



Final Report of the FFY 2008 Impact Evaluation

12/23/2009

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Funded by the U.S. Department of Agriculture Food Stamp Program, an equal opportunity provider and employer, through the *California Nutrition Network for Healthy, Active Families*.

The Research and Evaluation Unit for the *Network* would like to thank the committed staff from the following contractors that contributed data to this project. We are also grateful to the Program Managers of the Community Development team of CPNS for their collaboration in this project.

ABC USD
Alameda County Health Care Services Agency
Alameda County Office of Education(Coalition) Hayward USD
Alhambra USD
Alisal Union School District
Berkeley USD
California State University, Chico Research Foundation -SCNAC
Compton USD
Contra Costa County Health Services
Del Norte USD
East Los Angeles College
El Monte City School District
Fort Bragg Unified School District
Fresno County, Office of Education
Hawthorne School District
Humboldt County Office of Education
Huntington Beach Union High School District
Kernville Union School District
Long Beach Unified School District
Long Beach, City of, Department of Public Health
Los Angeles County Office of Education
Los Angeles Trade-Technical College
Los Angeles Unified School District
Marin County, Dept. of Health and Human Services
Merced Office of Education
Monrovia Unified School District
Montebello Unified School District
Monterey County Health Department
Mount Diablo Unified School District -
Newport-Mesa Unified School District
Orange County Health Care Agency,
Orange County Superintendent of Schools - ACCESS
Orange County Superintendent of Schools – Coalition
Pasadena Unified School District
Riverside, County of, Health Care Services Agency
Sacramento County Department of Health & Human Services - Clinic Services
San Bernardino, County of, Department of Public Health
San Francisco Unified School District
San Francisco, City and County Department of Public Health
Santa Ana Unified School District
Shasta County Health and Human Services Agency, Public Health Branch
Shasta County Office of Education
Tulare County Office of Education
Tulare, County of, Health and Human Services Agency
Ukiah Unified School District
University of California, Cooperative Extension of Alameda County
Ventura Unified School District

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Abstract

Forty-seven contractors representing six channels collected data from 7,736 individuals. The sample was 93% school youth and 51% female. Contractors measured consumption and physical activity, as well as eight factors influencing those behaviors.

The results show overall fruit and vegetable consumption increased. Depending on the intervention and targeted age group, contractors chose one of seven different surveys. Two versions of the Food Behavior Checklist and Fruit and Vegetable Checklist were used for adults. One showed an increase in consumption of 1.81 cups and the other 1.14 servings between the pre-test day and “yesterday”. For low-resource school youth, students who completed the Day in the Life Questionnaire showed an increase of 0.57 times between the pre-test day and “yesterday”. Those who reported consumption using the School and Physical Activity Nutrition project survey showed an increase of 0.21 times. When stratified by fruit, juice or vegetables all but three contractors showed a statistically significant increase. Eight factors related to fruit and vegetable consumption showed a statistically significant increase including: perceived peer behavior, perceived parental consumption, access to fruit and vegetables, attitudes and beliefs, preferences, knowledge, self-efficacy, outcome expectations, and teacher encouragement. The change for physical activity was significant but decreased from pre- to post.

While very positive, it is unclear which strategies led to the change. This may be due to the myriad of methods used to implement a given strategy. Process evaluation and standardized nutrition education activities could help elucidate the effective elements.

The changes reported here resulted from varied interventions implemented in settings where contractors have little control over conditions influencing fruit and vegetable consumption. Advertising, availability of high quality fruit and vegetables in schools and homes, and societal policies favoring the consumption of calorie dense foods are among factors limiting the impact of the nutrition education delivered by *Network*-funded contractors.

Introduction

The Institute of Medicine's framework for evaluating obesity programs is a comprehensive evaluation model that includes precursors of behavior change. This impact evaluation measured change in some of the precursors the model refers to as behavioral, cognitive, social, and environmental.

The *Network for a Healthy California (Network)* is the largest Supplemental Nutrition Assistance Program (SNAP-Ed) in the United States. Funded by the United States Department of Agriculture (USDA), its mission is to increase fruit and vegetable consumption, physical activity, full use of food stamps by eligible individuals, and increase chronic disease prevention. The desired long-term outcome of these efforts is to reduce obesity, body mass index (BMI) levels, related morbidity and mortality, and improve health outcomes. To achieve these outcomes the *Network* uses social marketing strategies grounded in a social ecological approach and contracts with agencies and institutions (contractors) throughout the state to provide nutrition education to SNAP-Ed eligible populations.

In Federal Fiscal year (FFY) 2004, contractors began evaluating the immediate impact of their programs to ascertain if *Network*-funded nutrition education programs lead to changes in fruit and vegetable consumption, physical activity, and related factors.

During the first year of impact evaluation, 12 contractors participated. The second year, FFY 05, the number doubled, nearly doubled again (n=46) in FFY 06, and peaked at 48 in FY 2007. This report describes the evaluation undertaken by 47 contractors in FFY 08. Their Federal budgets ranged from \$181,619 to \$5,989,829 with an average share of just over \$1.1 million. Combined, these 48 contractors represented 49% of the total Federal Share received by the *Network* from USDA.

Evaluation Framework

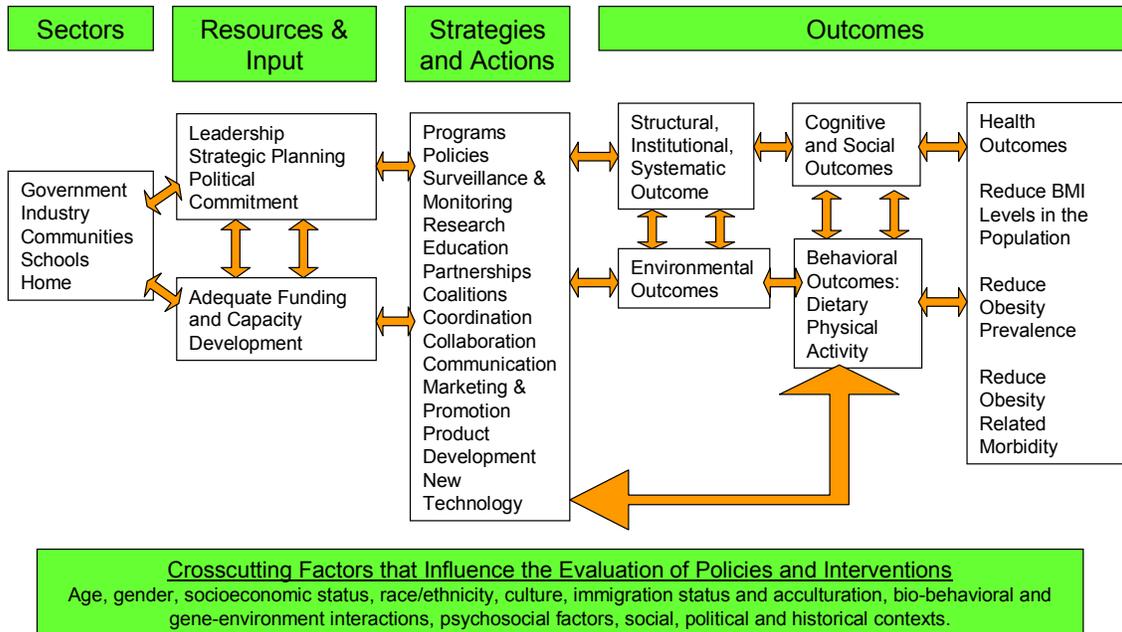
This impact/outcome evaluation aligns with the Institute of Medicine's evaluation framework¹ and with the Office of Analysis, Nutrition and Education's (OANE) definitions of impact and outcome evaluation. OANE defines change in cognitive factors, like knowledge, and change in behavior as outcome measures². Impact evaluation is conducted to determine if changes can be attributed to the nutrition education activities³. This type of attribution is commonly established through the use of control or comparison groups. However, it is difficult for the *Network* to use this model since many eligible populations have already received some nutrition education and it is unethical to withhold nutrition education. Consequently, we use the term impact/outcome evaluation to describe the evaluations in this report as a whole.

