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Supplemental Nutrition Assistance Program

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*SNAP Education and Evaluation Study (Wave I):  
Final Report*



United States  
Department of  
Agriculture

Food and  
Nutrition  
Service

January 2012

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## *SNAP Education and Evaluation Study (Wave I)*

### *Final Report*

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# Executive Summary

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This executive summary presents the background, methods, and key findings of the final report produced for the U.S. Department of Agriculture (USDA) Food and Nutrition Service (FNS) study entitled *Models of SNAP Education and Evaluation, Wave I*. This study evaluated four Supplemental Nutrition Assistance Program-Education (SNAP-Ed) demonstration projects. The findings and methodology specific to each demonstration project are presented in four separate case study reports.<sup>1</sup> The evaluation included three components: a process evaluation of the program's implementation, an evaluation of the program's impact on nutrition behaviors, and an assessment of the methods and results of the self-evaluations conducted by each demonstration project.

## A. Background

### 1. Overview of SNAP-Ed

Under subcontract agreements with State SNAP agencies, a variety of organizations partner to implement SNAP-Ed within States. The goal of these programs is to improve the likelihood that SNAP participants and persons eligible for SNAP will make healthy food choices within a limited budget and choose physically active lifestyles. FNS' SNAP-Ed Guiding Principles call for interventions that are science-based and behaviorally focused. FNS also requests that States' SNAP-Ed efforts be consistent with the current (2010) Dietary Guidelines for Americans, including the following (USDA, FNS, 2011)<sup>2</sup>:

- Eating fruits and vegetables, whole grains, and fat-free or low-fat milk products every day;
- Being physically active every day as part of a healthy lifestyle; and
- Balancing caloric intake from food and beverages with calories expended.

SNAP-Ed Guidance also encourages all States to evaluate the effectiveness of their SNAP-Ed interventions. These can include formative, process, outcome, and impact evaluations. In Federal Fiscal Year (FY) 2004, 74 percent of SNAP-Ed implementing agencies (IA) reported that they did conduct outcome evaluations on at least some aspects of services. However, based on interviews with 17 IAs, these evaluations were focused to a greater extent on process outcomes, such as program use, than they were on participant behavior change (USDA, FNS, 2006).<sup>3</sup> As the largest USDA funding source for nutrition education, FNS, States, and local IAs have a significant stake in ensuring that SNAP-Ed meets FNS' goals.

This study, *Models of SNAP Education and Evaluation (Wave I)*, is the first of two FNS-initiated independent evaluations designed to identify potential models of effective SNAP-Ed and impact evaluation. The overarching goal of this evaluation is to determine whether the selected projects can serve as good examples of effective nutrition education and promotion activities within SNAP-Ed by meeting the following criteria:

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<sup>1</sup> The individual case study reports for each demonstration project are published separately and included in the reference list at the end of this report. They are available at [www.fns.usda.gov/ora/](http://www.fns.usda.gov/ora/)

<sup>2</sup> See also SNAP-Ed Connections Web site at: <http://snap.nal.usda.gov>.

<sup>3</sup> At the time that the FSNE Systems Review was conducted, no formal evaluation guidance was given from FNS on program evaluation other than encouraging states to evaluate the effectiveness of their nutrition education programming. In 2007, FNS provided guidance with information on the use of a control or comparison group so that the impact of the program could be assessed (USDA, FNS, 2007).

- ▲ **Positively affecting the nutrition and health behaviors of SNAP clients while adhering to FNS Guiding Principles;**
- ▲ **Exhibiting the potential to serve as models of effective nutrition intervention for large segments of the SNAP audience that can be replicated by other IAs; and**
- ▲ **Providing methodologically robust yet logistically practical examples of project-level SNAP-Ed evaluation efforts.**

FNS also sought to understand the factors influencing the implementation of these nutrition education projects and lessons learned from these project experiences.

## **2. Selection and Overview of Wave I Demonstration Projects**

In FY 2008, FNS issued a request for applications to States to participate in the FNS-funded independent evaluation, *Models of SNAP Education and Evaluation*. Applicants proposed various program and evaluation designs with children and/or women as their primary target audience. Applications were received from agencies implementing ongoing SNAP-Ed programs, modifications of existing programs, or new programming models. In a competitive selection process, each application was scored and ranked by an independent technical review panel chaired by FNS. The review panel selected the following four projects to participate in the study:

- ▲ **New York State Department of Health’s (NYSDOH) Eat Well Play Hard in Child Care Settings (EWPHCCS);**
- ▲ **University of Nevada Cooperative Extension Service’s (UNCE) All 4 Kids;**
- ▲ **Chickasaw Nation Nutrition Services’ (CNNS) Eagle Adventure; and**
- ▲ **Pennsylvania State University’s (PSU) About Eating.**

Three of the selected demonstration projects (EWPHCCS, All 4 Kids, and Eagle Adventure) implemented interventions targeted to low-income children in either a childcare or school setting. Despite variations in their nutrition education messages, modes of delivery, and planned nutrition education dosage, all three child-focused interventions aimed to increase children’s consumption of fruits and vegetables—the focus of this study—as well as the amount of time children engage in physical activity. Children’s average exposure to direct education ranged from 145 minutes for the Eagle Adventure program (4 30-minute classes plus a 25 minute play performance) to 498 minutes for the All 4 Kids program (16.6 classes × 30 minutes per class). In addition, each of these interventions sought to engage parents and caregivers to some extent, either through direct education lessons, participatory family events, or take-home materials and activities.

The About Eating program differed from the other demonstration projects in several critical ways, including its target audience (low-income women), behavior-related goals (increasing eating competence), and its primary mode of nutrition education delivery (Web-based lessons). Also, because About Eating is a self-paced program, program administrators did not have control over the amount of exposure participants would have to each lesson, though to meet the independent evaluation’s timeline and achieve the desired sample size, participants in the About Eating demonstration were not allowed to go back to a lesson after they completed it. The program tracking data show that among the women who were eligible and engaged in at least one lesson, their average nutrition education exposure was 38 minutes (4.2 lessons × 9 minutes per lesson).

The four demonstration projects also varied in terms of their relative maturity. The EWPHCCS program has been implemented by NYSDOH since 2006, making it the longest running program out of the four projects. All 4 Kids has been previously implemented in Las Vegas with a pilot evaluation, whereas the

Eagle Adventure program was implemented for the first time during the study. Although the About Eating program was originally developed in 2007, it was tailored in 2009 for implementation with a low-income audience and implemented in its current form for the first time during the study.

In addition to variations in program maturity, the demonstration projects were also diverse in terms of their geographic scope, ranging from an implementation area of a single metropolitan area or county to multiple counties situated across an entire State. For this reason, the number of implementation sites (where applicable) and anticipated reach also differed by demonstration project.

Each of the four agencies implemented these SNAP-Ed programs in FY 2010 and conducted their own evaluations, supported primarily by SNAP-Ed administrative funds, State and local matching resources. The demonstration projects also received a \$100,000 incentive to offset expenses directly incurred as a result of their participation in this evaluation project, such as those associated with facilitating access to SNAP-Ed participants, participation in interviews, record keeping, and providing documents describing the implementer's SNAP-Ed intervention and evaluation processes.

## **B. Study Methodology**

To accomplish the evaluation study goals, three complementary types of assessments were conducted: a process evaluation, an impact evaluation, and an assessment of the demonstration project's own outcome or impact evaluations. Exhibit ES-1 lists the broad research questions framing the design and measures used in the evaluation of each demonstration project.

### **Exhibit ES-1.— Research Questions**

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#### *Process Evaluation*

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- What were the demonstration project's overall objectives and approach?
- How was the intervention implemented and administered?
- How many people did the intervention reach, and how much exposure did participants have to it?
- What resources and costs were needed for the design (where relevant) and implementation of the intervention?
- What were the facilitators, challenges, and lessons learned regarding implementation and administration of the intervention?
- What feedback did participants have about the implementation of and their satisfaction with the intervention?

#### *Impact Evaluation*

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- What was the intervention's impact on primary nutrition behavioral outcomes (i.e., cups of fruits and vegetables consumed)?
- What was the intervention's impact on secondary outcomes (e.g., eating a variety of fruits and vegetables each day)?

#### *Assessment of the Demonstration Project's Self-Evaluation*

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- How did the demonstration project's actual evaluation compare with their planned evaluation?
- What were the resources needed and costs of the evaluation?
- What were the results of the self evaluation, and how did they compare with the independent impact evaluation?
- What were the lessons learned?

## 1. Process Evaluation Methods

The process evaluations began by creating a baseline description of the objectives, approach, and components of the design, administration, and implementation of the program. This information was obtained from interviews with program-level staff members and from secondary program documents. Once the intervention was implemented, data collection and analysis of information on factors influencing the implementation began, resulting in the lessons learned for program improvement and replicability.

Across the four demonstration projects, primary data were collected from five categories of key informants—program-level staff members, direct educators, intervention site administrators (school principals or childcare center directors), intervention site classroom teachers, and program participants or their parents and caregivers. The timing of data collection from key informants took place approximately one month before the start and immediately following completion of the interventions. Key informant interviews were conducted during both time periods. These data were supplemented through direct observation by evaluation team members for the three school- or childcare center-based interventions.

Data collectors used standardized secondary data abstraction tools and primary data collection instruments designed for the evaluation of the four SNAP-Ed demonstration projects. The question wording in each key informant interview guide and focus group discussion guide was tailored to the specific characteristics of each project. In addition, key informant interviews included relevant, probing questions to allow for in-depth discussions of important issues or topics raised by the respondents. Data collection commenced in early 2010.

The analysis approach for the process evaluation used a mix of qualitative and quantitative methods. Program administrative data were used to calculate the projects' reach and a combination of administrative data and participant survey data were used to estimate the average amount of exposure that participants had to each intervention. Information on program costs and budget justifications were obtained directly from reports submitted by the SNAP-Ed IA to the evaluation team and per participant costs were estimated based on program implementation costs and reach. SAS 9.2 was used to analyze program dosage, participant satisfaction, and factors affecting program access from the survey responses of parents and caregivers of children in the child-focused demonstration projects and the low-income women who participated in PSU'S About Eating program. Qualitative analysis was conducted on information collected from secondary documents, key informant interviews, focus groups, and open-ended responses to survey questions. This methodology was used to accurately describe the program's design and implementation, to identify common themes in program successes and challenges, and assess lessons learned. The qualitative information was triangulated with the quantitative survey findings to confirm or further explain these findings.

## 2. Impact Evaluation Methods

Designing the impact evaluation approach required the consideration of a number of factors such as the characteristics of the interventions, the target audience, and the IA's proposed methods for its self-evaluation. While the approach used to evaluate the impact of each program was similar, it was customized to the particular characteristics of the intervention.

**Conceptual framework and outcome measures.** To provide a more integrative understanding of the impact of each demonstration project, the impact evaluation was guided by a conceptual framework that helped track the range of potential program effects. This framework was adapted from Green and

colleagues (1980) and has been used by others to capture the main types of secondary outcomes associated with changes in nutrition behavior (Mullen, Hersey, & Iverson, 1987).

This framework enabled the evaluation of the effects of the program through the specification of secondary outcomes that link the intervention to the long-term, primary outcome of average daily consumption of fruits and vegetables. The secondary outcomes capture, in greater detail, some of the complexity of the behavior change process. The greater the number and strength of the changes seen among the secondary outcomes, the greater the likelihood of observing changes in fruit and vegetable consumption.

The secondary outcomes include mediating factors and short-term outcomes. The following three main types of mediating factors can influence changes in dietary consumption:

- **Predisposing factors** include the knowledge and attitudes of an individual related to the motivation to act, for example, willingness of a child to try new fruits and vegetables.
- **Enabling factors** include the skills and resources needed to engage in healthy nutrition practices, for example, the availability of fruits and vegetables in a child's home.
- **Reinforcing factors** include factors that help reinforce healthy nutrition, for example, parents offering fruits and vegetables for snacks or at dinner.

Short-term outcomes include dietary behaviors such as the child eating vegetables for a snack or the daily variety of fruits and vegetables eaten by the child.

**Primary impacts.** For the three child-focused interventions—EWPHCCS, All 4 Kids, and Eagle Adventure—the independent evaluators assessed the impact of the program on the primary outcome measure of children's average daily at-home consumption of fruits and vegetables as reported by their parent or caregiver. Based on FNS' interest in observing a minimum change in children's dietary intake of 0.30 standard deviation units, it was hypothesized that children participating in the program would increase their average daily at-home consumption of fruits and vegetables combined by approximately 0.30 cups per day compared with children not participating in the program. The impact of the EWPHCCS program on the child's in-home use of 1% or fat-free milk during the past week was also examined.

The fundamental objective of the About Eating program is to increase eating competence of low-income women. PSU's application provided evidence that individuals with higher levels of eating competence have higher-quality diets, including a higher intake of fruits and vegetables. Thus, the primary outcome for the independent evaluation was daily consumption of fruits and vegetables. Based on FNS' interest in observing a minimum change in dietary intake of 0.30 standard deviation units, it was hypothesized that women participating in About Eating would increase their average daily consumption of fruits and vegetables by approximately 0.44 cups as compared with women not participating in the program.

**Evaluation design.** All of the independent evaluations used a research design that employed a comparison strategy so that plausible alternative explanations of program impact could be ruled out. A randomized experimental design was used for the evaluations of the About Eating and EWPHCCS programs, and a quasi-experimental design was used for the evaluations of the All 4 Kids and Eagle Adventure programs. It was not possible to use a randomized experimental design for All 4 Kids because two of the Head Start centers had previous exposure to the program and had to be assigned to the intervention group. Resource and staffing constraints prohibited CNNS from providing Eagle Adventure to schools in more than one county. To provide the most rigorous design possible under this constraint, a neighboring county with similar characteristics was used for selection of comparison schools.

Sample size was estimated following commonly accepted evaluation practices (i.e., 80 percent statistical power and a type I error rate of 0.05 with a two-tailed test). As noted above, sample size estimation was based on observing a change in daily consumption of fruits and vegetables combined of 0.30 standard deviation units or better as specified by FNS. Estimates were based on a statistical model that assesses change across time between the intervention and comparison groups.

**Data collection.** Using a mail and telephone survey approach (plus in-person interviews for the baseline survey for the All 4 Kids evaluation) parents and caregivers were surveyed at baseline and follow-up to collect information on their child’s consumption and other dietary behaviors at home for the three programs targeted to children.<sup>4</sup> For About Eating, the baseline and follow-up surveys for this online intervention were administered via the Internet by PSU’s Survey Research Center, concurrent with PSU’s own survey administration. Nonrespondents to the Internet post-survey were mailed a hardcopy of the FNS questionnaire and subsequently contacted by telephone if a completed mail survey was not received. Across the four evaluations, response rates for the follow-up surveys ranged from 79 to 87 percent. The independent evaluation achieved the required sample sizes based on the power analysis calculations for each evaluation.

**Impact analysis.** The similarity of the intervention and comparison groups was assessed at baseline, and the potential impact of attrition from the evaluation study on generalizability was investigated by comparing the pre-intervention similarity of study participants who provided follow-up data and those who did not. For the three child-focused demonstration projects, general linear mixed models (continuous impact variables) and generalized linear mixed models (dichotomous impact variables) were used to evaluate the impact of the program while accounting for the clustering of children within childcare centers or schools. These models were estimated via difference-in-difference estimates of program effect, comparing change across time (baseline and follow-up) in the intervention group with change across time in the comparison group. Covariates in the model included child and respondent characteristics. For About Eating, program impact was estimated via linear regression using adjusted endpoint models that included preference scores as a proxy for fruit and vegetable intake at baseline and other covariates describing the demographic characteristics of the respondent and her Internet use.

### **3. Assessment of the Demonstration Project’s Self-Evaluation**

This study also examined the soundness of the demonstration projects’ self-evaluations. This assessment encompassed a detailed description of the evaluation methodology used by the IAs, including the management, staffing, and costs of the evaluation; an assessment of the quality of the self-evaluations, including an identification of strengths, weaknesses, and areas for improvement; and a comparison of the results from the self-evaluations with those of the independent impact evaluations.

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<sup>4</sup> The survey instrument and other survey materials were available in English and Spanish for the EWPCCS and All 4 Kids evaluations.



## C. Process Evaluation Findings

### 1. Child-Focused Demonstration Projects

Findings from the process evaluation indicate that, in general, the child-focused demonstration projects were implemented as planned with the following key successes:

- **Intervention site staff members were enthusiastic in their support of the programs.** Childcare center directors and school principals were key partners in implementation and reported greatly appreciating the high-quality of program materials, flexibility of the program staff to accommodate their scheduling needs, and in particular, the relevancy of the programs' design, content, and messages. Because of the perceived value of these programs, most childcare directors and school principals helped support program implementation and, in some cases, reinforced nutrition messages with the children. They also indicated that they would welcome these programs again at their sites if the opportunity was offered. The vast majority of surveyed teachers at childcare centers that participated in the EWPHCCS or All 4 Kids interventions reported that they used the program's nutrition messages with the children in their classrooms and at mealtimes.
- **Parents and caregivers of child participants expressed high levels of satisfaction.** Parents and caregivers were also very satisfied with the program, citing an appreciation for aspects of each program that paralleled feedback from center directors and school principals. In addition to the quality of program materials and relevancy of the nutrition education messages, parents and caregivers also noted the usefulness of suggested at-home activities, satisfaction with parent classes and family events, and in general, the programs' support of their efforts to help their children be healthy.
- **Direct educators were well prepared and found the curriculum easy to implement.** Direct educators for the child-focused demonstration projects reported feeling well prepared to teach the curricula and that it was easy to implement. This finding provides some indication that IAs are using staff members with the appropriate background, experience, and skill set to deliver their nutrition education programs; are employing effective training programs; or are doing both.

These implementation successes suggest that demonstration project planners and implementers have a deep understanding of their target audiences and a profound dedication to quality—both of which could serve as best practices for future SNAP-Ed program implementers as they develop their own plans for implementation.

At the same time, there were a number of challenges in implementation of the three child-focused projects identified by the process evaluation that might have had an impact on children's at-home consumption of fruits and vegetables. These factors are briefly described below.

- **Parent participation was lower than desired.** Each of the child-focused demonstration projects had difficulty with implementing the parent engagement portion of their programs. Parents and caregivers attributed their lack of participation or inability to carry out the at-home activities for the most part to their time constraints and schedule conflicts with the class and event times. During focus groups, parents and caregivers also mentioned the cost of fruits and vegetables as a barrier to purchasing and preparing these foods more often for their children.

- **The programs received limited support from some intervention sites.** Although most childcare center directors and school principals helped support the demonstration projects' implementation, this was not always the case. At sites with lower levels of director engagement, some conflicts with the scheduling of intervention activities and lower levels of parent recruitment by center staff were reported. Classroom teacher engagement in the demonstration project lessons and reinforcement of the nutrition education messages was an integral part of the EWPHCCS program and to a lesser degree in the All 4 Kids program. The Eagle Adventure program did not require teachers to attend the lessons nor did it directly encourage teachers to promote the messages and the process evaluation found low levels of teacher engagement in this intervention.
- **Child exposure was less than planned for two programs.** Children in the All 4 Kids summer wave and the Eagle Adventure program received less than the planned amount of exposure to their respective nutrition education programs. For All 4 Kids, this was the result of having to implement one wave of the demonstration in the summer months when attendance is typically lower and more irregular in childcare settings. In the case of the Eagle Adventure program, the schools typically allocated a shorter time period in the classroom (30–35 minutes) than was originally planned (40 minutes) to deliver each lesson, thereby reducing children's exposure to the program.

## 2. About Eating Web-Based Demonstration Project

Findings from the process evaluation of the About Eating demonstration project identified the following successes unique to this Web-based intervention targeted to low-income women.

- **Nutrition education content was relevant for and well-received by the target audience.** Similar to the child-focused demonstration projects, the About Eating nutrition education content was well received by the intended target audience. Participant reports of high degrees of satisfaction with the nutrition education messages and content of the program are evidence that the About Eating team had a good understanding of their target audiences' interests and needs. In addition to being satisfied with the program's nutrition education content and activities, the participant follow-up survey revealed that program participants were satisfied with the amount of time it took to complete the course.
- **The program was accessible and easy to use for most participants.** The majority of participants who completed the About Eating program found it to be easy to use and were able to access and navigate the Web site as well as read and understand the information provided.
- **Recruitment strategies were diverse, well-planned, and supported by key partners.** Recruitment efforts in About Eating focused on recruitment of a large number of individuals, while recruitment efforts in the other demonstrations focused on recruiting sites. The recruitment strategies, procedures, and training provided to the About Eating team well in advance of project implementation prepared them for the recruitment phase of the project. Key informants reported that regular communication among staff members helped them to stay focused and to accomplish their recruitment goals.



The following factors in program implementation might have limited the About Eating demonstration project’s ability to impact adult participants’ consumption of fruits and vegetables.

- **There was a high attrition rate among women who enrolled.** Because participants in the intervention visited the site on their own time and of their own choice, there was more risk of participants dropping out of the Web-based intervention than the school- and childcare-based programs. Though enrollees reported that competing priorities were their primary reason for not completing the program, level of education and relative access to the Internet also appeared to be related to the high attrition rate—about 45 percent of women who initially enrolled in the About Eating did not complete the program and the majority of these women left after completing the initial program survey but did not begin the first lesson. Additionally, participants who did not complete the About Eating program were not as likely as program completers to “strongly agree” with statements related to their satisfaction with the About Eating program’s ease of use and content, which might have decreased their interest in completing the lessons.
- **Limits on exposure time to program.** Because of the timing protocol that the PSU team utilized for the purpose of this demonstration project to meet the independent evaluation’s data collection timelines, participants were not able to voluntarily go back to previous lessons. This reduced participants’ total potential exposure to the lessons. Though the amount of time spent on each lesson varied extensively among program participations, participants spent an average of 9 minutes on each lesson they accessed.

## D. Impact Evaluation Findings

Exhibit ES-2 summarizes the findings from the independent impact evaluations for the four demonstration projects. The table columns represent the program effects (mediating factors, short-term outcomes, primary impacts) from the previously described evaluation framework. The EWPHCCS program had a statistically significant impact on two of the primary outcomes; the other three programs did not have an impact or trend on the primary outcomes of interest. For short-term outcomes, statistically significant impacts were observed for the EWPHCCS and Eagle Adventure programs and trends were observed for the All 4 Kids program. For mediating factors, trends were observed for the EWPHCCS and Eagle Adventure programs. The About Eating program did not impact any of FNS’ primary or secondary outcomes of interest.

**Exhibit ES-2.— Statistically Significant Impacts and Trends for the Four Demonstration Projects**

| Program         | Secondary Impacts |                     | Primary Impacts    |
|-----------------|-------------------|---------------------|--------------------|
|                 | Mediating Factors | Short-Term Outcomes | Long-Term Outcomes |
| EWPHCCS         | ●                 | ●                   | ●                  |
| All 4 Kids      | ○                 | ●                   | ○                  |
| Eagle Adventure | ●                 | ●                   | ○                  |
| About Eating    | ○                 | ○                   | ○                  |

● Statistical significance at  $p \leq 0.05$ .

● Trend  $0.05 < p \leq 0.10$ .

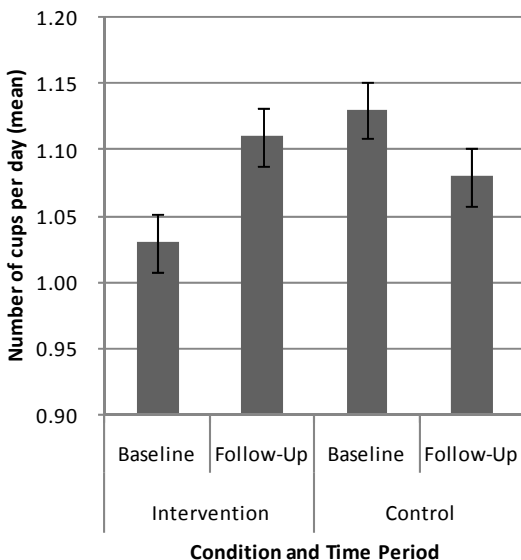
○ Not statistically significant,  $p > 0.10$ .

## 1. Primary Impact Results

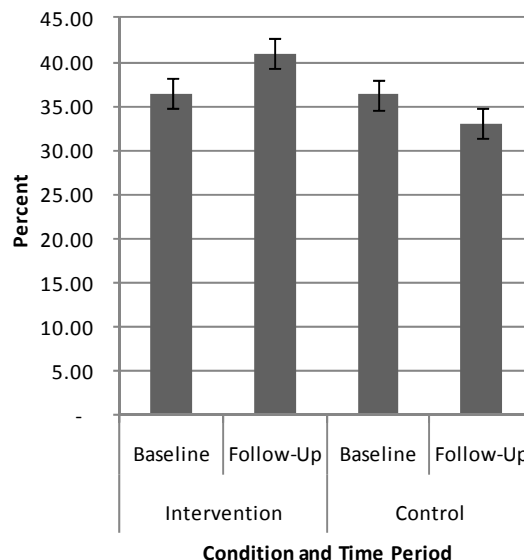
The EWPHCCS, All 4 Kids, and Eagle Adventure programs did not have a statistically significant impact on daily at-home consumption of fruits and vegetables combined based on parental reports of their child’s consumption. Changes in average daily consumption of fruits and vegetables combined were quite modest ranging from –0.04 cups for All 4 Kids (indicating that the comparison group reported a greater baseline-to-follow-up change than the intervention group) to 0.19 cups for EWPHCCS. Changes in the reported consumption of fruits were similarly modest supporting the conclusion of no effects for these three programs.

- The EWPHCCS program did have a statistically significant impact on children’s daily at-home consumption of vegetables (see figure ES-1), but no impact was observed on children’s vegetable consumption for All 4 Kids and Eagle Adventure.
- The EWPHCCS program also produced a statistically significant impact on children’s at-home use of 1% or fat-free milk (see figure ES-2). Children in the intervention group were about 39 percent more likely at follow-up than children in the control group to drink or use 1% or fat-free milk on their cereal.
- About Eating did not have an impact on the primary outcome of participants’ average daily consumption of fruits, vegetables, or fruits and vegetables combined.

**Figure ES-1.— EWPHCCS Impact Evaluation—Changes in Daily At-Home Consumption of Vegetables ( $p = 0.0427$ )**



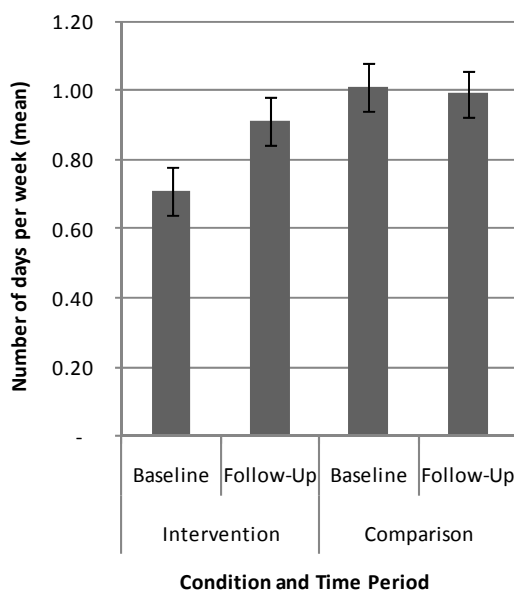
**Figure ES-2.— EWPHCCS Impact Evaluation—Changes in Percentage of Children Using 1% or Fat-Free Milk during the Past Week ( $p = 0.0241$ )**



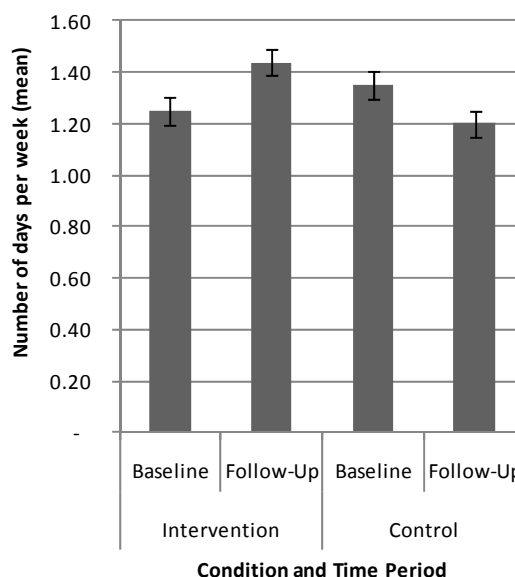
## 2. Secondary Impact Results

The EWPHCCS, All 4 Kids, and Eagle Adventure programs had an impact on several of the secondary outcomes or resulted in upward trends approaching statistical significance. EWPHCCS and Eagle Adventure had a statistically significant impact on children asking or helping themselves to vegetables as a snack (see figures ES-3 and ES-4).

**Figure ES-3.— Eagle Adventure Impact Evaluation—Changes in Children Asking or Helping Themselves to Vegetables as a Snack ( $p = 0.0441$ )**



**Figure ES-4.— EWPHCCS Impact Evaluation—Changes in Children Asking or Helping Themselves to Vegetables as a Snack ( $p = 0.0146$ )**



Additionally, several trends were observed for the three child-focused programs:

- Increased child-initiated vegetable snacking,  $p = 0.0658$  (All 4 Kids);
- Increased willingness to try new fruits  $p = 0.0774$  (All 4 Kids);
- Increased willingness to try new vegetables  $p = 0.0925$  (Eagle Adventure);
- Increased parental offerings of vegetables for snacks  $p = 0.0644$  (EWPHCCS); and
- Greater at-home availability of fruits and vegetables  $p = 0.0771$  (Eagle Adventure).

About Eating did not have an impact on the secondary outcomes of snacking, variety, preferences, and at-home availability of fruits and vegetables; use of, at-home availability, and preferences for 1% or skim milk; and preferences for and at-home availability of whole-wheat bread.

## **E. Findings from the Assessment of the Self-Evaluations**

The evaluation approaches and the quality of the demonstration projects' self-evaluations varied; however, the assessment of the self-evaluations identified some common areas where changes could be made by the IAs to improve the quality of future evaluations.

