

# Tracking the Use of Free Produce Coupons Given to Families and the Impact on Children's Consumption

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## ABSTRACT

**Background:** American children typically eat fewer fruits and vegetables than recommended by guidelines. This study examines whether free coupons can increase children's fruit and vegetable intake at home.

**Methods:** Families of the participating students received weekly coupons for fresh fruits and vegetables over a 1-month period. Pretest and posttest surveys were conducted to measure change in consumption. Each survey consisted of 3 consecutive days of self-reported dietary recall of each student's fruit and vegetable intake for dinner.

**Results:** Coupon redemption across the 4-week study was 27.3%. There was evidence of increased vegetable consumption, but not fruit consumption.

**Conclusions:** We identified successes and challenges that can guide practitioners, policymakers, and other academic researchers in future endeavors to meet this goal.

## INTRODUCTION

Poor nutrition in children contributes to childhood obesity persisting into adulthood and is correlated with increased risks for costly chronic diseases.<sup>1</sup> American children typically eat fewer fruits and vegetables than recommended by the United States Department of Agriculture guidelines.<sup>2</sup> In particular, low fruit and vegetable intake and high obesity rates are significant among low-income households.<sup>3</sup> Thus, the challenge is to find strategies to increase children's fruit and vegetable consumption to promote healthier outcomes, especially for families of lower socioeconomic status.

Many school-based interventions have attempted to increase

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children's fruit and vegetable intake using a variety of methods during school lunch and snack periods.<sup>4</sup> Results have generally found modest positive effects on children's fruit and vegetable consumption at school. However, many children, especially in low-income families, have limited access to fruits and vegetables at home.<sup>5</sup> Studies also have shown that coupons, vouchers, and price discounts positively impact fruit and vegetable consumption.<sup>6</sup>

The objective of this study was to evaluate an intervention to increase children's fruit and vegetable intake at home by increasing access to these items through free coupons. We addressed 2 primary research questions: (1) At what rate were the free coupons redeemed by families over the study period; (2) Did fruit and vegetable consumption increase for children in families that redeemed most of their free coupons?

## METHODS

### Participants

Six classrooms of fourth grade students, three each in 2 Wisconsin elementary schools participated in this study (N=121). Overall, 60% and 75% of students were eligible for free/reduced-price school meals in Schools 1 and 2, respectively. Table 1 presents demographic information for the sample. Parents received a letter notifying them of the study and asking them to return the signed letter only if they did not want their child to participate. Participation was extremely high with only 2 students opting out. Seven area grocery stores also participated by agreeing to accept the coupons.

### Materials and Procedure

**Coupons**—The family of each student received 4 sets of coupons

each containing fifteen \$1 coupons valid for 1 week, giving every family \$15 each week for a total opportunity of \$60 to spend on fresh fruits and vegetables. Figure 1 presents an example of the coupons used in this study.

All coupons were mailed to the families along with instructions on when, how, and where to use the coupons. The coupons were redeemable only for fresh fruits and vegetables because of the added health benefits compared to canned/frozen items. Parents also received information regarding the benefits of eating fresh fruits and vegetables, including recipes to prepare fresh produce.

*Procedure*—We conducted training meetings with each of the 7 stores to design the coupons and arrange for accepting the coupons at the point of sale. Prior to coupon distribution we administered a pretest survey, followed by 2 posttest surveys given during the second and fourth weeks. Each of these surveys included dietary recall used to calculate average fruit and vegetable intake across 3 days. All surveys were conducted on Tuesday, Wednesday, and Thursday with students recalling what they had eaten on Monday, Tuesday, and Wednesday. Each family/child was assigned an identification number, which was printed on every coupon and on each student’s surveys so each child’s fruit and vegetable consumption could be matched with their family’s redeemed coupons.

*Measurement*—We collected self-reported consumption of the students using the “A Day in the Life Questionnaire” (DILQ). The DILQ has been validated for measuring incidences of fruit and vegetable intake for elementary school age children.<sup>7</sup> We used 1 question from the DILQ, asking children to recall what they ate for dinner. It is important to note that the DILQ gives only the frequency that fruits and vegetables were consumed, and does not assess the serving size or exact amount eaten.

All materials and procedures used in this study were approved by the University of Wisconsin-Eau Claire Institutional Review Board and the principals of both participating elementary schools.