Figure 1 shows the desired outcomes of nutrition education efforts as they relate to childhood obesity¹. While some of these go beyond the *Network*'s scope of work, like those at the extreme right of the model, many overlap with the *Network*'s efforts. The *Network*'s contractors target fruit and vegetable consumption and physical activity behaviors. They also target related cognitive outcomes like knowledge, self-efficacy, outcome expectations, food preferences and social indicators such as attitudes and norms.

Environmental outcomes, like access and availability, influence these behaviors; nonetheless, due to funding restrictions, Network contractors do not directly target these outcomes. The same restrictions inhibit efforts to change important factors related to structural, institutional, and systemic outcomes. Structural elements govern the way fruit and vegetable consumption opportunities are organized and delivered. Institutional determinants encompass organizational culture, institution-wide policies and practices, and environmental factors within the institution like an office gym or a school fruit stand. The development, revision or implementation of policies are systemic elements that may influence consumption. The model shows change in these areas influence one another. Interventions targeting behavior may influence the availability of fruit and vegetables in the environment. Such interventions may also impact school wellness policies or the processes through which fruit and vegetables are delivered.

Figure 1.

Institute of Medicine's Obesity Evaluation Framework



Strategies and Actions

The strategies and nutrition education activities used to change fruit and vegetable consumption were very diverse. Overall, contractors implemented over 40 nutrition education activities. A full list of activities is available in Appendix A. Ten or more contractors implemented each of the 14 activities (Table 1). The section below describes the 14 activities.

Taste tests were the most commonly implemented activity, 42 contractors featured a produce item during the evaluation period. This activity is a structured sensory exploration activity. Students explore the featured produce using their senses to observe, compare, and contrast different forms and varieties of the featured produce. Student involvement in the food preparation varied from site to site. Some contractors involved all students in the preparation of the item tasted, some only involved four or five volunteers, and some had nutrition educators prepare and distribute tastes to the participants. Children experienced just over three taste tests per month. Adults participated in an average of almost five.

Thirty-three contractors used **Nutrition Education Reinforcement Items (NERIs)**. These included items such as hats, t-shirts, aprons, cookbooks, backpacks, and Frisbees contractors used to reinforce the nutrition education message and facilitate engagement in healthy eating and physical activity.

Educators commonly **integrate nutrition education** into science, math or English language core competencies to increase fruit and vegetable-related knowledge, beliefs, and attitudes. For example, a teacher may use drawings of apples to create a graph or introduce the concept of volume by observing the amount of water displaced by submersing a pumpkin in a tub of water. This evaluation only assessed the impact of some of the 33,001 classes that generated over 1.9 million impressions in FFY 2008.⁴

The **newsletters for educators** include nine distinct activities ranging from providing information to increasing knowledge about nutrition facts to building skills through

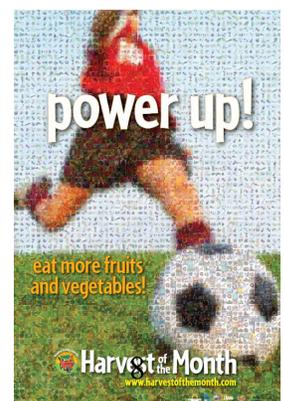
	Youth	Adults
Taste Tests	36	6
Nutrition Education Reinforcement Items (NERI)	28	5
Integrated Nutrition Education	32	0
Educator Newsletters	27	1
Family Newsletters	26	2
Posters (HOTM)	24	2
Posters (other)	22	3
Cooking Classes	23	2
Partnerships	17	3
HOTM workbooks	17	1
Cafeteria Connections	14	1
Guest Lectures	11	1
Garden-based Nutrition Education	11	1
Field Trips	10	2

hands-on activities in areas such as classroom cooking and gardening. Exposure to these activities varies according to the teachers' interest in the newsletter strategy, the feasibility of implementing it with available resources and buy-in from other school or contractor staff. The contractors may hand deliver these to the teachers or may have school staff place them in the teachers' mailboxes.

The **family newsletters** were designed to increase knowledge and exposure to fruit and vegetables through five distinct sets of activities.

These range from providing age-appropriate nutrition information to tips for selecting, storing, and preparing produce. Each included a simple recipe for home preparation. These may be mailed through the U.S. postal service to parents, sent home via students, or distributed at school events that attract parents. Some contractors use parts of the newsletters in other school or community publications.

The contractors used a variety of **posters**. Some were created by *Network* staff as part of Harvest of the Month, others by contractors, and others at schools with student involvement. They were posted in hallways, classrooms and used as visuals in newsletters.



Partnerships were created to acquire supplies and resources that could not be purchased with *Network* funds. Contractors reported receiving seeds from a source like Home Depot, child care from a local Child Care Council, and technical assistance from the local regional collaborative.

The **Harvest of the Month Workbooks** were designed by contractors to operationalize the contents of the newsletters, for example, holding cooking classes to test the recipes found in the newsletters. Educators can integrate the lessons into grade-based education standards for subjects including reading, math, and science. The workbooks also serve as a resource to implement a specific activity and include materials, like overhead transparencies, teaching points, and kid-friendly recipes. The grade-specific workbooks are available for 24 different fruits and vegetables for grades K-6 on the Los Angeles Collaborative for Healthy, Active Children website:
<http://publichealth.lacounty.gov/nut/lacollab/LACollabAboutUs.htm>

Cafeteria Connections offer strategies for educators, child nutrition staff, and students to utilize the cafeteria as a learning laboratory. This may involve serving the HOTM featured produce in the cafeteria, naming new kinds or varieties of fruits or vegetables, or describing students' favorite way to eat a particular type of produce. It may also include a collaboration to get the HOTM produce item featured during school meals or having nutrition advocates encourage students to eat from the salad bar.

Other activities included guest lectures in the classroom by farmers and garden-based nutrition education which permitted students to experience the process of growing produce, from soil preparation to the harvest. Some contractors offered field trips to sites like gardens or farmers' markets. Nutrition advisory councils, comprised of student representatives, determine the types of nutrition education activities conducted in the school and who provides nutrition education in the classrooms. Several contractors used peer mentoring, pairing older students with younger ones and having the former teach the latter nutrition education over the course of several weeks. In addition to these common *Network* activities, contractors used non-*Network* nutrition education resources and activities like those provided by the Dairy Council, USDA's Team Nutrition, SPARK, and CATCH.

Evaluation Methods

Thirty-seven of the 47 contractors worked only with youth. Seven contractors worked only with adults. Three worked with adults and youth. A total of 7,736 individuals provided pre-test and post-test surveys from contractors representing six channels (Table 2). A total of 78% of all survey respondents received an intervention and the remainder, from 20 agencies, served as controls. Of intervention participants, 49% were male. Of

control participants, 51% were male. Most (93%) were 5-17 years old from the school channel.

Channel of Impact/Outcome Evaluation Contractor	Number of Matched Surveys- Intervention	Number of Matched Surveys- Control	Total
School/District (24)	3226	713	3939
College/University (3)	901	357	1258
County Office of Education (7)	884	458	1342
First 5 Children and Families Commission (1)	73	0	73
Local Health Department (11)	829	134	963
University of California Cooperative Extension (1)	94	67	161
Total (47)	6007	1729	7736

Most intervention recipients were school children. Other recipients were reached in other locations, such as Independent Skills Programs, parks, and group homes. Table 3 lists the non-school intervention sites.

Adult Rehabilitation Centers	45
Adult Education & Job Training	102
Community Centers	42
Elderly Service Centers	30
Emergency Food Assistance Sites	59
Farmers Markets	20
Food Stores	67
Job training site	60
Other Youth Education Sites group home	60
Public/Community Health Centers	34
Shelters	18
Total	537

Impact Measurement Tools

The primary outcome for the impact evaluation project was fruit and vegetable consumption. The secondary outcomes were factors that influence fruit and vegetable consumption; specifically those listed in Table 4.

1. Fruit and vegetable consumption	6. FV Perceived parental consumption
2. Physical Activity	7. FV Perceived peer behavior
3. FV Access	8. FV Preferences
4. FV Attitudes and beliefs	9. FV Self-efficacy
5. FV Knowledge	10. FV Teacher encouragement
6. FV Outcome expectations	

Table 5 shows the name of the tools used to measure behavior change and the number of contractors that used it. It includes measures of fruit and vegetable consumption and physical activity.