### **1. Demonstration Projects' Evaluation Approaches**

A descriptive assessment of each IA's evaluation approach was made, including consideration of the study design and sampling strategy, sample size estimation, primary outcome measures, data collection procedures, and analysis procedures. Key differences and similarities among the four self-evaluations included the following:

- CNNS and NYSDOH employed a one-group observational design (no comparison group), UNCE used the same quasi-experimental design used by the independent evaluators, and PSU used a fully randomized experimental design.
- The target population surveyed varied for the four demonstration projects. NYSDOH surveyed parents or caregivers of children participating in the evaluation study using a mail survey; CNNS surveyed children participating in their intervention using a self-administered questionnaire; UNCE surveyed both children and their parents or caregivers using interviewer-administered questionnaires; and PSU surveyed adult women participating in the evaluation via the Internet.
- PSU conducted a power analysis to determine the required sample size for the evaluation study, whereas the other demonstration projects did not.
- With the exception of PSU, the primary outcome measure for nutrition behaviors centered on increasing fruit and vegetable consumption at home. For PSU, the primary outcome was improvement in participants' eating competence score. As specified by FNS, the independent evaluations were limited to nutritional outcomes, whereas the demonstration projects also included outcomes measures for physical activity.
- The type of data analysis varied depending on the study design. PSU was the only demonstration project to conduct general linear model univariate analyses for selected outcome measures and to conduct analyses comparing the characteristics of intervention completers and noncompleters.

### **2. Strengths and Limitations of the Evaluation Approaches**

The strengths and limitations of each of the evaluations varied, with the only common strength being that all four demonstration projects had minimal missing data (i.e., survey item nonresponse) for their analysis. There were no common limitations identified for the four self-evaluations. Other key differences and similarities included the following:

- A strength of the UNCE and PSU evaluations was the use of a comparison group which helped to eliminate validity threats, whereas a limitation of the NYSDOH and CNNS evaluations was the lack of a comparison group.
- Strengths of the PSU evaluation included stating the research objectives and hypotheses in quantifiable terms and conducting a power analysis to support sample size estimation,

whereas the failure to include these components was a weakness of the other three self-evaluations.

- The UNCE and CNNS evaluations benefitted from well-planned and implemented data collection, whereas the PSU and NYSDOH evaluations lacked quality control during data collection.
- PSU analysis procedures were conducted properly, whereas the data analysis conducted by UNCE, CNNS, and NYSDOH did not take into account the cluster of the evaluation design within school or childcare settings.

## **F. Recommendations for SNAP-Ed Program Implementation and Evaluation**

### **1. Recommendations for Child-Focused Programming**

The impact evaluation findings for EWPHCCS, All 4 Kids, and Eagle Adventure suggest that SNAP-Ed for children and their parents or caregivers can improve children’s nutrition behaviors but, as explained above, in two of the three child-focused programs there were no increases in children’s overall at-home fruit or vegetable consumption. The programs appeared to have more limited influence on mediating factors such as in-home availability of fruits and vegetables and parental offerings of fruits and vegetables for snacks or at dinner, which would serve to reinforce healthy nutrition. More needs to be done to strengthen the carryover of these programs into the home to affect children’s daily at-home fruit and vegetable consumption. To this end, it is recommended that SNAP-Ed program implementers, both current and future, build on the lessons learned through this evaluation and aim to improve child-focused programs including in the following ways.

- ▲ **Maximize parent and caregiver reach and engagement.**
- ▲ **Encourage greater involvement and support from intervention site staff, including ongoing reinforcement by classroom teachers.**
- ▲ **Address food cost issues raised by parents and caregivers by promoting all forms of fruits and vegetables and helping families access nutrition assistance programs including SNAP, the Special Supplemental Nutrition Program for Women, Infants and Children (WIC), and emergency food programs.**
- ▲ **Conduct needs assessment and pre-test materials and messages before implementing new programs.**

### **2. Recommendations for Web-Based Programming and/or Curricula**

The objective of PSU’s About Eating program was to improve eating competence of low-income women. It has been suggested that individuals with higher levels of eating competence have better quality diets, including a higher intake of fruits and vegetables, than those with lower levels of eating competence. Based on the results of the PSU self-evaluation and the FNS independent evaluation, the About Eating program did not significantly impact eating competence or consumption of fruits and vegetables, thus the hypothesis for a relationship between eating competence and consumption of fruits and vegetables could not be tested in this study. However, the low cost and flexibility of nutrition education via the Internet are inherently appealing, and the results of this study suggest that there is a need for further evaluation of Internet-based nutrition education interventions for low-income audiences. The following implementation recommendations build on the lessons learned through the independent evaluation of the About Eating program.

- ▲ **Work closely with State and local Department of Public Welfare (DPW) staff early on in program planning to inform them about the goals of the program and obtain their assistance in recruitment.**
- ▲ **Identify additional recruitment venues.**
- ▲ **Help participants overcome barriers to participation.**
- ▲ **Increase participant retention and exposure to lessons.**

### **3. Recommendations for SNAP-Ed Evaluation**

While evaluations without a control or comparison group may provide useful information for program improvement, they should not be conducted if the purpose of the evaluation is to establish causality between the intervention and the dietary behavioral outcomes (i.e., an impact evaluation). Evaluations that include a control or comparison group, such as those conducted by PSU and UNCE, are desirable for determining program impact.

The assessment identified the following changes that could be made by the IAs to improve the quality of future evaluations and increase their ability to accurately measure changes attributable to the program.

- ▲ **Determine the anticipated size of the program impact on the target audience before conducting the intervention.**
- ▲ **Use a comparison or control group, and to the extent possible randomly assign units to either the treatment or comparison/control group. If random assignment is not possible, then employ a quasi-experimental design.**
- ▲ **If use of a comparison or control group is not possible, collect additional waves of data from the intervention group for trend and interrupted time-series analyses.**
- ▲ **Conduct a power analysis to determine the minimum sample size needed for the evaluation study.**
- ▲ **Use existing survey instruments that are demonstrated to be valid and reliable. If developing new instruments or measurement tools, conduct pretesting to demonstrate adequate psychometric properties (i.e., validity and reliability) of the measures.**
- ▲ **Establish standardized procedures for data collection and quality control.**
- ▲ **Match the analytic strategies to the characteristics of the evaluation design. For studies that include the clustering of individuals within schools or centers, the analysis needs to account for the complexities of the evaluation design.**

There are a range of potential evaluation methodologies that are available, so the challenge to SNAP-Ed evaluators is to design an approach that eliminates plausible alternatives of program effects and allows the establishment of causality between the intervention and the dietary behavioral outcomes, within the resource constraints. According to the Food Stamp Nutrition Education (FSNE) Systems Review, 43 percent of IAs surveyed in 2004 identified lack of funds and expertise on the part of their local project staff and subcontractors as significant barriers to conducting successful evaluations (USDA, FNS, 2006). Thus, some IAs may need to secure additional funding (e.g., joint state funding or grant funding) and consider partnering with evaluators or statisticians at a local university to aid in conducting a rigorous impact evaluation.

## A. Background

Nutrition education is an optional component of the Supplemental Nutrition Assistance Program (SNAP), known as SNAP-Education or SNAP-Ed. The goal of SNAP-Ed is to improve the likelihood that SNAP participants and persons eligible for SNAP will make healthy food choices within a limited budget and choose physically active lifestyles.

SNAP-Ed Guidance also encourages all States to evaluate the effectiveness of their SNAP-Ed interventions. This can include formative, process, outcome, and impact evaluations.<sup>5</sup> In Federal Fiscal Year (FY) 2004, 74 percent of SNAP-Ed implementing agencies (IAs) reported that they conducted outcome evaluations on at least some aspects of services. However, based on interviews with 17 IAs these evaluations were focused to a greater extent on program use than they were on participant behavior change (Food and Nutrition Service [FNS], 2006). As the largest U.S. Department of Agriculture (USDA) funding source for nutrition education, FNS, States, and local IAs have a significant stake in ensuring that SNAP-Ed nutrition education meets FNS' goals.

This study, *Models of SNAP Education and Evaluation (Wave I)*, is the first of two FNS-initiated independent evaluations designed to identify potential models of effective SNAP-Ed nutrition education and impact evaluation. The overarching goal of this evaluation is to determine whether the selected projects can serve as good examples of effective nutrition education and promotion activities within SNAP-Ed by meeting the following criteria:

- Positively impacting the nutrition and health behaviors of SNAP participants while adhering to FNS Guiding Principles,
- Exhibiting the potential to serve as models of effective nutrition intervention for large segments of the SNAP audience while requiring levels of resources that are manageable by a large percentage of SNAP-Ed IAs, and
- Providing methodologically robust yet logistically practical examples of project-level SNAP-Ed evaluation efforts.

To accomplish the study goal, three complementary assessments were conducted: a process evaluation, an impact evaluation, and an assessment of the demonstration project's own outcome or impact evaluation. Exhibit I-1 lists the broad research questions framing the design and measures used in each component of the evaluation.

## B. Selection of SNAP-Ed Demonstration Projects for Evaluation

In FY 2008, FNS issued a request for applications to states to propose models of SNAP-Education and participate in the FNS-funded independent evaluation. Applicants proposed various program and evaluation designs with children and/or women as their primary target audience. Numerous applications were received, including ongoing SNAP-Ed programs, modifications to existing programs, or new

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<sup>5</sup> Prior to 2007, no formal evaluation guidance was given from FNS on program evaluation other than encouraging states to evaluate the effectiveness of their nutrition education programming. In 2007, FNS provided guidance with information on the use of a control or comparison group so that the impact of the program could be assessed (USDA, FNS, 2007).



## Exhibit I-1.— Research Questions

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### *Process Evaluation*

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- What were the demonstration project's overall objectives and approach?
- How was the intervention implemented and administered?
- How many people did the intervention reach, and how much exposure did participants have to it?
- What resources and costs were needed for the design (where relevant) and implementation of the intervention?
- What were the facilitators, challenges, and lessons learned regarding implementation and administration of the intervention?
- What feedback did participants have about the implementation of and their satisfaction with the intervention?

### *Impact Evaluation*

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- What was the intervention's impact on primary nutrition behavioral outcomes (i.e., cups of fruits and vegetables consumed)?
- What was the intervention's impact on secondary outcomes (e.g., eating a variety of fruits and vegetables each day)?

### *Assessment of the Demonstration Project's Self-Evaluation*

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- How did the demonstration project's actual evaluation compare with their planned evaluation?
- What were the resources needed and costs of the evaluation?
- What were the results of the self evaluation, and how did they compare with the independent impact evaluation?
- What were the lessons learned?

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programming models. In a competitive selection process, each application was scored and ranked by an independent technical review panel chaired by FNS. The criteria used for scoring proposals are displayed in exhibit I-2. Chapter II provides an overview of these four projects and their similarities and differences. These projects together comprise Wave I of the SNAP-Ed and Evaluation study. Three additional demonstration projects are being evaluated under Wave II of this study.

Each of the four agencies implemented their demonstration project in FY 2010 and conducted a self-evaluation supported by SNAP-Ed administrative funds and State and local matching resources. Each demonstration project received a \$100,000 incentive to offset expenses incurred as a result of their participation in this study, including expenses associated with facilitating access to data needed for the independent evaluation, such as recruiting SNAP-Ed participants, participation in key informant interviews, record keeping, and providing documents describing the implementer's SNAP-Ed intervention and evaluation processes.



## Exhibit I-2.— Scoring Criteria Used for Demonstration Project Selection

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| Criterion   | Specific Requirements   |
|---|---|
| <b>Quality of intervention plan</b><br>(30 points)  | <ul style="list-style-type: none"><li>• Incorporates SNAP-Ed Guiding Principles</li><li>• Budgets are provided per SNAP-Ed annual guidance</li></ul>  |
| <b>Intervention schedule fits the proposed FNS data collection period</b> (5 points)              | <ul style="list-style-type: none"><li>• Intervention will begin and end sometime between March 2010 and September 2010</li></ul>  |
| <b>Suitability for an FNS evaluation using a rigorous impact evaluation design</b><br>(30 points) | <ul style="list-style-type: none"><li>• Can support the random assignment of multiple units (person, classes, etc.) to treatment and control conditions or the quasi-experimental, nonrandom assignment of matched units to both treatment and control groups</li><li>• If other nutrition education or promotions are delivered to the target audience, they are delivered to both the treatment and control groups during the course of the project</li></ul> |
| <b>Promise for replication</b><br>(15 points)   | <ul style="list-style-type: none"><li>• Does not require unusually high levels of resources and technical expertise</li><li>• Materials and curricula are, or can be made, readily accessible to other nutrition educators</li></ul>  |
| <b>Quality of staff and staffing plan</b> (20 points)   | <ul style="list-style-type: none"><li>• Individuals with key project responsibilities are identified and their allocated hours are indicated and adequate</li><li>• Proposed staff are well qualified and planned training is provided</li></ul>  |

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### C. Purpose and Organization of the Report

This report integrates key findings from the four case studies describing the results of the independent evaluation of the Wave I demonstration projects and the independent assessment of their self-evaluations.<sup>6</sup> This report highlights the commonalities and differences and cross-cutting themes from the process and impact evaluation findings that may have implications for future SNAP-Ed programming and evaluation. Outlined below are the topics addressed in each of the remaining chapters of this report:

- Chapter II: Overview of the Demonstration Projects,
- Chapter III: Summary of Evaluation Methodology,
- Chapter IV: Integrated Process Evaluation Findings,
- Chapter V: Integrated Impact Evaluation Findings,
- Chapter VI: Integrated Findings from the Assessment of the Demonstration Projects' Self-Evaluations, and
- Chapter VII: Discussion and Recommendations

Following these chapters are three appendices which summarize the designs used for the FNS independent impact evaluation for each demonstration project, the literature review conducted to develop the impact instruments, and the instruments used to develop the parent and adult participant surveys.

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<sup>6</sup> The individual case study reports for each demonstration project are published separately and included in the reference list at the end of this report. They are available at [www.fns.usda.gov/ora/](http://www.fns.usda.gov/ora/)



## Chapter II ● Overview of Demonstration Projects

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The following projects participated in this first round of Food and Nutrition Service (FNS)-initiated evaluations of Models of SNAP-Ed and Evaluation:

- ▲ **New York State Department of Health’s (NYSDOH) Eat Well Play Hard in Child Care Settings (EWPHCCS)**
- ▲ **University of Nevada Cooperative Extension Service’s (UNCE) All 4 Kids**
- ▲ **Chickasaw Nation Nutrition Services’ (CNNS) Eagle Adventure**
- ▲ **Pennsylvania State University’s (PSU) About Eating**

Three of these projects (EWPHCCS, All 4 Kids, and Eagle Adventure) implemented child-focused Supplemental Nutrition Assistance Program-Education (SNAP-Ed) programs in either a childcare or school setting. Despite variations in their nutrition education messages, modes of delivery, and dosage, all three child-focused programs aimed to increase children’s consumption of fruits and vegetables as well as the amount of time children engage in physical activity. In each of these programs the core of the curriculum is direct education through lessons in the children’s regular classrooms. They also provided take-home materials and activities targeted to parents and caregivers. The two childcare focused programs (EWPHCCS and All 4 Kids) also invited parents and caregivers to take part in participatory family events or weekly parent classes. Additionally, EWPHCCS focused on engaging the intervention site staff to support and reinforce the behavioral goals of the program.

The About Eating program was different from the other three programs in several ways, including its target audience (low-income women), behavior-related goals (increasing eating competence), and its primary mode of nutrition education delivery (Web-based lessons). Also, because About Eating is a self-paced program, program administrators did not have control over the amount of exposure participants would have to the lessons or the nutrition education materials.

The four demonstration projects also varied in terms of their nutrition education programs’ relative maturity. The EWPHCCS program has been implemented by the NYSDOH since 2006 making it the longest running program out of the four demonstration projects, whereas the Eagle Adventure program was implemented for the first time during the study. Additionally, the demonstration projects were diverse in terms of their geographic scope, ranging from an implementation area of a single metropolitan area or county to multiple counties situated across an entire state. For this reason, the number of implementation sites (where applicable) differed by demonstration project.

An overview of the key characteristics of each of these programs, including their goals, program content, eligibility criteria, and the number and type of intervention sites, where relevant, are provided below. Key aspects of the four demonstration projects are summarized at the end of this chapter in exhibit II-1. Understanding these cross-project similarities and differences is important in the context of this evaluation because they influenced: (1) the extent to which common facilitators and challenges to program implementation could be identified; and (2) the designs of the independent impact and process evaluations.

## A. Eat Well and Play Hard in Child Care Settings Program

The EWPHCCS program was developed and first implemented by the NYSDOH in 2006 as a SNAP-Ed program targeted to preschool children. The program is administered at the state level by the NYSDOH and locally through seven subcontracting agencies. These agencies employ and directly supervise the educators who implement the program. To be eligible to participate as a project site, centers must be actively enrolled in the Child and Adult Care Food Program (CACFP), and at least 50 percent of the enrolled children must qualify for free or reduced-price meals. The program operates in 27 New York State counties and 4 New York City boroughs. The behavioral outcome goals of the program are to:

- Increase young children's consumption of fruits and vegetables,
- Ensure that children drink 1% or fat-free milk rather than milk with higher fat content,
- Increase the amount of time that young children spend in physical activity, and
- Decrease the amount of time they spend watching television.

Its design is based upon the social ecological model of behavior change which suggests that an individual's health behaviors are influenced on multiple levels: individual, interpersonal, organizational, community, and societal (McElroy, Bibeau, Steckler, & Glanz, 1988). Thus, the EWPHCCS curriculum and materials include multilevel messaging targeted to preschool children, their parents and caregivers, and other adults who are influential role models and shape the policies and practices in the childcare environment (i.e., childcare center staff). The program includes three complementary components:

- **Direct education for children and their parents and caregivers.** The EWPHCCS curriculum includes 10 modules, each with detailed lesson plans and activities that the direct educators use to provide a series of classes for children and their parents or other caregivers. The direct educators select six of the curriculum's modules, including one focused on physical activity, to implement at each center. Over a 6- to 10-week period, they provide these six lessons to children in individual classrooms, and six classes with complementary messages and goals are offered separately to parents who are recruited and volunteer to participate.
- **Indirect education to parents and caregivers provided through take-home materials and activities.** At the end of each child lesson, children take home a newsletter, *Parent Pages*, which introduces their families to the lesson of the day and includes a recipe, activities the adults can do with their children, and corresponding informational worksheets on specific nutrition topics intended to extend the lesson to the home. Adults who participate in the parent classes receive additional educational materials that complement the week's lesson.
- **Self-assessments and training for childcare center staff.** The EWPHCCS educator works with each center director to identify areas of improvement for center-level policies that can enhance healthy eating and physical activity opportunities (e.g., policies regarding serving family-style meals, and limiting the kinds of snacks that families can bring in for birthdays or other occasions). The educator also teaches at least two classes to the staff at each center to encourage their own healthy behaviors and help them integrate the program's messages into their classroom activities when the EWPHCCS educator is not there. The teachers are also asked to stay in the classroom during the child lessons to participate in the in-classroom activities.

During FY 2010, the EWP/HCCS program was implemented at 246 childcare centers statewide, reaching more than 10,000 children and their parents and caregivers. The FNS independent evaluation was conducted at a sample of 12 of these centers from March through June 2010.

## **B. All 4 Kids Program**

UNCE's All 4 Kids Healthy, Happy, Active, and Fit program (hereafter referred to as All 4 Kids) is an educator-led, preschool-based SNAP-Ed program. Its target audience is low-income children ages 3–5 and their parents and caregivers. The curriculum and materials were first developed in 2008 and piloted by UNCE prior to this demonstration project evaluation. The program curriculum and methods were designed based on guidelines for developmentally appropriate practices by the National Association for the Education of Young Children (Copple & Bredekamp, 2009). For example, the All 4 Kids program follows the guideline that teaching is designed to enhance development and learning. UNCE program planners further emphasized that they designed their program to engage young children as active learners and consider their physical, social, emotional, cognitive, and language abilities.

All 4 Kids' overarching goals are to promote healthy eating, support age-appropriate physical development, and encourage children's self acceptance and acceptance of differences among peers. Each lesson and its accompanying materials incorporates the key message "Eat Smart, Be Active" and includes a nutrition focus to help children and their parents identify and choose healthy snacks while increasing their daily fruit and vegetable consumption. The behavioral outcome goals of the program are to:

- Increase preschool children's intake of healthy snacks,
- Increase their fruit and vegetable consumption,
- Enhance their movement skills, and
- Increase their level of physical activity by dancing to music.

To achieve these outcomes, the All 4 Kids curriculum includes the following components:

- **Direct education for children and their families.** The core of the curriculum is direct education, with 24 unique 30-minute lessons provided by trained direct educators in the preschool classroom and three Family Activity sessions also provided onsite at the childcare center. Healthy eating, physical activity, and physical development are promoted through different and complementary messages throughout the lessons using language and activities designed for preschool-age children. The central program goals and objectives are further reinforced with music and dance through the learning of three choreographed pieces which the children perform for the parents and caregivers at the Family Activity sessions.
- **Indirect education to parents and caregivers provided through take-home materials.** Indirect education is provided through Family Connection activities, designed as at-home activities for parents and caregivers to complete with their children. These materials are distributed weekly to the parents and caregivers through their child's classroom.
- **Education for the child care teachers.** The teachers in the centers are also involved in the program through weekly Teacher Connection handouts that outline concrete methods for applying All 4 Kids concepts in the classroom and ways to reinforce the program's messages with parents and caregivers. They also are asked by All 4 Kids staff to stay in the classroom during the child lessons to participate in the in-classroom activities.

For this evaluation, the All 4 Kids program was implemented by UNCE in 22 classrooms at a total of six different Head Start centers in Las Vegas, Nevada. The interventions were conducted in two sequential waves in the spring and summer of 2010.

### C. Eagle Adventure Program

The goal of the CNNS Eagle Adventure Program is to prevent diabetes in Native American families by using a culturally appropriate intervention strategy aimed at children and delivered through schools. The nutrition education messages and materials build upon a diabetes prevention program developed by the Centers for Disease Control and Prevention (CDC) Division of Diabetes Translation's Native Diabetes Wellness Program, the Tribal Leaders Diabetes Committee, and the Indian Health Service. The Chickasaw Nation developed the Eagle Adventure curriculum based on the Eagle Books, and used the opportunity of the FNS-funded Models of SNAP Education and Evaluation Project to implement their approach. This approach encourages children to increase consumption of fruits and vegetables, and balance calorie intake with energy expenditure through increased physical activity. The program is primarily directed at elementary (first through third grades) school-age children. This is accomplished through a series of objectives that include increasing children's

- Intent to choose fruits and vegetables,
- Consumption of fruits and vegetables,
- Knowledge of fruits and vegetables as healthful snack options,
- Intent to participate in physical activities,
- Physical activity behaviors, and
- Knowledge of healthful physical activities.

The Eagle Adventure program was developed using the social ecological model as a framework. The program aims to evoke behavior changes by providing multiple modes of message delivery, which includes both direct and indirect education.

- **Direct education.** The Eagle Adventure program or curriculum is officially kicked off through the performance of a four-act play, which is intended to capture the attention and interest of the first- through third-grade target audience. Following the play, participating classrooms receive four classroom lessons implemented over an approximate 2-month period.
- **Indirect education for the children and their parents and caregivers.** Corresponding take-home materials, activities, and homework are sent home with child participants after each lesson. Parents and caregivers are encouraged to engage in the suggested activities and complete the homework with their child. In doing so, parents and caregivers are exposed to the program's key messages, which they can reinforce with their children. Additional indirect educational materials, such as banners and posters, are displayed inside and outside the school and brief nutrition-related messages called "Eagle Tips" are read over the school intercom on a daily basis throughout the intervention period

Implemented for the first time as part of this demonstration project evaluation, Eagle Adventure was conducted from March through May 2010 at five public elementary schools in Pontotoc County, Oklahoma, with a Native American enrollment that exceeded the State average of 19 percent and where more than 50 percent of the children were eligible to receive free and reduced-price school lunch.

## D. About Eating Program

The goal of PSU's About Eating program is to increase eating competence among low-income women based on the Satter model of eating competence (ecSatter), which encourages individuals to choose and eat foods they enjoy in amounts they find satisfying, to be reliable about regularly feeding themselves meals and snacks, and to pay attention to hunger cues when they eat (Satter, 2008).<sup>7</sup> The About Eating program was originally developed in 2006 for a college-aged target audience. It was modified and pilot tested by PSU for a SNAP-Ed audience in 2008 and further refined in 2009 for this demonstration project.

About Eating consists of five Web-based lessons. Four of the five lessons focus on eating competence constructs, including eating attitudes, food acceptance, internal regulation, and external influences. The fifth lesson is on physical activity. Each lesson is presented visually on the PSU Survey Research Center (SRC) Web site using text and graphics, such as photos, to add interest and assist with readability and comprehension for this target audience. All lessons offer self-assessment, self-reflection, and goal-setting, with pictures, tailored language and content, and user-driven navigation. Some lessons have a survey at the beginning only; others have interactive surveys throughout. The purpose of the surveys is three-fold: to provide an element of self-discovery about the participants' own eating habits; to reinforce information contained in the lesson; and to make the lesson more user-friendly—techniques often used in small group and one-on-one educational interventions.

The program takes a learner-centered approach by allowing participants to choose specific topics of interest within each lesson. Overall, the About Eating program gives participants flexibility and an array of choices of content and activities as well as references to additional information on topics of interest.

Implemented in its current form for the first time as part of this demonstration project evaluation, About Eating was conducted from March through August 2010 in selected counties across the state of Pennsylvania where other SNAP-Ed programming was not being offered. Women ages 18–45 who were participating in SNAP or eligible for SNAP were targeted for the demonstration project and recruited in one of two ways:

- **Community outreach.** Flyers were posted or handed out at grocery stores; low-income community venues, such as laundromats, job service agencies, and discount stores; and distributed directly to Expanded Food and Nutrition Education Program (EFNEP) participants; and
- **Department of Public Welfare (DPW) outreach.** Flyers were posted in Pennsylvania DPW county assistance offices and at job training events. PSU also used DPW SNAP program databases to reach out to women participating in SNAP and other DPW programs that serve women who were potentially SNAP-eligible. Outreach was conducted using postcards or phone calls. Those receiving phone calls were then followed up with a post card or email message that included the website sign-up information.

A total of 1,010 individuals were recruited using these two methods and 576 (57 percent) met the eligibility criteria for participation in the demonstration project. Among this eligible group, 500 women enrolled in the program by completing the PSU pre-intervention survey and 282 were assigned to the intervention group.

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<sup>7</sup> Additional information on eating competence can be found in Krall and Lohse (2011).



**Exhibit II-1.— Comparison of Demonstration Projects’ Key Program Features**

| <b>Feature</b>                                     | <b>EWPHCCS (NYSDOH)</b>  | <b>All 4 Kids (UNCE)</b>  | <b>Eagle Adventure (CNNS)</b>   | <b>About Eating (PSU)</b>   |
|--|--|---|---|---|
| <b>Implementing agency type</b>                    | State Department of Health   | Cooperative Extension   | Indian Tribal Organization  | University  |
| <b>Year first implemented</b>                      | 2006   | 2008  | 2010  | 2007 (revised for SNAP-Ed in 2009)  |
| <b>Theoretical framework</b>                       | Social ecological model of behavior change   | National Association for the Education of Young Children guidelines   | Social ecological model of behavior change  | Satter model of eating competence   |
| <b>Behavioral goals and objectives</b>             | Increasing children’s consumption of fruits and vegetables and their use of low-fat versus whole milk, and increasing amount of time spent in physical activity                          | Increasing children’s consumption of healthy snacks and fruit and vegetables, and increasing amount of time spent in physical activity      | Increasing children’s consumptions of fruits and vegetables, and increasing amount of time spent in physical activity   | Increasing women’s eating competence  |
| <b>Intervention sites (number)</b>                 | Childcare centers participating in CACFP w/ at least 50 percent of children eligible for free or reduced price meals<br>( <i>n</i> = 246 statewide; <i>n</i> = 12 for evaluation sample) | Head Start centers<br>( <i>n</i> = 6)   | Elementary schools w/at least 50 percent of children eligible for free or reduced price meals in the National School Lunch Program<br>( <i>n</i> = 5)                                       | Anywhere with Internet accessibility  |
| <b>Geographic scope</b>                            | 26 counties and 4 New York City boroughs   | Las Vegas, Nevada   | Pontotoc County, Oklahoma   | 39 counties in Pennsylvania   |
| <b>Target SNAP-Ed audience</b>                     | Preschool age children and their parents and caregivers  | Preschool age children and their parents and caregivers   | Children in 1 <sup>st</sup> –3 <sup>rd</sup> grades (primary) and their parents (secondary)   | SNAP-participating and eligible women, ages 18–45                           |
| <b>Education delivery channels</b>                 | Classroom lessons for children, lessons for parents and caregivers, lessons for center staff members; take-home materials and activities   | Classroom lessons for children and Family Activity nights for children and their parents and caregivers; take-home materials and activities | In-school play performance and classroom lessons for children; take-home materials and activities; posters and banners displayed in school, and announcements made over the school intercom | Web-based lessons   |
| <b>Planned per-participant exposure to lessons</b> | Children: 6 lessons (30 minutes each)<br>Parents and caregivers: 6 lessons (60 minutes each)   | Children: 24 lessons (30 minutes each)<br>Parents and Caregivers: 3 sessions (60 minutes each)  | Children: 1 play (25 minutes) and 4 classroom lessons (40 minutes each)   | Adults: 5 lessons (varied exposure because of program’s self-guided nature) |



## Chapter III • Summary of Evaluation Methodology

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This chapter summarizes the methodologies employed to conduct the process evaluation, impact evaluation, and assessment of the self-evaluations for the four Wave I Supplemental Nutrition Assistance Program-Education (SNAP-Ed) demonstration projects. The sections that follow highlight the commonalities and differences in the research designs, evaluation approaches, and data collection methods across the four demonstration projects. In designing and carrying out the study, similar and standardized approaches were implemented and the same primary impact measures were used so that similarities and differences in the findings across the projects could be determined. At the same time, the evaluations were tailored, as necessary, to address and capture each project’s unique objectives, curriculum, target audiences, and intervention approaches. Where possible, the independent evaluators capitalized on opportunities to reduce respondent burden by coordinating some of the independent evaluation efforts with those of the projects’ self-evaluations, while avoiding contamination of the two separate evaluations. This study’s methods and data collection instruments were reviewed and approved by the U.S. Office of Management and Budget (OMB) in January 2010.

### A. Process Evaluation Methodology

The broad process-focused research questions described in chapter I guided the design of this component of the evaluation. To address the research questions it was necessary to gather both objective and subjective information; as such, the process evaluation team acquired and assessed data from primary and secondary data sources using multiple methods, including data abstraction; in-depth, open-ended interviews with stakeholders; direct observation (where applicable); and focus groups with parents or caregivers of nutrition education recipients or interviews with adult participants.

#### 1. Data Sources

Secondary data sources that were collected and reviewed as part of the process evaluation varied somewhat by demonstration project. Examples of these secondary data sources are provided in exhibit III-1. These sources offered descriptive, objective information on key aspects of the demonstration projects’ design and implementation and can be categorized into four groups: planning and reporting documents, implementation documents, administrative data on program reach and dosage, and program costs.

