

Background

The Fresh Fruit and Vegetable Program (FFVP) aims to increase fruit and vegetable consumption among students in the Nation's poorest elementary schools by providing free fresh fruits and vegetables to students outside of regular school meals. FFVP began as a pilot program in 2002 and was converted into a nationwide program in the Food, Conservation, and Energy Act of 2008, also known as the Farm Bill (PL 110-234).¹

FFVP funds are allocated at a level of \$50 to \$75 per student per school year, or between \$1 and \$2 per week "to schools with the highest percentages of low-income students, to the maximum extent practicable" (PL 110-234). Initial funding was \$40 million for the 2008–2009 school year, rising to \$65 million, \$101 million, and \$150 million in the following three school years, allowing more schools to participate in each year. Funding is to continue at \$150 million thereafter (indexed for inflation).

The 2008 Farm Bill also required the Secretary of Agriculture to conduct an evaluation of the program in order to determine "*whether children experienced, as a result of participating in the program—*

- (A) *increased consumption of fruits and vegetables;*
- (B) *other dietary changes, such as decreased consumption of less nutritious foods; and*
- (C) *such other outcomes as are considered appropriate by the Secretary.*"

The results presented in this interim report, for the 2010-2011 school year, focus on the total quantity

of fruits and vegetables consumed and total energy intake (also referred to as total caloric intake), allowing the assessment of whether any additional fruit and vegetable consumption was in addition to or in place of other foods consumed.

Methods

This evaluation estimates the impact of FFVP using regression discontinuity (RD), which is considered the strongest possible design when random assignment is not feasible. The RD approach leverages the procedure by which schools are assigned to participate in FFVP. Specifically, the FFVP legislation and FNS guidance require that available FFVP funding be allocated to the poorest schools in each State that applied for the program, where poverty is defined by the percent of students eligible for free or reduced-price school lunch (FRPSL) in the previous school year. The RD design estimates impacts by comparing schools immediately above and below the funding cutoffs in each of a nationally representative sample of States.

The final preferred analytic sample included 4,696 students in 214 schools within 2.5 percentage points of the funding cutoff in each State: 2,225 students in 99 FFVP schools just above the funding cutoff, and 2,471 students in 115 non-FFVP schools just below the funding cutoff.

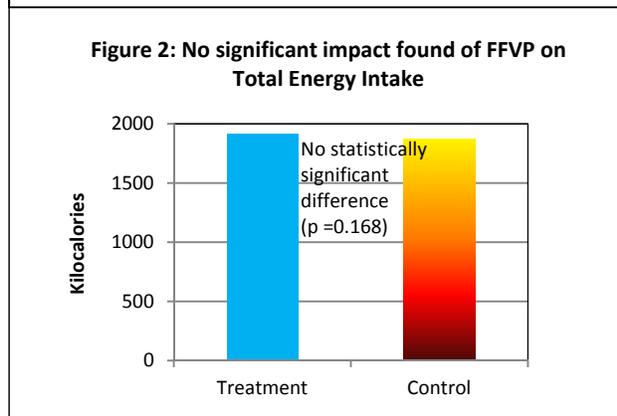
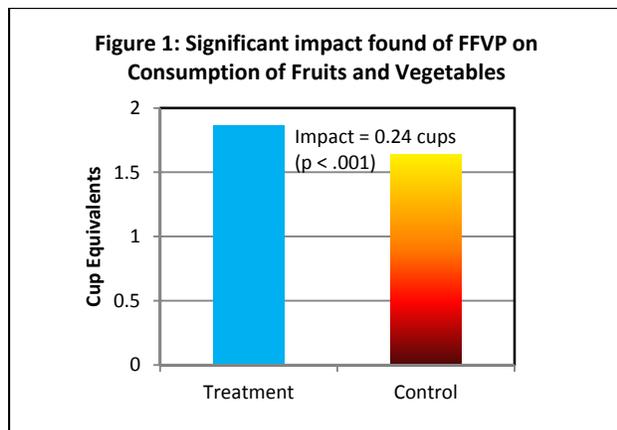
The study collected information on student food intake using diary-assisted 24-hour recall interviews, which have been successfully used with elementary school aged children. In FFVP schools, the diary was completed on a day on which FFVP fruits and/or vegetables were offered to students, allowing us to estimate the impact of FFVP on intake on FFVP days.

Findings

The results indicate that FFVP increased average fruit and vegetable consumption among students in participating schools on FFVP days by

¹ The Food, Conservation, and Energy Act of 2008 amended the Richard B. Russell National School Lunch Act (NSLA). FFVP is described in Section 19 of the amended NSLA.

approximately one-quarter of a cup per day ($p < 0.001$). This represents an increase of 15 percent over fruit and vegetable consumption levels in the absence of FFVP. No increase in total energy intake was found (see Figures 1 and 2). If an increase in total energy (caloric) intake had been found, we might have been concerned that FFVP could contribute to weight gain. Instead, increased fruit and vegetable consumption appears to have replaced consumption of other foods.



Conclusion

An increase in fruit and vegetable consumption of one-quarter of a cup per day is within the range observed in various other interventions to increase fruit and vegetable consumption in school children. Although there is no standard consensus as to what constitutes a meaningful change in fruit and vegetable intake, it is generally accepted that children with the lowest intakes are at greatest risk of poor health outcomes, and that the greatest benefit would be conferred by increasing intakes of fruits and vegetables among this group.

In this context, the fact that FFVP targets poorer schools is potentially significant. Because children in low socio-economic status households are more likely to have the lowest intakes of fruits and vegetables (Dubowitz et al., 2008²), increasing fruit and vegetable intakes in this population even by small amounts is likely to confer a health benefit.

The final evaluation report will expand on this interim report by including impacts for additional outcomes and by including detailed information on how FFVP was implemented in a nationally representative sample of schools.

Reference

USDA, FNS, Office of Research and Analysis, *Evaluation of the Fresh Fruit and Vegetable Program (FFVP): Interim Evaluation Report*, by Lauren Olsho, Jacob Klerman, and Susan Bartlett, Abt Associates. Project Officer: Karen Castellanos-Brown, Alexandria, VA: 2011.

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² Dubowitz, M. et al. (2008). Neighborhood socioeconomic status and fruit and vegetable intake among whites, blacks, and Mexican Americans in the United States. *American Journal of Clinical Nutrition*, 87(6), 1883-1891.