Measures of fruit and vegetable consumption and physical activity for adults and children	# contractors that used the tool
Measures of fruit and vegetable consumption for adults	
• Food Behavior Checklist (FBC) (Townsend, 2003 ⁵)	3
• Fruit and Vegetable Checklist (FVC) (Townsend, et al., 2006 ⁶) with instruction guide (Townsend et al., 2007 ⁷)	4
Measures of fruit and vegetable consumption for elementary – middle school age students	
• Day in the Life Questionnaire (DILQ) (Edmunds and Ziebland, 2002 ⁸)	4
• Consumption School and Physical Activity Nutrition project (SPAN) (Hoelscher 2003 ⁹)	18
• Consumption questions from the California Health Kids Survey (CHKS)	9
• Mixed measures based on validated scales	10
Surveys other than fruit and vegetable consumption	
• Physical activity (PACE) for middle school (Prochaska and Sallis 2001 ¹⁰)	6
• Physical activity checklist for adults	1

Contractors measured change in eight factors using 14 different survey tools. Table 6 shows the name of the factors used to measure factors influencing fruit and vegetable consumption for adults and children.

Table 6: Measure of factors that influence fruit and vegetable consumption	
Factors measured for elementary – middle school age students	Number of contractors that measured this outcome
• Perceived peer behavior (Vereecken et al. 2005 ¹¹)	12
• Perceived parental consumption (Vereecken et al., 2005 ¹⁰).	12
• Socialization-encouragement (Veerecken et al., 2005 ¹⁰)	12
• Access (Hearn 1993 ¹²)	16
• Self Efficacy for Eating, Asking and Preparing Survey (Reynolds, et al., 2002 ¹³)	1
• Self Efficacy for Eating Fruits and Vegetables (Baranowski, et al., 2000 ¹⁴)	4
• Self Efficacy for Asking and Shopping (Baranowski, et al. 2000 ¹³)	13
• Self Efficacy for Eating, Asking, Buying (Other)	1
• Preferences Survey (Domel et al., 1993 ¹⁵)	24
• Outcome Expectations Survey (Reynolds, et al., 2002 ¹² and (Baranowski, et al., 2000 ¹³)	19
• Knowledge Survey (adapted from Reynolds et al., 2002 ¹² and Hoelscher et al., 2004 ¹⁶)	18

The pre-test took place before the beginning of intervention and post-tests took place after the last intervention session. One contractor did a follow-up survey after the post-test was administered.

Results

Behavioral Outcomes

Almost half (45%) of all contractors showed a significant change in total fruit and vegetable consumption compared to 32% for juice, 30% for fruit, and 13% for vegetables.

Measures of Adult Consumption

The Food Behavior Checklist (FBC) and Fruit and Vegetable Checklist (FVC) were used to measure adult consumption of fruit and vegetables. These surveys were validated in English and Spanish with low-literacy, low-income populations in California, thereby making them a strong measure of consumption for this evaluation. There are two versions

of each tool. One version measures consumption in cups and the other in servings by asking respondents “How many servings/cups of fruit/vegetables do you eat each day”. Table 7 shows the results by measure of consumption.

Table 7: Consumption results stratified measure of consumption					
	n	Pre-test mean	Post-test mean	Difference	p-value
Cups Fruit	45	1.19	2.14	0.95	<.001
Cups Vegetable	45	1.33	2.18	0.85	<.001
Cups Fruit & Vegetable	43	2.49	4.30	1.81	<.001
Servings Fruit	161	2.07	2.73	0.658	<.001
Servings Vegetable	162	2.29	2.78	0.494	<.001
Servings Fruit & Vegetable	156	4.37	5.51	1.14	<.001

Contractors provided sound data using the FBC or FVC from 199 individuals. Results showed 43 individuals showed an increase of 1.81 cups of fruit and vegetables. Another 156 respondents reported an increase of 1.14 servings of fruit and vegetables. Both results were statistically significant.

Measures of Child Consumption

Contractors used one of three surveys to measure children’s consumption of fruits and vegetables, the Day in the Life Questionnaire (DILQ), California Healthy Kids Survey (CHKS), and School and Physical Activity Nutrition project (SPAN). Table 8 shows the results by survey.

Table 8: Consumption results by survey and stratified by FVJ					
	n	Pre-test mean	Post-test mean	Difference	p-value
DILQ FV	431	1.57	2.14	0.57	0.427
DILQ Fruit	431	0.89	0.78	-0.11	0.140
DILQ Vegetables	431	0.58	0.77	0.19	0.001
CHKS FVJ	1,227	8.31	8.66	0.35	0.022
CHKS Fruit	1,235	3.01	3.09	0.08	0.178
CHKS Vegetables	1,233	2.67	2.82	0.15	0.026
CHKS Juice	1,237	2.63	2.76	0.13	0.038
SPAN FVJ	2,861	4.41	4.62	0.21	<0.001
SPAN Fruit	2,894	1.63	1.73	0.10	<0.001
SPAN Vegetables	2,895	1.41	1.46	0.05	0.020
SPAN Juice	2,889	1.37	1.43	0.06	0.007

Day in the Life Questionnaire

The Day in the Life Questionnaire is the measure of choice for use with younger students. Four contractors collected data from 598 primarily 4th and 5th grade students with the DILQ. This tool measures the number of times they ate fruit, vegetables or juice

“yesterday” on an open ended scale. Children reported eating fruit and vegetables an average of 1.57 times “yesterday” at pre-test and 2.14 times at post-test. When the results of all contractors were combined, there was a statistically significant increase of 0.57 times with more change in vegetable than fruit consumption ($p < 0.001$). One of the four contractors did not target fruit consumption which would partially explain why results were not significant for their fruit outcome.

“Oh my goodness! My kindergarteners had so much fun with [Harvest of the Month] today. They were interested from the very beginning of the process. While I was preparing...they were doing their own hands-on observation on a stalk of asparagus...some had never seen it before. During the tasting, more than 2/3 of my class liked it...”

Kindergarten teacher

Measures of Child Consumption – California Healthy Kids Survey

Eight contractors used the three questions from California Healthy Kids Survey to measure the number of times they ate fruit/vegetables / juice during the past 24 hours using five response choices with a summary score ranging from 0 to 15. The 1,227 students who completed this set of consumption questions increased their consumption from 8.31 to 8.66 times, a difference of 0.354 times. The biggest change was for vegetables (.147 times) which was significant.

Measures of Child Consumption - School and Physical Activity Nutrition Survey

A group of 18 contractors used the modular Nutrition Education Survey (NES) to measure fruit and vegetable consumption using three questions from the School and Physical Activity Nutrition project (SPAN) to measure the number of times the child ate fruit/ vegetables/ or drank juice “yesterday”. The summary score for the four response categories ranged from 0 to 12. The pretest score increased from 4.41 to 4.62, a difference of 0.21 times. The change for juice, fruit and vegetables was significant and greatest for fruit.

Physical Activity

The NES included two physical activity questions: “Over the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day?” and “Over a typical or usual week, on how many days are you physically active for a total of at least 60 minutes per day?” Response categories ranged from 0 to 7 days and the summary score ranged from 0 to 14. At pre-test, 1,235 respondents reported being physically active for 60 minutes for 9.29 times while at post-test this fell to 9.03. The negative change (-0.26) was significant.

Cognitive, Social and Environmental Outcomes

The interventions implemented by the contractors targeted outcomes found in the inner circles of the social ecological model (SEM), the personal and interpersonal realms. Contractors chose the sets of questions that matched their intervention and administered a survey to capture change in those areas. The data from 18 contractors that used the Nutrition Education Survey were aggregated and analyzed together yielding a sample size greater than 1,200 depending on the number of individuals who answered the set of questions at pre-test and post-test.