Across the four demonstration projects, primary data were collected from four types of key informants—program-level staff members, direct educators, intervention site staff (directors and classroom teachers at the childcare-based programs and principals at the school-based programs), and program participants or the parents and caregivers of children who participated. These data were supplemented through direct observation by evaluation team members for the three school- or childcare-based interventions. The timing of data collection from key informants took place approximately one month before the start and immediately following completion of the interventions. Interviews were conducted during both time periods with most staff members and administrators. Information about the types of respondents for each demonstration project are presented in exhibit III-2.

**Exhibit III-1.— Secondary Data Collected for the Process Evaluation of the Demonstration Projects**

| Document Category                                      | Specific Documents Reviewed   |
|--|---|
| <b>Planning and Reporting Documents</b>                | <ul style="list-style-type: none"> <li>• Demonstration project application</li> <li>• FY 2010 SNAP-Ed Plan</li> </ul>   |
| <b>Implementation Documents</b>                        | <ul style="list-style-type: none"> <li>• Nutrition education curriculum and lesson plans</li> <li>• Nutrition education materials</li> <li>• Training curriculum and protocols</li> <li>• Quality assurance documentation</li> </ul>  |
| <b>Administrative Data on Program Reach and Dosage</b> | <ul style="list-style-type: none"> <li>• Type and number of education contacts made</li> <li>• Demographic information on program participants (New York State Department of Health [NYSDOH], University of Nevada Cooperative Extension [UNCE], and Pennsylvania State University [PSU])</li> <li>• Planned and actual number of children in the direct education interventions at each site</li> <li>• Planned and actual number of parents in the direct education interventions at each site (UNCE and NYSDOH)</li> <li>• Type of educator implementing the direct education at each site (NYSDOH, Chickasaw Nation Nutrition Services [CNNS], UNCE)</li> <li>• Activity logs documenting lesson duration (CNNS), name of lessons taught (NYSDOH), and implementation schedule by classroom (CNNS, NYSDOH, UNCE)</li> </ul> |
| <b>Program Costs<sup>a</sup></b>                       | <ul style="list-style-type: none"> <li>• Standardized cost tables with budget justifications</li> </ul>   |

<sup>a</sup>The independent evaluators provided each demonstration project with the same resource and expense tracking form to ensure cost data were reported consistent with SNAP-Ed annual reporting requirements and in a standardized fashion.

**Exhibit III-2.— Number of Respondents and Data Collection Methods for Each Respondent Type, by Demonstration Project**

| Type of Respondent   | Data Collection Method    | EWP/CCS (NYSDOH) | All 4 Kids (UNCE) | Eagle Adventure (CNNS) | About Eating (PSU) |
|--|---------------------------|------------------|-------------------|------------------------|--------------------|
| <b>Program-level staff members</b>   | Interview                 | 5                | 5                 | 3                      | 5                  |
| <b>Direct educators</b>  | Interview                 | 11               | 3                 | 2                      | —                  |
| <b>Intervention site staff:</b>  |                           |                  |                   |                        |                    |
| <b>Childcare directors or principals</b>   | Interview                 | 3                | 4                 | 5                      | —                  |
| <b>Classroom teachers (post-intervention only)</b>   | Questionnaire             | 32               | 17                | —                      | —                  |
| <b>Parents and caregivers of child participants or adult participants (post-intervention only)</b> | Focus groups <sup>a</sup> | 23               | 20                | 23                     | —                  |
|  | Interview                 | —                | —                 | —                      | 9                  |
|  | Survey                    | 440              | 244               | 344                    | 154                |

<sup>a</sup> Number of individual participants in focus groups.

## **2. Instrumentation**

Trained data collectors used standardized secondary data abstraction tools and primary data collection instruments designed either for the evaluation of each project. The wording of questions in each key informant interview guide and the focus group discussion guide were tailored to the specific activities of each project. The key informant interviews included relevant, probing questions to allow for in-depth discussions of important issues or topics.

## **3. Analysis Approach**

Interview responses from key informants, including program-level staff, direct educators, intervention site administrators, classroom teachers, and adult program participants where applicable, were compiled into a master Microsoft Word 2007 document and organized by broad process evaluation research questions and process indicators. This approach helped to organize the extensive amount of information that was available and allowed for the identification of broad themes (e.g., implementation challenges) and specific topics (e.g., lesson plan scheduling) as well as agreement and disagreement amongst respondents. Direct quotations were also identified where relevant and used to support key findings.

Quantitative analyses were conducted on program reach and dosage from the program administrative databases provided by the three child-focused demonstration projects. SAS 9.2 was used to analyze program dosage, participant satisfaction, and factors affecting program access from the survey responses of parents and caregivers or the low-income women who participated in PSU'S About Eating program. The cost data were analyzed based on information reported by the demonstration projects in a series of standardized tables.

Transcripts from focus groups with parents or caregivers of nutrition education recipients were coded in QSR International NVivo version 8, which allowed the evaluation team to systematically organize, process, and summarize information provided by this key stakeholder group. It also allowed the capture of the breadth of opinions offered by parents or caregivers while identifying common themes and issues and relevant direct quotations. Open-ended responses from the surveys and additional telephone interviews with women who participated in the About Eating Program were also coded and analyzed in Microsoft Excel, and used for the same purpose.

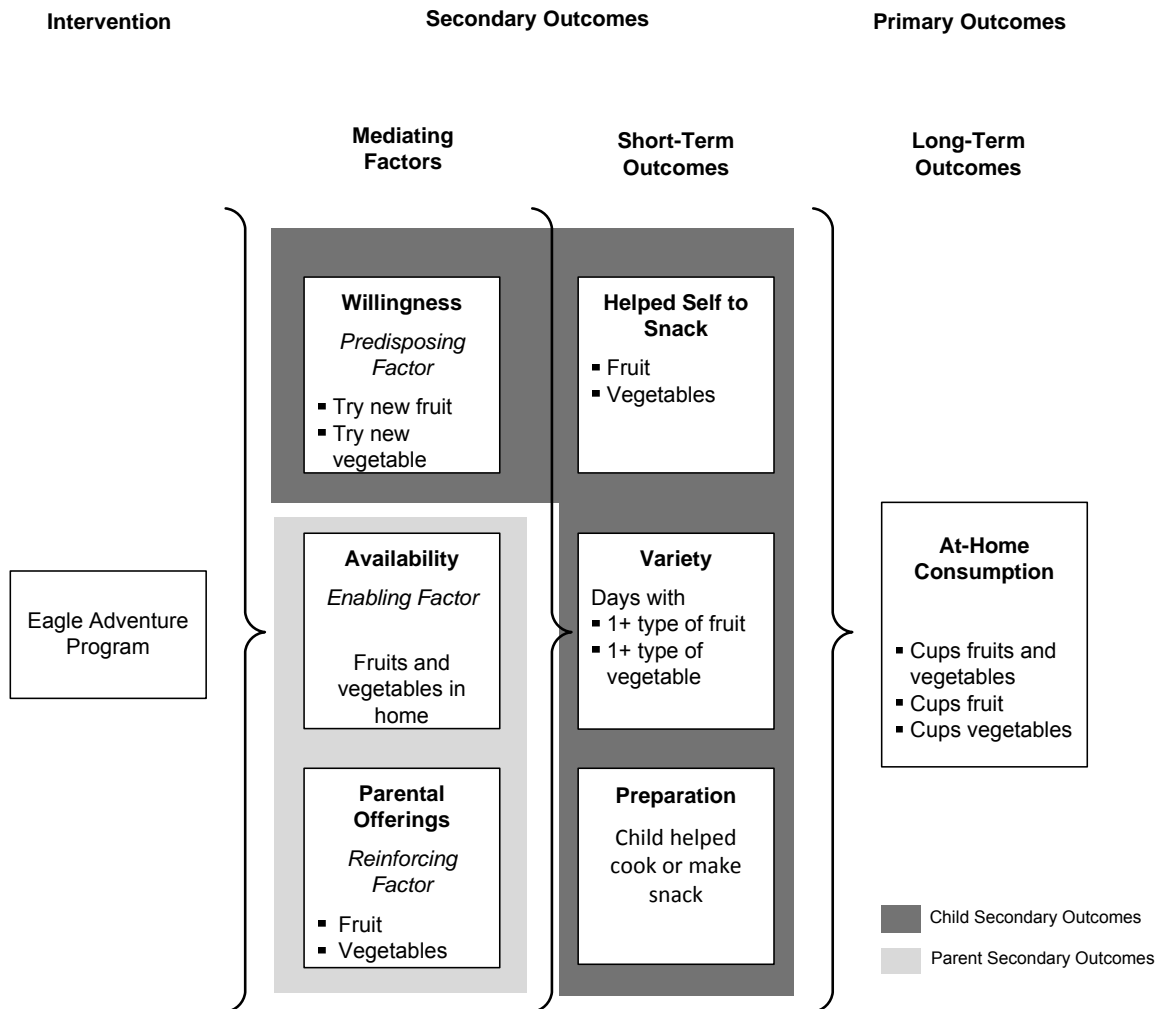
## **B. Impact Evaluation Methodology**

### **1. Conceptual Framework for the Impact Evaluation**

To provide an integrative understanding of the impacts of each demonstration project's program, the impact analysis was guided by a conceptual framework that helped track the range of potential program effects. The framework enabled the evaluation of the program's effects by specifying secondary outcomes that link the intervention to the long-term, primary outcome of average daily consumption of fruits and vegetables. The secondary outcomes capture, in greater detail, some of the complexity of the behavior change process for fruit and vegetable consumption. The greater the number and strength of the changes seen among the secondary outcomes, the greater the likelihood of observing changes in fruit and vegetable consumption (Green, Kreuter, Deeds, & Partridge, 1980).

Figure III-1 shows the framework used for the impact evaluation of Chickasaw Nation Nutrition Services' (CNNS) Eagle Adventure program. A similar framework was used for the other three demonstration projects. This framework is adapted from Green and colleagues (1980) and has been applied in other

**Figure III-1.— Conceptual Framework for the Eagle Adventure Program Impact Evaluation**



Adapted from: Green, L. W., Kreuter, M. W., Deeds, S. G., & Partridge, K. B. (1980). Health education planning: A diagnostic approach. Palo Alto, CA: Mayfield Publishing Co.

studies to capture the main types of secondary outcomes associated with changes in nutrition behavior (Mullen, Hersey, & Iverson, 1987). The secondary outcomes include mediating factors and short-term outcomes. Three main types of mediating factors can influence changes in dietary consumption:

- **Predisposing factors** include the knowledge and attitudes of an individual related to the motivation to act. For the Eagle Adventure evaluation, an example of a predisposing factor is the willingness of a child to try new fruits and vegetables.
- **Enabling factors** include the skills and resources needed to engage in healthy nutrition practices. For the Eagle Adventure evaluation, an example of an enabling factor is the availability of fruits and vegetables in a child’s home.
- **Reinforcing factors** include factors that help reinforce healthy nutrition. For the Eagle Adventure evaluation, an example of a reinforcing factor is a parent offering fruits and vegetables for snacks or at dinner.

For the CNNS impact evaluation, these mediating factors could affect dietary-related behaviors that include the following short-term outcomes: (1) child helped self to fruits or vegetables as snack, (2) child eats daily variety of fruits and vegetables, and (3) child helped parent prepare a meal or snack. These short-term outcomes are directly related to lessons in the Eagle Adventure curriculum. For example, according to the model, greater willingness to try new fruits and vegetables may influence the frequency with which a child eats a variety of fruits and vegetables or asks for fruits or vegetables as a snack. Changes in these short-term outcomes might ultimately influence at-home consumption of fruits and vegetables. As described in the next section, the mediating and short-term outcomes were similar for the other demonstration projects, with a few differences based on the specific curriculum used in the intervention.

This conceptual framework is helpful in tracking the impacts of each program, but it is not intended to represent a comprehensive logic model, because the program could also affect consumption through other pathways that are not reflected in this framework. Nonetheless, using this conceptual framework helps provide a fuller evaluation of the impacts of each program.

## **2. Summary of Primary and Secondary Outcome Measures**

### ***a. Primary outcome measures***

As shown in exhibit III-3, the primary outcome measure for the four demonstration projects was average daily consumption of fruits and vegetables. For the three child-focused demonstration projects (EWPHCCS, All 4 Kids, and Eagle Adventure), measured consumption was limited to at-home consumption because parental reports were used to collect information on the child's consumption at baseline and follow-up. Based on the Food and Nutrition Service's (FNS) interest in observing a minimum increase in dietary intake of 0.30 standard deviation units, it was hypothesized that children participating in these programs would increase their average daily at-home consumption of fruits and vegetables combined by approximately 0.30 cups per day compared with children not exposed to the programs.<sup>8</sup> For EWPHCCS, an additional primary outcome measure was the child's use of 1% or fat-free milk during the past week because one of the lessons, "Dairylicious," focused on the health benefits of 1% and fat-free milk (the lesson was offered in all but one of the 12 intervention centers).

As discussed in chapter II, the fundamental objective of the About Eating program is to increase eating competence of low-income women. PSU's application provided evidence that individuals with higher levels of eating competence have higher quality diets, including a higher intake of fruits and vegetables. Thus, the primary outcome for the independent evaluation was consumption of fruits and vegetables. Based on FNS' interest in observing a minimum increase in dietary intake of 0.30 standard deviation units, it was hypothesized that women participating in the About Eating program would increase their average daily consumption of fruits and vegetables combined by approximately 0.44 cups compared with women not participating in the program.

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<sup>8</sup> Anticipated program impacts are often described in terms of standard deviations, which provide a unit-free measure of anticipated change and are useful when different measurement tools or populations are involved. Unit-free measures can then be transformed into any appropriate metric (e.g., cups) based on the characteristics of the applied data collection tools.

### Exhibit III-3.— Primary Outcome Measures by Demonstration Project

| Measures  | EWPHCCS (NYSDOH) <sup>a</sup> | All 4 Kids (UNCE) <sup>a</sup> | Eagle Adventure (CNNS) <sup>a</sup> | About Eating (PSU) |
|---|-------------------------------|--------------------------------|-------------------------------------|--------------------|
| Cups of fruits consumed each day                                    | ✓                             | ✓                              | ✓                                   | ✓                  |
| Cups of vegetables consumed each day                                | ✓                             | ✓                              | ✓                                   | ✓                  |
| Cups of fruits and vegetables consumed each day                     | ✓                             | ✓                              | ✓                                   | ✓                  |
| Used 1% or fat-free milk during past week (drank or used on cereal) | ✓                             |                                |                                     | ✓                  |

<sup>a</sup>Consumption was limited to at-home consumption because parental reports were used to collect information on the child’s consumption at baseline and follow-up.

#### *b. Secondary outcome measures*

Secondary outcomes reflect the attitudes, beliefs, and behaviors that would be expected to change in order to facilitate increased fruit and vegetable consumption. These measures are important because they can provide information to program developers and other interested parties that can be used to identify strengths and weaknesses in the program theory and execution. Conceptually, they are closely aligned with the intervention theory and materials and vary somewhat from program to program. The project team reviewed the curriculum for each program to therefore identify the secondary outcome measures to include in the impact evaluation.

As shown in exhibit III-4, secondary outcome measures common to the three child-focused programs included the following:

- Variety—eat more than one type of fruit or vegetable each day,
- Snacking—help oneself to or request a fruit or vegetable as a snack,
- Willingness—willingness to try new fruits and vegetables,
- Availability—average weekly at-home availability of fruits and vegetables, and
- Parental offerings—frequency of parental offerings of fruits or vegetables for a snack and at dinner.

Exhibit III-5 lists the secondary outcome measures for the evaluation of PSU’s About Eating program.

### 3. Summary of Impact Evaluation Approaches

Designing the impact evaluation approach for each demonstration project required the consideration of a number of factors. First, the independent evaluators considered the uniqueness of each demonstration project. This included the characteristics of the intervention, the design of the implementing agency’s (IA) impact evaluation, and the IA’s data collection procedures so that the independent evaluation did not contaminate the IA’s implementation of its intervention or self-evaluation. Second, the independent evaluators considered FNS’ requirements for the study, which included establishing causality between the interventions and the dietary behavioral outcomes. This consideration required balancing an approach that can establish causality within the limitations imposed by delivering nutrition education through a public program. Additionally, the study required incorporation of an “intention-to-treat” approach. Thus, the independent evaluators used a data collection approach that included contacting individuals who dropped

**Exhibit III-4.— Secondary Outcome Measures for the Child-Focused Interventions**

| Measures  | EWPHCCS (NYSDOH) | All 4 Kids (UNCE) | Eagle Adventure (CNNS) |
|---|------------------|-------------------|------------------------|
| <b>Other dietary behaviors at home</b>  |                  |                   |                        |
| Number of days child ate more than one type of fruit during past week   | ✓                | ✓                 | ✓                      |
| Number of days child ate more than one type of vegetable during past week   | ✓                | ✓                 | ✓                      |
| Number of days child helped self to or requested fruit for a snack during past week                                       | ✓                | ✓                 | ✓                      |
| Number of days child helped self to or requested vegetables for a snack during past week                                  | ✓                | ✓                 | ✓                      |
| Number of days helped parent make snack or meal during past week  | ✓                |                   | ✓                      |
| Willingness to try a new kind of fruit  | ✓                | ✓                 | ✓                      |
| Willingness to try a new kind of vegetable  | ✓                | ✓                 | ✓                      |
| Number of days child ate low-fat or fat-free yogurt during past week  | ✓                |                   |                        |
| Frequency that child asked for fruits or vegetables instead of French fries when eating at fast-food restaurants          |                  | ✓                 |                        |
| <b>Parent behavior and household variables</b>  |                  |                   |                        |
| Availability of fruits and vegetables at home during past week  | ✓                | ✓                 | ✓                      |
| Availability of 1% or fat-free milk at home during past week  | ✓                |                   |                        |
| Number of days parent offered fruit for a snack during past week  | ✓                | ✓                 |                        |
| Number of days parent offered fruit at dinner during past week  | ✓                | ✓                 |                        |
| Number of days parent offered fruit for a snack or at dinner during past week   |                  |                   | ✓                      |
| Number of days parent offered vegetables for a snack during past week   | ✓                | ✓                 |                        |
| Number of days parent offered vegetables at dinner during past week   | ✓                | ✓                 |                        |
| Number of days parent offered vegetables for a snack or at dinner during past week  |                  |                   | ✓                      |
| Number of days parent made child eat everything on his or her plate   |                  | ✓                 |                        |
| Frequency that parent ordered fruits or vegetables for child instead of French fries when eating at fast-food restaurants |                  | ✓                 |                        |



### Exhibit III-5.— Secondary Outcome Measures for the About Eating Program

| Measures  | About Eating (PSU) |
|---|--------------------|
| Number of days participant ate fruit or vegetables for a snack during past week   | ✓                  |
| Availability of fruits and vegetables at home during past week                    | ✓                  |
| Availability of milk at home during past week (1%/skim milk versus 2%/whole milk) | ✓                  |
| Availability of chips, nacho chips, or corn chips at home                         | ✓                  |
| Availability of regular soft drinks or sodas at home                              | ✓                  |
| Preferences for fruits  | ✓                  |
| Preferences for vegetables  | ✓                  |
| Preferences for whole-wheat bread and white bread                                 | ✓                  |
| Preferences for skim and whole milk   | ✓                  |
| Self-rating of eating habits  | ✓                  |

out of the intervention and collecting information on outcome measures as well as reasons for dropping out of the program when possible.

Exhibit III-6 summarizes the impact evaluation approaches for the four demonstration projects. Exhibits A-1 through A-4 in appendix A list the study population, research design and sample selection; required sample size; data collection procedures; survey response; and data analysis procedures for each demonstration project. The following sections provide a summary of the approach used by the independent evaluators to examine the impact of the four demonstration projects and discuss the similarities and differences in the approaches used.

#### ***a. Study population, research design, and sample selection***

For the three child-focused demonstration projects (EWPHCCS, All 4 Kids, and Eagle Adventure) the study population was parents or caregivers of children participating in the evaluation study. For About Eating, the study population was low-income women living in selected Pennsylvania counties who met the eligibility requirements for participating in the intervention (e.g., in good health, not enrolled in a 4-year college or university, and have Internet access and an email address).

All of the evaluations used a research design that employed a comparison strategy so that plausible alternative explanations of program impact could be ruled out. A fully randomized experimental design was used for the evaluations of the About Eating and EWPHCCS programs and quasi-experimental designs were used for All 4 Kids and Eagle Adventure. It was not possible to use a randomized experimental design for All 4 Kids because two of the Head Start centers had previous exposure to the program and had to be assigned to the intervention group. Resource and staffing constraints prohibited CNNS from providing Eagle Adventure to schools outside of Pontotoc County; therefore, to provide the most rigorous design possible under this constraint, Bryan County, a neighboring county with similar characteristics, was used to select comparison schools.



**Exhibit III-6.— Summary of Evaluation Designs for the FNS Independent Evaluations**

| Characteristic                            | EWPHCCS (NYSDOH)   | All 4 Kids (UNCE)   | Eagle Adventure (CNNS)  | About Eating (PSU)   |
|---|--|---|---|--|
| <b>Study population</b>                   | Parents/caregivers of preschool-aged children <sup>a</sup>                   | Parents/caregivers of preschool-aged children <sup>a</sup>  | Parents/caregivers of 1st–3rd graders <sup>a</sup>                            | SNAP-eligible women aged 18–45   |
| <b>Study design</b>                       | Fully randomized experimental design   | Quasi-experimental design   | Quasi-experimental design   | Fully randomized experimental design   |
| <b>Sample size/ number of respondents</b> | 12 intervention and 12 control centers (902 parent respondents at follow-up) | 6 intervention and 6 comparison centers (511 parent respondents at follow-up)   | 5 intervention and 5 comparison schools (723 parent respondents at follow-up) | 436 respondents at follow-up   |
| <b>Data collection</b>                    | Mail survey with telephone survey of nonrespondents                          | Pre: In-person interviews (concurrent with UNCE survey administration)<br>Post: Mail survey with telephone survey of nonrespondents | Mail survey with telephone survey of nonrespondents                           | Online (concurrent with PSU survey administration) with follow-ups by mail and phone for nonrespondents                  |
| <b>Data analysis</b>                      | Mixed-model regressions using maximum likelihood estimation                  | Mixed-model regressions using maximum likelihood estimation   | Mixed-model regressions using maximum likelihood estimation                   | Linear regression using adjusted endpoint models that included preference scores as proxy for fruit and vegetable intake |

<sup>a</sup>Parents/caregivers reported on their children’s at-home nutrition behaviors.

Sample size was estimated following commonly accepted evaluation practices (i.e., 80 percent statistical power and a type I error rate of 0.05 with a two-tailed test). As previously noted, sample size estimation was based on observing a change in daily consumption of fruits and vegetables combined of 0.30 standard deviation units or better as specified by FNS. Estimates were based on a statistical model that assesses change across time between the intervention and comparison or control groups.

***b. Instrument development and testing***

To develop the impact evaluation instruments, the project team assessed the appropriateness of existing instruments, as compiled for the literature review conducted for this study (see appendix B), for collecting data on the outcomes of interest. Many of the questionnaire items were taken or adapted from instruments that have been administered successfully with low-income audiences, validated, and demonstrated to be reliable and sensitive to change in previous studies (see appendix C).

For the primary outcome measures, consumption of fruits and vegetables, questions from previously validated instruments—the Food Stamp Program Fruit and Vegetable Checklist (Townsend, Kaiser, Allen, Joy, & Murphy, 2003) and University of California Cooperative Extension Food Behavior Checklist (Townsend, Silva, Martin, Metz, & Wooten-Swanson, 2008)—were modified for the three

programs targeted to children to ask the respondent (parent or other caregiver) to report on his or her child's consumption of fruits and vegetables. Respondents were instructed not to include meals eaten at school or the childcare center so that they were reporting only on observed consumption behavior. It was not necessary to modify these questions for the About Eating evaluation.

Interviews were conducted with parents and caregivers (for the three programs targeted to children) and low-income women to test and refine the instruments. The readability of the instruments was assessed using the Fry Test, which examines the average number of syllables and sentences per 100 words, and is a commonly used measure of reading level (Fry, 1968). Generally, the questions were at the fifth-grade reading level.

### ***c. Data collection procedures and response***

Parents and caregivers of children who participated in the evaluation (EWPCCS, All 4 Kids, and Eagle Adventure) and participants (About Eating) completed a survey before and after the intervention. A multimodal survey approach was used to maximize the survey response rate, and incentives of \$10 (baseline) and \$15 (follow-up) were provided for completing the survey. For the EWPCCS and All 4 Kids evaluation, the questionnaires and other survey materials were available in English and Spanish because of the large number of Hispanic children in the intervention. Response rates for the follow-up surveys ranged from 79 to 87 percent, which achieved the required sample sizes based on the power analysis calculations for each evaluation. Appendix A provides additional information on the data collection mode and survey response for each evaluation.

### ***d. Analysis procedures***

#### **i. Impact analysis for evaluation of the child-focused interventions**

For the evaluations of the three child-focused programs, general linear mixed models were used for continuous impact variables, and generalized linear mixed models were used for dichotomous impact variables to evaluate program impacts while accounting for the clustering of children within schools or centers. These models were estimated via difference-in-difference estimates of program effect, comparing change across time (baseline and follow-up) in the intervention group with change across time in the comparison group. Covariates included child age, child sex, household size, respondent race and ethnicity, respondent age, and respondent sex. Missing data for covariates ranged from 2 to 10 percent of responses.

#### **ii. Impact analysis for evaluation of About Eating**

To avoid potential reactivity effects, the project team did not collect self-reported measures of fruit and vegetable consumption before implementing the About Eating program. Instead, a measure of food preference (Drewnowski & Hann, 1999), shown to correlate with dietary intake, was collected at baseline. Program impact was estimated via linear regression using adjusted endpoint models that included preference scores as a proxy for fruit and vegetable intake at baseline. Other covariates included age category, race and ethnicity, education level, household size, single-adult household status, marital status, source of Internet access, and frequency of Internet access. Missing data for these covariates ranged from 4 to 7 percent. Two analyses were conducted: (1) an analysis including all study participants and (2) an analysis limited to participants who completed all the About Eating lessons (i.e., analysis of the treated).

### iii. Attrition analysis

Before conducting the impact analyses, the potential impact of attrition from the evaluation study on generalizability of the study findings was assessed by comparing the pre-intervention similarity of study participants who provided follow-up data and those who did not.<sup>9</sup> This comparison was made by fitting a logistic regression model that regressed completion status on variables that describe survey responders and, in the case of programs targeted to children, the characteristics of their children. This analysis provided odds ratios that highlight any association between the descriptive characteristics of participants and the likelihood of providing data at follow-up.

## C. Methodology for the Assessment of the Demonstration Projects' Self-Evaluations

Determining the effectiveness of the evaluations conducted by the demonstration projects required a clear understanding of the planning, design, and implementation of the evaluation. To the extent possible, the assessment was based on objective information such as the evaluation report prepared by each IA. Qualitative methods were used to gather in-depth information and perspectives of key players in the evaluation (e.g., program administrators and the evaluation manager). Exhibit III-7 describes the data sources used for the assessment of the self-evaluations.

The assessment of the self-evaluations included a detailed description of the evaluation methodology, including management, staffing, and costs of the evaluation; an assessment of the quality of the self-evaluations, including strengths and weaknesses; a comparison of the study design and results with the FNS independent evaluation; and an assessment of lessons learned based on the quality assessment, cost analysis, and reported factors affecting evaluation implementation.

As noted in Exhibit III-7 an evaluation review form was used to assess the quality of each self-evaluation. To compare findings from the demonstration project's self-evaluations with a rigorous independent evaluation, a scoring tool was adapted based on the one used by the Center for Substance Abuse Prevention in development of the National Registry of Evidence-based Programs and Practices (NREPP) database (U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, 2011). The evaluation review form includes eight evaluation components and requires a reviewer to assign a numerical score ranging from one to five for each component, where 1 means the component is missing or so poorly described that its value to the evaluation cannot be determined and 5 means the component is appropriate for the program being evaluated and is presented in a way that shows the evaluator has a clear understanding of its role in the evaluation. Scores of 1, 2, and 3 indicate components that are not aligned with the overall evaluation design in a way that makes them unlikely to contribute useful or interpretable information. Scores in this range indicate opportunities for improvement in future evaluations. Scores of 4 and 5 indicate components that are well matched to the design; these components are likely to contribute useful or interpretable information to the overall evaluation. Scores in this range indicate evaluation components that could be replicated in future evaluations.

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<sup>9</sup> Attrition includes individuals who did not complete the intervention (e.g., their child stopped attending Head Start during the intervention) and individuals who did not complete the follow-up survey.

**Exhibit III-7.— Description and Use of Data Sources for the Assessment of the Demonstration Projects’ Self-Evaluations**

| Data Source                              | Description and Use   |
|--|---|
| <b>Demonstration project application</b> | The application to request funding as a demonstration project provided information on the proposed evaluation procedures. The study team abstracted information from the demonstration project’s application to describe their evaluation approach and identify any differences between their planned and actual evaluation approach.   |
| <b>Evaluation review form</b>            | This form was used to assess the quality of the self-evaluation. Additional information about the development and use of this form is provided in this section.   |
| <b>Evaluation cost form</b>              | This form, completed by the IA, documented the resources used and costs incurred to evaluate their program. The study team used the completed form and the findings from the key informant interviews to prepare a descriptive assessment of the cost of conducting the evaluation.   |
| <b>Evaluation report</b>                 | The team provided each IA with an outline for preparing a report on their evaluation methodology and results. The team reviewed and abstracted key information from the report to complete the assessment of the quality of the self-evaluations and to compare the study design and results with the FNS independent evaluation.   |
| <b>Key informant interviews</b>          | Using structured interview guides, the study team conducted in-depth interviews with the principal investigator(s), evaluation manager(s), and other project staff before and after the self-evaluation. The findings from these interviews informed all aspects of the assessment of the self-evaluations, in particular, the assessment of the management of the evaluation and lessons learned from conducting the evaluation. |

Using the evaluation review form, two members of the impact evaluation staff (one rater was the designated impact evaluation leader for the independent evaluation) rated each evaluation component. The study team assessed inter-rater agreement and came to a consensus score for each evaluation component. As part of the scoring process, the study team identified the strengths and weaknesses or limitations of each self-evaluation and made recommendations for improving future evaluations.

