

PBH's Fruit and Vegetable Research Priorities

Below is a list of possible research topics developed by the Produce for Better Health Foundation (PBH) in the area of fruit and vegetable research. We hope that researchers at various agencies and organizations will consider these research priorities as they develop their research agendas for the coming years.

Note about recommendations: the term “fruits and vegetables” used throughout this document refers to a variety of fruit and vegetable products including fresh, canned, frozen, naturally dried and 100% juices.

USDA's Expanded Food and Nutrition Education Program (EFNEP)

The Cooperative State Research, Education, and Extension Service's (CSREES) EFNEP is a program operated in all 50 states and some territories. It is designed to assist limited resource audiences in acquiring the knowledge, skills, attitudes, and changed behavior necessary for nutritionally sound diets, and to contribute to their personal development and the improvement of the total family diet and nutritional well-being. For many years, EFNEP has shown large increases in fruit and vegetable consumption by low-income families, most of who are receiving federal food assistance. Given the success of the program in increasing fruit and vegetable intake among program participants, we urge you to consider the following research priorities:

- How does EFNEP impact health, for example, achieving healthy weight, reduction in blood pressure, and cholesterol, improvements in overall diet quality, etc?
- To provide additional validation of the food recall method used in EFNEP, investigate whether this method can be verified using changes in biological markers, such as serum carotinoid levels.
- Given the success of the EFNEP program in increasing fruit and vegetable intake among program participants, can the EFNEP model be replicated in other nutrition assistance arenas? If so, what would the cost of such an effort be? What would the health benefits be, for example, achieving healthy weight, reduction in blood pressure, and cholesterol, improvements in overall diet quality, etc.
- What is the impact/value of out-of-school complementary programs to reinforce the changes that are occurring in the school environment? For example, what effect does an after school 4-H program that emphasizes fruits and vegetable have on reinforcing other efforts within the school environment?
- While not specific to EFNEP, research initiatives that look at “Return On Investment” (ROI) questions are critical to helping understand the impact of nutrition assistance programs, and more specifically, fruit and vegetable intake, on health care costs. These ROI studies can be done on a variety of USDA nutrition assistance programs with an emphasis on fruits and vegetables. For example, if people eat more fruits and vegetables, how does this change health care costs?

Promotion of Healthy Diets in the School Setting: School Based Efforts to Promote Fruits and Vegetables

Preliminary data from California and Florida has shown that student access to salad bars as part of a comprehensive program involving classroom, staff and community elements improves consumption of fruits and vegetables and has led to improved perception of the school meals program among students, parents and school staff. In addition, other creative ways to market and promote fruits and vegetables, such as farmers markets, pre-packaged salads, salads in a cup, exotic fruit cups, etc. are gaining in popularity, both in the retail setting as well as in schools. In order to better understand the impact that salad/garden bars, farmers markets, and other fruit and vegetable promotion efforts have on the overall school meals program, as well on student health, we urge you to consider the following research priorities:

- What is the impact of access to garden/salad bars, farmers markets or other marketing/promotion efforts for fruits and vegetables on student intake of fruits and vegetables both in the school setting as well as throughout the entire day?
- Does access to garden/salad bars, farmers markets or other innovative fruit/vegetable offerings in schools impact consumption of fruits and vegetables outside of the school setting? For example, are they only eating fruits and vegetables at school but not at home; or do they eat more at home because they have been exposed to them at school?
- What is the impact on eating patterns of family members when students are exposed to garden/salad bars, farmers markets or other marketing/promotion efforts for fruits and vegetables at schools? For example, does access to them at school lead to increased or decreased consumption or purchases of fruits and vegetables in the home?
- How much does it cost, per student, to operate a garden/salad bars, farmers markets or other marketing/promotion efforts for fruits and vegetables? How can such efforts be instituted in a cost-effective way?
- Do students who use the garden/salad bar, farmers markets or other marketing/promotion efforts for fruits and vegetables also have better eating and exercise habits across the board than those who do not use the bar? For example, do high users also consume less fat/sat fat, eat more whole grains, are they more physically active? Can fruit/vegetable consumption at school serve as a marker for healthier diets across the day?
- Are there significant plate waste, supervision costs, extra time in school day, or cleanup issues related to garden/salad bars or other marketing/promotion efforts for fruits and vegetables in schools?
- What is the impact of in-school promotion of the garden/salad bar, farmers markets or other marketing/promotion efforts for fruits and vegetables on student consumption of fruits and vegetables? For example, what are effective education and promotion efforts that result in greater consumption of fruits and vegetables?