Cognitive Outcomes

Cognitive outcomes relate to knowledge, attitudes, awareness and beliefs about a behavior. These included knowledge, outcome expectations, self-efficacy, and

preferences. Table 9 shows the results for 18 contractors with the exception of preferences which are displayed in Appendix B.ⁱ

Table 9: Summary of cognitive factors targeted by interventions					
	N	Pre-test mean	Post-test mean	Difference	p-value
Knowledge (5 items)	1,630	2.32	2.53	0.21	<0.001
Outcome expectations (7 items)	1,692	18.07	18.51	0.44	<0.001
Outcome expectations (11 items)	188	27.89	28.46	0.57	0.018
Outcome expectations (12 items)	100	31.17	33.00	1.83	<.001
Outcome expectations (13 items)	100	51.56	53.02	1.46	0.098
Self-efficacy for asking and shopping (8 items)	2,607	31.88	32.25	0.37	0.010

Knowledge

The scores for the five knowledge questions ranged from 0, all incorrect, to 5, all correct. The score of 2.53 at post-test means the respondents, on average, answered approximately half of the questions incorrectly. The majority failed to answer correctly: “Fruits and vegetables that are high in Vitamin A are [Yellow-orange and dark green] in color” and “Almost all fruits and vegetables contain a lot vitamins and [fiber]”. Although the increase in knowledge was small (0.17), it reached statistical significance.

Outcome Expectations

Change in outcome expectations was assessed by 19 contractors using different tools. Fifteen used a 7-item instrument validated by Reynolds, et al., 2002.¹² The three response categories were: “disagree, not sure, agree” and the summary scale ranged from 8 to 21. The increase of 0.44 to 18.51 at post-test was significant. The question with the lowest average score was “I will get sick more often if I don’t eat fruit and vegetables.”

Two contractors used a 12-item scale to assess outcome expectations. Results for both were statistically significant. One contractor used a ten-item scale that showed no change and one other used an 11-item scale that was significant. One contractor used a 13-item scale with five response categories ranging from “I disagree very much” to “I agree very much”. That contractor’s results were positive but not statistically significant.

ⁱ It is worth noting larger sample sizes allow smaller differences in two means to differ in a statistically significant way. Very large sample sizes will produce significance even when the differences are not qualitatively meaningful. Samples that are too small may fail to detect a difference of statistical significance. This should be considered when interpreting results.

Self-efficacy for asking and shopping

Thirteen contractors measured self-efficacy for asking and shopping for fruit and vegetables from over 2,600 youth by using an eight-item instrument (Baranowski, et al. 2000¹³). Response categories ranged from “I disagree very much” to “I agree very much” and scores ranged from 8 to 40. At pre-test, respondents reported agreeing a little with the statements and the increase of 0.37 points was small but significant. Ten of the 13 had a comparison group. Three showed significant change in the intervention but not the comparison group.

Self-efficacy for eating fruits and vegetables

Four other contractors used a 13-item tool (Baranowski, et al., 2000¹³) to assess change in self-efficacy for eating fruits and vegetables. None of the results were significant.

Self-efficacy for other behaviors

One contractor used the aforementioned survey to assess change in buying fruit/vegetablesⁱⁱ. The results were not significant. Another contractor assessed change in self-efficacy for eating, asking, and preparing fruits and vegetables with a 17-item tool (Reynolds, et al., 2002¹²). The p-values were not significant for the intervention or control groups.

Social outcomes

Social outcomes included socialization-encouragement, perceived peer behavior, and perceived adult behaviors. These are societal attitudes and norms that influence behavior (Table 10). These may be modeled by the adults in a child’s life, for example teachers and parents, or by their peers.

Table 10: Summary of Social Factors Targeted by Interventions					
	N	Pre-test mean	Post-test mean	Difference	p-value
Socialization-encouragement (8 items)	2,335	12.69	13.20	0.51	<0.001
Perceived peer behavior (6 items)	2,041	8.39	8.88	0.49	<0.001
Perceived Parent consumption (2 items)	2,431	5.30	5.41	0.11	0.017

ⁱⁱ The surveys included questions about fruits separate from items about vegetables. This is captured as “fruit/vegetables” in this section.

Socialization-Encouragement

The eight items for socialization-encouragement captured the messages teachers gave students about fruit and vegetables including: fruit/vegetables are good for them, are healthy, taste good, and to eat them every day (yes/no/I don't know). The scores ranged from 8 to 16. The 0.51 increase to 13.2 at post-test means students said yes to more than six questions. The lowest scores were reported for two questions: "Does your teacher tell you vegetables taste good?" and "Does your teacher tell you to eat vegetables every day?"

Perceived Peer Behavior

The perceived peer behavior questions concerned the respondent's perception of what their "friends" and their "best friend" do and like to do regarding consumption of fruit and vegetables. In response to questions like: "do most of your friends like to eat fruit?" the respondents could answer "yes, no, or I don't know". There were similar questions about what their best friends like to do or currently do in regard to fruit and vegetable consumption. Scores ranged from 6 to 12. A score of six would mean respondents did not believe their peers or best friends liked to eat or ate fruit and vegetables. A score of 12 would mean their friends and best friends like to eat and did eat fruit and vegetables. The statistically significant increase of 0.49 to 8.88 at post-test means, on average, respondents answer "no" to over three questions in this scale. The questions that had more "no" responses were related to the consumption of vegetables ("Do most of your friends like to eat...?" "Do they eat...?" and "Does your best friend eat vegetables...?").

Perceived Parent Consumption

Perceived parent consumption was measured with two items soliciting children's perception of their parents' consumption of fruit and vegetables. They were asked to indicate how often their parents eat fruit/vegetables with five response categories ranging from "never to every day". An "I don't know" category was coded as 0 so responses ranged from 2 to 8. The pre-test mean increased from 5.30 to 5.41 at post-test ($p < 0.05$) and was significant.

Environmental Outcomes

Access

Access, an environmental outcome, was measured to help explain change or lack thereof. The two access questions were: "At your home do you have fruits/vegetables to eat?" The four response categories ranged from "never to always," with an "I don't know" option. This led to scores from 0 to 6 and the increase of 0.15 to 4.86 at post-test was statistically significant. At pre-test 7.6% said they never have fruit at home compared to 52.1% who said always ($n=2148$). These numbers were similar for vegetables, 9.2% and 48.8% respectively. Thirty-eight percent said fruit/vegetables are available sometimes. At post-test 6.4% said they never have fruit at home compared to 59% who said always ($n=2143$). These numbers were similar for vegetables, 8.5% and 53.3% respectively. In both cases

about one-third said they have fruit and vegetables in the home sometimes. Although this was not a direct target of interventions, it is hypothesized the nutrition education outside the home, e.g., the family newsletters, influenced shopping behavior.

In sum, the 18 contractors using the Nutrition Education Survey found a statistically significant change in seven cognitive, social, and environmental factors outcomes. Eleven of the surveys used to measure these are in Appendix C.

Key strategies of nutrition education

Taste tests, cooking classes, educator and family newsletters, and garden-based nutrition education are key elements within the nutrition education contractors provide to youth. These strategies build skills, provide methods to integrate nutrition education into classroom curricula, and provide opportunities for families, communities, and school staff to work synergistically. Table 11 shows the number of contractors that used a given strategy and achieved a significant change in overall fruit and vegetable consumption did not differ greatly from those that did not achieve a significant change with the same strategy.

Strategy Used	Significant change	No Significant change
Taste Tests	22	23
Educator Newsletters	13	19
Cooking Classes	16	14
Family Newsletters	15	17
Garden-based nutrition education	22	37

Diversity of Nutrition Education Activities

Contractors implemented a very diverse set and number of activities. Table 11 shows the results are not strikingly different when looking at the change in total consumption for the five key strategies analyzed in different combinations. Twenty-two of the contractors that conducted taste tests showed a significant change in total FVC (Table 11). The 2nd column of Table 12 below shows 26 contractors implemented a taste test AND a cooking class. Half showed a significant change and half did not. The results are not very different after educator newsletters are added with 22 using all three and only ten demonstrating a significant difference. This similarity persists once family newsletters and gardens are added but the total number of contractors decreases to 12. So, even when considering these five key strategies, only 12 of the 47 contractors implemented all five and half of the 12 showed a statistically significant difference.