## Chapter IV ● Integrated Process Evaluation Findings

Based on the experiences across the demonstration projects, this chapter describes and examines the similarities and differences in the projects' implementation and the common lessons that can be learned for future implementation of these and other Supplemental Nutrition Assistance Program-Education (SNAP-Ed) programs. For example, all of the projects relied on formative research for their program design and the cooperation of program partners, and all had challenges with recruiting and retaining adults. The About Eating program included a more intensive effort for recruitment of the primary target audience compared to the three child-focused demonstration projects where much of the recruitment was focused on securing participation and assistance from childcare centers or schools. Yet even in the school- and childcare-based programs, where children were a captive audience because the education was provided in their regular classrooms, the process evaluation identified recruitment of parents and caregivers for in-person education as a critically important aspect of program implementation that requires more attention and multiple strategies.

While there were common lessons learned from all four projects, there were many more similarities specific to the three child-focused programs and unique issues facing implementation of the About Eating program, including participant access to computers and the Internet, technical issues that could impact participants' ability to navigate the on-line lessons, and methods for promoting participant retention to complete the lessons. The strengths, challenges, and lessons learned from the About Eating Web-based programming were particularly unique; thus, they are examined separately in this chapter.

### A. Key Partners in Program Development and Implementation

A common theme across all four demonstration projects was the need to engage key partners at some point during each program's development phase or during implementation. Having the cooperation of partners was critical to the successful implementation of the interventions. Partner roles varied extensively by project, but generally fell into one of the following four categories: program development, primary audience recruitment, support from intervention sites, and nutrition education delivery. Key partners and their respective roles are shown in exhibit IV-1 and described in more detail below.

#### Key Findings

- The interventions' designs and the topics chosen were well received by participants and program partners.
- Staff members at the childcare and school intervention sites were generally very enthusiastic about participating.
- The Web-based intervention faced few technical challenges, and participants found it easy to navigate.
- Program partner cooperation is critical to successful program implementation.
- Whether adults are the primary focus of the intervention (i.e., in Web-based demonstration programs) or the secondary audience (as parents of child-focused interventions), finding effective methods to recruit and engage them in SNAP-Ed programming is a common challenge.
- For child-focused interventions, using multiple methods of nutrition education delivery may be most effective in maximizing parent and caregiver reach and engagement.

## Exhibit IV-1.— List of Key Partners and Their Roles, by Demonstration Project

| Project  | Partner  | Role  |
|--|--|---|
| <b>Eat Well Play Hard in Child Care Settings (EWPHCCS)</b> | Six regional childcare resource and referral agencies and New York City Department of Health and Mental Hygiene (NYCDOHMH)   | <ul style="list-style-type: none"> <li>• Recruitment</li> <li>• Nutrition education delivery</li> </ul>                               |
|  | Childcare centers participating in the Child and Adult Care Food Program (CACFP)   | <ul style="list-style-type: none"> <li>• Program development and Intervention sites</li> </ul>  |
|  | University professors  | <ul style="list-style-type: none"> <li>• Program development</li> </ul>   |
| <b>All 4 Kids</b>  | Acelero Learning Head Start program and individual centers in Clark County, Nevada   | <ul style="list-style-type: none"> <li>• Program development and Intervention sites</li> </ul>  |
| <b>Eagle Adventure</b>                                     | Chickasaw Nation Performing Arts Department  | <ul style="list-style-type: none"> <li>• Program development</li> </ul>   |
|  | Pontotoc County 4-H Nutrition Club   | <ul style="list-style-type: none"> <li>• Nutrition education delivery</li> </ul>  |
|  | Elementary schools in Pontotoc County  | <ul style="list-style-type: none"> <li>• Intervention sites</li> </ul>  |
| <b>About Eating</b>  | Community venues (e.g., libraries), Expanded Food and Nutrition Education Program (EFNEP), Pennsylvania Department of Public Welfare, county assistance offices, job training programs | <ul style="list-style-type: none"> <li>• Recruitment</li> </ul>   |
|  | Pennsylvania State University (PSU) Survey Research Center   | <ul style="list-style-type: none"> <li>• Nutrition education pretesting and delivery</li> <li>• Evaluation-related support</li> </ul> |

### 1. Partners in Program Development

The only IA using partners in the curriculum design during the study period was Chickasaw Nation Nutrition Services (CNNS). After outlining the four Eagle Adventure lessons in the early stages of development, CNNS program staff assembled an experienced and multidisciplinary team to further develop their curriculum and various program components. Specifically, CNNS staff called on the experience and expertise of the Chickasaw Nation Performing Arts Department to develop a script for the Eagle Adventure play based on the Eagle Books. They described this partnership as being both easy to form because it was based on existing relationships and instrumental to the development of this critical program component.

Though conducted before the study period, New York State Department of Health (NYSDOH) and All 4 Kids also engaged many partners in the formative research they conducted to develop and pretest their original curricula. This research included focus groups and group interviews with childcare center staff and the low-income parents of children in the target age groups. The draft EWPHCCS curriculum was also reviewed by partners at several universities across New York State, and revised based on their input.

### 2. Partners in Primary Audience Recruitment

Unlike the three child-focused programs, where the child participants were a captive audience in their classrooms, recruitment of the primary target audience (low-income adult women) for the About Eating demonstration project required a much more extensive effort. To assist with this task, the About Eating program manager and support staff engaged a number of partners during this phase of the intervention. In most cases, these partners—generally consisting of low-income community venues or service centers



(e.g., laundromats, job service agencies, discount stores, county assistance offices, job training programs)—played a limited yet important role in the recruitment process by allowing the About Eating staff to post or distribute various flyers to potentially eligible adult women. However, some partners did take on a slightly larger role. For example, some staff members at libraries that were used for recruitment provided outreach to or assisted with potentially eligible women gaining access to the online program. Additionally, the Pennsylvania Department of Public Welfare (DPW) not only allowed flyers to be posted in county assistance offices, they also provided PSU with lists from both the SNAP database and other program participants who were potentially SNAP-eligible. The contact information provided by DPW allowed the About Eating team to recruit via direct mail, email, and telephone.

### **3. Partners Supporting Onsite Program Implementation**

All three child-focused programs depended on partnerships with the staff at nutrition education intervention sites—childcare centers, Head Start centers, and elementary schools. In all three cases, these partnerships were formed and the sites agreed to volunteer to participate in the intervention based purely on the program’s merit and perceived value. In general, these partners were asked to serve as the site for the nutrition education program. However, school principals and center directors were needed for program implementation in many other ways, including helping SNAP-Ed program staff schedule the child classes, securing support from classroom teachers, and finding space for activities to be conducted outside the classrooms. For the EWPHCCS and All 4 Kids programs, center directors also were asked to help recruit parents and caregivers for the voluntary parent classes or Family Activity sessions offered onsite during the intervention period.

### **4. Partners in Delivery of Nutrition Education**

EWPHCCS is different from the other child-focused demonstration projects in that its curriculum is not delivered by program staff, but rather by direct educators from partner agencies (childcare resource and referral agencies and the NYCDOHMH). The expansive reach of the EWPHCCS program, which is implemented throughout New York City as well as in a number of counties across the state, necessitates the need to subcontract the program’s implementation at the community level.

Two other IAs also involved partners to varying degrees for the nutrition education delivery phase of their interventions. CNNS, for example, partnered with the Pontotoc County 4-H Nutrition Club, which provided youth members to serve as performers in the Eagle Adventure play. Additionally, the About Eating program manager subcontracted with the PSU Survey Research Center to provide both program delivery- and evaluation-related support. Specifically, the SRC was responsible for the randomization of participants into the intervention and control groups, administration of the pre- and post-online surveys, and maintenance of the About Eating Web site and participants’ access to it.

## **B. Target Audience Recruitment**

Target audience recruitment was an essential part of all four demonstration projects. However, the type of recruitment (e.g., intervention site, parent and caregiver, and adult program participant recruitment) required, as well as the extent to which each partner agency was involved, varied by project.

### **1. Intervention Site Recruitment (EWPHCCS, All 4 Kids, and Eagle Adventure)**

Recruitment of intervention sites was not necessary for the About Eating Web-based intervention, but it was a critical component in the implementation process for the three child-focused programs. For the

Eagle Adventure (CNNS) and All 4 Kids (UNCE) programs, program managers and support staff members were primarily responsible for gaining the cooperation of the selected intervention sites and were reportedly met with minimal resistance. Once CNNS learned of their selection as a demonstration project, the program manager and coordinator scheduled in-person meetings with school administrators to promote program buy-in and encourage the schools' participation in the intervention. The UNCE program manager took a slightly different approach, relying heavily on her already established connection with the local Head Start program (Acelero Head Start) and requesting that the county Head Start director make an announcement about the opportunity to participate in All 4 Kids at the Head Start center directors meeting. Intervention sites for the EWPHCCS were recruited by direct educators at the seven local agencies with whom NYSDOH subcontracts to carry out the program. NYSDOH provides each subcontracted agency with a list of eligible centers from which the direct educators can recruit. The direct educators reported that recruitment of centers for EWPHCCS was also not very difficult because there is high overall interest in the program across the state.

## **2. Parent and Caregiver Recruitment (EWPHCCS and All 4 Kids)**

Parents and caregivers—though a secondary target audience—were direct recipients of nutrition education in two of the demonstration projects: EWPHCCS (parent classes) and All 4 Kids (Family Activity sessions). Therefore, recruitment of parents and caregivers was required, and in both cases, proved to be challenging. To enhance parent and caregiver buy-in for the All 4 Kids program, the UNCE staff held three days of open houses at each intervention site before the start of the intervention as an opportunity to explain the goals, structure, and schedule of the program. In addition, before each Family Activity session, flyers were distributed to parents through their child's classroom—usually at the time of drop-off or pick-up. Staff members involved with recruitment of parents and caregivers noted that making mention of the child's performance at the upcoming event was an effective strategy for increasing parent and caregiver attendance.

For the EWPHCCS program, direct educators typically displayed mini posters at the intervention site (e.g., entryway, hallways, classrooms) or sent colorful flyers home. These materials were provided in the child's or parents' primary language, as necessary. The subcontracting agencies provide the EWPHCCS direct educators with small items that they can offer parents as an incentive (e.g., kitchen tools, such as vegetable scrubbers, valued at \$4 or less) for their participation in the parent classes. In some cases, direct educators were also able to include parent classes on the center's monthly event calendar—a resource used by many parents and caregivers. In New York City, the EWPHCCS program has recently incorporated marketers—paraprofessionals with community health education or outreach experience who visit the centers during child drop-off or pick-up times—into the recruitment protocol to help promote parent and caregiver participation. Specifically, the marketers are tasked with visiting the centers to talk individually with parents about the program, distribute educational materials and parent class flyers, offer food tastings, and encourage parent class attendance.

Additionally, key informants from both childcare-based programs reported that, although it was not required, most center directors and some staff members also provided outreach directly to parents to inform them of and encourage their participation in the parent and caregiver events. Program direct educators from the EWPHCCS and All 4 Kids programs reported that where center directors were more engaged with the program, parent and caregiver participation was higher; conversely, where center director and teacher engagement levels were lower the educators reported more difficulties finding adequate space for the parent events and that fewer parents attended.



### **3. Primary Target Audience Recruitment (PSU only)**

The only demonstration project that required recruitment of the primary target audience was the About Eating program. As previously described, PSU recruited SNAP participants and potentially SNAP-eligible, low-income adult women through a variety of venues with help from partners including both community groups and the State DPW. Community group outreach methods resulted in a total of 9,068 outreach flyers distributed to women potentially eligible for the intervention, and the DPW flyers and contacts reached 10,882 women. If a woman was contacted by mail and wanted to enroll but did not have an email address, she could call the telephone number on the card to reach PSU staff who instructed her on how to set up an email address. To increase program participation and completion rates and to compensate participants for their time, PSU provided \$20 store gift cards upon completion of the follow-up survey. Once a woman was enrolled, the About Eating team also employed methods to prompt her completion of each lesson and increase participant retention in the overall program. Specifically, the demonstration project staff sent reminders to participants through emails and Blue Mountain<sup>®</sup> digital e-cards.

## **C. Description of Program Staffing Across Demonstration Projects**

The number and type of personnel used to implement the four demonstration projects varied extensively, likely because of differences in program design and scope. Some commonalities were observed, however, and are described in the following section, which is organized by type of staff.

### **1. Program Managers or Principal Investigators**

Each demonstration project has between one and three individuals who are generally responsible for the management and oversight of their program. Both the EWPCCS and All 4 Kids programs have three senior-level staff members operating and managing their programs and sharing related responsibilities (i.e., general administration, assisting with program design and implementation, developing the program's self-evaluation, etc.). Similar duties are performed by two Eagle Adventure team members and by one member of the About Eating team.

### **2. Direct Educators (EWPCCS, All 4 Kids, and Eagle Adventure)**

The number of direct educators used to deliver each of the school and childcare-based nutrition education programs varied by demonstration project. For example, a total of two direct educators were used to deliver the Eagle Adventure program across five area elementary schools; four direct educators—one of whom was the program coordinator—were used to deliver the All 4 Kids curriculum for both waves of the intervention in a total of 22 classrooms in 6 Head Start centers in Las Vegas; and 17 full-time equivalent (FTE) direct educators delivered the EWPCCS curriculum across 246 childcare centers in New York State.<sup>10</sup> A summary of direct educator qualifications and the program-related training that they received is provided in exhibit IV-2.

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<sup>10</sup> Statewide, the EWPCCS program is staffed with one full-time equivalent direct educator for every 13-15 centers where it is implemented. As noted earlier, the evaluation of EWPCCS was conducted in a sample of 12 of the programs' sites between March and June 2010. Eleven direct educators taught the program at these sites. During the study period, most of these 11 educators were also implementing the EWPCCS program at sites not in the independent evaluation sample.

**Exhibit IV-2.— Direct Educator Qualifications and Program-Related Training, by Demonstration Project**

| <b>Project<br/>(Number of<br/>Direct Educators)</b>                                   | <b>Typical Direct Educator<br/>Qualifications</b>   | <b>Training Provided to Direct Educators</b>   |
|---|---|--|
| <b>EWPHCCS<br/>(n = 17 FTEs<br/>statewide or 1<br/>FTE for every<br/>12–15 sites)</b> | <ul style="list-style-type: none"> <li>• College degree in nutrition, public health, or related field (required)</li> <li>• Certification as a registered dietitian (required)</li> <li>• Experienced nutrition educators prior to joining EWPHCCS</li> </ul> | <ul style="list-style-type: none"> <li>• Orientation training, 2.5 days</li> <li>• Ongoing training, including participation in quarterly meetings</li> <li>• Bimonthly team meetings (NYC only)</li> <li>• Ongoing feedback and monitoring visits by supervisors and program managers</li> <li>• Facilitated and intentionally integrated training program (e.g., not top-down approach)</li> </ul> |
| <b>All 4 Kids<br/>(n = 4)</b>   | <ul style="list-style-type: none"> <li>• Previous experience working with young children or children with special needs</li> <li>• Child Development Associate (CDA) degree</li> </ul>  | <ul style="list-style-type: none"> <li>• Conducted over a 2–3 week period</li> <li>• Senior team reviews lessons and role plays with direct educators and offers demonstrations of different teaching strategies</li> <li>• Ongoing feedback and technical assistance from program officer</li> </ul>  |
| <b>Eagle<br/>Adventure<br/>(n = 2)</b>  | <ul style="list-style-type: none"> <li>• College degree in early childhood education or public health</li> <li>• Previous experience working with youth</li> </ul>  | <ul style="list-style-type: none"> <li>• Formal overview of lessons</li> <li>• Educator demonstration of an Eagle Adventure lesson</li> <li>• 40 hours of independent study and practice of the lessons</li> <li>• Approximately 30 hours of nutrition content training per year</li> </ul>  |

**3. Other Staff Needed for Program Implementation**

Each program, with the exception of EWPHCCS, also identified a staff position generally described as a program coordinator. This individual is typically responsible for more of the day-to-day oversight of the program, including program development and design, recruitment, reviewing project materials, and supervising or training direct educators (if applicable). Both the Eagle Adventure and All 4 Kids programs also employed evaluation coordinators who were responsible for assisting with the development of their self-evaluation design and instrumentation, data collector training, and data entry. The About Eating study team included a staff assistant who helped maintain records, prepare institutional review board (IRB) applications, prepare reports, implement recruiting and retention efforts, and distribute incentives to program participants as well as a field recruiter who focused entirely on recruitment related issues and efforts.

**D. Program Reach and Exposure**

Across the four demonstration projects, program reach and dosage varied extensively. In all cases, the demonstration projects aimed to reach their primary target audiences through direct education, and in two cases—EWPHCCS and All 4 Kids—the demonstration projects aimed to provide direct education to both a primary (children) and a secondary target audience (parents and caregivers). Both of these programs also aimed to promote nutrition education messages at the organizational level by incorporating

classroom teacher focused materials or lessons into the curricula in an effort to encourage the reinforcement of nutrition education messages in the classrooms. Because of the intensive focus of the EWPHCCS program on classroom teacher training, data was also collected from lead classroom teachers in the EWPHCCS evaluation sample to determine the number of times each week that they reported incorporating the program's messages in their classrooms or when talking with the children at mealtimes. The three school- and childcare-based nutrition education programs also used indirect education methods (e.g., take-home materials and activities for parents and children to do together) to reinforce their programs' messages with the children and parents.

### **1. Direct Education**

A summary and comparison of program reach and exposure for the primary and secondary target audiences of each of the four demonstration projects is provided in Table IV-1. It is important to note that, given the variations in program design and levels of exposure, direct comparisons of these indicators across the four demonstration projects should be interpreted with caution. The type of information provided by the demonstration projects for this purpose was not consistent. Moreover, these indicators are not always precise measurements but rather averages based on assumed exposure levels and do not take into account the nature or intensity of the exposure participants had to the respective programs.

The EWPHCCS program had the greatest reach among children, its primary target audience. A total of 728 children were reached through the 12 centers that participated in the demonstration project and were evaluated as part of this study. Children in the 12 demonstration project centers participated, on average, in 4.4 lessons each lasting 30 minutes. Thus, the average dosage of nutrition education provided directly to participating children was 132 minutes over the 6-week program.

The Eagle Adventure program reached nearly as many children (714) through its implementation in all first through third grade classes across five elementary schools. Although CNNS did not capture individual-level dosage among children in the classrooms, children in the intervention classrooms were exposed to a maximum of four lessons and an average of 145 minutes of nutrition education, including the Eagle Adventure play. Child exposure to this program most closely paralleled that of the EWPHCCS program.

The All 4 Kids program reached 403 children, little more than half the number of children reached through the EWPHCCS and Eagle Adventure demonstration projects. However, because it was a much longer intervention, children who were in the intervention classrooms at participating Head Start centers received substantially more exposure to the All 4 Kids nutrition education program. They participated in an average of 16.6 thirty-minute classes for an average of 498 minutes per child, compared to 145 minutes in the Eagle Adventure demonstration and 132 minutes in the EWPHCCS demonstration, respectively.

Among the 282 eligible women who enrolled in the About Eating program, 202 participants completed at least one About Eating lesson and 155 of these women completed all of the lessons. Their average exposure was 9 minutes per lesson and 38 minutes overall based on a weighted average of the number of lessons accessed by participants.

**Table IV-1.— Key Indicators of Program Reach and Dosage by Demonstration Project**

| Project         | Reach<br>Number of Primary<br>Target Audience<br>Members Reached in<br>the Evaluation<br>Sample <sup>a</sup> | Number of Lessons<br>Attended or<br>Accessed by Primary<br>Target Audience |       | Average<br>Lesson<br>Duration<br>(Minutes) | Dosage<br>Average<br>Duration of<br>Total<br>Exposure per<br>Participant<br>(Minutes) |
|-----------------|--|--|-------|--|---|
|                 |  | Mean   | Range |  |   |
| EWPHCCS         | 728  | 4.4  | n/a   | 30   | 132   |
| All 4 Kids      | 403  | 16.6   | 1–24  | 30   | 498   |
| Eagle Adventure | 714  | n/a  | 1–4   | 30   | 145 <sup>b</sup>  |
| About Eating    | 202  | 4.2  | 1–5   | 9  | 38  |

<sup>a</sup> For the child-focused projects, program reach is defined as the number of children who participated in at least one in-person class. For the EWPHCCS program, this value represents the number of children reached across the 12 centers included in the evaluation, not the statewide program reach. For the About Eating program, this value represents the number of participants that completed at least one lesson.

<sup>b</sup> For the Eagle Adventure program, this includes exposure to both the four 30-minute classroom lessons and the 25 minute play performance that all participating children attended at the beginning of the intervention. Because CNNS did not track individual children’s lesson attendance, the average class exposure value of 120 minutes is an estimate based on the total number of lessons (4) offered in each classroom and may be an overestimate.

n/a = not applicable

Source: Demonstration project administrative data

Both the EWPHCCS and All 4 Kids programs included parents and caregivers as direct recipients of nutrition education by incorporating parent classes (EWPHCCS) or Family Activity sessions (All 4 Kids) into the curriculum. The EWPHCCS program offered a series of six classes for parents and caregivers. Response to this direct education opportunity was very low. According to NYSDOH’s administrative data for EWPHCCS, only 88 parents and caregivers enrolled in at least one parent class at the 12 intervention sites, equal to 12 percent of the number of children who were reached by the intervention at those sites. Among the 440 parents and caregivers who responded to the FNS evaluation follow-up survey, a much higher proportion reported attending at least one class (138 of 440 or 31 percent of respondents). Within that group of parents and caregivers, approximately one-half (71 of 138) reported that they attended at least three or more of the parent classes. (See table IV-2 for a summary of EWPHCCS lesson dosage among participating parents and caregivers.)<sup>11</sup>

<sup>11</sup> The difference in administrative data and survey responses regarding the number of parents and caregivers participating in EWPHCCS can most likely be explained by variations in reporting. Only parents and caregivers who officially signed in and enrolled in at least one parent class are documented in the NYSDOH SNAP-Ed administrative data, whereas survey respondents likely reported attending parent classes if they were physically present for any part of the class. For this reason, NYSDOH administrative data were used as the most reliable data available to calculate parent reach. However, the program administrative database is not designed to collect unduplicated parent attendance and thus could not provide information on the number of classes each participating parent or caregiver attended. For this reason, the follow-up parent survey was the only available source of data on parent class dosage (i.e., the number of classes each participating parent attended).

**Table IV-2.— Class Dosage among Parents and Caregivers Participating in EWPHCCS Classes, by Region<sup>a</sup>**

| Number of Classes Attended                                     | Overall<br>( <i>n</i> = 138) | NYC<br>( <i>n</i> = 91) | Outside of NYC<br>( <i>n</i> = 47) |
|--|------------------------------|-------------------------|------------------------------------|
| Mean   | 2.9                          | 3.0                     | 2.6                                |
| <b>Number of parent/caregiver classes attended<sup>a</sup></b> | <i>n</i> (%)                 | <i>n</i> (%)            | <i>n</i> (%)                       |
| 1 class  | 34 (24.6)                    | 14 (15.4)               | 20 (42.5)                          |
| 2 classes  | 33 (23.9)                    | 25 (27.5)               | 8 (17.0)                           |
| 3 classes  | 30 (21.7)                    | 25 (27.5)               | 5 (10.6)                           |
| 4 classes  | 14 (10.1)                    | 10 (11.0)               | 4 (8.5)                            |
| 5 classes  | 9 (6.6)                      | 5 (5.5)                 | 4 (8.5)                            |
| 6 classes  | 18 (13.0)                    | 12 (13.2)               | 6 (12.8)                           |

<sup>a</sup> Dosage is based on information from the 138 of 440 parents and caregivers surveyed who reported attending at least one EWPHCCS parent class.

Source: Parent/caregiver follow-up survey, 2010

The All 4 Kids program included Family Activity sessions that aimed to get parents and caregivers directly involved in the nutrition education program along with their children (unlike the EWPHCCS parent classes that were targeted solely to the adults). However, the All 4 Kids program offered fewer parent-focused events than the EWPHCCS program—three Family Activity sessions in total during the demonstration project. Both the fewer number of parent sessions offered and the child involvement in these events contributed to parents’ attending a greater proportion of the sessions offered to them. All 4 Kids administrative data indicate that a total of 209 parents and caregivers attended at least one session or roughly half the number of children who participated in the program. Of this group, only one-third (69) attended all three sessions. (See table IV-3 for information on the session dosage among participating parents and caregivers.)

**Table IV-3.— Session Dosage among Parents and Caregivers Participating in Family Activity Sessions, by Intervention Wave**

| Number of Sessions Attended                         | Overall<br>( <i>n</i> = 209) <sup>a</sup> | Spring Wave<br>( <i>n</i> = 99) <sup>a</sup> | Summer Wave<br>( <i>n</i> = 110) <sup>a</sup> |
|---|---|--|---|
| Mean  | 2.0                                       | 2.1  | 2.0   |
| <b>Number of parent/caregiver sessions attended</b> | <i>n</i> (%)                              | <i>n</i> (%)                                 | <i>n</i> (%)                                  |
| 1 session   | 69 (33.0)                                 | 26 (26.3)                                    | 43 (39.1)                                     |
| 2 sessions  | 71 (34.0)                                 | 39 (39.4)                                    | 32 (29.1)                                     |
| All 3 sessions                                      | 69 (33.0)                                 | 34 (34.3)                                    | 35 (31.8)                                     |

<sup>a</sup> Dosage information is based on program attendance records of the 209 of 403 parents and caregivers who attended at least one All 4 Kids class.

Source: UNCE All 4 Kids program administrative data

## **2. Indirect Education**

For the three child-focused demonstration projects, indirect education was primarily provided in the form of take-home materials, such as newsletters, fact sheets, quizzes, and healthy recipe ideas, that were intended to promote child and parent or caregiver interaction and reinforce key nutrition education messages. In general, parents and caregivers reported relatively high use of these types of materials and activities. For example, when surveyed caregivers of children in the EWPHCCS demonstration project were asked whether they received and read the *Parent Pages* that were distributed weekly through their children's childcare centers, just over half (52 percent) reported reading all or most of the series of six *Parent Pages*, a third (34 percent) reported reading some of them, and only 3 percent said that they had received the newsletters but did not read any of them.

Similarly, when surveyed caregivers of children in the Eagle Adventure program were asked how many Eagle Books they had read to their children, more than 46 percent reported reading all four and 93 percent reported reading at least one. Likewise, when surveyed caregivers of children in the All 4 Kids program were asked about their use of the Smart Snack Cards—cards with pictures of healthy snack foods and their serving sizes that were designed to help parents encourage their child to pick a healthy snack, 88 percent of caregivers who received the cards reported using them. Similar rates of use were reported for the other take-home materials offered through EWPHCCS, Eagle Adventure, and the All 4 Kids programs.

## **E. Costs of Program Development and Implementation**

### **1. Costs of Program Development**

Only two of the four IAs—CNNS and PSU—provided information on the costs required to design and develop their model of nutrition education because these programs were designed during the evaluation study period. Overall, the design and development of the CNNS and PSU demonstration projects cost nearly \$313,000 and just over \$35,000, respectively. The largest cost center in both cases was staff salaries, which accounted for between 76 and 82 percent of total costs. One explanation for the substantial difference between the two projects' development costs is that the About Eating program was largely developed by the time it was selected as a demonstration project. Once notified of their selection, the PSU program manager took steps to ensure that the previously developed four-module online program was appropriate for a low-income audience and added a fifth module on physical activity. Conversely, the Eagle Adventure program was developed almost entirely during the study period, prior to the start of their intervention in March 2010.

### **2. Implementation Costs (Total and per Participant)**

The total cost of program implementation varied greatly across the four projects (see table IV-4) with the contribution of salaries being the most diverse. Staffing costs accounted for approximately three-quarters of program implementation costs for the EWPHCCS and All 4 Kids projects but only approximately one-third of the implementation costs for the Eagle Adventure and About Eating projects. To some extent, these differences reflect the variations in program reach across the four projects and the number of staff required to implement the programs based on the demonstration projects' planned reach and dosage. For example, implementation costs for the Eagle Adventure demonstration project may have been lower than for the other two child-focused demonstration projects because it involved only four lessons and a play at each intervention site compared with 12 classes per site for the EWPHCCS program (six parent and six child lessons) and 27 classes (24 child classes and three family events) at each All 4 Kids site. The Eagle Adventure program also had only two staff members teaching the classes at all of the intervention sites



compared with larger teams of direct educators for the EWPHCCS statewide program and the All 4 Kids demonstration project. Total implementation costs for the About Eating demonstration project were the lowest of the four demonstration projects because its mode of education delivery was the Internet rather than in-person classes provided by trained direct educators.

Another way to compare implementation costs among demonstration projects is to examine their per-participant implementation costs. This comparison, however, presented some challenges. Depending on the type of intervention, costs per program participant can be calculated based on the number of children or adults who receive a single intervention dose, complete the entire intervention, or are enrolled in a “site” where interventions are being conducted. In addition, estimating costs associated with indirect education of parents and caregivers through the distribution and use of take-home materials is not straightforward, making it difficult to develop costs per program participant by participant type.

To ensure common definitions of participants in the three child-focused demonstration projects, the number of children reached—defined as having participated in at least one nutrition education lesson—served as the denominator for cost-per-participant calculation. For the About Eating demonstration project, the denominator was the number of women who participated in at least one online lesson. The total cost of program implementation, as reported by the demonstration projects, served as the denominator for this calculation. These values and each program’s estimated cost per participant, which ranged from approximately \$92 for Eagle Adventure to more than \$370 for All 4 Kids, are presented in table IV-4.

**Table IV-4.— Total and Per-Participant Cost of Program Implementation, by Demonstration Project**

| Measure                                  | NYSDOH <sup>a</sup> | UNCE            | CNNS           | PSU <sup>b</sup> |
|--|---------------------|-----------------|----------------|------------------|
| Number of children or women participants | 10,314              | 403             | 714            | 202              |
| Total cost of implementation             | \$3,056,675         | \$149,151       | \$65,752       | \$39,684         |
| <b>Cost per participant</b>              | <b>\$296.36</b>     | <b>\$370.10</b> | <b>\$92.09</b> | <b>\$196.46</b>  |

<sup>a</sup> NYSDOH was unable to provide implementation costs relative only to the 12 sites that were included in the demonstration project; therefore, both the reach and costs related to statewide-implementation of the EWPHCCS program were used to calculate cost per participant. However, there is no reason to believe that per-participant costs for the intervention sites would be different because the same program materials, protocols, and staff were used at the evaluation sites for the other centers participating in the program. At the same time, the cost per participant may be overstated because the implementation costs used to calculate cost per child include the administrative costs associated with both the traditional EWPHCCS program evaluated for this study and the 49 additional self-run centers where, in FY 2010, EWPHCCS direct educators taught childcare directors and teachers to implement the EWPHCCS lessons on their own. The number of participants included in the self-run program was not included in the count of EWPHCCS participants for this evaluation because the self-run program was a different program model than the one being evaluated.

