### Average Increase in Fruit and Vegetable Servings Chosen by Selected School Types

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*Daily means of fruit and vegetable servings per student.

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**Summary**

The first year of the pilot proved successful, with an increase in fruit and vegetable consumption ranging from 9% to 31% in the schools studied. It was also found that the more programming implemented in schools, especially at the elementary level, the more fruits and vegetables consumed by students. The second year of the pilot has expanded to include six additional school districts with the intent for all participating schools to test the models developed in the first year. Once the models have been revised and refined, the guidebook will be ready for dissemination nationwide.

**About PBH and 5 A Day**

Produce for Better Health Foundation is a non-profit organization whose mission is to be the catalyst for creating a healthier America through increased consumption of a variety of fruits and vegetables. The Foundation is a member of the National 5 A Day Partnership, consisting of government agencies, non-profit organizations, and industry working in collaboration to expand 5 A Day efforts to increase consumption of fruits and vegetables for improved public health. The 5 A Day for Better Health program is the nation’s largest public-private nutrition education initiative with 5 A Day coordinators in each state, territory and the military.

**CONTACT:** For more information about PBH and the 5 A Day Color Way program, visit [www.5aday.org](http://www.5aday.org) or call PBH’s Foodservice Department at 302-235-ADAY (2329).

Produce for Better Health Foundation, 5341 Limestone Road, Wilmington, DE 19808
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**REFERENCES**


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**Overview**

**FUNDING AND SPONSORSHIP**

This project is coordinated by Produce for Better Health Foundation through a grant from the Florida Department of Agriculture and Consumer Services. The grant funds were used to develop promotional and curriculum materials and to provide technical assistance to the schools. Participating school districts received a designated amount of 5 A Day The Color Way materials to help launch their project.

**BACKGROUND**

*The Eat Your Colors Every Day Salad Bar and Salad Options Project* was designed to increase student consumption of fresh produce, particularly Florida grown crops, by implementing, enhancing, and expanding Salad Bars and a variety of Salad Options in schools.

Thousands of Florida school children are eating more fruits and vegetables because of a project that began in 12 schools in 4 school districts in Florida in September 2002. In September 2003, the project was expanded to 6 additional school districts in Florida, with 2 schools participating per district. Additionally, 3 states, Kansas, Oregon and South Carolina, are involved in the expansion of the pilot for the 2003-04 school year.

**OBJECTIVES**

- Increase students' consumption of fruits and vegetables.
- Develop and test foodservice, promotion, and nutrition education models.
- Disseminate the tested models to schools nationwide for their use in the 2004-05 School Year.

**The pilot included:**

- Changes in school foodservice operations
- Promotions and marketing
- Nutrition education activities

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**REFERENCE**

- Children’s mean daily intake of fruit is 1.4 servings.¹
- Children’s mean intake of vegetables is 2.6 servings.¹
- The prevalence of overweight children has doubled in the last two decades and the prevalence of overweight adolescents has tripled over the same time period.¹
- Only 20% of students have access to a salad bar on a typical school day.¹
- Only 21% of schools offer a salad bar at least once a week.¹

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*Only 14% of school-aged children met the target of 2 servings of fruit daily.¹*
*Only 17% met the target of 3 servings of vegetables a day.¹*
The researchers collected baseline data in phase one of the study during September 2002. They conducted phase two of the study in March 2003. Researchers measured the difference in consumption by comparing September 2002, before any interventions to March 2003 after 6 months of a variety of low-intensity interventions. Weighed and visual plate waste methods were used. Recipes for Practical Research published by the National Food Service Management Institute was the source for the forms and procedures used by the researchers.

Plate Waste Results
Researchers reported an increase of fruit and vegetable consumption that ranged from 9% to 31% in the schools studied. Additionally, they reported that four schools showed an improvement in the percentage of students eating more than 50% of their fruits and vegetables following the interventions. One school increased in the “100% consumed” category by 26% and two other schools by 12%.

Interventions Results
Researchers report statistically significant increases in fruit and vegetable servings in elementary schools and in schools with a high percent of free and reduced price students. Elementary schools showed an average mean increase of 0.14 servings, and low-income schools showed an increase of 0.2 servings of fruits and vegetables. Additionally, researchers report about a 10% overall increase in fruit and vegetable consumption.