Table 12: Number of Contractors (% of total) with Statistically Significant and Non-significant Change in FVC by Combination of Strategy Used

Nutrition education activities →	Taste Tests	Taste Tests	Taste Tests	Taste Tests
	Cooking Class	Cooking Class	Cooking Class	Cooking Class
		Educator News	Educator News	Educator News
			Family News	Family News
Statistical significance ↓				Integrated Garden Nutrition Education
Not Significant	13 (28)	12 (26)	10 (21)	6 (13)
Significant	13 (28)	10 (21)	9 (19)	6 (13)
Total	26 (55)	22 (47)	19 (40)	12 (26)

A regression analysis was used to determine if any one of the five key activities was associated with change. In order to capture the dose of key strategies delivered, contractors reported the number of taste tests performed, number of cooking classes carried out, number of months newsletters were distributed, and amount of time spent in the garden conducting nutrition education during the evaluation period. These were entered into a regression model with fruit, vegetable, and juice consumption as a dependent variable then separately for fruit consumption and vegetable consumption as dependent variables. Since the number of response categories and range of answers varied, the analysis was stratified by the set of consumption questions used.

Eight contractors delivered their standard intervention and an enhanced intervention. Three delivered the standard, an enhanced, and a heavy dose intervention. A Chi square analysis showed none of the contractors with more than a standard intervention were more likely to demonstrate a change than those with only one level of intervention ($p < .05$).

The results do not help determine what activity or what set of activities makes a difference in fruit and vegetable consumption. In some cases gardening is associated with an increase in the number of times fruit and vegetables, just fruits, and/or just vegetables are consumed and other times it is associated with a decrease. The same is true for cooking classes, educator newsletters, and family newsletters.

Adults

Five contractors evaluated interventions serving adults using the Food Behavior Checklist or Fruit and Vegetable Checklist. All five showed a significant improvement in fruit and vegetable consumption.

Consumption was measured in cups by one contractor and in servings by the four others. Key activities (and number of contractors that did them) included taste tests (5), cooking classes (2), food demonstrations (1), and family newsletters (2). A regression analysis did

not produce a significant model that could be used to attribute change to any of the activities. All contractors delivered taste tests so this was omitted from the model since there was no variance.

Contextual Factors that may Influence Consumption

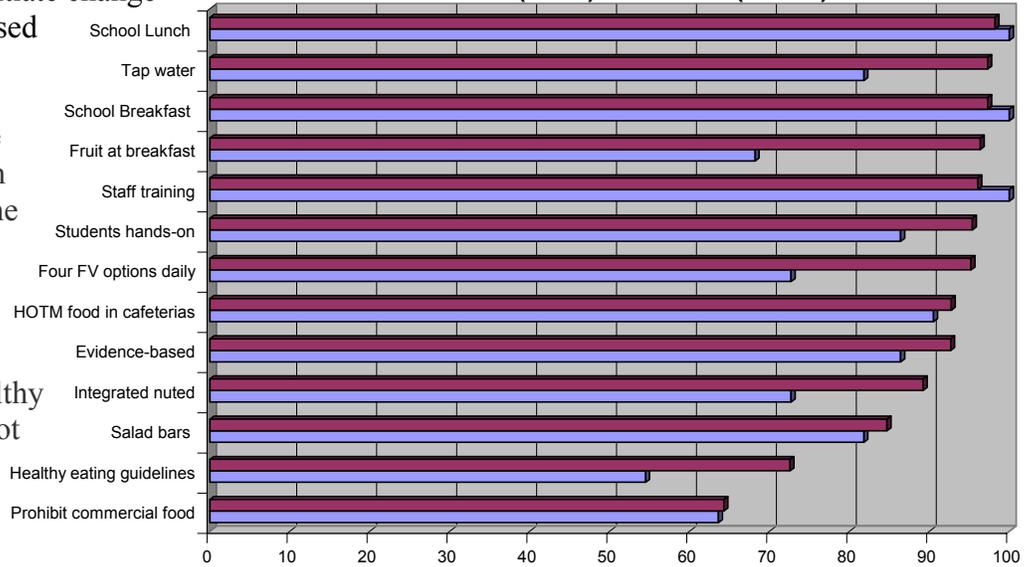
In 2007-08 an online Checklist for School Nutrition Program Planning (Appendix D) was pilot tested to determine if schools had or did not have 23 elements that might influence fruit and vegetable consumption. The Checklist was administered to help describe the environment in which nutrition education takes place and not to measure impact since these are not areas contractor seek to change with *Network* funding.

Contractors collected data from 22 schools in FFY 2008 and 122 schools in FFY 2009 . Figure 2 shows more than 50% of the contractors had 13 elements in both years. This lack of variance makes it difficult to differentiate change

in consumption based on these strategies.

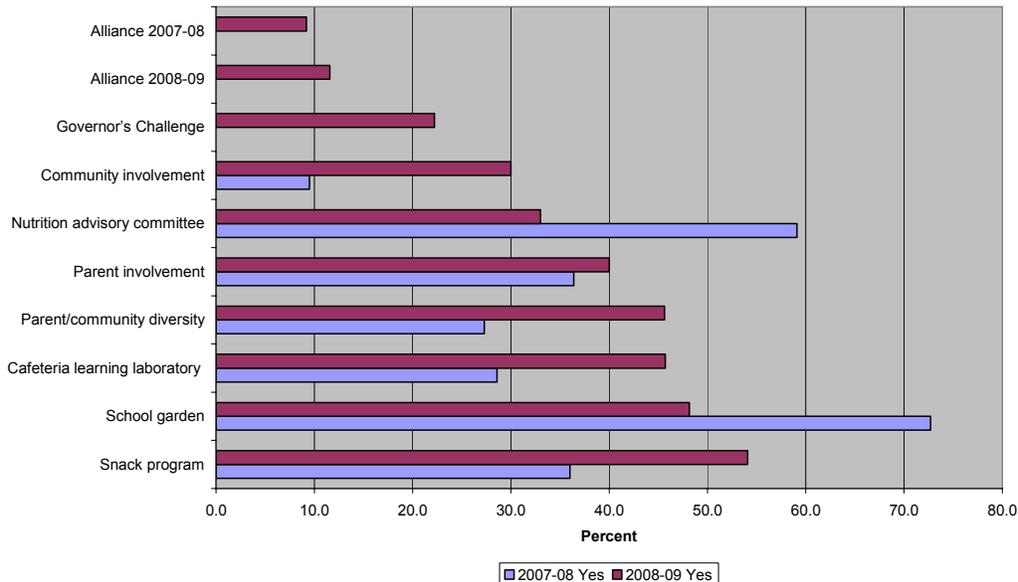
Figure 3 shows the elements present in less than 50% of the schools in both years. The questions concerning the Alliance for a Healthy Generation were not included on the checklist.

Figure 2: Contractors that reported the element was present in the school in 07-08 (n=22) and 08-09 (n=112)



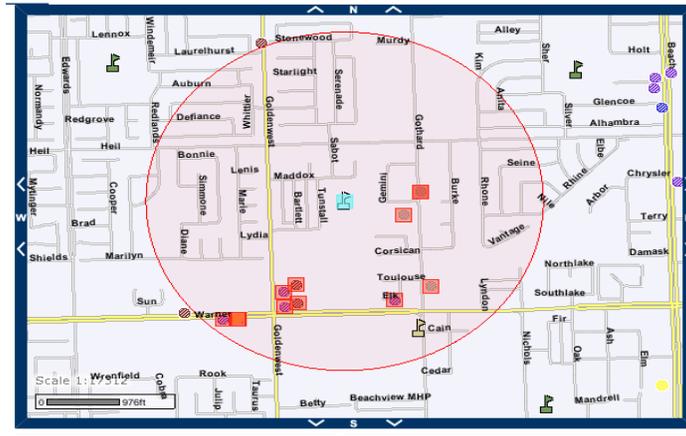
The *Network* GIS system can map the number of fast food

Figure 3: Contractors that reported the element was present in the school in 07-08 (n=22) and 08-09 (n=112)



restaurants within a given radius around a school and regression techniques used to determine if they exert an influence on fruit and vegetable consumption. Figure 4 shows an example of how the number on schools within the 0.5 mile radius was calculated. The blue rectangle in the middle represents a school and the 10 red rectangles represent fast food establishments. No relationship was found between number of fast food restaurants within 0.5 miles and fruit and vegetable consumption. This is not surprising since the data come from elementary students who were not allowed free passage off campus during school and because they did not live near the school. Appendix E shows the district, school name and number of fast food restaurants within 0.5 miles for a sample of schools involved in the evaluation.