<sup>b</sup> For PSU, the per-participant costs were based on the number of women who accessed at least one About Eating lesson. The total costs of implementation would be lower if the costs of staff and other resources used to recruit, process, and monitor the control group (for the self-evaluation) were excluded. However, it was not feasible for PSU to separate out the costs for conducting the intervention without controls.

Source: Demonstration project administrative data

## F. Implementation Successes, Challenges, and Lessons Learned Among the Child-Focused Demonstration Projects

The FNS process evaluation revealed some common and encouraging successes in the implementation of the child-focused demonstration projects. At the same time, the process evaluation identified a number of challenges in implementing the three child-focused projects that might have had an impact on children's at-home consumption of fruits and vegetables. This section summarizes the implementation successes and challenges that were common across the child-focused projects and concludes with lessons learned. These lessons represent opportunities for program refinement and provide important considerations for future implementation of these specific programs as well as other SNAP-Education programs seeking to improve young children's consumption of fruits and vegetables.

### 1. Common Successes

Findings from the process evaluation indicate that the child-focused demonstration projects were implemented as planned. Moreover, several specific indicators of the programs' success were identified through the process evaluation, including:

- The program design, content, and messages were very well received by the childcare center directors and school principals at the intervention sites;
- Most childcare directors and school principals helped support program implementation and reinforced nutrition messages with children;
- Direct educators felt well prepared to teach the curricula and found it easy to implement; and
- Parents and caregivers were very satisfied with the program.

#### ▲ Programs were very well received by childcare center directors and school principals.

School principals and childcare center directors at participating sites routinely praised each program's design, messages, and materials. In one-on-one interviews, principals and childcare directors frequently noted that they enjoyed the programs' focus on nutrition and physical activity, appreciated the use of multiple methods for delivering nutrition messages, and respected the high quality of the educational materials and the direct education staff. School principals and childcare center directors across these programs said that the lessons and methods reflected an in-depth knowledge not only of the target population's needs, but an awareness of how young children learn. In particular, principals and directors appreciated the interactive, child-focused nature of the lessons, as well as the use of parent education as a way to encourage change in children's behavior. Childcare center directors and principals also appreciated the flexibility of SNAP-Education program staff in accommodating class needs, staff schedules, and unexpected events.

Directors at the sites implementing All 4 Kids and EWPCCS said that they particularly liked how the curricula successfully encouraged children to become actively involved in learning either through movement and music or food tastings and simple food preparation activities. School principals participating in the Eagle Adventure program praised its use of a play as a creative and fun way to introduce the program and engage children's interest before classroom lessons began.

In post-implementation interviews, when directors and school principals were asked whether they would like the program to come back to their sites, all respondents indicated that they would welcome the program again at their sites if the opportunity was offered.



**▲ Most school principals, childcare directors, and childcare teachers helped support program implementation and reinforced the nutrition messages with the children.**

Based on information gathered from a number of key informant interviews, most childcare directors and principals were very helpful throughout program implementation. Program managers and direct educators suggested that the presence of an administrator who was engaged in the program—demonstrated by their willingness to assist with parent and caregiver recruitment, provide adequate space for parent classes, promote staff buy-in, and ensure teacher presence during classroom lessons—was a major facilitator of implementation. Several of the most engaged directors also reported holding meetings with their teachers to encourage their promotion of the nutrition education lessons and take-home materials with parents during child drop-off or pick-up.

Key informant interviews and direct observations of the two childcare programs also revealed broad teacher support for these programs. In both cases, classes and materials were provided to teachers in an effort to increase their buy-in and encourage their reinforcement of the program’s messages in the classroom. Consequently, nearly all of the teacher respondents from the All 4 Kids and EWPHCCS intervention sites reported repeating the programs’ nutrition messages with the children in their classrooms or at mealtimes at least once a week. In EWPHCCS, the level of childcare teacher reinforcement of the program messages was particularly high, with nearly two-thirds of respondents reporting that they used nutrition messages and sample activities from the EWPHCCS lessons “a couple or a few times” or “more than a few times” a week. A few teachers from the EWPHCCS intervention sites said that they planned to continue incorporating the EWPHCCS activities and messages into their lesson plans even after the 6-week program was completed.

**▲ Direct educators felt well prepared to teach the curriculum and found it easy to implement.**

The ease with which direct educators were able to implement the curriculum was fundamental to their successful implementation. Direct educators’ confidence in their ability to teach the curriculum was critical in terms of winning the support of school principals and childcare center directors, as well as ensuring program fidelity across the intervention sites. The educators uniformly reported that the lesson plans were both enjoyable and easy to carry out regardless of the classroom size and environment. Many of the direct educators who had not been directly involved in the design of these SNAP-Ed programs attributed their comfort and ease in implementing the classes to the clarity of the written lesson plans, the classroom resources they were given, and the training and technical assistance provided by the senior program staff members.

**▲ Parents and caregivers were very satisfied with the program.**

Parents of participating children expressed satisfaction with what they and their children were learning. Across the three programs, the majority of parent survey respondents were very satisfied with the programs’ take-home materials. In focus group sessions, parents and caregivers described how important the programs were in supporting their efforts to help their children be healthy. In particular, they praised the content and relevance of the nutrition messages and the quality and usefulness of take-home materials and activities. Across programs, parents reportedly liked the recipes and food preparation suggestions they received. Focus group participants particularly mentioned liking and reading the Eagle Books, the All 4 Kids music CDs, and the EWPHCCS sticker charts that parents could use at home to give their child a sticker or star when they tried a new fruit or vegetable at home.

Parents appreciated program efforts to be culturally and linguistically accessible and relevant. For example, parents in the Eagle Adventure program noted the respectful incorporation of the Native

American culture into the lessons. Parents whose children participated in the All 4 Kids program were thankful for the presence of bilingual (Spanish and English) educators and the Spanish-language translations of all materials.

Parents whose children participated in the two childcare-based programs reported a high level of satisfaction with the parent classes and family events that were offered. Though participation in these events was less than ideal from the program planners' perspective, the majority of parent survey respondents who reported attending at least one of these events said they were useful in helping their child to eat healthier foods. Direct observations of the EWPCCS parent classes and All 4 Kids family-focused activities that were conducted as part of the independent evaluation also found that most adult participants were actively engaged and interested in the discussions and activities.

## **2. Common Challenges**

Despite the many aspects of program implementation that were successful, the process evaluation also identified several challenges and barriers that may have impeded the ability of these three child-focused programs to be fully successful. The implementation challenges common to the child-focused demonstration projects were:

- Maximizing parent and caregiver reach and engagement;
- Maximizing school and childcare center staff engagement in supporting program implementation;
- Parent and caregiver concerns about costs of purchasing fruits and vegetables and trying new recipes;
- Limited available space in some childcare settings; and
- Implementation timeframe imposed by the independent evaluation.

### **▲ Maximizing parent and caregiver reach and engagement**

Many key informants across the three child-focused projects suggested that reaching and engaging parents and caregivers posed the greatest challenge to effectively implementing SNAP-Education programs targeted to young children. Programs that held classes and sessions for parents reported that attendance was much lower than expected. Specifically, in the All 4 Kids program, 52 percent of parents and caregivers of children who participated in the program attended at least one of the program's events for families. In the EWPCCS program, parent and caregiver participation was even lower, with only 12 percent of parents and caregivers at the independent evaluation's 12 intervention sites participating in at least one of the six lessons offered to them. While the Eagle Adventure program did not include classes or events designed specifically for parents, parents in focus groups reported low attendance at the Eagle Adventure play and that they could not always complete the take-home nutrition education materials sent home with their children. Across the three projects, parents and caregivers most commonly cited limited time or schedule conflicts as reasons for not participating in sessions or using take-home nutrition education materials and activities.

### **▲ Maximizing school and childcare center staff engagement in supporting program implementation**

As noted above, the level of engagement with these programs was generally high among school principals and childcare directors and teachers. However, there were several childcare directors and elementary school teachers who reportedly were not very engaged and did not provide needed help in program

implementation. At the centers where directors were not actively engaged, key informants reported that implementation was challenged. They pointed out that less engaged directors do not provide the support that the EWPCCS or All 4 Kids program direct educators need to recruit parents, facilitate scheduling, or locate adequate space for the parent and family activities.

While principal support and engagement was strong at the five Eagle Adventure intervention sites, lack of consistent teacher engagement was cited as a challenge to this program's implementation. Unlike the two childcare-based demonstration projects, teachers in the Eagle Adventure intervention classrooms did not receive any training from the CNNS program staff, nor were they required to remain in the classroom during the Eagle Adventure lessons. Both direct observations and interviews with direct educators revealed various levels of teacher engagement with some teachers leaving their classroom when the Eagle Adventure lessons were being taught while others remained in the classroom to provide discipline as necessary. CNNS direct educators reported that lesson implementation was much more effective when the classroom teacher was present in the classroom. It should also be noted that there was no indication that teachers were reinforcing the program messages as part of other lessons in their classrooms.

▲ **Parent and caregiver concerns about costs of purchasing fruits and vegetables and trying new recipes**

According to focus group participants from all three programs, the high cost of fruits and vegetables made it difficult for many to make some of the recommended dietary changes. These parents also said that they were reluctant to try some of the recipes because they could not afford to waste the leftovers if their child would not try the new foods. Though not specified in the nutrition messages of the three child-focused demonstration projects, several parents clearly perceived that they were being encouraged to feed their children only fresh fruits or vegetables, instead of canned, frozen, or dried forms. Focus group participants expressed concern about the expense of maintaining an adequate supply of fresh produce whose shelf life is limited and can easily spoil. In some cases, parents reported that, though they wanted to buy more fruits and vegetables, they could not afford the time and expense required to travel to several stores to find affordable, quality produce.

▲ **Limited available space in some childcare settings**

The program managers, and several direct educators and parents in the focus groups from the All 4 Kids and EWPCCS programs noted that the physical space available for parent or family events was very limited at some centers. The educators reported that they could adapt the lessons and activities to the space available—sometimes only a hallway or the staff lunchroom—but the lessons and Family Activity sessions at these centers were crowded. Parents pointed out that they could be more engaged if the class space was private and educators believed that at centers where the classes were crowded many parents were turned away or did not come back to the next class.

▲ **Reduced child exposure to the program**

Due to the time needed to secure Office of Management and Budget (OMB) approval and the requirements for the successful completion of the independent evaluation's data collection and analysis, children in the All 4 Kids summer wave and the Eagle Adventure program received less than the planned amount of exposure to their respective nutrition education programs, though for different reasons. For the All 4 Kids program, there were a limited number of Head Start centers in Las Vegas that had not been exposed to the All 4 Kids pilot. Thus, to meet the sample size requirements of the independent evaluation, UNCE had to implement a second wave of the demonstration during the summer when attendance is typically lower in childcare settings. As a result, the children who participated in the summer wave of All 4 Kids on average attended fewer of the 24 All 4 Kids classes offered at each center.

In the case of the Eagle Adventure program, the independent evaluation could not begin pre-intervention data collection until OMB approval was obtained in late January 2010; thus, the intervention could not begin until March 2010 instead of February as originally planned. As a result, the program implementation period was reduced by approximately 2 weeks so that the intervention could be completed before the end of the school year. Having to implement in this shorter timeframe also reduced the amount of time for families to complete the program's homework activities (Nestwork) and reduced children's exposure to reinforcing announcements and banners at the school. During the demonstration project, the schools typically allocated a shorter time period in the classroom (30 to 35 minutes) than was originally planned (40 minutes) to deliver each lesson, thus reducing children's total potential exposure to the program.

### **3. Lessons Learned**

This section identifies a number of lessons learned from studying the implementation of the child-focused demonstration projects. These lessons address what worked well in program design and implementation as well as opportunities for improved program implementation in these and other SNAP-Ed programs that target preschool and early elementary school-age children.

#### **▲ Formative research helps the program tailor its messages and methods.**

When key informants were asked during site visits and surveys which factors contributed most to the quality and successful implementation of these programs, they emphasized the program's design, including simple messages, relevancy to the target audiences, and ease of implementation. Senior program managers from NYSDOH, UNCE, and CNNS uniformly said that their investment in formative research or pilot testing was critically important to achieving these successes. Each of these programs intentionally included the target audience and some also included intervention site staff input as part of formative research or pilot testing of their curricula. As part of developing the EWPHCCS program, in 2005–2006 NYSDOH conducted focus groups with low-income parents of preschool children and interviews with childcare center staff. The goal of this formative research was to obtain feedback on the program's draft messages and lesson format, to understand what parents of young children wanted to know about nutrition and physical activity, and obtain practical information on the logistical aspects of recruiting for and implementing the program at childcare centers. CNNS also conducted focus groups prior to developing the Eagle Adventure program model. These focus groups were held with Native American women in the Chickasaw Nation boundaries and revealed a preference for interventions that are fun, exciting, and intergenerational with nutrition education programs focused on diabetes prevention information. Although UNCE did not initially conduct formative research, it did conduct a series of pilot tests prior to the demonstration. UNCE investigators report that these pilot test results helped them refine the program's core messages to better meet child ability levels and parent and caregiver needs.

#### **▲ It is important to establish strong working relationships with intervention site directors.**

All of the senior program staff emphasized the importance of establishing strong working relationships with school administrators or childcare center directors at the intervention sites. They remarked that the time and effort spent on visiting and communicating directly with the school principals or childcare directors helped to secure their onsite support in program implementation, including the childcare directors much needed assistance in recruiting parents, caregivers and teachers to participate in the program. School principals at the Eagle Adventure intervention sites reported that during the initial meetings with the CNNS Eagle Adventure team, they were very impressed with their passion for the program and in-depth understanding of the Chickasaw Nation culture. The principals pointed to the Eagle

Adventure team's meetings with them and their flexibility in scheduling the play and classes as being instrumental in gaining their cooperation and satisfaction with the program.

**▲ A focus on training and monitoring is key to promoting program fidelity and quality.**

The program managers and direct educators in the EWPHCCS and All 4 Kids programs noted that the trainings, onsite reviews, lesson logs, and team meetings each played a critical role in helping educators learn how to use the curriculum and improve the quality of their teaching skills. The trainings and team meetings were seen as practical formats for the educators to learn new information, practice teaching in front of their peers, and obtain feedback on how to address challenges in program implementation. The lesson logs completed by the direct educators and onsite reviews by program supervisors were recognized by program managers as a positive and supportive way not only to track program fidelity but, more importantly, as a way for direct educators to improve their teaching methods and for supervisors to identify common needs to inform future trainings.

**▲ Sensitivity to the culture and language of the target audience is critically important.**

Each project attempted to develop culturally appropriate lessons and materials for their target audiences. Key informants from each program noted that sensitivity to the culture and language of the target audience is critical to engaging program participants. Focus group participants from the Eagle Adventure program praised the portrayal of Native Americans in the Eagle Adventure materials. Similarly, in the All 4 Kids program, where 65 percent of the children who participated were Hispanic, all program materials were available in English and Spanish. Parents also reported that the foods served and mentioned in the take-home materials were culturally appropriate, and greatly appreciated that all the classes had at least one bilingual educator present. As a statewide program, the EWPHCCS intervention tried to adapt its materials and recipes for the very racially and ethnically diverse populations served. Handouts were translated and available for distribution in Spanish, Chinese, Russian, Arabic, French, and Haitian Creole. The program has a few direct educators who are bilingual in English and Spanish or English and Chinese; however, according to intervention site directors, this capacity is clearly limited relative to the need.

**▲ Using multiple methods of nutrition education delivery may be most effective in maximizing parent and caregiver reach and engagement.**

SNAP-Ed programs that target young children and their families need to find ways to make their information and materials more accessible to low-income families. Key informants offered several ways to improve the reach of such programs. For example, to increase attendance at parent and family events, they suggested increased communication directly from the school or childcare center about these events, encouraging parents to attend. They also recommended that such events be held at different times of the day to accommodate parents' varied work hours and scheduling needs. Childcare center directors suggested that the program try different formats for the parent events. For example, the EWPHCCS intervention and Eagle Adventure program might consider holding family events, while the All 4 Kids program might consider holding some events for parents and caregivers only.

A few of the parents of children in the childcare interventions and one childcare center director suggested that the programs should offer the ingredients for the recipes being prepared to parents who attend parent or family events. They suggested that that this could both promote parent attendance and address the target audience's concerns about the costs of trying new recipes. They suggested that once the parents see

their children are willing to try new vegetables or fruits in a recipe, they may be more likely to make the recipe again and try to prepare the vegetables or fruits another way.<sup>12</sup>

Other suggestions for ways SNAP-Ed programming can reach the parents and children of preschool and young elementary school-age children include the following:

- Adding additional educational channels to reach parents, such as information dissemination via the Web (i.e. a school Web site) or direct emails;
- Implementing a social marketing campaign to reach children and families enrolled at the targeted schools or childcare centers;
- Distributing a recipe book that includes all of the recipes used in the program; and
- Providing an opportunity for caregivers to share recipe ideas with one another (e.g., via a blog or shared Web site).

**▲ There is a need to encourage greater involvement and support from intervention site staff, including ongoing program reinforcement by teachers.**

As highlighted in the discussion of implementation challenges above, a sustained effort is necessary to maximize staff engagement in SNAP-Ed programs that are conducted in childcare centers and schools. Recognizing that center directors, principals, and teachers are very busy, securing their help in program implementation will require sensitivity to the multiple demands on their time. In this light, such programs should consider providing clear, written expectations to principals and childcare directors as part of the site recruitment process. For example, these expectations might include providing logistical support in scheduling the lessons, raising program awareness among parents, and recruiting for the parent classes and events.

Expectations for teacher engagement during the SNAP-Ed classroom lessons should be clearly communicated to the directors and principals and consideration should be given to including an educational component targeted to classroom teachers, similar to the staff classes provided by EWPHCCS. Additionally, as was the case in the All 4 Kids program and the EWPHCCS sites in New York City, teachers could also be given sample scripts and lesson plans to reinforce SNAP-Ed program messages with the children in their classrooms.

**▲ It is important to communicate solutions for addressing low-income families' food cost concerns.**

SNAP-Ed programming targets families who have limited budgets to meet their basic needs. To maximize a SNAP-Ed program's impact on children's fruit and vegetable consumption at home, the program must address parent and caregiver concerns about the costs of fruits and vegetables relative to their available budget—whether these are real or perceived barriers to healthy eating behaviors for their children. For example, the curriculum could be supplemented with more informational materials on meal planning and shopping on a limited budget and include more recipes using the same fruits or vegetables. Parents and caregivers should be encouraged to serve all forms of fruits and vegetables, including fresh, frozen, canned, and dried. Additionally, SNAP-Ed programs should provide eligible nonparticipants information on how they can access the Special Supplemental Nutrition Program for Women, Infants and Children (WIC), SNAP, and emergency food assistance.

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<sup>12</sup>Current SNAP-Ed guidance does not allow distribution of food, other than that used in recipe/taste testing or demonstration purposes, in SNAP-Ed.



## **G. Implementation Successes, Challenges, and Lessons Learned Unique to the About Eating Program**

As noted earlier, the About Eating program was very different from the projects directed at children. Similar to the child-focused interventions, formative research was key to developing and designing this intervention and tailoring it to the SNAP-Ed target audience. The FNS process evaluation of the About Eating program revealed important successes in the implementation of this unique demonstration project. The process evaluation also revealed some challenges that, if addressed, could enhance the program's ability to achieve its objectives. The individual case study report for the About Eating program provides more details about the facilitators and challenges to implementation of About Eating. This section examines those in the context of how the About Eating successes and challenges compare or contrast to those noted above for the projects directed at children.

### **1. Successes**

Findings from the process evaluation indicate that many aspects of the About Eating program were implemented as planned. Moreover, several specific indicators of success are summarized below.

#### **▲ Nutrition education content was relevant for and well-received by target audience.**

Across all four demonstration projects, the nutrition education content was well received by the intended target audience. However, the About Eating target audience was not “captive” in the sense that all of the About Eating participants actively chose to visit the Web site. The designers and implementers of About Eating strongly believe that their knowledge and experience with the target audience allowed them to design a nutrition education program that was well received by the target audience. Participants reported a high degree of satisfaction with the nutrition education messages and content of the program, which is evidence that the About Eating team did have a good understanding of their target audiences' interests and needs. When asked to indicate their level of agreement with various statements related to their satisfaction with the About Eating program, 86 percent “strongly agreed” or “agreed” that the About Eating program was designed for someone like them. Through open-ended questions on the follow-up survey, program participants reported liking in particular the quizzes, surveys, and other engaging activities embedded in the lessons as well as the charts and graphs. In addition to being satisfied with the program's nutrition education content and activities, the participant follow-up survey revealed that program completers were also satisfied with the amount of time it took to complete the course.

#### **▲ The program was accessible and easy to use for most participants.**

One major concern of FNS and the evaluation team was the extent to which technical problems would hamper or discourage participants from completing the lessons. Since the Web application required that Internet connections work properly, the Web site needed to be easy to navigate, and the programming of the lesson sequences function as intended, there was a risk of technical problems at several levels. However, the majority of participants who completed the About Eating program found the program to be easy to use and were able to access and navigate the Web site as well as read and understand the information provided. Among this group, Internet access was readily available; 84 percent of program completers reported having access to the Internet at home and 87 percent reported accessing the Internet on a daily basis. Of the women who enrolled in the program and engaged in at least one lesson, more than three-quarters completed all five lessons of the program.

**▲ Recruitment strategies were diverse, well-planned, and supported by key partners.**

As noted earlier, recruitment efforts in About Eating focused on reaching out to large numbers of individuals, while recruitment efforts in the other demonstrations focused on congregate sites. The recruitment strategies, procedures that were planned out well in advance of project implementation prepared PSU for this phase of the project. Key informants reported that regular communication among staff members helped them to stay focused and to accomplish their goals. In addition, as they experienced some challenges in achieving their desired program reach, PSU tried several different methods to recruit participants such as handing out flyers at grocery stores in low-income communities and distributing flyers through county assistance offices.

Based on participant response to the baseline survey, postcards—which were distributed to nearly 7,000 potentially eligible women—were the most common way that About Eating completers heard about the program (reported by 32 percent of program completers). As noted above, these postcards were distributed through county assistance offices and job training programs as well as to individuals identified through DPW SNAP databases. Friends/family/coworkers, and libraries were the two other common responses, reported by 13.7 percent and 11 percent of completers, respectively. The About Eating project coordinator reported that recruitment venues that allowed for face-to-face interaction with SNAP-eligible participants (such as county assistance offices) were also effective recruitment methods. For example, library staff members not only agreed to post flyers but were also helpful to potential participants who were interested in enrolling. Participants who visited libraries typically had Internet access there and thus could sign up immediately for the course after reading the flyer. County assistance offices were also, reportedly, an effective location to recruit because caseworkers could promote the program directly to potential participants.

## **2. Challenges**

Despite these successes, the program manager and staff reported several challenges while implementing the About Eating program. Program participants also provided insight into barriers they faced in accessing and completing the About Eating program.

**▲ Intensity of efforts needed to recruit SNAP-eligible populations**

Recruiting individuals rather than sites required significant effort. During the course of recruitment these efforts had to be increased because fewer than expected participants enrolled in the program. This meant sending out more flyers to recruitment venues, calling SNAP-eligibles from the DPW lists, and locating other venues serving low-income populations. Interviews with the About Eating program manager and the project coordinator revealed that in their experience, barriers to recruitment of SNAP-eligible participants include lack of time or interest on the part of the participant or lack of access to computers and the Internet.

Additionally, the low-income programs and venues the About Eating staff collaborated with had different levels of commitment for the distribution of information about this program. For example, although the DPW is the most likely venue from which to recruit SNAP-eligible populations, it was difficult for PSU to obtain a complete list of client phone numbers or email addresses or to post information on the DPW Web site. The DPW did provide PSU with names, some telephone numbers, and mailing addresses, but a more complete list would have helped the PSU staff in their recruitment efforts.



### ▲ Participant retention

Because participants in the intervention visited the web site on their own time and of their own choice, there was a greater risk of clients dropping out of the intervention. Much like the efforts to engage parents in the other three demonstrations, outside factors influenced the amount of time participants had available to be engaged in the program. Though 77 percent of the women who accessed at least one lesson (155 of 202) completed all five lessons, among the women who enrolled in the program and were assigned to the intervention group 45 percent (127 of 282) did not complete all five About Eating lessons. When asked about their reasons for not completing the lessons, respondents most commonly reported that they were “too busy with other activities like work or family.” A participant attrition analysis<sup>13</sup> revealed that participants who did not complete high school, had limited access to the Internet at home, and accessed the Internet only a few times per month were less likely to complete the About Eating program. Additionally, participants who did not complete the About Eating program were not as likely as completers to “strongly agree” with statements related to their satisfaction with the About Eating program’s ease of use and content, which might have decreased their interest in completing the lessons.

### ▲ Limits on exposure time to intervention

An additional challenge to implementation of the About Eating program was the limited exposure time to each of its lessons. As noted above, participants spent an average of 9 minutes on each lesson they accessed. This may have been due to the timing protocol that was put into place as part of the design of the demonstration project to fit within the available data collection timeframe for the independent evaluation. This strict timing protocol was followed to ensure time between lessons, but, as a consequence, participants were not allowed to return to a lesson after they had completed it. The program manager reported that the timing protocol did not allow participants enough time to voluntarily go back to lessons to help them apply what they had learned and to incorporate changes into their lifestyle before they completed the evaluation’s follow-up survey.

## 3. Lessons Learned

Other SNAP-Ed providers seeking to replicate the About Eating program can benefit from lessons learned for this kind of Web-based programming for SNAP-Ed audiences. The need to identify more effective methods for recruitment of SNAP-Ed eligible participants to Web-based programs and increasing participant retention and exposure time to lessons stand out as the most important lessons for future SNAP-Ed Web-based programming.

### ▲ There is a need to identify additional recruitment venues and focus on venues that prove to be most effective.

When asked what other recruitment venues may have been effective for this project, the project coordinator said career centers with training programs and organizations with education classes would be useful for recruitment in low income areas because of the access to computers, encouragement from staff members at the site, and consistency of accessing these resources. Recruitment would also be bolstered by a higher level of commitment from the agencies and organizations that served as recruitment venues. Some of these agencies and organizations provided the material and assistance needed to promote this program (e.g., libraries), but others did not have the same level of commitment (e.g., State DPW). Clearly, a commitment to the program is an important component to successful recruitment and should be

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<sup>13</sup> Participant attrition analysis compares the characteristics of participants who did and did not complete all of the About Eating lessons.

obtained prior to initiating a program. This may include in-depth discussions with key stakeholders, such as DPW staff members at the State and local levels.

Additionally, neither the independent evaluation nor PSU's self-evaluation included surveys of women who received outreach but chose not to enroll in About Eating. To improve the cost-effectiveness of the program's recruitment efforts and maximize reach among the target audience, it would be useful to learn more about these women and their reasons for nonparticipation as well as how to overcome the barriers they might face.

**▲ There is a need to identify ways to maximize participant retention and length of exposure to Web-based programs.**

Despite the usefulness of formative research in designing a program that is relevant and accessible for a majority of those eligible to participate, it is important to recognize that many of those who were eligible and recruited never enrolled in the program and as noted above a large portion of those who enrolled did not complete all the About Eating demonstration project lessons. Consideration should be given to identifying potential participants who may experience access-related barriers and to helping all participants overcome these barriers. One opportunity that emerged in the implementation of this program was the role that public libraries can play in recruitment and retention, as described above. Thought should be given to the location of public libraries in relation to potential participants and whether these libraries have adequate resources and staff.

It is also important to note that approximately one-half (49 percent) of About Eating program enrollees reported that the offer of a gift card for completion of the follow-up survey after the last program lesson was an influential reason for their participation. Because this kind of incentive would not be an allowable SNAP-Ed program implementation cost, a greater focus on other types of program retention efforts (such as partnerships with public libraries and emailing reminder post cards) should be considered for this and other Web-based SNAP-Ed programming.

To address concerns related to program exposure, the program manager suggested making the lessons available to participants for an extended period of time after they had been completed, thereby allowing the participant to go back and review selected (or all) lessons. This added time would provide the opportunity for additional exposure to the nutrition education messages and reinforcement of concepts—at a pace that is more conducive to behavior change.

# Chapter V ● Integrated Impact Evaluation Findings

The independent evaluators conducted an impact evaluation for each demonstration project using the approach described in chapter III. This chapter summarizes the findings for the primary and secondary impacts and compares and contrasts the impact evaluation findings for the four demonstration projects. Because of the numerous differences in the secondary outcome measures for the three child-focused programs and Pennsylvania State University’s (PSU) About Eating program for Supplemental Nutrition Assistance Program-Education (SNAP-Ed) participants and SNAP-eligible women, About Eating’s results are presented and discussed separately.

## A. Overview of Evaluation Findings from the Evaluation Framework Perspective

As described in chapter III, the impact evaluation was guided by a conceptual framework that helped track the range of potential program effects. The framework specified two types of secondary outcomes: (1) mediating factors that represent attitudes, beliefs, and actions that would be expected to change in order to facilitate the desired changes in short- and long-term dietary outcomes such as willingness to try new fruits and vegetables and (2) short-term outcomes that include behavioral antecedents such as having fruits and vegetables in the home and the child’s involvement in meal preparation. The long-term outcomes, or primary program impacts, reflect the ultimate goals of the program—changes in dietary intake that will improve nutrition.

Exhibit V-1 summarizes the impact evaluation findings. The table columns represent the program effects (mediating factors, short-term outcomes, primary impacts) from the evaluation framework. The EWPHCCS program had a statistically significant impact on two of the primary outcomes; the other three programs did not affect the primary outcomes of interest. Statistically significant impacts on short-term outcomes were observed for EWPHCCS and Eagle Adventure and trends were observed for All 4 Kids. Additionally, trends were observed for mediating factors for

### Key Findings

#### Primary Impacts

- For the four demonstration projects, there was no statistically significant impact on the primary impact measure of average daily consumption of fruits and vegetables combined.
- The Eat Well Play Hard in Child Care Settings (EWPHCCS) program had a statistically significant impact on children’s average daily at-home consumption of vegetables and their in-home use of 1% or fat-free milk.

#### Secondary Impacts

- The EWPHCCS and Eagle Adventure programs had a statistically significant impact on child-initiated vegetable snacking.
- Several trends were observed for the three programs targeting children:
  - Increased child-initiated vegetable snacking (All 4 Kids)
  - Increased willingness to try new fruits (All 4 Kids)
  - Increased willingness to try new vegetables (Eagle Adventure)
  - Increased parental offerings of vegetables for snacks (EWPHCCS)
  - Greater at-home availability of fruits and vegetables (Eagle Adventure)
- About Eating, an online intervention for SNAP participants and SNAP-eligible women did not have an impact on any of the secondary program outcomes.