- Is there a difference in consumption rates among schools? For example, are salad/garden bars or other marketing/promotion efforts for fruits and vegetables more/less popular in elementary, middle or high schools, urban, suburban, rural, large schools, smaller schools?
- Is there a difference in consumption rates among various groups? For example, are salad/garden bars, farmers markets or other promotional efforts more or less appealing to low income students, African Americans, Hispanics, Asians, Whites, etc.? Are there differences in consumption among ages of students? Does participation increase among (a) paying students, (b) F/RP students, and (c) staff.
- Are there increases in fruit and vegetable intake in other school venues? For example, are there increases in participation with the traditional school lunch, school breakfast, after-school snack programs? What influence does increased intake of fruit and vegetable have on intake of competitive foods, including vending choices?
- What is the impact on perception of the school nutrition programs in schools with garden/salad bars, farmers markets or other marketing/promotion efforts for fruits and vegetables among school staff and parents as compared to schools without such innovative efforts?
- What is the impact on consumption of fruits and vegetables in schools with an active 5 A Day for better health program/initiative? What are the key components of effective programs that increase consumption?

General Marketing and Promotion

Schools have developed other innovative ways to promote fruits and vegetables and we urge you to consider the following research priorities:

- What effective marketing and promotion strategies have been used in schools to promote fruits and vegetables? For example, what are effective nutrition education strategies in the classroom coupled with merchandising, pricing or promotion, such as a taste testing in the cafeteria; are there exceptionally appealing ways to promote/display; are there exceptionally appealing ways to display fruits and vegetables; does placement of the fruits and vegetables on the line matter – beginning of line or end of line?
- What are the relative importance of various barriers to promoting fruits and vegetables across the board (salad/garden bars or just offering more fruits and vegetables in general)? For example, to what degree is cost or year round availability a factor, what role do purchasing, delivery, storage and labor costs for preparation play in the overall operation of fruit and vegetable offerings at school; is food safety perceived as an issue; are students more hesitant to select from a salad bar than choosing a pre-packaged item?
- Are there vending options available for fruits and vegetables as there are for sodas, salty and high fat/sugar snacks, and dairy products? What impact do they have on overall intake of fruits and vegetables in schools?

- What are keys to effective marketing and promotion that help reduce plate waste? A recent report from ERS (*Plate Waste in School Nutrition Programs*, March 2002) estimated that approximately 12% of calories from food served to students in the National School Lunch Program go uneaten, with a sizable portion of this waste attributed to vegetables and fruits. What are successful efforts in schools to reduce plate waste especially in the fruit and vegetable category, and therefore better target federal funds and promote health?

Child and Adult Care Food Programs Fruit and Vegetable Efforts

CACFP programs may provide a unique opportunity to expose young children to healthy food choices, such as fruits and vegetables that may set the stage for the development of lifelong healthy habits. In order to better understand the impact of fruit and vegetable exposure in the CACFP setting, we urge you to consider the following research priorities:

- Do young children who are exposed to and consume a wide variety of fruits and vegetables as part of a comprehensive effort (that includes childcare staff and parents) in the childcare setting continue to consume fruits and vegetables in elementary school?
- Does increased consumption of fruits and vegetables in the childcare setting impact consumption in the non-child care setting?
- What is the effect of fruit and vegetable focused nutrition education/promotion efforts on fruit and vegetable intake in the CACFP setting?