Figure 4: Proximity of Fast Food Restaurants within 0.5 miles of school



Challenges and Recommendations

Challenge

The results of the evaluation indicate changes in primary and secondary outcomes are positive. However, it is unclear which intervention activities lead to the positive changes. Without clearer results regarding effective strategies the *Network* cannot make solid recommendations about what strategies to replicate and the dosage to deliver. This diversity makes it difficult to understand how one activity impacts results versus another activity or combination of activities.

Recommendation

Behavioral theory and evidence from other studies can guide program development and implementation. The *Network* can closely monitor the implementation methods and results for contractors using strategies that have been part of effective interventions. This can be done using reporting forms developed for 2008-09.

Additional statistical analysis might help elucidate this. Nested modeling could help tease out some of the effects related to distinct site characteristics.

Also, the impact of specific activities could be partially isolated if a few contractors implemented a standardized set of activities in the same way and collected data from a

sample large enough to detect a meaningful difference in consumption and factors influencing it.

Challenge

The influence of contextual factors is difficult to untangle. Over half the schools had many supportive elements present in the environment, like those in Figure 2, which make it difficult to differentiate change based on those elements. Sample sizes for the others were too small to assess the role of these elements on fruit and vegetable consumption. Additionally, funding restrictions do not allow the *Network* to intervene in these areas.

Recommendation

Continued monitoring using the existing Checklist for Nutrition Program Planning will provide data to help describe factors at the outer layers of the SEM influencing fruit and vegetable consumption.

Challenge

Since the beginning of the impact evaluation, the *Network* insisted contractors use valid and reliable tools. Over time, it has become apparent this has limited the credibility of the findings because surveys have included questions not addressed in nutrition education activities. Retaining these questions on a survey lowers overall scores for a given determinant if they are not addressed in nutrition education.

Most of the surveys used with children in this impact evaluation were validated in populations outside California with demographic characteristics, like income, ethnicity, and education, different from those of the populations served by contractors. These limit the validity of these surveys with the target population.

Recommendation

There are two recommendations for this challenge. One would require modifying the surveys offered, then cognitively testing and validating them; however, this would be an expensive and time intensive undertaking.

Another recommendation would be to further analyze existing qualitative data. Contractors throughout the State said they know they are making a difference when they see children or adults show enthusiasm for the taste tests, cooking classes or other activities offered by the educators. They saw parents or program coordinators make personal changes, such as not drinking soda, which lead to dramatic weight loss and sustained healthy eating behavior. Contractors told stories where parents were surprised their children would eat a vegetable like spinach or that their child would ask them to buy pineapples at the store. One contractor told a story about a nutrition educator who was conducting taste tests in a grocery store in a low-income neighborhood. The educator said, after offering customers samples of asparagus, she looked at the asparagus in the

produce section and noticed it was almost empty. Another example comes from contractors in southern California who reported the teachers they work with changed the rules in their classroom to allow students to eat healthy snacks during a snack period in the classroom; a snack period that previously did not exist.

These themes emerge from the stories contractors write in their final reports to the Community Development team in the *Network*. They are also told in small group settings like impact evaluation training workshops. The stories could be more formally analyzed as qualitative data to further document the *Network's* success. In addition, they could be mined as a source of survey questions to measure impact.

Challenge

Staff turnover at the local and State level slow the advance of program evaluation. In order to rigorously implement evaluations and effectively use them to improve nutrition education, evaluation capacity must be built among new staff.

Recommendation

Web-based meetings and in-person trainings are effective methods to address this challenge. Web-based meetings were conducted during the evaluation period to orient new contractor staff to the *Network's* impact evaluation system and provide technical assistance throughout the year. In-person trainings were effectively used to deepen contractors understanding of evaluation concepts, network with others to share ideas about how to conduct evaluation or implement nutrition education strategies, and to interpret results. A total of 59 individuals attended one of the five regional impact evaluation workshops in 2009 at an average cost of \$31 per person.

Post workshop evaluations show networking and dialoguing about methods used to implement the impact evaluation and conduct nutrition education were the best part of the workshop for many participants. The small-group work, testimonials and presentations by participant's peers should be continued to maintain this effective component. Results from post-workshop evaluations show they could be improved by allowing contractors to share how they implement effective nutrition education strategies and the results of this work.

Conclusion

While challenges still exist with identifying measures that match and recommending effective strategies, the impact evaluation is making a difference in the quality of nutrition education funded by the *Network*. Evaluative thinking is becoming institutionalized as evaluation participants continue year after year. Several contractors have said they learned a lot about their program, found ways to improve it and had fun doing the evaluation. These are signs of successful impact evaluation implementation.

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Appendix A: Nutrition Education Activities Implemented by Contractors

Activity	# contractors that implemented it
Taste tests	42
Nutrition education reinforcement items	33
Integrated nutrition education	32
Educator newsletters - HOTM	28
Family newsletters – HOTM	28
Posters HOTM	26
Cook classes	27
Posters - other	25
Partnerships	20
HOTM workbook	18
Cafeteria connections	15
Garden-based nutrition education	13
Guest lectures	12
Field trips	12
Peer mentors	10
Nutrition advisory council	10
Integrated nutrition classes	8
PSAs	3
Power Play!	3
Physical activity activities	3
Bulletin boards	2
My pyramid	2
Family parent events	2
Farmers Market-based nutrition education	2
Assemblies	2

Other activities implemented by only one contractor included resource tables, activity sheets, books, worksite newsletters, professional development, training academy, Five A Day, CATCH nutrition curriculum, adult school, theatre production, healthy vending, and CA Fit Business Kit.

Appendix B: Preferences Results:
Produce items featured, Pre-test and Post-test Means, and p-value of Difference
Between Pre and Post-test

	N ⁱⁱⁱ	Pre-test mean	Post-test mean	Difference	p-value	# Contractors Featuring Item
HOTM Fall produce						
Apples	191	3.69	3.65	-0.04	0.347	2
Kiwifruit	1824	3.57	3.62	0.05	0.002	12
Pears	259	3.43	3.45	0.02	0.639	3
Persimmons	727	2.14	2.4	0.26	<0.001	6
Tomatoes	354	3.19	3.24	0.05	0.294	2
Winter Squash	351	2.37	2.59	0.22	<0.001	2
HOTM Winter produce						
Mandarins	764	3.54	3.53	-0.01	0.673	5
Oranges	347	3.71	3.69	-0.02	0.497	5
Grapefruit	88	3.15	3.04	-0.11	0.408	1
Tangerines	385	3.62	3.79	0.17	<0.001	1
Broccoli	892	3.27	3.32	0.05	0.091	10
Cabbage	146	3.15	3.08	-0.07	0.376	1
Sweet Potatoes	1676	2.97	3.05	0.08	0.001	11
HOTM Spring produce						
Raisins	30	3.63	3.53	-0.1	0.639	1
Dried Plums	543	2.50	2.48	-0.02	0.703	4
Strawberries	304	3.80	3.78	-0.02	0.491	3
Blueberries	68	2.93	3.12	0.19	0.155	1
Asparagus	896	2.23	2.46	0.23	<0.001	6
Carrots	498	3.47	3.50	0.03	0.430	6
Peas	294	3.02	3.29	0.27	<0.001	2
Spinach	1665	2.84	2.97	0.13	<0.001	12
Cucumber	202	3.68	3.82	0.14	0.002	1
HOTM Summer produce						
Grapes	637	3.87	3.86	-0.01	0.466	3
Melons	883	3.71	3.76	0.05	0.101	5
Figs	214	2.13	2.39	0.26	0.001	2
Peaches	124	3.77	3.78	0.01	0.858	2
Plums	85	3.11	3.36	0.25	0.011	1

ⁱⁱⁱ Number of students that contributed data. The n will not sum 4088 since contractors featured more than one item.