**Exhibit V-1.— Statistically Significant Impacts and Trends for the Four Demonstration Projects**

| Program                | Secondary Impacts |                     | Primary Impacts    |
|------------------------|-------------------|---------------------|--------------------|
|                        | Mediating Factors | Short-Term Outcomes | Long-Term Outcomes |
| <b>EWPHCCS</b>         | ●                 | ●                   | ●                  |
| <b>All 4 Kids</b>      | ○                 | ●                   | ○                  |
| <b>Eagle Adventure</b> | ●                 | ●                   | ○                  |
| <b>About Eating</b>    | ○                 | ○                   | ○                  |

- Statistical significance at  $p \leq 0.05$ .
- Trend  $0.05 < p \leq 0.10$ .
- Not statistically significant,  $p > 0.10$ .

EWPHCCS and Eagle Adventure. The About Eating program did not impact any of the primary or secondary outcomes of interest.

**B. Summary of Impacts for the Child-Focused Demonstration Projects**

**1. Findings Related to Primary Impacts**

Primary impacts common to the three child-focused programs—EWPHCCS, All 4 Kids, and Eagle Adventure—included measures of daily at-home consumption of fruits and vegetables. It was hypothesized that children participating in these programs would increase their average daily at-home consumption of fruits and vegetables by an average of 0.30 cups of fruits and vegetables, compared with children not participating in the programs. The evaluation of the EWPHCCS program also assessed program impact on the child’s use of 1% or fat-free milk.

Table V-1 presents the results of the primary impact models. None of the programs demonstrated a statistically significant impact on parental reports of children’s at-home daily consumption of fruits and vegetables combined. Changes in average daily consumption were quite modest ranging from –0.04 cups for the All 4 Kids program (indicating that the comparison group reported a greater baseline-to-follow up change than the intervention group) to 0.19 cups for the EWPHCCS program. Changes in the reported consumption of fruits were similarly modest supporting the conclusion of no effects for all three programs.

The EWPHCCS program did have a statistically significant impact on children’s at-home daily consumption of vegetables, but no impact was observed on children’s vegetable consumption for the All 4 Kids and Eagle Adventure programs. The EWPHCCS program also produced a statistically significant impact on parental reports of children’s at-home use of 1% or fat-free milk. Children in the intervention group were about 39 percent more likely than children in the control group to drink or use 1% or fat-free milk on their cereal instead of 2% or whole milk (odds ratio = 1.39).

**Table V-1.— Primary Impacts for Child-Focused Programs: Child’s At-Home Consumption of Fruits and/or Vegetables (cups per day)**

| Measure  | Model-Adjusted Baseline Means (SE) |                  | Model-Adjusted Follow-Up Means (SE) |                  | Estimated Impact <sup>a</sup> (95% CI) |
|--|------------------------------------|------------------|-------------------------------------|------------------|--|
|  | Intervention Group                 | Comparison Group | Intervention Group                  | Comparison Group |  |
| Cups of fruits and vegetables combined                 |                                    |                  |                                     |                  |  |
| EWPHCCS  | 2.44 (0.08)                        | 2.57 (0.08)      | 2.59 (0.08)                         | 2.52 (0.08)      | 0.19 (–0.09, 0.48)                     |
| All 4 Kids   | 2.45 (0.14)                        | 2.33 (0.14)      | 3.01 (0.14)                         | 2.92 (0.14)      | –0.04 (–0.43, 0.36)                    |
| Eagle Adventure  | 2.22 (0.07)                        | 2.39 (0.07)      | 2.24 (0.08)                         | 2.35 (0.07)      | 0.07 (–0.18, 0.32)                     |
| Cups of fruits   |                                    |                  |                                     |                  |  |
| EWPHCCS  | 1.41 (0.05)                        | 1.44 (0.05)      | 1.47 (0.05)                         | 1.45 (0.05)      | 0.06 (–0.12, 0.24)                     |
| All 4 Kids   | 1.37 (0.08)                        | 1.32 (0.07)      | 1.70 (0.08)                         | 1.56 (0.08)      | 0.09 (–0.15, 0.32)                     |
| Eagle Adventure  | 1.08 (0.04)                        | 1.18 (0.04)      | 1.15 (0.04)                         | 1.18 (0.04)      | 0.07 (–0.07, 0.21)                     |
| Cups of vegetables                                     |                                    |                  |                                     |                  |  |
| EWPHCCS  | 1.03 (0.05)                        | 1.13 (0.05)      | 1.11 (0.05)                         | 1.08 (0.05)      | 0.12 (0.00, 0.24)*                     |
| All 4 Kids   | 1.08 (0.07)                        | 1.01 (0.07)      | 1.31 (0.08)                         | 1.36 (0.07)      | –0.12 (–0.33, 0.09)                    |
| Eagle Adventure  | 1.16 (0.06)                        | 1.20 (0.05)      | 1.11 (0.06)                         | 1.16 (0.06)      | –0.01 (–0.18, 0.16)                    |
| Used 1% or fat-free milk during past week <sup>b</sup> |                                    |                  |                                     |                  |  |
| EWPHCCS  | 36.53 (0.03)                       | 36.31 (0.03)     | 41.03 (0.04)                        | 33.16 (0.03)     | 1.39 (1.05, 1.84)*                     |

<sup>a</sup> Program impact (with 95 percent confidence limits) was estimated via difference-in-difference models comparing change across time in the intervention versus comparison groups. Impact estimates provided as odds ratios for dichotomous variables.

<sup>b</sup> Dichotomous variable indicates proportion responding yes.

\*Indicates statistical significance if the *p*-value is less than or equal to 0.05.

Notes: General linear mixed models (SAS PROC MIXED) and generalized linear models (SAS PROC GLIMMIX) were used to evaluate the program impact while accounting for the clustering of children within schools or centers. Covariates in the model included child age, child sex, number of people in household, whether household only had one adult (Eagle Adventure only), respondent race/ethnicity, respondent age, and respondent sex. SE = standard error. CI = confidence interval.

EWPHCCS analysis included 902 parent or caregiver respondents at follow-up in 24 centers.

All 4 Kids analysis included 511 parent or caregiver respondents at follow-up in 12 centers.

Eagle Adventure analysis included 723 parent or caregiver respondents at follow-up in 10 schools.

Source: Parent Baseline and Follow-up Surveys, 2010

## 2. Findings Related to Secondary Impacts

Tables V-2 through V-4 present the results of the secondary impact models for the three child-focused programs for short-term outcomes, child mediating factors, and parent mediating factors, respectively.

### ▲ Short-term outcomes for children

Increases in children helping themselves to or requesting vegetables for a snack occurred in all three programs (table V-2). Parents of children in EWPHCCS and Eagle Adventure reported a statistically significant increase in the frequency at which their children asked for or helped themselves to vegetables for a snack compared with parents of children in the comparison group. A similar trend, below the level of statistical significance, is seen for the All 4 Kids program. None of the programs led to an increase in the variety of fruits children consumed each day, the variety of vegetables children consumed each day, or children helping themselves to or requesting fruit for a snack.

### ▲ Mediating factors for children

Some encouraging results are noted for two of the programs in children's willingness to try new fruits and/or vegetables (see table V-3). Parents of children in the Eagle Adventure program reported increased willingness of their children to try new vegetables, and parents of children in the All 4 Kids program reported increased willingness of their children to try new fruits; neither of these trends reached a level of statistical significance. Similar findings were not observed for the other programs.

### ▲ Mediating factors for parents

The Eagle Adventure program was the only program that demonstrated a trend toward increased at-home availability of fruits and vegetables, and EWPHCCS was the only program that demonstrated a trend toward increased parental offerings of vegetables for a snack (table V-4). None of the programs led to an increase in parental offerings of fruit for a snack, fruit at dinner, or vegetables at dinner.

**Table V-2.— Secondary Impacts for Child-Focused Programs: Short-Term Outcomes**

| Measure   | Model-Adjusted Baseline Means (SE) |                  | Model-Adjusted Follow-Up Means (SE) |                  | Estimated Impact <sup>a</sup><br>(95% CI) |
|---|------------------------------------|------------------|-------------------------------------|------------------|---|
|   | Intervention Group                 | Comparison Group | Intervention Group                  | Comparison Group |   |
| <b>Child Ate a Variety of Fruits or Vegetables Each Day (days per week)</b>               |                                    |                  |                                     |                  |   |
| Fruits  |                                    |                  |                                     |                  |   |
| EWPHCCS   | 4.16 (0.10)                        | 4.11 (0.10)      | 4.33 (0.11)                         | 4.19 (0.11)      | 0.08 (–0.23, 0.39)                        |
| All 4 Kids  | 4.59 (0.19)                        | 4.58 (0.18)      | 4.43 (0.19)                         | 4.35 (0.19)      | 0.06 (–0.37, 0.50)                        |
| Eagle Adventure   | 3.08 (0.10)                        | 3.16 (0.09)      | 3.40 (0.10)                         | 3.31 (0.10)      | 0.17 (–0.14, 0.49)                        |
| Vegetables  |                                    |                  |                                     |                  |   |
| EWPHCCS   | 3.31 (0.16)                        | 3.40 (0.16)      | 3.36 (0.16)                         | 3.39 (0.16)      | 0.06 (–0.32, 0.43)                        |
| All 4 Kids  | 3.33 (0.19)                        | 3.43 (0.18)      | 3.61 (0.19)                         | 3.59 (0.19)      | 0.11 (–0.33, 0.56)                        |
| Eagle Adventure   | 4.11 (0.19)                        | 4.28 (0.19)      | 3.92 (0.20)                         | 4.11 (0.19)      | –0.02 (–0.73, 0.68)                       |
| <b>Child Helped Self to or Requested Fruits or Vegetables for a Snack (days per week)</b> |                                    |                  |                                     |                  |   |
| Fruits  |                                    |                  |                                     |                  |   |
| EWPHCCS   | 3.30 (0.12)                        | 3.33 (0.12)      | 3.41 (0.12)                         | 3.19 (0.13)      | 0.24 (–0.14, 0.62)                        |
| All 4 Kids  | 3.63 (0.17)                        | 3.50 (0.16)      | 3.68 (0.18)                         | 3.51 (0.17)      | 0.05 (–0.51, 0.61)                        |
| Eagle Adventure   | 2.39 (0.12)                        | 2.53 (0.12)      | 2.73 (0.13)                         | 2.77 (0.12)      | 0.10 (–0.34, 0.55)                        |
| Vegetables  |                                    |                  |                                     |                  |   |
| EWPHCCS   | 1.25 (0.11)                        | 1.35 (0.10)      | 1.44 (0.11)                         | 1.20 (0.11)      | 0.34 (0.07, 0.61)*                        |
| All 4 Kids  | 1.21 (0.13)                        | 1.27 (0.12)      | 1.89 (0.13)                         | 1.64 (0.13)      | 0.32 (–0.03, 0.67) <sup>†</sup>           |
| Eagle Adventure   | 0.71 (0.07)                        | 1.01 (0.07)      | 0.91 (0.07)                         | 0.99 (0.07)      | 0.22 (0.01, 0.43)*                        |

<sup>a</sup> Program impact (with 95 percent confidence limits) was estimated via difference-in-difference models comparing change across time in the intervention versus comparison groups.

\*Indicates statistical significance if the *p*-value is less than or equal to 0.05.

<sup>†</sup>Indicates trend if the *p*-value is greater than 0.05 but less than or equal to 0.10.

Notes: General linear mixed models (SAS PROC MIXED) used to evaluate the program impact while accounting for the clustering of children within schools or centers. Covariates in the model included child age, child sex, number of people in household, whether household only had one adult (Eagle Adventure Program only), respondent race/ethnicity, respondent age, and respondent sex. SE = standard error. CI = confidence interval.

EWPHCCS analysis included 902 parent or caregiver respondents at follow-up in 24 centers.

All 4 Kids analysis included 511 parent or caregiver respondents at follow-up in 12 centers.

Eagle Adventure analysis included 723 parent or caregiver respondents at follow-up in 10 schools.

Source: Parent Baseline and Follow-up Surveys, 2010

**Table V-3.— Secondary Impacts for Child-Focused Programs: Child Mediating Factors**

| Measure  | Model-Adjusted Baseline Means (SE) |                  | Model-Adjusted Follow-Up Means (SE) |                  | Estimated Impact <sup>a</sup><br>(95% CI) |
|--|------------------------------------|------------------|-------------------------------------|------------------|---|
|  | Intervention Group                 | Comparison Group | Intervention Group                  | Comparison Group |   |
| <b>Child's Willingness to Try New Fruits or Vegetables (Percentage responding yes)</b> |                                    |                  |                                     |                  |   |
| Fruits   |                                    |                  |                                     |                  |   |
| EWPHCCS  | 49.06 (0.03)                       | 52.70 (0.03)     | 59.21 (0.03)                        | 57.63 (0.03)     | 1.23 (0.86, 1.78)                         |
| All 4 Kids   | 55.26 (0.04)                       | 61.06 (0.03)     | 63.60 (0.04)                        | 59.09 (0.04)     | 1.54 (0.94, 2.49) <sup>†</sup>            |
| Eagle Adventure  | 58.16 (0.03)                       | 59.71 (0.03)     | 66.95 (0.03)                        | 63.35 (0.03)     | 1.25 (0.78, 2.01)                         |
| Vegetables   |                                    |                  |                                     |                  |   |
| EWPHCCS  | 35.48 (0.02)                       | 35.88 (0.02)     | 42.83 (0.03)                        | 39.81 (0.03)     | 1.15 (0.86, 1.55)                         |
| All 4 Kids   | 41.42 (0.03)                       | 41.25 (0.03)     | 50.17 (0.03)                        | 41.99 (0.03)     | 1.38 (0.90, 2.12)                         |
| Eagle Adventure  | 33.54 (0.03)                       | 39.48 (0.03)     | 44.31 (0.03)                        | 42.18 (0.03)     | 1.41 (0.93, 2.14) <sup>†</sup>            |

<sup>a</sup> Program impact (with 95 percent confidence limits) was estimated via difference-in-difference models comparing change across time in the intervention versus comparison groups. Impact estimates provided as odds ratios for dichotomous variables.

<sup>†</sup> Indicates trend if the *p*-value is greater than 0.05 but less than or equal to 0.10.

Notes: Generalized linear mixed models (SAS PROC GLIMMIX) used to evaluate the program impact while accounting for the clustering of children within schools or centers. Covariates in the model included child age, child sex, number of people in household, whether household only had one adult (Eagle Adventure Program only), respondent race/ethnicity, respondent age, and respondent sex. SE = standard error. CI = confidence interval.

EWPHCCS analysis included 902 parent or caregiver respondents at follow-up in 24 centers.

All 4 Kids analysis included 511 parent or caregiver respondents at follow-up in 12 centers.

Eagle Adventure analysis included 723 parent or caregiver respondents at follow-up in 10 schools.

Source: Parent Baseline and Follow-up Surveys, 2010



**Table V-4.— Secondary Impacts for Child-Focused Programs: Parent or Household Mediating Factors**

| Measure   | Model-Adjusted Baseline Means (SE) |                  | Model-Adjusted Follow-Up Means (SE) |                  | Estimated Impact <sup>a</sup> (95% CI) |
|---|------------------------------------|------------------|-------------------------------------|------------------|--|
|   | Intervention Group                 | Comparison Group | Intervention Group                  | Comparison Group |  |
| <b>At-Home Availability of Fruits and Vegetables<sup>b</sup></b>                  |                                    |                  |                                     |                  |  |
| EWPHCCS   | 4.28 (0.08)                        | 4.25 (0.08)      | 4.50 (0.08)                         | 4.57 (0.08)      | -0.11 (-0.35, 0.13)                    |
| All 4 Kids  | 4.01 (0.10)                        | 4.02 (0.10)      | 4.57 (0.11)                         | 4.49 (0.10)      | 0.09 (-0.22, 0.39)                     |
| Eagle Adventure   | 4.78 (0.08)                        | 4.67 (0.08)      | 5.00 (0.09)                         | 4.62 (0.08)      | 0.26 (-0.04, 0.55) <sup>†</sup>        |
| <b>Frequency of Parental Offerings of Fruit for a Snack and/or at Dinner</b>      |                                    |                  |                                     |                  |  |
| Fruit for a snack <sup>c</sup>  |                                    |                  |                                     |                  |  |
| EWPHCCS   | 3.81 (0.10)                        | 3.72 (0.10)      | 3.94 (0.11)                         | 3.85 (0.11)      | 0.00 (-0.34, 0.34)                     |
| All 4 Kids  | 4.15 (0.18)                        | 4.15 (0.17)      | 4.08 (0.18)                         | 4.11 (0.18)      | -0.03 (-0.49, 0.43)                    |
| Fruit at dinner <sup>c</sup>  |                                    |                  |                                     |                  |  |
| EWPHCCS   | 1.94 (0.12)                        | 1.79 (0.12)      | 2.24 (0.13)                         | 1.90 (0.13)      | 0.19 (-0.14, 0.53)                     |
| All 4 Kids  | 1.57 (0.16)                        | 1.59 (0.15)      | 2.16 (0.17)                         | 2.18 (0.16)      | -0.01 (-0.45, 0.44)                    |
| Fruit for a snack or at dinner <sup>d</sup>                                       |                                    |                  |                                     |                  |  |
| Eagle Adventure   | 4.11 (0.17)                        | 4.04 (0.16)      | 4.54 (0.18)                         | 4.40 (0.17)      | 0.07 (-0.53, 0.66)                     |
| <b>Frequency of Parental Offerings of Vegetables for a Snack and/or at Dinner</b> |                                    |                  |                                     |                  |  |
| Vegetables for a snack <sup>c</sup>   |                                    |                  |                                     |                  |  |
| EWPHCCS   | 1.57 (0.10)                        | 1.55 (0.10)      | 1.78 (0.11)                         | 1.50 (0.11)      | 0.25 (-0.02, 0.53) <sup>†</sup>        |
| All 4 Kids  | 1.71 (0.14)                        | 1.86 (0.13)      | 2.15 (0.15)                         | 2.18 (0.14)      | 0.12 (-0.33, 0.58)                     |
| Vegetables at dinner <sup>c</sup>   |                                    |                  |                                     |                  |  |
| EWPHCCS   | 3.90 (0.17)                        | 3.74 (0.17)      | 4.09 (0.17)                         | 3.72 (0.17)      | 0.21 (-0.08, 0.50)                     |
| All 4 Kids  | 2.68 (0.26)                        | 3.20 (0.26)      | 3.01 (0.27)                         | 3.23 (0.26)      | 0.30 (-0.18, 0.79)                     |
| Vegetables for a snack or at dinner <sup>d</sup>                                  |                                    |                  |                                     |                  |  |
| Eagle Adventure   | 5.96 (0.18)                        | 6.18 (0.17)      | 6.10 (0.19)                         | 6.15 (0.18)      | 0.17 (-0.48, 0.81)                     |

<sup>a</sup> Program impact (with 95 percent confidence limits) was estimated via difference-in-difference models comparing change across time in the intervention versus comparison groups.

<sup>b</sup> Index score, 0–6 for EWPHCCS, 0–7 for All 4 Kids, and 0–8 for Eagle Adventure.

<sup>c</sup> Days per week, 0–7.

<sup>d</sup> Times per week, 0–14.

<sup>†</sup> Indicates trend if the *p*-value is greater than 0.05 but less than or equal to 0.10.

Notes: General linear mixed models (SAS PROC MIXED) used to evaluate the program impact while accounting for the clustering of children within schools or centers. Covariates in the model included child age, child sex, number of people in household, whether household only had one adult (Eagle Adventure Program only), respondent race/ethnicity, respondent age, and respondent sex. SE = standard error. CI = confidence interval.

EWPHCCS analysis included 902 parent or caregiver respondents at follow-up in 24 centers.

All 4 Kids analysis included 511 parent or caregiver respondents at follow-up in 12 centers.

Eagle Adventure analysis included 723 parent or caregiver respondents at follow-up in 10 schools.

Source: Parent Baseline and Follow-up Surveys, 2010

## C. Summary of Findings Related to the About Eating Program

### 1. Findings Related to Primary Impacts

Based on the results of the impact analysis, there is no indication that the About Eating program had an impact on participants' average daily consumption of fruits, vegetables, or fruits and vegetables combined (see table V-5). These findings apply to the impact analysis for all participants as well as the analysis limited to participants who completed all of the About Eating lessons. The women in the intervention and control groups were not meeting the U.S. Department of Agriculture's (USDA) Food Patterns recommendations for fruits and vegetables at follow-up.<sup>14</sup> These findings are similar to those reported by Guenther, Dodd, & Krebs-Smith (2006) using 24-hour dietary recall data from the 1999–2000 National Health and Nutrition Examination Survey and 1994–1996 Continuing Survey of Food Intakes by Individuals.

**Table V-5.— Primary Impacts for the Evaluation of PSU's About Eating Program**

| Measure                       | Model-Adjusted Follow-Up Means (SE) |               | Estimated Impact <sup>a</sup> (95% CI) |
|-------------------------------|-------------------------------------|---------------|--|
|                               | Intervention Group                  | Control Group |  |
| Cups of fruits and vegetables | 2.49 (0.10)                         | 2.59 (0.11)   | -0.10 (-0.39, 0.19)                    |
| Cups of fruits                | 1.18 (0.06)                         | 1.21 (0.06)   | -0.03 (-0.20, 0.14)                    |
| Cups of vegetables            | 1.31 (0.06)                         | 1.38 (0.06)   | -0.07 (-0.23, 0.10)                    |
| Number of respondents         | 235                                 | 191           |  |

<sup>a</sup> Program impact (with 95 percent confidence limits) was estimated via linear regression (SAS PROC GLM) using adjusted endpoint models that include preference scores as a proxy for fruit and vegetable intake at baseline. Additional covariates included respondent demographics and Internet use.

Notes: SE = standard error. CI = confidence interval.

Source: Baseline Survey, March–July 2010 and Follow-Up Survey, May–September 2010

### 2. Findings Related to Secondary Impacts

Table V-6 shows the results of the impact models for participants' other dietary behaviors. Based on the results of the impact analysis, there is no indication that the About Eating program had an impact on participants choosing fruits and vegetables as snacks, eating a variety of fruits and vegetables each day, and using 1% or skim milk; their food preferences and food availability; and participants' self-rating of eating habits. These findings apply to the impact analysis for all participants as well as the impact analysis limited to participants who completed all of the About Eating lessons.

<sup>14</sup> It is recommended that women between the ages of 19 and 50 eat 1.5 to 2 cups of fruit each day and 2.5 cups of vegetables each day. These recommendations are for women who get less than 30 minutes per day of moderate physical activity, beyond normal daily activities (USDA, Center for Nutrition Policy and Promotion, 2011).

**Table V-6.— Secondary Impacts for the Evaluation of PSU’s About Eating Program**

| Measure   | Model-Adjusted Follow-Up Means (SE) |               | Estimated Impact (95% CI) <sup>a</sup> |
|---|-------------------------------------|---------------|--|
|   | Intervention Group                  | Control Group |  |
| Ate fruit or vegetables as snacks <sup>b</sup>        | 3.46 (0.15)                         | 3.40 (0.16)   | 0.06 (–0.38, 0.50)                     |
| Ate variety of fruits <sup>b</sup>                    | 2.58 (0.14)                         | 2.54 (0.16)   | 0.03 (–0.39, 0.46)                     |
| Ate variety of vegetables <sup>b</sup>                | 3.70 (0.14)                         | 3.39 (0.16)   | 0.32 (–0.11, 0.74)                     |
| Used 1% or skim milk <sup>c</sup>                     | 0.30 (0.04)                         | 0.34 (0.04)   | 0.85 (0.52, 1.38)                      |
| Food preferences <sup>d</sup>                         |                                     |               |  |
| Fruits  | 7.49 (0.10)                         | 7.44 (0.11)   | 0.05 (–0.23, 0.34)                     |
| Vegetables  | 6.82 (0.09)                         | 6.83 (0.10)   | –0.01 (–0.27, 0.24)                    |
| White bread   | 6.45 (0.14)                         | 6.63 (0.16)   | –0.18 (–0.60, 0.24)                    |
| Whole-wheat bread                                     | 6.84 (0.14)                         | 6.84 (0.15)   | 0.00 (–0.40, 0.41)                     |
| Whole milk  | 5.24 (0.16)                         | 5.32 (0.17)   | –0.08 (–0.54, 0.38)                    |
| Skim or nonfat milk                                   | 5.62 (0.16)                         | 5.65 (0.18)   | –0.03 (–0.51, 0.46)                    |
| Food availability                                     |                                     |               |  |
| Fruits and vegetables <sup>e</sup>                    | 2.91 (0.07)                         | 2.79 (0.08)   | 0.12 (–0.09, 0.33)                     |
| Whole or 2% milk <sup>c</sup>                         | 0.93 (1.92)                         | 0.94 (1.64)   | 0.84 (0.48, 1.46)                      |
| 1% or skim milk <sup>c</sup>                          | 0.39 (0.04)                         | 0.36 (0.04)   | 1.11 (0.70, 1.78)                      |
| Potato chips, nacho chips, or corn chips <sup>c</sup> | 0.81 (0.03)                         | 0.74 (0.04)   | 1.47 (0.90, 2.40)                      |
| Regular soft drinks or sodas <sup>c</sup>             | 0.68 (1.11)                         | 0.61 (1.21)   | 1.35 (0.88, 2.08)                      |
| Self-rating of eating habits <sup>f</sup>             | 5.99 (0.10)                         | 5.86 (0.11)   | 0.13 (–0.17, 0.44)                     |
| Number of respondents                                 | 241                                 | 195           |  |

<sup>a</sup> Program impact (with 95 percent confidence limits) was estimated via linear regression (SAS PROC GLM) for continuous outcomes and logistic regression (SAS PROC LOGISTIC) for dichotomous outcomes. Impact estimates are based on adjusted endpoint models that include preference scores as a proxy for fruit and vegetable intake at baseline. Additional covariates included respondent demographics and Internet usage. Impact estimates are provided as odds ratios for dichotomous variables.

<sup>b</sup> Reported as the number of days in the past week.

<sup>c</sup> Dichotomous variable indicates the proportion responding yes.

<sup>d</sup> Indicates preference using 1–9 scale, 1 = extremely dislike, 5 = neither like or dislike, and 9 = extremely like.

<sup>e</sup> Index score (0–4) based on reported household availability of four fruits and vegetables.

<sup>f</sup> Measured using 1–10 scale, 1 = poor and 10 = excellent.

Notes: SE = standard error. CI = confidence interval.

Source: Baseline Survey, March–July 2010 and Follow-Up Survey, May–September 2010

## D. Limitations of the Independent Impact Evaluations

A well-designed impact evaluation permits the evaluator to draw a reasonable and supportable conclusion about the effect of the program and the likelihood that any changes observed in the sample participants would replicate to the broader target population. This is accomplished with a design that provides an unbiased estimate of the program impact while eliminating or reducing plausible alternative explanations for program effects. No design, however, is free from potential flaws, and it is the evaluator’s responsibility to note the design-related factors that may have introduced bias into program estimates or opened the door to reasonable alternatives to explain program impacts. The sections that follow identify

the limitations of the independent impact evaluation with regard to measurement and instrument effects and design issues.

## **1. Measurement and Instrumentation Effects**

### **▲ Social desirability bias that led to over-reporting in survey responses**

It is often difficult to completely rule out response bias in survey research. People have a tendency to remember events in a way that reinforces their personal beliefs and self-image. Food consumption is a very personal phenomenon and people tend to make judgments about themselves and others based on food choices. Similarly, parents who wish to appear (even if only to themselves) as good parents, may over-report the amount of fruits and vegetables their children eat. There is some indication that parents may have inflated their children's fruit and vegetable intake in these demonstration projects. This assertion is based on the fact that although the three programs focused on low-income families, in all three projects parent reports of their child's baseline fruit and vegetable consumption were above the national average; often meeting or quite close to current (2010) Dietary Guidelines for Americans recommendations. Low-income households tend to eat less nutritious diets than other households, and on average, they do not meet Federal recommendations for consumption of fruit, vegetables, whole grains, and low-fat dairy products (Golan, Stewart, Kuchler, & Dong, 2008). Thus, the chance of observing groups of children in three separate locations who are all exceeding national averages for fruit and vegetable consumption based on data reported by Lorson, Melgar-Quinonez, and Taylor (2009) is exceedingly unlikely.

It is also worth considering the impact that over-reporting would have on an evaluation's ability to observe change. The term "ceiling effects" refers to a situation in which participant's responses to a survey instrument are at the upper end of the reportable scale. This makes it difficult to observe upward change as there is little room for improvement. Ceiling effects often reflect a legitimate phenomenon and point to the need for a broader scale or one that is more sensitive to change. In the independent evaluations, however, ceiling effects based on over-reporting at baseline may have neutralized real increases in fruit and vegetable consumption among children exposed to the interventions.

### **▲ Limited opportunity for change because many children may eat up to two meals a day plus snacks in school or childcare setting**

The decision to design the evaluations around a program impact of 0.30 cups was based on a change that would be viewed as meaningful from a public health perspective and was supported by a recent meta-analysis (Knai, Pomerleau, Lock, & McKee, 2006). However, the programs examined by Knai and colleagues (2006) involved assessing total daily food intake while the three programs targeted to children focused on parents reporting only their child's at-home food intake. Because parents are unable to observe intakes away from home, the decision was made for the independent evaluation to assess at-home consumption only. Accordingly, a priori assumptions that parents would be able to observe and report dietary intake changes on the magnitude of 0.30 cups may have been too ambitious. Children, especially low-income children receiving free and reduced-price breakfast and lunch, may eat up to two of their three daily meals plus snacks while at school or in a childcare setting. It is certainly possible that this limited parents' influence on children's overall fruit and vegetable consumption.

## 2. Design Issues

### ▲ Attrition from the evaluation study

Attrition occurs when participants who completed a baseline survey fail to provide a follow-up survey. In the case of the three child-focused programs, parent or caregiver respondents could have failed to complete the follow-up survey because of survey nonresponse or because their child stopped going or started going to a different school or childcare center during the intervention period. For the About Eating program, participants could have failed to complete the follow-up survey because of survey nonresponse (which was very limited) or because the individual dropped out of the intervention (i.e., did not complete all the lessons). In general, information is not available on why participants did not provide data at follow-up. If, however, attrition is related to some characteristic of the participants, then examining data on program completers only would present a biased interpretation of the potential program impact on individuals in the broader population. The ability to make unbiased statements about a program's potential impact is called generalizability.

The potential impact of attrition from the evaluation study on generalizability was investigated by comparing the pre-intervention similarity of study participants who provided follow-up data and those who did not. This comparison was made by fitting a logistic regression model that regressed completion status on variables that describe survey responders and, for the three programs targeted to children, the characteristics of their children. This analysis provided odds ratios that highlight any association between the descriptive characteristics of participants and the likelihood of providing data at follow-up.