Programming Proves Important
Researchers concluded that programming can increase numerically the number of fruit and vegetable servings chosen by students by as much as half a serving with an average across all schools of 0.14 serving. They also found that the depth and intensity of programming correlates positively with an increase in fruit and vegetable servings; the more activities conducted, the greater the fruit and vegetable servings. Programming seems to have more of an effect on the increase of fruit and vegetable servings chosen by students in schools with a high percent of free and reduced price lunch program participants.

Other Key Findings
Programming is effective across all grade levels. It seems to be more effective at the elementary school level, from a perspective of statistical significance. From a percentage standpoint, the gain was actually bigger in the high schools, 15.9% versus 9.7% for elementary schools. Unique interventions could not be identified that would clearly explain the significant post-intervention data in some districts, grade levels, or populations receiving the free or reduced price lunches. All districts reported a variety of interventions, most of low intensity and not based on structured, sustained or daily activities. The classroom component was minimal, so any increase in fruit and vegetable servings may not have been caused by the classroom component.
### MODELS DEVELOPED

Based on the efforts of the 12 schools in the 4, first-year pilot districts, the models listed below were developed and are being field tested in additional schools and districts during the current 2003-04 school year.

The models include:

- **Foodservice**
  - Build Your Own Salad
  - Improving Food Quality
  - Increasing Variety of Fruits and Vegetables
  - Pre-plated Entrée Salads
  - Pre-plated Side Salads and Fruit and Veggie Combos
  - Salad Bar

- **Promotion**
  - Launch Event
  - Student Taste Tests
  - 5 A Day The Color Way School Foodservice Promotion Book

- **Nutrition Education**
  - Health Fair
  - There’s A Rainbow On My Plate

- **SUPPORT MATERIALS DEVELOPED**

Promotional materials include a series of student-tested posters, table tents, bookmarks, book covers, static clings, signage, and other items featuring 5 A Day The Color Way theme and key messages.

### Evaluation

**The Eat Your Colors Every Day Salad Bar and Salad Options Project** had two evaluation components funded by the National Cancer Institute. The first evaluation consisted of a Plate Waste Study conducted by Nutri-Tech in 8 randomly selected participating middle and elementary schools. The second component featured an overall Project Intervention Evaluation conducted by faculty and staff in the Nutrition, Food and Exercise Sciences Department and the Office of Research at Florida State University that looked primarily at production records and demographics in all 12 project schools.

### PLATE WASTE STUDY

**Objective**

The purpose of the study was to determine the plate waste and consumption of fruits and vegetables by middle and elementary school students before and after foodservice, nutrition education, and promotion interventions.

**Methodology**

The researchers collected baseline data in phase one of the study during September 2002. They conducted phase two of the study in March 2003. Researchers measured the difference in consumption by comparing September 2002, before any interventions to March 2003 after 6 months of a variety of low-intensity interventions. Weighed and visual plate waste methods were used. Recipes for Practical Research published by the National Food Service Management Institute was the source for the forms and procedures used by the researchers.

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### PROJECT INTERVENTION EVALUATION

**Objective**

The purpose of the overall Project Intervention Evaluation was to determine if interventions significantly increased student consumption of fruits and vegetables.

**Methodology**

The researchers established baseline data by comparing September 2001 to 2002, September 2001 to March 2002, and October 2001 to March 2002. They then compared this baseline data to the post intervention periods of October 2002 and March 2003. They used production records, itemization reports, demographic data, and an intervention strategies checklist. Researchers conducted their analysis using the Statistical Methodology Program, Minitab. The data entered for analysis were the total number of fruit and vegetable servings chosen each day (prepared - leftover servings) divided by the number of students participating at each school during each lunch period. All data were analyzed using either a paired samples t-test or a two-sample t-test. Significant differences were assumed at a p-value of <0.05.

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### PRODUCE FOR BETTER HEALTH FOUNDATION PRESENTS

**“Eat Your Colors Every Day Salad Bar and Salad Options Project” in Florida Schools**

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