this research is discussed or published, no one will know that you were in the study. However, laws and university rules might require us to disclose information about you. For example, if required by laws or University Policy, study information which identifies you may be seen or copied by the following people or groups: a) The university committee and office that reviews and approves research studies, the Institutional Review Board (IRB) and Office for Protection of Research Subjects, or b) University and state auditors, and Departments of the university responsible for oversight of research. If you have a question or need assistance in completing the survey, please call Natalie Masis, Dr. Chapman-Novakofski's graduate student, at (650) 296-8197 or e-mail her at masis2@illinois.edu. Or Dr. Chapman-Novakofski at kmc@illinois.edu or 217-244-2852. If you have any questions about your rights as a participant in this study or any concerns or complaints, please contact the University of Illinois Institutional Review Board at (217) 333-2670 or via email at irb@illinois.edu. PLEASE READ CAREFULLY BEFORE PROCEEDING. By clicking the next button, you indicate you have read and understand the above and voluntarily agree to participate in this study.

S2 Instructions: The Fresh Fruit and Vegetable Program (FFVP) provides free fresh fruits and vegetables to students in participating schools in your district, outside of normal school-provided meals. This part of the survey asks you to provide information and opinions about the general administration and implementation of the FFVP in your school.

Q1 Q1. How familiar are you with the Fresh Fruit and Vegetable Program (FFVP) implementation at your school?

- Extremely familiar (1)
- Very familiar (2)
- Moderately familiar (3)
- Slightly familiar (4)
- Not familiar at all (5)

University of Illinois at Urbana-Champaign
Institutional Review Board

Approved: _____

IRB #: _____

4-24-17

17722

APPENDIX G: IRB Approval Letters for FFVP Surveys Distribution (continued)

FFVP Coordinator Final_4.20.2017

Q59 The Fresh Fruit and Vegetable Program (FFVP) provides free fresh fruits and vegetables to students in participating schools in your district, outside of normal school-provided meals. Prior to starting the survey: Were you familiar with the way the Fresh Fruit and Vegetable Program (FFVP) was implemented in $\$(m://ExternalDataReference)?$

- Yes (1)
- No (2)

Display This Question:

If The Fresh Fruit and Vegetable Program (FFVP) provides free fresh fruits and vegetables to students in participating schools in your district, outside of normal school-provided meals... No Is Selected

Q60 If not, who was the coordinator of the FFVP at $\$(m://ExternalDataReference)?$ If you do not know, please write in N/A in the 'Name' field.

Name (1)

E-mail (2)

Condition: Name Is Not Empty. Skip To: End of Survey.

Q52 Dear $\$(m://FirstName) \$(m://LastName)$, The purpose of this research survey is to learn about how the USDA Fresh Fruit and Vegetable Program (FFVP) is implemented in various schools in Illinois. This research is being conducted by Dr. Karen Chapman-Novakofski of the Division of Nutritional Sciences at the University of Illinois. This survey contains 37 questions and takes about 10-15 minutes to complete. We ask that you complete the survey before May 15, 2017. The first 300 participants will receive a \$5 Starbucks gift card that will be e-mailed to them after completion of the survey. Completing this survey is voluntary. You do not need to complete the whole survey if you do not wish to. There is no penalty or discontinuance of participation in any University of Illinois-affiliated programs if you decline. There are no known risks to completing this survey outside those of daily life. Results may be aggregated to be presented at a scientific conference or in a scientific journal. In general, we will not tell anyone any information about you. When this research is discussed or published, no one will know that you were in the study. However, laws and university rules might require us to disclose information about you. For example, if required by laws or University Policy, study information which identifies you may be seen or copied by the following people or groups: a) The university committee and office that reviews and approves research studies, the Institutional Review Board (IRB) and Office for Protection of Research Subjects, or b) University and state auditors, and Departments of the university responsible for oversight of research. If you have a question or need assistance in completing the survey, please call Natalie Masís, Dr. Chapman-Novakofski's graduate student, at (650) 296-8197 or e-mail her at masís2@illinois.edu. Or Dr. Chapman-Novakofski at kmc@illinois.edu or 217-244-2852. If you have any questions about your rights as a participant in this study or any concerns or complaints, please contact the University of Illinois Institutional Review Board at (217) 333-2670 or via email at irb@illinois.edu. PLEASE READ CAREFULLY BEFORE PROCEEDING. By

University of Illinois at Urbana-Champaign
Institutional Review Board

Approved: 4-24-17
IRB #: 17720

APPENDIX G: Waiver of Documentation of Informed Consent for FFVP Surveys Distribution (continued)



WAIVER OF DOCUMENTATION OF INFORMED CONSENT FORM

Application for Waiver of Documentation on Informed Consent

ALL APPLICATIONS MUST BE SIGNED AND SUBMITTED VIA EMAIL TO IRB@ILLINOIS.EDU.

Responsible Project Investigator: Dr. Karen Chapman-Novakofski
Project Title: Fresh Fruit and Vegetable Program (FFVP) Implementation Survey of Schools
IRB Number

To request a waiver of documentation [signature] of informed consent, please provide a response to either of the following questions. Please be specific in explaining why either statement is true for this research.

In cases in which the documentation requirement is waived, the IRB may require the investigator to provide subjects with a written statement regarding the research.