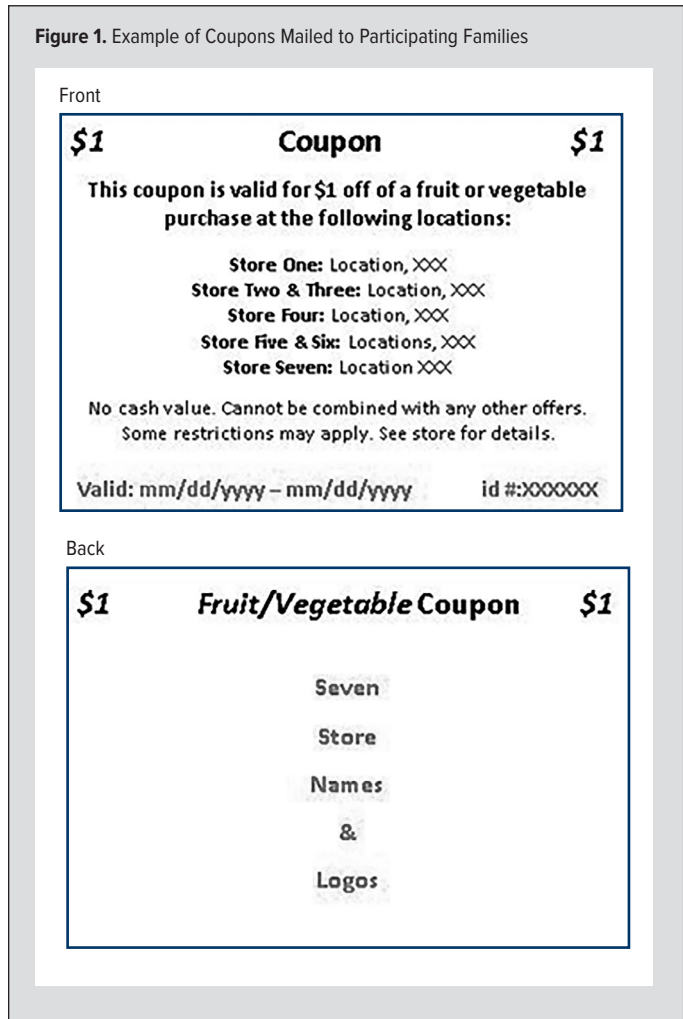
## RESULTS

### Coupon Redemption

Out of 7,260 coupons, 1,981 were used for a redemption rate of 27.3%. Figure 2 presents the distribution of total coupons redeemed by families over the 4-week period. The families of 67 students (55.3%) redeemed zero coupons, while 24 families (19.8%) redeemed half or less of their coupons. Only 18 families (14.9%) redeemed more than \$50 worth of coupons. On the positive side, almost \$2,000 of fruits and vegetables were purchased by families, but this also means that nearly \$5,300 of free fruits and vegetables were never purchased. Weekly coupon redemption rates were relatively consistent between 25% to 30% over the 4 weeks of study.

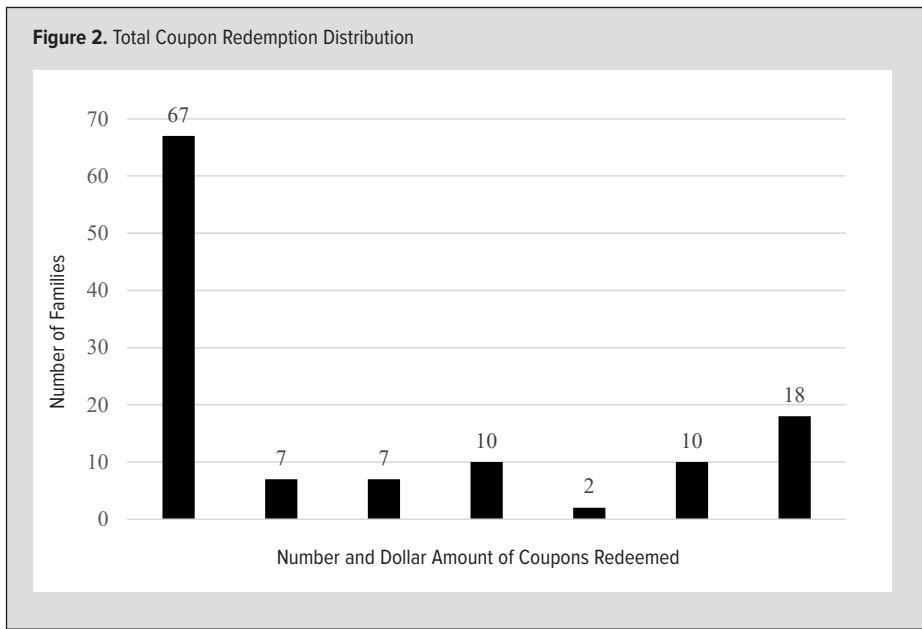
**Table 1.** Demographic Information

Race/Ethnicity	%
White	64.5
African American	6.6
Asian	20.7
Hispanic/Latino	5.8
American Indian	2.5
Sex	%
Male	41.3
Female	58.7