Across the programs targeted to children, attrition rates ranged from 16 to 21 percent (16 percent for Eagle Adventure, 18 percent for All 4 Kids, and 21 percent for EWPHCCS). For those three programs, older respondents (45 or older) were more likely to complete the follow-up survey compared with younger respondents (18 to 34). For the EWPHCCS and All 4 Kids evaluations, differences in completion were associated with race and ethnicity categories.

The highest rates of program attrition were observed for the evaluation of the About Eating program. About 45 percent of the women in the intervention group did not complete all of the About Eating lessons. There were significant differences between completers and noncompleters: participants who did not complete high school, had limited access to the Internet at home, and accessed the Internet only a few times per month were less likely to complete all the About Eating lessons. Some program attrition was mitigated by our ability to follow up with participants who did not complete all the lessons and to include their responses to the follow-up survey in the impact analysis. This approach insulates the evaluation design from criticism and enhances potential generalizability but at the likely cost of suppressing program impact. Based on the attrition analysis for the About Eating evaluation, individuals who did and did not complete the follow-up survey were similar with the exception of age: individuals aged 18 to 24 were less likely to complete the follow-up survey than individuals aged 35 to 45.

### ▲ Need for use of a quasi-experimental design for the All 4 Kids and Eagle Adventure impact evaluations

Two of the program evaluations (EWPHCCS and About Eating) included fully randomized experimental designs and two of the programs (All 4 Kids<sup>15</sup> and Eagle Adventure) included a quasi-experimental design. Experimental designs are preferred for their recognized ability to control for many of the potential

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<sup>15</sup> Because of prior exposure to the All 4 Kids program, two of the childcare centers were assigned to the intervention condition; all other childcare centers were randomly assigned to either intervention or comparison conditions.

threats to validity such as secular trends and maturation. The ability to rule out selection bias is one of the main benefits of randomization. Selection bias occurs when some factor related to the program treatment leads participants to self-select membership in one of the experimental conditions.

Quasi-experimental designs can have many of the same features as fully experimental designs but lack the opportunity to make random assignment. The evaluation of the Eagle Adventure program included a nonequivalent comparison group, instead of a randomized control. As the term suggests, one cannot claim that the members of the comparisons group are equivalent to the members of the intervention group as one can in a randomized design, so it is impossible to completely rule out selection bias. However, the inclusion of a comparison group helps rule out validity threats such as maturation. Additionally, baseline comparisons give a measure of the similarity of the two groups on many of the variables measured.

#### **▲ Sample size limitations for the All 4 Kids and Eagle Adventure evaluations**

For two of the programs targeting children (All 4 Kids and Eagle Adventure), a limited number of schools or childcare centers were available for the evaluation study. In programs where children are nested in schools or childcare centers, it is the school or center that becomes the unit of assignment. This type of sample presents two potential issues. First, the number of units available for assignment determines the degrees of freedom available for the test of the intervention effect. With a limited number of schools or childcare centers, degrees of freedom are limited and can complicate the test of the intervention effects. In brief, having few units to assign tends to increase between-unit variation in the outcomes of interest. The independent evaluators compensated for this by recruiting and retaining more individuals per school or center, which tends to reduce within-unit variation and helps hold down total variation. Thus, it was possible to achieve anticipated levels of statistical power but at the cost of requiring complete data collection on more individuals per unit.

Second, the limited number of units available for randomization limits the opportunity to evenly distribute potentially confounding influences. The main benefit of assignment of a large number of people, schools, or other units in a comparative evaluation is so that factors that might bias statistical findings are evenly distributed. With a small number of units available for assignment, it is difficult to trust that simple assignment processes will result in an even distribution of potential biases. The independent evaluators attempted to overcome this limitation by applying matching algorithms. These algorithms are based on the factors viewed as potentially confounding and help facilitate as even a distribution as possible. For the evaluation of the Eagle Adventure program, schools in the two counties included in the study were matched on size, percentage of Native American students, and percentage of students receiving free and reduced-price meals. Matching was particularly important because random assignment was not possible. For the evaluation of the All 4 Kids program, childcare centers were matched on size and primary language spoken in the home (English or Spanish).



# Chapter VI ● Integrated Findings from the Assessment of the Demonstration Projects' Self-Evaluations

The demonstration projects were evaluated both to determine the success of the nutrition education programs in effecting behavioral change as well as to validate the soundness of their evaluation methodology. This chapter summarizes the findings from the assessment of the self-evaluations conducted by the four demonstration projects. The sections that follow provide a summary of each demonstration project's evaluation approach, common strengths and limitations of the self-evaluations, a summary of findings of the self-evaluations, and, lastly, recommendations for improving the self-evaluations.

## A. Summary of Evaluation Approaches

Exhibits VI-1 through VI-4 outline the evaluation approaches used by the demonstration projects for their self-evaluations, including the study population, study design and sampling strategy, sample size estimation, primary outcome measures, data collection procedures, and data analysis procedures. The evaluation approach used by each demonstration project is summarized below, and similarities and differences in the approaches used are discussed from a cross-project perspective.

### 1. Evaluation Design for the EWPHCCS (NYSDOH) Self-Evaluation

Exhibit VI-1 outlines the key characteristics of the NYSDOH self-evaluation, which included parents or caregivers of children enrolled in eligible Child and Adult Care Food Program centers in an observational one-group design. Pre-test and post-test surveys were administered to the intervention group, assessing as primary outcomes the frequency with which a parent or caregiver offered fruits and vegetables to the child at meals and snacks and whether the child usually drinks low-fat or fat-free milk at home.

NYSDOH compared pre- and post-intervention group percentages and means using chi-squares or t-tests depending on the type of variable being analyzed.

### Key Findings

- The quality of the demonstration projects' self-evaluations varied. Pennsylvania State University (PSU) and the University of Nevada Cooperative Extension Service (UNCE) included a control or comparison group; thus, they were able to assess the impact of their programs on the outcomes of interest, whereas the New York State Department of Health (NYSDOH) and Chickasaw Nation Nutrition Services (CNNS) used observational one-group designs.
- Several changes could be made by implementing agencies (IAs) to improve the quality of future evaluations and increase their ability to accurately measure program changes:
  - Use an evaluation design that helps to rule out plausible alternative explanations for program effects (NYSDOH and CNNS)
  - Determine the anticipated size of the program impact on the target audience before conducting the intervention (NYSDOH, UNCE, and CNNS)
  - Strengthen quality control during data collection (PSU and NYSDOH)
  - Match analytic strategies to the characteristics of the evaluation design (NYSDOH, UNCE, and CNNS)



## Exhibit VI-1.— Evaluation Design for the NYSDOH Self-Evaluation

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| Characteristic                            | Description   |
|---|---|
| <b>Study population</b>                   | Parents and caregivers of preschool children enrolled in 246 Eat Well Play Hard in Child Care Settings (EWPHCCS) intervention sites across the state of New York (excluding the 12 intervention centers from the independent evaluation). Survey responses were received from 132 of the centers. |
| <b>Study design and sampling strategy</b> | Observational one-group design.   |
| <b>Sample size estimation</b>             | Attempted to conduct a census, thus a power analysis was not conducted.   |
| <b>Primary outcome measures</b>           | Frequency with which parent or caregiver offers fruits and vegetables to the child at meals and snacks.<br>Whether the child usually drinks low-fat or fat-free milk.   |
| <b>Data collection</b>                    | Pre-test and post-test surveys distributed via children’s cubbies and returned to the center with collection by Registered Dietitians and center staff.   |
| <b>Data analysis</b>                      | Compared the intervention group percentages and means from pre-test to post-test using chi-square, Wilcoxon signed-rank, and McNemer’s tests.   |

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### 2. Evaluation Design for the All 4 Kids (UNCE) Self-Evaluation

Exhibit VI-2 outlines the key characteristics of the UNCE self-evaluation, which included caregivers and their children enrolled in Acelero Head Start Centers in Las Vegas (Clark County), Nevada, using the same quasi-experimental design as the independent evaluation. Pre-test and post-test surveys were administered primarily in person (some interviews were conducted by telephone), assessing the ability of preschoolers to distinguish healthy snacks from unhealthy snacks and both variety and consumption of fruits and vegetables in the home. After controlling for multiple tests, UNCE compared pre- and post-test changes between the intervention and control groups using chi square tests, crosstabs, t-tests, and analysis of covariance (ANCOVA) to identify statistically significant differences.

### 3. Evaluation Design for the Eagle Adventure (CNNS) Self-Evaluation

Exhibit VI-3 outlines the key characteristics of the CNNS self-evaluation, which included students in first through third grades in an observational one-group design. Pre-test and post-test surveys were administered by nutrition educators to the intervention group, assessing children’s intention to eat fruits and vegetables, consumption of fruits and vegetables, and identification of fruits and vegetables as healthy snacks. CNNS compared pre- and post-intervention group means using analysis of variance (ANOVA)-based paired t-tests.

## Exhibit VI-2.— Evaluation Design for the UNCE Self-Evaluation

| Characteristic  | Description  |
|---|--|
| <b>Study population</b>                               | Preschool children aged 3 to 5 years attending Acelero Head Start Centers in Las Vegas (Clark County), Nevada, and their primary caregivers.   |
| <b>Study design and sampling strategy<sup>a</sup></b> | Quasi-experimental design with six matched pairs of centers.   |
| <b>Sample size estimation</b>                         | Power analysis was not conducted to determine required sample size.  |
| <b>Primary outcome measures</b>                       | Preschoolers will understand concept of healthy snacks by being able to name snack foods, select healthy snacks to eat, and distinguish healthy snacks from unhealthy snacks (preschooler survey)<br>Increase in child’s consumption and variety of fruits and vegetables and in purchases and availability of fruits and vegetables in the home (caregiver survey). |
| <b>Data collection</b>                                | Pre- and post-intervention surveys administered primarily in person (some interviews were conducted by telephone).   |
| <b>Data analysis</b>                                  | Chi square tests, crosstabs, t-tests, and ANCOVA were used to distinguish groups by pre and post and study cohort (intervention, control) and to identify statistically significant differences. Multiple tests were controlled for using Bonferroni test, and Levene’s test of homogeneity was used.  |

<sup>a</sup> UNCE used the same design as the independent evaluation.

## Exhibit VI-3.— Evaluation Design for the CNNS Self-Evaluation

| Characteristic                            | Description  |
|---|--|
| <b>Study population</b>                   | Students in first through third grades attending schools in Pontotoc County, Oklahoma.   |
| <b>Study design and sampling strategy</b> | Observational one-group design.  |
| <b>Sample size estimation</b>             | Attempted to conduct a census thus a power analysis was not conducted.   |
| <b>Primary outcome measures</b>           | Intention to eat fruits and vegetables.<br>Consumption of fruits and vegetables.<br>Identification of fruits and vegetables as healthy snacks. |
| <b>Data collection</b>                    | Classroom survey of students facilitated by nutrition educators.   |
| <b>Data analysis</b>                      | Compared the intervention group means from pre-test to post-test using ANOVA-based paired t-test.  |

### 4. Evaluation Design for the About Eating (PSU) Self-Evaluation

Exhibit VI-4 outlines the key characteristics of the PSU self-evaluation, which included Supplemental Nutrition Assistance Program-Education (SNAP-Ed) participants and SNAP-eligible women aged 18 to 45 living in selected Pennsylvania counties using a fully randomized experimental design. Pre-test and post-test surveys were administered via the Internet, assessing differences in eating competence scores between the intervention and control groups. PSU compared pre- and post- intervention groups using independent t-tests, one-way ANOVAs, and chi-square tests depending on the type of variable; and general linear model univariate analyses for selected outcome measures. PSU also compared

## Exhibit VI-4.— Evaluation Design for the PSU Self-Evaluation

| Characteristic                            | Description   |
|---|---|
| <b>Study population</b>                   | SNAP participants and SNAP-eligible women aged 18 to 45 living in selected Pennsylvania counties. Women with conditions affecting eating competence were restricted from participating in study.  |
| <b>Study design and sampling strategy</b> | Fully randomized experimental design, with stratification for Expanded Food and Nutrition Education Program (EFNEP) versus non-EFNEP county. Intervention group received About Eating Program, and control group was instructed to visit Click 'n Go Web site. For intervention group, two treatment models were examined based on level of physical activity but collapsed for the analysis because the number of completed surveys was too small. |
| <b>Sample size estimation</b>             | Power analysis specified 145 completed surveys for each group (intervention and control).   |
| <b>Primary outcome measure</b>            | Two-point increase in eating competence score.  |
| <b>Data collection</b>                    | Pre- and post-intervention surveys administered via Internet by the PSU Survey Research Center.   |
| <b>Data analysis</b>                      | Compared About Eating intervention group with Click 'n Go control group using independent t-tests, one-way ANOVA, and chi square depending on variable type. General linear model univariate analyses were conducted for selected outcome measures. Compared characteristics of intervention completers and noncompleters.  |

characteristics of respondents completing the intervention (completers) with those dropping out before the program's completion (noncompleters).

### 5. Similarities and Differences among the Demonstration Projects' Self-Evaluations

The demonstration projects used different study designs and sampling strategies. CNNS and NYSDOH employed a one-group observational design (no comparison group). UNCE used the same quasi-experimental design used by the independent evaluators, and PSU used a fully randomized experimental design. All demonstration projects collected data at baseline and at follow-up from the same study cohort.

There were differences in the study populations as well. NYSDOH surveyed parents or caregivers of children participating in the intervention (with the exception of the centers included in the independent evaluation), CNNS surveyed children participating in their intervention, UNCE surveyed both children and their parents or caregivers (intervention and control group), and PSU surveyed all the women participating in the evaluation study (intervention and control group). PSU conducted a power analysis to determine the required sample size for the evaluation study, whereas the other demonstration projects did not. NYSDOH, UNCE, and CNNS generally attempted to survey all children and/or caregivers participating in the study.

With the exception of PSU, the primary outcome measures centered on increasing fruit and vegetable consumption at home. For PSU, the primary outcome was improvement in participants' eating competence score. NYSDOH also included child's use of low-fat or fat-free milk at home as a primary outcome. As specified by the Food and Nutrition Service (FNS), the independent evaluations were limited to nutritional outcomes, whereas the demonstration projects also included outcome measures for physical activity.

The type of data analysis varied depending on the study design. PSU was the only demonstration project to conduct general linear model univariate analyses for selected outcome measures and to conduct analyses comparing the characteristics of intervention completers and noncompleters.

## **B. Common Strengths and Limitations of the Self-Evaluations**

To assess the quality of the self-evaluations, the independent evaluators adapted a scoring tool based on the one used by the Center for Substance Abuse Prevention in developing the National Registry of Evidence-based Programs and Practices (NREPP) database (U.S. Department of Health and Human Services, Substance Abuse and Mental Health Administration, 2011). In addition to assigning a numerical score to the eight evaluation components, the reviewers provided a qualitative description of the strengths and limitations of each self-evaluation.

Exhibit VI-5 lists the strengths of the self-evaluations, and exhibit VI-6 lists the limitations of the self-evaluations in terms of the study design and measures, data collection, and data analysis. The strengths and limitations of each evaluation varied; the only common strength was that all four demonstration projects had minimal missing data (i.e., survey item nonresponse) for the analysis. There were no common limitations identified for all four of the self-evaluations.

A strength of the UNCE and PSU evaluations was the use of a comparison or control group, which helped to eliminate validity threats, whereas a limitation of the NYSDOH and CNNS evaluations was the lack of a comparison or control group. Strengths of the PSU evaluation included stating the research objectives and hypotheses in quantifiable terms and conducting a power analysis to support sample size estimation, whereas the failure to include these components was a weakness of the other three self-evaluations. The UNCE and CNNS evaluations benefitted from well-planned and implemented data collection, whereas the NYSDOH and PSU evaluations lacked quality control during data collection. NYSDOH did not have standard protocols in place for distributing and collecting surveys statewide; thus, there was a lot of variability in how the surveys were distributed and collected and in the use of incentives. PSU faced some challenges working with their subcontractor, Survey Research Center, which adversely affected data collection for the evaluation.

PSU's analysis procedures were conducted properly, whereas the data analysis conducted by NYSDOH, UNCE, and CNNS did not take into account the clustering of individuals within school or childcare settings.

## **C. Summary of the Findings from the Self-Evaluations**

Exhibit VI-7 summarizes the key findings of each of the self-evaluations and how these findings compare with the findings from the independent evaluations. Overall, there were some consistencies between the findings from three of the four self-evaluations and their respective independent evaluations. Both the self and the independent evaluations of the EWP/HCCS program found significant increases in children's use of 1% or fat-free milk but differed with regard to behaviors related to fruit and vegetable consumption. Both the self and the independent evaluations of the Eagle Adventure program suggest that the program led to improvements in children's intentions to select healthier foods. Both the self and independent evaluations of the All 4 Kids program suggest a positive effect on children's understanding and preference for healthy snacks; however, these gains were not sufficient to translate into statistically significant effects on children's consumption of fruits and vegetables in the home.

There were also differences in the findings between each of the self-evaluations and their respective independent evaluations. Some of these differences are likely due to measuring different mediating and/or outcome variables between the two evaluations. In other cases, even when the same outcomes were measured, there were differences in the audience from which the data were collected and instrumentation that likely contributed to the differences in findings.

**Exhibit VI-5.— Summary of Strengths of the Self-Evaluations by Demonstration Project**

| Strengths   | EWPHCCS<br>(NYSDOH) | All 4<br>Kids<br>(UNCE) | Eagle<br>Adven-<br>ture<br>(CNNS) | About<br>Eating<br>(PSU) |
|---|---------------------|-------------------------|-----------------------------------|--------------------------|
| <b>Study Design and Measures</b>  |                     |                         |                                   |                          |
| Used a comparison or control group  |                     | ✓                       |                                   | ✓                        |
| Stated the research objectives and hypotheses in quantifiable terms   |                     |                         |                                   | ✓                        |
| Conducted power analysis to support sample size estimation  |                     |                         |                                   | ✓                        |
| <b>Data Collection</b>  |                     |                         |                                   |                          |
| Conducted training of data collectors before data collection and provided sufficient oversight of data collectors during data collection, which resulted in uniform data collection across schools or centers   |                     | ✓                       | ✓                                 |                          |
| Controlled data collection adequately (e.g., educators did not collect data from the students for whom they provided instruction, or baseline data was collected before intervention period in order to rule out alternative explanations of program effects) | ✓                   | ✓ <sup>a</sup>          |                                   |                          |
| Achieved acceptable retention levels  |                     | ✓ <sup>b</sup>          | ✓                                 |                          |
| <b>Data Analysis</b>  |                     |                         |                                   |                          |
| Conducted analysis to compare characteristics of completers and noncompleters   |                     |                         |                                   | ✓                        |
| Achieved minimal missing data (i.e., survey item nonresponse) for the analysis  | ✓                   | ✓                       | ✓                                 | ✓                        |
| <sup>a</sup> For about 2 percent of Spanish-speaking children, the teacher who provided instruction also conducted the surveys because of limited availability of bilingual data collectors.  |                     |                         |                                   |                          |
| <sup>b</sup> There was modest attrition for the caregiver survey but considerable attrition for the preschooler survey, which limited the amount of paired data for the analysis using the preschooler survey data.   |                     |                         |                                   |                          |

**Exhibit VI-6.— Summary of Limitations of the Self-Evaluations by Demonstration Project**

| Limitations   | EWPHCCS (NYSDOH) | All 4 Kids (UNCE) | Eagle Adventure (CNNS) | About Eating (PSU) |
|---|------------------|-------------------|------------------------|--------------------|
| <b>Study Design and Measures</b>  |                  |                   |                        |                    |
| Evaluation lacked an adequate comparison or control group   | ✓                |                   | ✓                      |                    |
| Some or all outcome measures and research objectives were not stated in quantifiable terms or based on relevant evidence-based literature   | ✓                | ✓                 | ✓                      |                    |
| Power analysis was not conducted  | ✓                | ✓                 | ✓                      |                    |
| <b>Data Collection</b>  |                  |                   |                        |                    |
| Lack of quality control during data collection  | ✓                |                   |                        | ✓                  |
| Lower-than-expected program enrollment and/or higher than expected attrition  |                  | ✓ <sup>a</sup>    |                        | ✓                  |
| <b>Data Analysis</b>  |                  |                   |                        |                    |
| Data analysis did not take into account the complexity of the evaluation design (i.e., clustering of individuals within schools or centers)   | ✓                | ✓                 | ✓                      |                    |
| Did not conduct attrition analysis to investigate the potential impact of attrition on generalizability   | ✓                | ✓                 | ✓                      |                    |
| <sup>a</sup> There was modest attrition for the caregiver survey but considerable attrition for the preschooler survey, which limited the amount of paired data for the analysis using the preschooler survey data. |                  |                   |                        |                    |

## Exhibit VI-7.— Summary of Findings from the Self-Evaluations and Comparison with Findings from the Independent Evaluations

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### EWPHCCS—NYSDOH

- Findings from self-evaluation:
  - Significant increase in child’s use of 1% or fat-free milk
  - Increased frequency of parental offerings of fruits and offering new fruits and vegetables
- Comparison to independent evaluation:
  - Significant increase in child’s use of 1% or fat-free milk consistent with the self-evaluation
  - Significant increase in child’s daily at-home consumption of vegetables and rate of child-initiated vegetable snacking, but no impact on parental offerings of fruits or vegetables

### All 4 Kids—UNCE

- Findings from self-evaluation:
  - Significant increase in child’s ability to name snack foods, select a healthy snack to eat, and distinguish healthy snacks from unhealthy ones
  - Significant improvement in the variety of fruits and vegetables eaten (child eats most fruits and vegetables)
  - Significant improvement in child’s movement skills, balance, and hopping endurance (physical activity was not assessed in the independent evaluation)
- Comparison to independent evaluation:
  - No impact on child’s daily at-home consumption of fruits and vegetables
  - Trends were observed for children helping themselves to or requesting vegetable for snacks and increased willingness to try new fruits, but no impact on variety of fruits and vegetables eaten

### Eagle Adventure—CNNS

- Findings from self-evaluation:
  - Significant improvement in child’s healthy food choices
- Comparison to independent evaluation:
  - No impact on child’s daily at-home consumption of fruits and vegetables
  - Significant increase in the number of times per week that children helped themselves to or asked to have vegetables for a snack, consistent with CNNS’s finding regarding improvement in child’s healthy food choices
  - Upward trend in child’s willingness to try new vegetables and increased availability of fruits and vegetables in the home

### About Eating—PSU

- Findings from self-evaluation:
  - No significant improvement in eating competence (not assessed in the independent evaluation)
- Comparison to independent evaluation:
  - No impact on the primary outcome of daily consumption of fruits and vegetables



## D. Suggested Improvements for the Self-Evaluations

This section identifies improvements that each demonstration project can make to improve future evaluations, based on the limitations previously identified. The suggested improvements focus on practical solutions, within the resource constraints of SNAP-Education programs, and are displayed in exhibit VI-8, grouped in terms of study design and measures, data collection, and data analysis.

Because a rigorous independent impact evaluation was conducted for EWPHCCS and the program was found to impact several nutrition behaviors, it may not be necessary for NYSDOH to conduct an impact evaluation of the current program, unless significant changes are made to the intervention. Nonetheless, for future evaluations, each of the four demonstration projects should consider the suggested improvements identified below to improve the rigor of their evaluation.

**Exhibit VI-8.— Summary of Suggested Improvements for the Self-Evaluations by Demonstration Project**

| Suggested Improvements   | EWPHCCS (NYSDOH) | All 4 Kids (UNCE) | Eagle Adventure (CNNS) | About Eating (PSU) |
|--|------------------|-------------------|------------------------|--------------------|
| <b>Study Design and Measures</b>   |                  |                   |                        |                    |
| Use design that can reduce plausible alternative explanations of program impact                                | ✓                |                   | ✓                      |                    |
| Determine the anticipated size of the program impact on the target audience before conducting the intervention | ✓                | ✓                 | ✓                      |                    |
| <b>Data Collection</b>   |                  |                   |                        |                    |
| Use standardized procedures for data collection including procedures to maximize the response rate             | ✓                |                   |                        |                    |
| Establish quality control procedures for data collection   | ✓                |                   |                        | ✓                  |
| Implement procedures to decrease program attrition   |                  |                   |                        | ✓                  |
| Overrecruit study participants to ensure an adequate sample size for the analysis                              |                  |                   |                        | ✓                  |
| <b>Data Analysis</b>   |                  |                   |                        |                    |
| Match analytic strategies to the characteristics of the evaluation design                                      | ✓                | ✓                 | ✓                      |                    |

### 1. Study Design and Measures

Both NYSDOH's and CNNS's evaluation designs would have been strengthened by steps that would have allowed the investigators to rule out plausible alternative explanations for program effects. Potential solutions likely to be within the resource constraints typical of SNAP-Education programs include those highlighted below.

- Use of nonrandomized control groups or a comparison group.** For example, for the same level of resources that NYSDOH used to conduct a census of intervention centers, they may be able to select a sample of intervention centers and matched control centers.

- **Collection of additional waves of data for trend and interrupted time-series analyses.** In this approach, a string of observations is interrupted by implementing an intervention, and the investigator can assess whether this phenomenon altered the slope (change over time) in the outcome of interest. Contemporaneous measurement of environmental factors such as media campaigns should also be considered. This approach may be preferable for projects that are unable to use a control or comparison group.
- **Develop stronger interventions with a larger anticipated program impact.** With a greater effect size, fewer participants are required for the evaluation to yield statistically significant results. Investigators can examine the published literature, especially meta-analyses, and assess the magnitude of program change similar to the intervention under consideration.
- **Use measures with small standard deviations.** When programs cannot afford to recruit or collect data on a large number of participants, careful selection of measurement tools can protect their ability to identify program-related change, by reducing error-related variability. For example, continuous measures of an outcome tend to have smaller standard deviations than dichotomous (yes/no) measures.

## 2. Data Collection

NYSDOH and PSU should consider establishing standardized procedures for data collection and quality control. The use of standard protocols, training, and/or a detailed statement of work that specifies quality control procedures when working with subcontractors for data collection will help ensure consistency and would likely lead to higher survey response rates.

## 3. Data Analysis

NYSDOH, UNCE, and CNNS should match their analytic strategies to the characteristics of the evaluation design. These projects did not account for the complexities of the evaluation design (e.g., clustering of individuals within schools or centers); thus, the level of variation in measured outcomes is likely to be underestimated. Statistical programs are now available within most of the standard analytic software packages that can address these designs. Alternatively, post-hoc corrections can be applied to test statistics.

## Chapter VII ● Discussion and Recommendations

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The lessons learned from this evaluation can guide the Food and Nutrition Service (FNS) in examining the efficacy of proposed Supplemental Nutrition Assistance Program-Education (SNAP-Ed) programs with similar characteristics and features of the four demonstration projects. This chapter discusses the impact of the demonstration projects, aspects of program implementation that were highly successful, and opportunities for improvement. It also includes recommendation for future SNAP-Ed programming in childcare centers and schools and Web-based SNAP-Ed programming, as well as recommendations for improving SNAP-Ed implementing agency (IA) evaluations of their own projects.

### A. Key Considerations for Childcare- and School-Based SNAP-Ed Programming

Findings from the process evaluation indicate that, in general, the child-focused demonstration projects were implemented as planned with the following key successes:

- **Intervention site staff members were enthusiastic in their support of the programs.** Overall, the programs were well received by the childcare center directors and school principals at the intervention sites. These key partners in implementation reportedly appreciated the high-quality of program materials, flexibility of the program staff to accommodate their scheduling needs, and in particular, the relevancy of the programs' design, content, and messages. They also indicated that they would welcome the program back at their sites if offered the opportunity in the future. Because of the perceived value of these programs, most childcare directors and school principals helped support program implementation, and in some cases reinforced nutrition messages with children, which could have influenced some of the observed positive outcomes of these demonstration projects.
- **Parents and caregivers of child participants expressed high levels of satisfaction.** Parents and caregivers were also very satisfied with the program, citing an appreciation for aspects of each program that paralleled feedback from center directors and school principals. However, in addition to the quality of program materials and relevancy of the nutrition education messages, parents and caregivers also noted the usefulness of suggested at-home activities, satisfaction with parent classes and family events, and in general, the programs' support of their effort to help their children be healthy. These program successes are related to the importance of understanding the target audiences through formative research conducted as part of SNAP-Ed program development.
- **Direct educators were well prepared and found the curriculum easy to implement.** Additionally, direct educators for the child-focused demonstration projects felt well prepared to teach the curriculum and reported that it was easy to implement. This finding provides some indication that IAs are using staff with the appropriate background, experience, and skill set to deliver their nutrition education programs; are employing effective training programs; or are doing both. Moreover, the more prepared direct educators feel, the more likely they are to encourage and maintain buy-in from classroom teachers,

center directors, and school principals and to influence behavior change among program participants.

These implementation successes suggest that demonstration project planners and implementers understand their target audiences and are dedicated to quality—both of which could serve as best practices for future SNAP-Ed program implementers as they develop their plans for implementation. Moreover, the impact evaluation findings for Eat Well Play Hard in Child Care Settings (EWPHCCS), All 4 Kids, and Eagle Adventure suggest that these SNAP-Ed interventions for children and their parents or caregivers can improve children’s nutrition behaviors as described below.

- ▲ **The EWPHCCS program increased preschool children’s daily at-home consumption of vegetables and their in-home use of 1% or fat free milk.**
- ▲ **The EWPHCCS and Eagle Adventure programs increased children’s asking for or helping themselves to vegetables for snacks, and a similar trend was observed for the All 4 Kids program.**
- ▲ **The impact evaluations found trends in the All 4 Kids and Eagle Adventure programs for children’s increased willingness to try new fruits (All 4 Kids) or vegetables (Eagle Adventure).**

The programs appeared to have more limited influence on mediating factors such as in-home availability of fruits and vegetables (limited to a trend for Eagle Adventure) and parental offerings of fruits and vegetables for snacks or at dinner (limited to a trend for offering vegetables as snacks for EWPHCCS), which would serve to reinforce healthy nutrition. The absence of increased offerings by parents and caregivers may be one reason increases were not observed in overall fruit or vegetable at-home consumption for two of the three child-focused programs. More needs to be done to strengthen the carryover of these programs into the home to affect children’s daily fruit and vegetable consumption.

There were also a number of implementation factors identified through the process evaluation that might have had an impact on children’s consumption of fruits and vegetables. These factors are briefly described below.