Green Beans	1500	3.08	3.09	0.01	0.668	10
Salad Greens	1698	3.23	3.33	0.1	<0.001	10
Bell Peppers	291	2.76	3.05	0.29	<0.001	2
Non HOTM produce						
Apricots	294	2.80	3.33	0.53	<0.001	2
Artichokes	200	1.91	2.83	0.92	<0.001	1
Jicama	195	2.63	3.43	0.8	<0.001	1
Eggplant	88	1.78	2.17	0.39	0.002	1
Celery	88	3.13	3.24	0.11	0.206	1
Onions	206	2.79	2.85	0.06	0.214	1
Pineapple	88	3.52	3.48	-0.04	0.642	1
Papaya	88	2.66	2.69	0.03	0.822	1

Appendix C: Selected Survey Items with Codes**Perceived Peer Behavior (range 0-12)**

	Yes	No	I don't know
1. Do most of your friends like to eat fruit?	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
2. Do most of your friends eat fruit every day?	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
3. Does your best friend eat fruit everyday?	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
4. Do most of your friends like to eat vegetables?	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
5. Do most of your friends eat vegetables every day?	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
6. Does your best friend eat vegetables everyday?	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>

Perceived Parental Consumption (range 0 – 8)

	Never	A few days a week	Most days a week	Every day	I don't know
1. How often do your parents eat fruit?	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	0 <input type="radio"/>
2. How often do your parents eat vegetables?	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	0 <input type="radio"/>

Self-efficacy for Asking and Shopping (range 8-40)

	I disagree very much	I disagree a little	I am not sure	I agree a little	I agree very much
How sure are you that you can:					
1. write my favorite fruit or vegetable on the family's shopping list	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>
2. ask someone in my family to buy my favorite fruit or vegetable	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>
3. go shopping with my family for my favorite fruit or vegetable	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>
4. pick out my favorite fruit or vegetable at the store and put it in the shopping basket	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>
5. ask someone in my family to make my favorite vegetable dish for dinner	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>
6. ask someone in my family to serve my favorite fruit at dinner	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>
7. ask someone in my family to have fruits and fruit juices out where I can reach them	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>
8. ask someone in my family to have vegetables cut up out where I can reach them	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>

Outcome Expectations (range 7-21)

	Disagree	Not Sure	Agree
1. I will have more energy for playing (sports, recess or after school) if I eat fruits and vegetables.	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>
2. I will get sick more often if I don't eat fruits and vegetables.	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>
3. Eating fruits and vegetables will help me grow.	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>
4. I will have healthier skin if I eat fruits and vegetables.	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>
5. If I eat fruits and vegetables, I will have stronger eyes.	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>
6. If I eat fruits or vegetables at breakfast, I will be able to think better in class.	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>
7. Eating fruits and vegetables will keep me from getting cavities.	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>

Socialization-encouragement (range 0-16)

Does your teacher tell you...	Yes	No	I don't know
1. ... that vegetables are good for you	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
2. ... that vegetables are healthy	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
3. ...that vegetables taste good	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
4. ...to eat vegetables every day	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
5. ...that fruit is good for you	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
6. ...that fruit is healthy	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
7. ...that fruit tastes good	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
8. ...to eat fruit every day	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>

Access (range 0-6)

1. At your home do you have fruits to eat?
 - 1 Never
 - 2 Sometimes
 - 3 Always
 - 0 I don't know

2. At your home do you have vegetables to eat?
 - 1 Never
 - 2 Sometimes
 - 3 Always
 - 0 I don't know

Consumption: school physical activity and nutrition project (span)

1. Yesterday, did you eat any vegetables?

Vegetables are all cooked and uncooked vegetables; salads; and boiled, baked and mashed potatoes.

Do not count French fries or chips.

- 0 O No, I didn't eat any vegetables yesterday.
- 1 O Yes, I ate vegetables 1 time yesterday.
- 2 O Yes, I ate vegetables 2 times yesterday.
- 3 O Yes, I ate vegetables 3 or more times yesterday.

2. Yesterday, did you eat fruit?

Do not count fruit juice.

- 0 O No, I didn't eat any fruit yesterday.
- 1 O Yes, I ate fruit 1 time yesterday.
- 2 O Yes, I ate fruit 2 times yesterday.
- 3 O Yes, I ate fruit 3 or more times yesterday.

3. Yesterday, did you drink fruit juice?

Fruit juice is a 100% juice drink like orange juice, apple juice, or grape juice.

Do not count punch, Kool-Aid®, sports drinks and other fruit-flavored drinks.

- 0 O No, I didn't drink any fruit juice yesterday.
- 1 O Yes, I drank fruit juice 1 time yesterday.
- 2 O Yes, I drank fruit juice 2 times yesterday.
- 3 O Yes, I drank fruit juice 3 or more times yesterday.

Grade, Age, Gender, Ethnicity And Race

1. What grade are you in? (Fill in one answer)

4 <input type="radio"/> 4 th grade	7 <input type="radio"/> 7 th grade	10 <input type="radio"/> 10 th grade
5 <input type="radio"/> 5 th grade	8 <input type="radio"/> 8 th grade	11 <input type="radio"/> 11 th grade
6 <input type="radio"/> 6 th grade	9 <input type="radio"/> 9 th grade	12 <input type="radio"/> 12 th grade

2. How old are you? (Fill in one answer)

8 <input type="radio"/> 8 years old	12 <input type="radio"/> 12 years old	16 <input type="radio"/> 16 years old
9 <input type="radio"/> 9 years old	13 <input type="radio"/> 13 years old	17 <input type="radio"/> 17 years old
10 <input type="radio"/> 10 years old	14 <input type="radio"/> 14 years old	18 <input type="radio"/> 18 years old
11 <input type="radio"/> 11 years old	15 <input type="radio"/> 15 years old	

3. Are you a boy or a girl? (Fill in one answer)
 - 1 Boy
 - 2 Girl

4. Are you Hispanic or Latino?
 - 1 Yes
 - 0 No

5. How would you describe yourself? (Fill in all that apply to you)
 - 1 American Indian or Alaska Native
 - 2 Asian
 - 3 Black or African American
 - 4 Native Hawaiian or Other Pacific Islander
 - 5 White/Caucasian
 - 6 More than one

Physical activity (range 0-14)

Physical activity is any activity that increases your heart rate and makes you get out of breath some of the time.

Physical activity can be done in sports, playing with friends, or walking to school.

Some examples of **physical activity** are running, brisk walking, and rollerblading.

1. Over the past 7 days, on how many days were you physically active for a total of at least 60 <u>minutes</u> per day?							
0 O 0 days	1 O 1 Day	2 O 2 Days	3 O 3 Days	4 O 4 Days	5 O 5 Days	6 O 6 Days	7 O 7 Days

2. Over a typical or usual week, on how many days are you physically active for a total of at least 60 minutes per day?							
0 O 0 days	1 O 1 Day	2 O 2 Days	3 O 3 Days	4 O 4 Days	5 O 5 Days	6 O 6 Days	7 O 7 Days

Preferences – sample items

The “I don’t know what this is” responses were dropped for the analysis of preferences assuming they don’t have a preference since they can’t identify it. Scores could range from 2 x the number of items to 4 x the number of items. In this example the range would be 2 x 10 =20 to 4 x 10 = 40.

How much do you like these fruits and vegetables?		I like this a lot 	I like this a little 	I do not like this 	I don’t know what this is 
Asparagus.....		4 O	3 O	2 O	1 O
Dried Plums		4 O	3 O	2 O	1 O
Green Beans.....		4 O	3 O	2 O	1 O
Kiwifruit.....		4 O	3 O	2 O	1 O
Mandarins		4 O	3 O	2 O	1 O
Melons		4 O	3 O	2 O	1 O
Persimmons.....		4 O	3 O	2 O	1 O
Salad Greens.....		4 O	3 O	2 O	1 O
Spinach.....		4 O	3 O	2 O	1 O
Sweet Potatoes...		4 O	3 O	2 O	1 O

Knowledge (range 0-5)

For all knowledge questions, enter a “1” for correct responses and a “0” for incorrect responses.