After School Snack Fruit and Vegetable Efforts

The After School Snack program offers children with a healthy snack in an after school setting for which there is an educational component. In order to better understand the impact of fruit and vegetable exposure in the after school setting, we urge you to consider the following research priorities:

- How often are fruits and/or vegetables offered as part of the after school snack program? What options are more popular? How are they being offered (fresh, canned, dried, etc.)?
- Is consumption of fruits and vegetables greater in programs that offer fruits and vegetables often?
- Does consumption of fruits and vegetables in the after school setting impact consumption in overall diet?
- How much would it cost to provide a serving of fruit or vegetable along with the other required food items for the snack? What would be the benefits of such a funding outlay in terms of healthier eating habits; better health indices (weight, cholesterol, blood pressure)?

Food Stamp Nutrition Education and Promotion of Fruits and Vegetables

The goal of the Food Stamp Nutrition Education Program is to provide educational programs that increase the likelihood of food stamp recipients making healthy food choices consistent

with the most recent dietary advice as reflected in the Dietary Guidelines for Americans and the Food Guide Pyramid. Via the Food Stamp Nutrition Education Program Guidance for 2003, the Food and Nutrition Service specifically encourages State agencies to particularly focus on the following core messages through the Food Stamp Program and other FNS programs, as these messages are essential for advancing the FNS strategic nutrition education goal and objectives as well as current national nutrition issues:

- increase intake of fruits, vegetables and whole grains*
- eat lower fat foods more often*
- be physically active and maintain a healthy weight*

Given the increased emphasis on fruits and vegetable in the food stamp program, we urge you to consider the following research priorities:

- Food Stamp Incentive Coupon Program: Conduct pilot tests using coupons given at supermarket checkout (such as Catalina) for free or price-off next produce purchase if recipients have just purchased a certain amount of fruits and/or vegetables with their EBT card. Coupon redemption cost would be paid by USDA food stamp program.
- Food Stamp Bonus Value: Pilot test a program that credits an EBT account for future EBT produce purchases as a way to give an incentive to encourage food stamp recipients to purchase more produce.
- For those that chose fruit and vegetable promotion as a goal, what are effective state-based nutrition education efforts that have resulted in increased purchases of fruit and vegetables among food stamp recipients? Examine new efforts being undertaken by public/private partnerships associated with the National 5 A Day Program.
- What statewide efforts have resulted in overall diet quality improvements?
- What are perceived and real barriers, among food stamp participants, to purchasing fruits and vegetables via coupons or EBT? For example, how much of a barrier is access to a variety of products, seasonality, preparation, cost, etc.?
- Examine the impact of the transition between script and EBT on the redemption of Food Stamps at farmers' markets that serve low-income communities, including the effect of EBT on low income/small scale/ethnic farmers. What are successful models on methods used to redeem script and/or use EBT for farmers' markets, co-ops, buying clubs and other community-based food security/fruit and vegetable marketing programs?

Fruit and Vegetable Efforts in the Special Supplemental Nutrition Program for Women, Infants and Children

The goal of the WIC program is to improve the health of low-income pregnant, breastfeeding and non-breastfeeding postpartum women, and infants and children up to 5 years old. WIC provides supplemental foods, nutrition education, and access to health services. WIC nutrition education efforts provide an excellent opportunity to encourage increased consumption of fruits and vegetables. USDA is in the process of developing proposed regulations that would enhance the WIC food package to include more green leafy

vegetables and fruit. Given the increased emphasis on fruits and vegetable in the WIC program, we urge you to consider the following research priorities:

- Study the nutritional/cost/satisfaction/behavioral impact of allowing states flexibility in WIC food package decisions within certain categories, like fruits and vegetables.
- Study the effect of encouraging state WIC programs to introduce systems, policies and environmental changes that promote fruit and vegetable intake by participating retailers. For example, study the impact and outcomes of requiring WIC-certified stores to offer certain amounts, types or quality of fruits and vegetables.
- Assess the impact of various WIC nutrition education programs that promote fruit and vegetable intake, like the Iowa WIC Program that is using a multi-faceted and client-focused nutrition education effort to increase vegetable intake among 2-5 year old WIC participants. For example, assess the impact in overall diet quality and fruit and vegetable intake among participants involved in fruit and vegetable based programs, versus those who are not. Determine whether the program has more impact on women or their children.
- Study the benefits on clients, farmers' markets and WIC programs of allowing Food Stamp clients to purchase WIC farmers' market coupons at WIC clinics using their EBT cards.