- **Limited administrative support from some intervention sites.** Although most childcare center directors and school principals helped support the demonstration projects’ implementation, this was not always the case. At sites with lower levels of director engagement, some conflicts with the scheduling of intervention activities onsite and lower levels of parent recruitment by the center’s staff were reported.
- **Reduced child exposure to the program.** Children in the All 4 Kids summer wave and the Eagle Adventure program received less than the ideal or planned amount of exposure to their respective nutrition education programs, each for different reasons. Because of the limited number of Head Start centers in Las Vegas that had not been exposed to the All 4 Kids pilot and to meet the sample size requirements of the independent evaluation, University of Nevada Cooperative Extension Service (UNCE) had to implement a second wave of the demonstration in the summer months when attendance is typically lower in childcare settings. In the case of the Eagle Adventure program, the schools typically allocated a shorter time period in the classroom (30 to 35 minutes) than was originally planned (40 minutes) to deliver each lesson, thereby reducing children’s total potential exposure to the program.
- **Lower than desired parent engagement.** Each of the child-focused demonstration projects had difficulty with implementing the parent engagement portion of their programs.

Parents and caregivers attributed their lack of participation or inability to carry out the at-home activities for the most part to their time constraints and schedule conflicts. The level of success in parent engagement likely influenced the programs' potential for impacts, given that young children's food choices at home are determined by their parents and caregivers.

- **Variability in level of support and reinforcement of program by classroom teachers.** Classroom teacher engagement in the demonstration project lessons and reinforcement of the nutrition education messages was an integral part of the EWPHCCS program and to a lesser degree in the All 4 Kids program. Conversely, the one program implemented in elementary school settings (Eagle Adventure) did not require teachers to attend the lessons nor did it directly encourage teachers to promote the messages. It is possible that the lack of reinforcement by the teachers in the school may have impeded the impact that the Eagle Adventure program had on children's consumption of fruits and vegetables. In fact, as CNNS program managers consider refinements to their program, they are planning to encourage teachers to stay in the classrooms during the Eagle Adventure lessons.
- **Parents cited food costs as a barrier and perceived that only fresh fruits and vegetables are recommended.** The barriers most commonly cited by parents and caregivers to achieving the SNAP-Ed program objectives were the cost and time required to find and purchase quality fruits and vegetables, as well as the risk of food spoilage. Several parents and caregivers expressed concern about their very limited food budgets and said they could not afford to try new recipes with foods that might go to waste if their child would not try them. Focus group discussions revealed that most parents and caregivers perceived that these programs were encouraging them to buy only fresh fruits and vegetables, though a review of the program materials demonstrate that while these programs encourage parents to offer children colorful fresh produce as snacks, several of the materials also include frozen, canned and dried forms of produce in the take-home recipes. The EWPHCCS program also provides outreach materials for SNAP during the parent classes, but these were not included as parent handouts in the other projects.

There were additional constraints placed on the three child-focused demonstrations by their intervention environment, which in many cases affected their implementation (e.g., scheduling of events and classes). Nutrition educators in all of the child-focused demonstration projects were constrained by such factors as timing of when the lessons occurred at the intervention sites, the physical location of where the parent-focused classes could take place, the inconsistent nature of child attendance in childcare settings, the demands on the school and children during periods of standardized testing, and the need to modify the timing of the classes around other unanticipated events and schedule changes. However, these constraints are not unique to these demonstration projects nor are they uncommon in school and childcare settings; they are just practical implications of implementing SNAP-Ed in these settings and are important to acknowledge even if they cannot be controlled.

In sum, more needs to be done to strengthen the carryover of these programs into the home to impact children's daily fruit and vegetable consumption. To this end, it is recommended that program implementers, both current and future, build on the lessons learned through this evaluation and aim to improve child-focused programs in the following ways:

- ▲ **Maximize parent and caregiver reach and engagement.** Consideration should be given to using multiple methods of direct and indirect education approaches to reach parents and caregivers and help

them provide the food and encouragement children need to increase their daily fruit and vegetable consumption.

- ▲ **Encourage greater involvement and support from intervention site staff, including ongoing reinforcement by classroom teachers.** SNAP-Ed programs conducted in childcare and school settings should establish clear expectations with the directors and principals about what they can do to help implement the program successfully and what the expectations are for teacher engagement during the lessons. Trainings directed to the teachers and tools could also be developed to help teachers implement simple activities to reinforce SNAP-Ed program messages with the children in their classrooms.
- ▲ **Address food cost issues raised by parents and caregivers by promoting all forms of fruits and vegetables and helping families access nutrition assistance programs including SNAP, the Special Supplemental Nutrition Program for Women, Infants and Children (WIC), and emergency food programs.** To more adequately address parent and caregiver concerns about the costs of fruits and vegetables, the parent lessons and take home materials could be supplemented with more information on meal planning and shopping on a limited budget. Consistent with the current (2010) Dietary Guidelines for Americans, SNAP-Ed program materials and direct educators should encourage the use of all forms of fruits and vegetables, including fresh, frozen, canned, and dried (U.S. Department of Agriculture (USDA), Center for Nutrition Policy and Promotion, 2011). Revisions or additions to the program handouts could be made to include more recipes using the same fruits or vegetables. Additionally, SNAP-Ed programs should provide parents and caregivers informational materials to help them access nutrition assistance programs they may be eligible for including SNAP, WIC, and emergency food programs.
- ▲ **Conduct needs assessments and pre-test materials with the target audience.** Similar to the process carried out by NYSDOH when first designing the EWPCCS program, resources should be devoted to conducting formative research to assess the needs of the target population when designing new SNAP-Ed programs. Needs assessments could include not only focus groups and interviews with the target audience but also dietary surveys to assess the baseline fruit and vegetable consumption in the communities targeted. This information can help determine how to focus the nutrition messages; for example, if baseline consumption of fruits meets the recommendations in the current Dietary Guidelines for Americans then the education can emphasize increasing vegetable consumption. Needs assessments can also be used to identify the food customs, recipes and food preparation techniques that are common in the targeted populations and the intervention settings. Before implementing an intervention, resources should also be devoted to pre-testing and refining program messages and materials with the target audiences, using qualitative methods such as focus groups and in-depth interviews. This kind of formative research can also help program designers adapt program messages and materials so that they are culturally sensitive to subgroups in the target population, including recent immigrants, those with low literacy, and non-English speakers.

## **B. Key Considerations Unique to Web-Based SNAP-Ed Programming**

Findings from the process evaluation indicate that, in general, the About Eating demonstration project was implemented as planned with the following key successes:

- **Nutrition education content was relevant for and well-received by the target audience.** Similar to the child-focused demonstrations, the About Eating nutrition education content was well received by the intended target audience. Participant reports of a



high degree of satisfaction with the nutrition education messages and content of the program are evidence that the About Eating team had a good understanding of their target audiences' interests and needs. In addition to being satisfied with the program's nutrition education content and activities, the participant follow-up survey revealed that program participants were also satisfied with the amount of time it took to complete the course.

- **The program was accessible and easy to use for most participants.** Because of its Web-based application, there were a number of ways in which participant access to the program could have been hampered. However, the majority of participants who completed the About Eating program were able to access and navigate the Web site as well as read and understand the information provided.
- **Recruitment strategies were diverse, well-planned, and supported by key partners.** Recruitment efforts in About Eating focused on recruitment of a large number of individuals, while recruitment efforts in the other demonstrations focused on recruiting sites. The recruitment strategies, procedures, and training provided to the About Eating team well in advance of project implementation prepared them for the recruitment phase of the project. Key informants reported that regular communication among staff members helped them to stay focused and to accomplish their recruitment goals.

The objective of Pennsylvania State University's (PSU) About Eating program was to improve eating competence of low-income SNAP-eligible women. It has been suggested that individuals with higher levels of eating competence have better quality diets, including a higher intake of fruits and vegetables, than those with lower levels of eating competence. Based on the results of the PSU self-evaluation and the FNS independent evaluation, the About Eating program did not impact eating competence or consumption of fruits and vegetables, thus the hypothesis for a relationship between eating competence and consumption of fruits and vegetables could not be tested in this study. There were a number of implementation factors identified through the process evaluation that might have limited the About Eating demonstration project's ability to impact adult participants' consumption of fruits and vegetables. These factors are briefly described below.

- **Participant retention.** Outside factors influenced the amount of time participants had available to be engaged in the program. Though participants reported that competing priorities were their primary reason for not completing the program, level of education and relative access to the Internet also appear to be related to the high attrition rate of 45 percent among the women who enrolled in the About Eating program.
- **Exposure time to program.** The PSU team put a strict timing protocol in place for this demonstration to meet the data collection timelines of the independent evaluation. Because of this, participants were not able to voluntarily go back to previous About Eating lessons, thereby reducing their total potential exposure to the lessons. This reduced participants' total potential exposure to the lessons. Although the amount of time spent on each lesson varied extensively among program participants, About Eating data indicate that participants spent an average of nine minutes on each lesson they accessed.

The low cost and flexibility of nutrition education delivered via the Internet make online SNAP-Ed programming inherently appealing. This study suggests that there is a need for further evaluation of ways to improve access to and use of effective Internet interventions by low-income audiences. The following is a short list of recommendations that build on the lessons learned through the evaluation of the About Eating demonstration program.



- ▲ **Identify additional recruitment venues.** Career centers with training programs and organizations with education classes in low income areas may be useful additions to the already diverse recruitment strategies employed by PSU because of the staff and computer resources that are available onsite. Obtaining the commitment of these organizations to the program before implementation can be key to successful recruitment. Also, because of the volume of participants who can be reached through the Department of Public Welfare (DPW) database, it is important to reach out directly to State and local DPW staff to discuss the program goals and the assistance they can provide in participant recruitment.
- ▲ **Help participants overcome barriers to participation.** Additionally, neither the independent evaluation nor PSU’s self-evaluation included surveys of women who received outreach but chose not to enroll in About Eating. To improve the cost-effectiveness of the program’s recruitment efforts and maximize reach among the target audience, it would be useful to conduct qualitative research, for example in the format of focus groups, to learn more about these women and their reasons for nonparticipation as well as how to overcome the barriers they might face.
- ▲ **Increase participant retention and exposure to lessons.** Due to relatively high rates of attrition for the About Eating demonstration project and the barriers reported by some noncompleters, consideration should be given to identifying potential participants who may experience access-related barriers and to helping all participants overcome these barriers. To address concerns related to program exposure, the About Eating lessons should be made available to participants for an extended period of time after they have completed the program; an additional 3 weeks was recommended by the About Eating program manager.

## C. Key Considerations for SNAP-Ed Evaluations

SNAP-Ed Guiding Principles call for SNAP-Ed programs that are science-based and behaviorally focused. Moreover, FNS expects that “States demonstrate through research review or sound, self-initiated evaluation, if needed, that interventions have been tested and demonstrated to be meaningful for their specific target audience(s), implemented as intended or modified with justification, and shown to have the intended impact on behavior” (USDA, FNS, 2011). Although FNS guidelines encourage all States to evaluate the effectiveness of their SNAP-Ed programs, measuring and identifying the results of nutrition education in terms of measurable changes to dietary behaviors is a challenge for both FNS and its State and local partners.

The independent evaluator’s assessment of the demonstration project’s self evaluations included an assessment of the quality of the evaluations compared to a rigorous impact evaluation, with an identification of the strengths and limitations of the evaluation and areas for improvement. As discussed in chapter VI, the quality of the self-evaluations conducted by the four demonstration projects varied. According to FNS, an “impact evaluation requires comparing those who receive the nutrition education being evaluated (i.e., referred to as the treatment or intervention group) to those who do not receive any nutrition education (i.e., the control group) and/or to those who receive another kind of nutrition education (i.e., comparison group),” and an outcome evaluation “indicates the degree to which the intended outcomes occur among the target population. It does not provide definitive evidence, however, that the observed outcomes are due to the intervention” (USDA, FNS, 2005).

Thus, the self-evaluations conducted by NYSDOH and CNNS are outcome evaluations, not impact evaluations. While outcome evaluations provide useful information for program improvement, they should not be conducted if the purpose of the evaluation is to establish causality between the intervention

and the nutrition behavior outcomes. The evaluations conducted by PSU and UNCE are impact evaluations because the study design included control and comparison groups, respectively, with assessments conducted at pre- and post-intervention. The evaluations conducted by these demonstration projects were technically sound and demonstrated most of the characteristics of a rigorous evaluation, and should be replicated with the improvements noted in chapter VI.

The document, “Nutrition Education: Principles of Sound Impact Evaluation” (USDA, FNS, 2005) provides SNAP-Ed IAs with information on the characteristics of a sound impact evaluation (see sidebar). There are a range of potential evaluation methodologies that are available, so the challenge to the evaluator is to design an approach that eliminates plausible alternatives of program effects and allows the establishment of causality between the intervention and the dietary behavioral outcomes, within the resource constraints of the evaluation staff.

As previously noted, the 2006 FSNE systems review revealed that, for some IAs, the lack of funds and expertise on the part of local project staff and subcontractors is a barrier to conducting rigorous impact evaluations. Thus, some IAs may need to secure additional funding (e.g., joint State funding or grant funding) or partner with evaluators or statisticians at a local university to conduct a rigorous impact evaluation.

Based on the assessment of the self-evaluations, and considering the types of resources and staff typically available to SNAP-Ed IAs, the following recommendations are offered for improving the impact evaluations conducted by SNAP-Ed IAs:

- ▲ **Determine the anticipated size of the program impact on the target audience before conducting the intervention.** When resources are constrained, investigators can examine the published literature, especially meta-analyses, and assess the magnitude of programs similar to the intervention under consideration.
- ▲ **Use a comparison or control group, and to the extent possible randomly assign units to either the treatment or comparison/control group.** If random assignment is not possible, then a quasi-experimental design is acceptable. If a control or comparison group is not a feasible option, consider an interrupted time-series analysis.
- ▲ **Conduct a power analysis to determine the minimum sample size needed for the evaluation study.**
- ▲ **Use existing survey instruments that are demonstrated to be valid and reliable.** If developing new instruments or measurement tools, conduct pretesting to demonstrate adequate psychometric properties (i.e., validity and reliability) of the measures.

### Principles of Impact Evaluation

1. Make certain that the nutrition education intervention can be evaluated.
2. Build on available research.
3. Hold out for research designs with random assignment but use them selectively.
4. Choose impact measures that fit the intervention and approach existing standards for credible assessment.
5. Observe standards for the fair treatment of study participants.
6. Collect impact data after start-up problems get resolved but before implementation rolls out.
7. Report both positive and negative results—but do so accurately.
8. Share results to maximize their value.

Source: U.S. Department of Agriculture, Food and Nutrition Service. (2005). *Nutrition education: Principles of sound impact evaluation*.

- ▲ **Establish standardized procedures for data collection and quality control.** The use of standard protocols, training, or a detailed statement of work that specifies quality control procedures when working with subcontractors for data collection will help to ensure consistency and would likely lead to higher survey response rates.
- ▲ **Match the analytic strategies to the characteristics of the evaluation design.** For studies that include the clustering of individuals within schools or centers, the analysis needs to account for the complexities of the evaluation design. Statistical programs are now available within most of the standard analytic software packages that can address these designs. Alternatively, post-hoc corrections can be applied to test statistics.

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*Appendix A*  
*Evaluation Designs for the FNS Independent*  
*Evaluations*

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**Exhibit A-1.— Evaluation Design for the Independent Evaluation of the Eat Well Play Hard in Child Care Settings (EWPHCCS) Program, NYSDOH**

| Characteristic                                | Description  |
|---|--|
| <b>Study population</b>                       | Parents and caregivers of preschool-age children attending SNAP-Ed eligible childcare centers participating in Child and Adult Care Food Program (CACFP) throughout New York.  |
| <b>Evaluation design and sample selection</b> | Experimental research design with childcare centers randomly assigned to the intervention group ( $n = 12$ ) or the control group ( $n = 12$ ). A stratified sample design was used (New York City versus outside of New York City), and within each strata centers were matched based on type (standard versus Head Start), region, and size. |
| <b>Required sample size</b>                   | Complete baseline and follow-up data from 550 parents or caregivers.   |
| <b>Data collection procedures</b>             | Surveyed parents and caregivers pre- and post-intervention using a mail survey; nonrespondents were contacted and the survey was administered by telephone.  |
| <b>Survey response</b>                        | 1,143 respondents at baseline (75 percent response rate) and 902 respondents at follow-up (79 percent response rate).  |
| <b>Data analysis</b>                          | Mixed model regressions using maximum likelihood estimation.   |

**Exhibit A-2.— Evaluation Design for the Independent Evaluation of the All 4 Kids Program, UNCE**

| Characteristic                                | Description  |
|---|--|
| <b>Study population</b>                       | Parents and caregivers of preschool-age children attending Acelero Head Start Centers in Las Vegas (Clark County), NV.   |
| <b>Evaluation design and sample selection</b> | Quasi-experimental design; the two Head Start Centers that had previously received the intervention were assigned to the intervention group and the remaining 10 centers were randomly assigned to the intervention or comparison group, for a total of 6 centers in each study group. |
| <b>Required sample size</b>                   | Complete baseline and follow-up data from 480 respondents.   |
| <b>Data collection procedures</b>             | At pre-intervention, surveyed parents and caregivers in person concurrent with UNCE data collection. At post-intervention, surveyed parents and caregivers using a mail survey; nonrespondents were contacted and the survey was administered by telephone.                            |
| <b>Survey response</b>                        | 622 respondents at baseline (64 percent response rate) and 511 respondents at follow-up (82 percent response rate).  |
| <b>Data analysis</b>                          | Mixed model regressions using maximum likelihood estimation. Estimated models for all study participants and models limited to participants whose children were enrolled in Head Start at end of intervention.   |

**Exhibit A-3.— Evaluation Design for the Independent Evaluation of the Eagle Adventure Program, CNNS**

| Characteristic                                | Description   |
|---|---|
| <b>Study population</b>                       | Parents and caregivers of first- through third-grade children attending school in Pontotoc County, OK.  |
| <b>Evaluation design and sample selection</b> | Quasi-experimental research design with intervention schools in Pontotoc County, OK ( $n = 5$ ), matched to control schools in Bryan County, OK ( $n = 5$ ), based on characteristics of the school and students. |
| <b>Required sample size</b>                   | Complete baseline and follow-up data from 696 respondents.  |
| <b>Data collection procedures</b>             | Surveyed parents and caregivers pre- and post-intervention using a mail survey; nonrespondents were contacted and the survey was administered by telephone.   |
| <b>Survey response</b>                        | 856 respondents at baseline (55 percent response rate) and 723 respondents at follow-up (84 percent response rate).   |
| <b>Data analysis</b>                          | Mixed-model regressions using maximum likelihood estimation.  |

**Exhibit A-4.— Evaluation Design for the Independent Evaluation of the About Eating Program, PSU**

| Characteristic                                | Description   |
|---|---|
| <b>Study population</b>                       | SNAP-eligible women aged 18 to 45 living in selected counties in Pennsylvania who met the study eligibility criteria.   |
| <b>Evaluation design and sample selection</b> | Experimental research design in which study participants were randomly assigned to the intervention group or the comparison group, with stratification for whether the county participates in Expanded Food and Nutrition Education Program (EFNEP).  |
| <b>Required sample size</b>                   | Complete baseline and follow-up data from 290 respondents.  |
| <b>Data collection procedures</b>             | Pre- and post-intervention surveys administered via Internet by PSU's Survey Research Center (SRC), concurrent with PSU survey administration. Nonrespondents to Internet post-survey were mailed hard copy of FNS questionnaire and subsequently contacted by telephone if completed mail survey was not received.                 |
| <b>Survey response</b>                        | 500 respondents at baseline (87 percent response rate) and 436 respondents at follow-up (87 percent response rate).   |
| <b>Data analysis</b>                          | Estimated program impact via linear regression using adjusted endpoint models that included preference scores as a proxy for fruit and/or vegetable intake at baseline and demographic covariates. Estimated impact models for all study participants and models limited to individuals who completed all the About Eating lessons. |

*Appendix B*  
*Nutrition Education Impact Measurements/  
Instruments Literature Review*

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## Introduction

To develop the survey instruments for the impact evaluation, the Altarum/RTI International team reviewed the literature to identify existing instruments that are feasible, appropriate for the target audience of low-income women and children, reliable, and valid. The purpose of the literature review was to provide a menu of instruments and measures to choose from when developing the survey instruments for the impact evaluation.

This document describes the approach used to conduct the literature review and provides a reference list for the articles reviewed (Attachment A).

## Approach for Conducting the Literature Search and Review

We began our literature search with the sources identified in Appendix A of the Statement of Work and expanded the search to identify other potentially useful instruments. We limited our search to studies conducted in the United States, articles available in English, and articles published after 2003 (since articles published before this year would have been included in the Economic Research Service [ERS] Prototype Notebook).

We searched the following databases:

- PubMed
- Web of Science, Science Citation Expanded and Social Sciences Citation Index
- PsycINFO
- CINAHL
- AGRICOLA
- CAB Abstracts
- Food Science and Technology Abstracts
- New York Academy of Medicine Grey Literature Report

We conducted separate searches for two categories of food: (1) fruits and vegetables and (2) low-fat milk and dairy products. Exhibit B-1 describes the searches that we conducted and provides the general search terms/strategy used to identify articles on fruits and vegetables. The three searches yielded more than 300 articles. Exhibit B-2 describes the searches that we conducted and provides the general search terms/strategy used to identify articles on low-fat milk and dairy products. The three searches yielded about 25 articles. Based on discussions with the demonstration project review committee, we conducted additional searches for instruments used to measure availability and willingness to eat fruits and vegetables.

We reviewed the abstracts for the articles identified from the literature searches to determine which articles to include in the template. We generally limited our literature review to instruments that have been proven reliable and valid with the SNAP-Ed audience or other low-income populations. Additionally, the focus of the literature review was on instruments used to measure dietary intake, but we also included instruments used to measure efficacy, availability, and other measures as appropriate. We excluded long food frequency questionnaires ([FFQs]), diet histories, and 24-hour dietary recalls because the target length of our impact evaluation instrument is 15 minutes.

Attachment A provides the citations for the articles included in the template.

### **Template for the Literature Review**

We used an Excel template to record key information about each instrument identified in the literature search. We prepared separate Excel files for (1) fruits and vegetables and (2) low-fat milk and dairy products. As shown in Table B-1, we recorded the following types of information in the template for each instrument:

- characteristics of the instrument, including the type (FFQ, food behavior checklist, or other), developer, original audience, topics (e.g., intake, efficacy), and number of items addressed by the instrument;
- administration of the instrument, including year, study population and size, whether the original instrument was modified, mode (e.g., telephone, mail, in person), length, and other languages used for administration, for each study conducted using the instrument;
- measurement properties of the instrument, including cognition (readability and cognitive testing), reliability (internal consistency, test-retest), validity (convergent, criterion), and sensitivity to change, for each study conducted using the instrument; and
- the citation (author and date) for each study conducted using the instrument and other relevant information.

The fruit and vegetable template includes 54 instruments; a total of 79 articles were reviewed to prepare this template. The low-fat milk and dairy products template includes 20 instruments; a total of 30 articles were reviewed to prepare this template. Some instruments (and corresponding articles) are included in both templates. Of special interest were instruments that have been used with preschool-aged and other children, since these subpopulations are represented in the demonstration projects. Thirty-one instruments in the fruit and vegetable template and six instruments in the low-fat milk and dairy products templates were administered to children or in the day care environment. A small number of instruments (five for fruits and vegetables and one for low-fat milk and dairy) were administered to parents to collect information on their child's consumption practices.

## **Exhibit B-1.— Summary of Searches Conducted for Fruits and Vegetables<sup>a</sup>**

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### **Search #1—General Search**

- Fruit(s) or vegetable(s)  
and
- Survey, questionnaire, checklist, inventory, assessment, dietary intake, or food frequency  
and
- Poverty, poor, low income, food stamp, literacy, illiteracy, illiterate, nutrition education, evaluation instrument, impact evaluation, behavior change, or food habit

### **Search #2—Articles about National Nutrition Surveys**

- Fruit(s) or vegetable(s)  
and
- BRFSS/Behavioral Risk Factor Surveillance System, NHANES/National Health and Nutrition Examination Survey, 5 a day/five a day, or California dietary practices survey

### **Search #3—Studies with Children Aged 12 or Younger that Included Reliability or Validity Testing**

- Fruit(s) or vegetable(s)  
and
- Survey, questionnaire, checklist, inventory, assessment, dietary intake, or food frequency  
and
- Reliability/reliable or validity/valid  
and
- Child, children, preschool, elementary school, or middle school

<sup>a</sup> When appropriate, database-specific subject terms were used as well; for example, in PubMed Medical Subject Headings (MeSH) terms such as poverty, poverty areas, socioeconomic factors, and educational status, were used.

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## **Exhibit B-2.— Summary of Searches Conducted for Low-Fat Dairy and Milk Products<sup>a</sup>**

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### **Search #1—General Search**

- Low-fat milk, low-fat dairy product(s), fat-free milk, fat-free dairy product(s), skim milk, non-fat milk, non-fat dairy product(s), 1% milk  
and
- Survey, questionnaire, checklist, inventory, assessment, dietary intake, or food frequency  
and
- Reliability/reliable or validity/valid

### **Search #2—Studies with Children Aged 12 or Younger that Included Reliability or Validity Testing**

- Low-fat milk, low-fat dairy product(s), fat-free milk, fat-free dairy product(s), skim milk, non-fat milk, non-fat dairy product(s), 1% milk  
and
- Survey, questionnaire, checklist, inventory, assessment, dietary intake, or food frequency  
and
- Reliability/reliable or validity/valid  
and
- Child, children, preschool, elementary school, or middle school

### **Search #3—Articles on the 1% or Less Campaign**

- 1% or Less Campaign  
and
- Reliability/reliable or validity/valid

<sup>a</sup> When appropriate, database-specific subject terms were used as well; for example, in PubMed Medical Subject Headings (MeSH) terms such as poverty, poverty areas, socioeconomic factors, educational status, were used.

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**Table B-1. — Information Included in the Template**

| <b>Field</b>                                       | <b>Description</b>  |
|--|---|
| <b>Instrument</b>                                  |   |
| Name   | Title of the instrument or module   |
| Type   | Type of instrument (e.g., FFQ, screener, checklist, or other type of instrument)  |
| Developer  | Name of person or organization that developed the instrument  |
| Original audience                                  | Audience for initial administration of the instrument   |
| Topic and number of items                          | Topics and the number of question items addressed in the instrument   |
| <b>Survey Administration</b>                       |   |
| Year   | Year the survey was conducted.  |
| Study population and size                          | Demographic information on the sample population, including region, age, race, gender, education, and income (specifically, SNAP-Ed or other federal assistance program audience), as well as the number of completed surveys/interviews.   |
| Modification                                       | Whether instrument used in a subsequent study was modified from the original version and the extent of the modification.  |
| Mode   | Approach used to administer the instrument (e.g., self- or interviewer administered; in person or by telephone, mail, or Internet; and individually or in group setting).   |
| Length of administration                           | Amount of time required to administer the instrument.   |
| Other languages                                    | Whether the data collection instrument was administered in other languages or dialects.   |
| <b>Measurement Properties</b>                      |   |
| Cognition  | Whether the instrument was cognitively tested with the target audience or tested for readability.   |
| Reliability (internal consistency, test-retest)    | Reliability may be reported as either internal consistency (i.e., Cronbach's coefficient alpha) or as test-retest reliability (typically expressed as a correlation coefficient). If available, specify the length of time between measurements.  |
| Validity (convergent validity, criterion validity) | Two types of validity information are included: (1) correlation of results from the instrument with results from a more detailed measure (e.g., 24-hour recall) and (2) consistency between results from the instrument and results from biochemical measures of nutritional status. Specify the measure against which the measure was evaluated. |
| Sensitivity to change                              | The magnitude of difference over time that was detectable as statistically significant by comparing pre- and posttest results or the difference between treatment and control groups.   |
| <b>References</b>                                  | Citation for the article (author, date)   |
| <b>Notes</b>                                       | Other relevant information regarding the instrument/study   |

## Attachment A

### Articles Included in Template

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*Appendix C*  
*Summary of Instruments Used to Develop Impact*  
*Instruments for the FNS Independent Evaluations*

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## Exhibit C-1.— Summary of Instruments Used to Develop Impact Instruments for the FNS Independent Evaluations

| Outcome Measures   | Instrument  | Study Population(s)            | Mode(s) of Data Collection   | Reliability   | Validity  | Sensitivity to Change  |
|--|---|--------------------------------|--|---|---|--|
| Cups of fruits, vegetables, and fruits and vegetables consumed each day          | Food Stamp Program Fruit and Vegetable Checklist (Townsend et al., 2003)  | Low-income women               | Self-administered, self-administered in group setting, and interviewer administered individually and in groups | The internal consistency for the 7-item fruit and vegetable subscale was high ( $\alpha = 0.80$ ) | The 7-item fruit and vegetable subscale showed a significant correlation with serum carotenoid values ( $r = 0.44$ , $p < 0.001$ ), indicating acceptable criterion validity, and showed significant correlation with dietary variables | Demonstrated sensitivity to change for items expected to change as a result of the study intervention  |
| Ate variety of fruits each day   | University of California Cooperative Extension Food Behavior Checklist (Townsend et al., 2008)                  |                                |  |   |   |  |
| Ate variety of vegetables each day   |   |                                |  |   |   |  |
| Used 1% or fat-free milk   | NHANES 2005–2006 (CDC, 2007)  | General population             | Interviewer administered   | Not reported  | Not reported  | Not reported   |
| Willingness to try new fruits  | Willingness to try new fruits and vegetables (Jamelske, Bica, McCarty, & Meinen, 2008)                          | 4th, 7th, and 9th graders      | Self-administered  | Not reported  | Not reported  | Compared with controls, intervention participants reported an increased willingness to try new fruits and vegetables at school ( $p < 0.01$ )                              |
| Willingness to try new vegetables  |   |                                |  |   |   |  |
| Availability of fruits and vegetables at home during past week                   | Fruit, juice, and vegetable availability questionnaire (Marsh, Cullen, & Baranowski, 2003; Cullen et al., 2003) | Parents of 4th and 6th graders | Self-administered and interviewer administered via telephone   | The internal consistencies for the fruit and vegetable availability items were high               | There was significant agreement between self-reported and observed at-home availability for all fruit juices and most fruits and vegetables   | Fruit, juice, and vegetable availability was a significant predictor of child fruit, juice, and vegetable consumption ( $p < 0.05$ )                                       |
| Preferences for 10 fruits and vegetables, 2 types of breads, and 2 types of milk | (Drewnowski & Hann, 1999)   | Women aged 20–41 years old     | Self-administered  | The internal consistency of the fruit and vegetable preference subscales was high                 | Not reported  | Food preference and consumption was significantly correlated with nearly all item pairs tested; the median Pearson correlation coefficient was 0.40 (range: -0.04 to 0.62) |