<p>1. Eating fruits and vegetables can help lower your chances of getting heart disease or cancer.</p> <p><input type="radio"/> 1 O True</p> <p><input type="radio"/> 0 O False</p> <p><input type="radio"/> 0 O Don't know</p>
<p>2. Fruits and vegetables that are high in Vitamin A are _____ in color.</p> <p><input type="radio"/> 0 O Red and white</p> <p><input type="radio"/> 0 O Blue and light brown</p> <p><input type="radio"/> 1 O Yellow-orange and dark green</p> <p><input type="radio"/> 0 O Brown and purple</p> <p><input type="radio"/> 0 O I don't know</p>
<p>3. Almost all fruits and vegetables contain a lot vitamins and _____.</p> <p><input type="radio"/> 0 O Protein</p> <p><input type="radio"/> 1 O Fiber</p> <p><input type="radio"/> 0 O Cholesterol</p> <p><input type="radio"/> 0 O Fat</p> <p><input type="radio"/> 0 O Don't know</p>
<p>4. Which of the following fruits and vegetables are grown in California:</p> <p><input type="radio"/> 0 O Spinach</p> <p><input type="radio"/> 0 O Apples</p> <p><input type="radio"/> 0 O Pears</p> <p><input type="radio"/> 1 O All of the above</p>
<p>5. Fruits and vegetables, like apples and pears, are best when eaten with the peel because that is where most of the fiber and antioxidants are.</p> <p><input type="radio"/> 1 O True</p> <p><input type="radio"/> 0 O False</p> <p><input type="radio"/> 0 O Don't know</p>

Adult consumption:

University of California Cooperative Extension

Food Behavior Checklist

These questions are about the ways you plan and fix food.
Think about how you usually do things.

Name _____ Date _____ ID# _____ Entry Exit

Choose one answer for each question.

1. 

Do you eat fruits or vegetables as snacks?

no yes, sometimes yes, often yes, everyday

2. 

Do you drink fruit drinks, sport drinks or punch?

no yes, sometimes yes, often yes, everyday

3. 

Did you have citrus fruit or citrus juice during the past week?

yes no

The full version of the Food Behavior Checklist and Fruit and Vegetable Checklist can be found online at: <http://townsendlab.ucdavis.edu/>

Appendix D: Checklist for School Nutrition Program Planning

(Response categories: Yes/ No)

1. What is the name of this school?
2. What is the name of the Network contractor supporting nutrition education in this school?
3. Does your school have a National School Lunch Program?
4. Does your school have a National School Breakfast Program?
5. Will this school participate in the Alliance for a Healthier Generation Healthy Schools Program this year (2008-09)
6. Did this school participate in the Alliance for a Healthier Generation Healthy Schools Program last year (2007-08)?
7. Did the school participate in the Governor's Challenge Competition last year?
8. Does your school have a fruit and/or vegetable snack program?
9. Does your school have clean, free sources of tap water and/or working water fountains available and accessible to students at meals and throughout the day?
10. Does your school serve at least one fruit (fresh or canned in fruit juice) at breakfast in addition to 100% fruit juice?
11. Does your school have salad bars or other opportunities to offer fresh fruits and vegetables, e.g., crunch lunches, boxed salads and veggie meals?
12. Does your school offer at least four non-fried, no-added sugar fruit and/or vegetable options daily? (salad can count as one of the four)
13. Does your school market and promote fruit and vegetable consumption of the featured HOTM food in cafeterias, a la carte area of lunch area, and/or corridors as well as in classrooms at least once a month?
14. Does your school use cafeteria as 'nutrition education' learning laboratory on a weekly basis via programs, promotions, nutrition labeling, or special demonstrations?
15. Does your school prohibit commercial food and beverage branding in non-food environments such as recreational facilities, classrooms, and hallways?
16. Does your school offer evidence-based nutrition education (i.e., curriculum/lesson plans/programs) that are based on the National Health Education Standards or California Health Education Content Standards, e.g., Eat Smart/Play Hard, Harvest of the Month, Power Play!) in each grade for the level of school being evaluated (elementary, middle, high)?
17. Are fruit and vegetable-focused nutrition education integrated into academic learning using theory and skills-based lessons on an ongoing basis?
18. Do students participate in hands-on preparation, cooking, and tasting of fruits and/or vegetables in your school?
19. Do students in your school plant fruits and/or vegetables in a garden that is cultivated regularly during growing season and produce is used in nutrition education?
20. Does your school have a school health council or a student nutrition advisory committee where students have roles in making key decision in planning and implementing nutrition policies to improve nutrition in their schools, homes, and community?

21. Do low income parents and other community members that reflect the diversity of the district actively engage in planning, implementing and supporting school policies and programs that address healthy eating through participation in School Wellness Council, parent organizations, or other concrete examples.
22. Do parents in our school help plan, implement and participate in nutrition education programs and promotions that focus on fruit and vegetable consumption?
23. Do students, parents, and/or school staff work with community businesses, such as corner stores, grocery stores, fast food places, and restaurants, to promote fruit and vegetable consumption in a way that is integrated with school activities?
24. Have teacher and child nutrition program staff attended training sessions that promote fruit and vegetable consumption?
25. Does your school have administrative support and worksite healthy eating guidelines for staff training, employee events, meetings, and work environment?

Appendix E: Number of Fast Food Restaurants within 0.5 miles of Selected Schools

School District	Name of School	# Fast Food Restaurants within 0.5 miles	School District	Name of School	# Fast Food Restaurants within 0.5 miles
ABC USD	Melbourne	8	Mt. Diablo USD	Glenbrook Middle	1
Monrovia USD	Monroe Elementary	18	Mt. Diablo USD	Holbrook Elementary	1
Monrovia USD	Wild Rose Elementary	6	Mt. Diablo USD	Meadow Homes Elementary	1
El Monte CSD	Durfee	1	Mt. Diablo USD	Oak Grove Middle	1
E LA Coll	Joseph Gascon	8	Mt. Diablo USD	Rio Vista Elementary	0
E LA Coll	La Merced	1	Mt. Diablo USD	Riverview Middle	0
E LA Coll	Sheridan Street	11	Mt. Diablo USD	Shore Acres Elementary	0
E LA Coll	South Ranchito	10	Mt. Diablo USD	Sun Terrace Elementary	1
E LA Coll	Wilcox	3	Mt. Diablo USD	Wren Elementary	1
Hawthorne SD	Eucalyptus	5	Mt. Diablo USD	Ygnacio Valley Elementary	3
Hawthorne SD	Jefferson	8	Newport Mesa USD	Paularino Elementary	5
Hawthorne SD	Ramona	3	OCSS Coalition	El Cerrito	5
Hawthorne SD	York	4	OCSS Coalition	Ladera Plama	0
LA COE	Bennett Kew	4	OCSS Coalition	Las Lomas	2
LA COE	McKinley	11	Pasadena USD	Blair High	2
LA COE	Roosevelt Elementary	6	Pasadena USD	Marshall	5
LA COE	Rorimer	0	Santa Ana USD	Esqueda	5
LA COE	Vilacorta	1	Santa Ana USD	Franklin	5
LA COE	Woodworth	8	Santa Ana USD	Madison	6
LA COE	Worthington	3	Santa Ana USD	Romero-Cruz	11
Long Beach USD	King Elementary	1	Santa Ana USD	Roosevelt Elementary	8
Monterey CDPH	Echo Valley	0	Turlare COE	Castle Rock	1
Monterey CDPH	Elkhorn Elementary	0	Turlare COE	Santa Fe	2
Mt. Diablo USD	Bel Air Elementary	4	Turlare COE	Westfield	1
Mt. Diablo USD	Cambridge Elementary	7	Ukiah USD	Redwood Elementary	0
Mt. Diablo USD	Delta View Elementary	0	Ventura USD	Citrus Glen Elementary	2
Mt. Diablo USD	El Dorado	2	Ventura	E.P. Foster	3