1. Explain that the only record linking the subject and the research would be the consent document and the principal risk would be potential harm resulting from a breach of confidentiality. Each subject will be asked whether the subject wants documentation linking the subject with the research, and the subject's wishes will govern. *Note: A waiver of documentation of informed consent is **not permissible under this category if subject to FDA regulations.**

2. The research presents no more than minimal risk of harm to subjects and involves no procedures for which written consent is normally required outside the consent.

The participant will take a no risk survey and the research presents no more than minimal risk of harm to participation. The participant will be informed on the initial survey page that by clicking the 'NEXT' button on the survey, that they are granting consent of their participation in our survey.

Karen Chapman-Novakofski

4.21.17

Responsible Principal Investigator

Date

IRB Approval:

University of Illinois at Urbana-Champaign
Institutional Review Board

Approved: _____

4.24.17

IRB #: _____

17722

OFFICE FOR THE PROTECTION OF RESEARCH SUBJECTS | UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN
805 West Pennsylvania Avenue, MC-095, Urbana, IL 61801 | T 217-333-2670 | irb@illinois.edu | www.irb.illinois.edu | Revised: 3/21/17

APPENDIX H: FFVP Survey Index Expert Panel Documents

The following pages contain the IRB approval form for the expert panel review to create the index of FFVP Survey implementation and the informational letter distributed to the expert panel members.

8/3/2017 Exempt Approval - IRB #17777

Reply Reply All Forward Chat

Exempt Approval - IRB #17777

Institutional Review Board

To: Chapman-Novakofski, Karen Marie
Cc: Masis, Natalie M
Attachments: 17777_Consent_05172017.pdf (51 KB)

Wednesday, May 17, 2017 1:49 PM

IRB EXEMPT APPROVAL


RPI Name: Karen Chapman-Novakofski
Project Title: Expert panel review on index of schools for Fresh Fruit and Vegetable Program (FFVP) implementation
IRB #: 17777
Approval Date: May 17, 2017

Thank you for submitting the completed IRB application form and related materials. Your application was reviewed by the UIUC Office for the Protection of Research Subjects (OPRS). OPRS has determined that the research activities described in this application meet the criteria for exemption at 45CFR46.101(b)(2). This message serves to supply OPRS approval for your IRB application.

Please contact OPRS if you plan to modify your project (change procedures, populations, consent letters, etc.). Otherwise you may conduct the human subjects research as approved for a period of five years. Exempt protocols will be closed and archived at the time of expiration. Researchers will be required to contact our office if the study will continue beyond five years.

Copies of the attached, date-stamped consent form(s) are to be used when obtaining informed consent.

We appreciate your conscientious adherence to the requirements of human subjects research. If you have any questions about the IRB process, or if you need assistance at any time, please feel free to contact me at OPRS, or visit our website at <http://oprs.research.illinois.edu>

Sincerely,


Michelle Lore
Human Subjects Research Specialist, Office for the Protection of Research Subjects
Attachment(s): Online consent

c: Natalie Masis

Office of the Vice Chancellor for Research | Office for the Protection of Research Subjects
University of Illinois | Urbana-Champaign
805 West Pennsylvania Avenue, MC-095 | Urbana, IL 61801
Phone: (217) 333-2670 | Email: irb@illinois.edu
Website: <http://oprs.research.illinois.edu>

Office for the Protection of Research Subjects
Providing administrative support services and resources to the research community and the IRB
<https://webmail.illinois.edu/owa/?ae=Item&a=Open&t=IPM.Note&id=RgAAAADn6Yja%2fSVHRK48cP948jZ2BwBRTe%2fHmVsQS5Fivxnl0DwAAAAILWvAAB...> 1/1

APPENDIX H: FFVP Survey Index Expert Panel Informational Letter (continued)

Dr. Karen Chapman-Novakofski and a research team from the Departments of Food Science and Human Nutrition and Agricultural and Consumer Economics at the University of Illinois are developing a survey to evaluate how the Fresh Fruit and Vegetable Program (FFVP) is being implemented among Illinois schools. We want to develop an index that assesses different levels of implementation of the program (low, high implementation) based on the survey questions. We anticipate that this will help with identifying factors that are most beneficial in improving implementation of the program.

If you choose to participate in the study, you will be interviewed in person, phone, or online at a time most convenient for you, to discuss the survey questions and the content of what may be considered low or high implementation of the program based on the questions and answer choices of the survey. During the interview, audio equipment will be used to record your responses. Your participation is voluntary and your name will not be associated with any publication.

This process may take 30 minutes to an hour, depending on the discussion of the survey questions. You may decline any time if you would not like to participate further.

Will my study-related information be kept confidential? Yes, but not always. In general, we will not tell anyone any information about you. When this research is discussed or published, no one will know that you were in the study. However, laws and university rules might require us to disclose information about you. For example, if required by laws or University Policy, study information which identifies you and the consent form signed by you may be seen or copied by the following people or groups:

- The university committee and office that reviews and approves research studies, the Institutional Review Board (IRB) and Office for Protection of Research Subjects;
- University and state auditors, and Departments of the university responsible for oversight of research;

Results may be included in a professional journal or presentation. If you have any questions about your rights as a participant in this study or any concerns or complaints, please contact the University of Illinois Institutional Review Board at 217-333-2670 or via email at irb@illinois.edu. If you have questions or complaints about this study, please contact Dr. Karen Chapman-Novakofski at kmc@illinois.edu or 217-244-2852.

University of Illinois at Urbana-Champaign
Institutional Review Board

Approved: _____

IRB #: _____

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