### Fruit and Vegetable Intake

We compared pretest consumption to posttest consumption in weeks 2 and 4 respectively among children whose families redeemed most of the coupons (redeemers) compared to those who did not redeem any coupons (non-redeemers). Subjects were classified as “redeemers” if their family redeemed at least \$14 of coupons during either week 2 or 4 during the study (N=9). These families also tended to have consistent pattern of coupon redemption. Children were classified as non-redeemers if their family did



**Table 2. Fruit and Vegetable Consumption**

		Pretest		Posttest 1 (Week 2)		Posttest 2 (Week 4)	
		Mean	SD	Mean	SD	Mean	SD
Fruit intake	Redeemer	0.171	0.31	0.150	0.27	0.188	0.26
	Non-Redeemer	0.113	0.24	0.092	0.21	0.079	0.25
Vegetable intake	Redeemer	0.171	0.27	0.154	0.24	0.239	0.25
	Non-Redeemer	0.263	0.38	0.189	0.28	0.139	0.27

not redeem any coupons during the 4 weeks (N=67). We did not include children whose families had a random pattern of coupon redemption (some weeks high or low) in the analysis. The sample for these comparisons was restricted to only those students who were present for all 6 survey days.

**Fruit Intake**

The results were analyzed using a two-way 2 (redeemer vs non-redeemer) x 3 (pretest vs posttest 1 vs posttest 2) mixed design ANOVA with repeated measures on the consumption. There was a significant main effect of coupon redemption on fruit intake,  $F(1, 102)=3.85, P=.05$ . In general, children whose families redeemed coupons showed higher pretest fruit intake (mean=.171) than the non-redeemers (mean=.113). There was no significant change in fruit consumption among redeemers; non-redeemers showed a slight decline in their fruit intake but the difference was not significant (see Table 2).

**Vegetable Intake**

Vegetable intake results displayed a significant interaction between coupon redemption and the test period,  $F(2, 206)=4.71, P<.05$ . This indicates the change in vegetable consumption among

coupon redeemers and non-redeemers. Contrast analysis revealed a significant interaction when comparing pretest and posttest 2 to coupon redemption,  $F(1, 103)=6.76, P<.01$ . The interaction showed that coupon redeemers consumed fewer vegetables than non-redeemers during the pretest period. However, coupon redeemers increased their vegetable intake after 4 weeks, whereas non-redeemers decreased their vegetable intake after 4 weeks suggesting that coupon redemption helps increase vegetable consumption among children (see Table 2).

**DISCUSSION**

This study assessed whether Wisconsin families would use free coupons to purchase fresh fruits and vegetables, and whether children in families that redeemed their coupons would increase their fruit and vegetable consumption. Despite relatively low coupon redemption rates (25%), for children whose families redeemed at least \$14 of their \$15 of coupons during the weeks of measurement, there was evidence of increased vegetable consumption, but not fruit consumption. For fruit consumption, the redeemers generally con-

sumed more fruit than the non-redeemers. However, free coupons did not change the amount of fruit intake.

This study has several strengths that should be highlighted. First, the sample included 2 separate comparison groups (redeemers and non-redeemers) arising through differences in coupon use across families. Second, our design consisted of pre/post comparisons of consumption across these 2 groups with consumption measured as a 3-day average. Additionally, the children included in this study were largely from families of lower socioeconomic status and thus they represent a high-need group.

Additionally, recent changes to include fruits and vegetables in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) food package were designed to help families meet recommended dietary intake<sup>8</sup> and there have also been calls to reform Supplemental Nutrition Assistance Program (SNAP) targeting healthy purchases including fruits and vegetables.<sup>9</sup> More investigation is needed on these topics; thus, this research has applications for both the WIC and SNAP programs.

**Limitations**

This study has several limitations that should be addressed in future research. The small sample size combined with a low cou-

pon redemption rate and relatively short period of study limited the power of statistical tests of the program effect. The low coupon redemption rate could be due to misunderstanding of coupon instructions, lack of knowledge/experience in buying fresh fruit and vegetables, a mismatch between coupon validity dates, or shopping patterns. Also, our consumption measure over 3 days for only dinner was not ideal, as it was possible the purchased fruits and vegetables were eaten at times other than dinner, eaten by other family members, or not eaten at all.

Future research should include all area grocery stores, including smaller stores and larger chains and use a debit card to improve redemption rates. A more effective consumption measure is also needed, possibly involving parental documentation. Additional research could also include parent follow-up surveys/focus groups to better assess factors influencing coupon redemption rates and to better understand existing barriers to increasing children's fruit and vegetable consumption.<sup>10</sup>

Despite these limitations, the project was successful. In 1 month, nearly \$2,000 of fresh fruits and vegetables were purchased using free coupons, and vegetable consumption for dinner among children whose families used the majority of their coupons increased.

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