INTERVENTION TABLE 3

Government Nutrition Assistance Programs

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
United States						
Herman, Harrison (2008); Herman, Harrison (2006) California	Subsidies to the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) in the form of vouchers for purchase of fruits & vegetables (F&V) ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* Not reported *Complex:* Not reported	***DESIGN:*** Non-randomized trial ***DURATION:*** 8 months with follow up 6 months post-intervention ***SAMPLE SIZE:*** 451 women enrolled at three Los Angeles WIC Centers [Site 1=168, Site 2=140, Site 3=143 (control)] ***PRIMARY OUTCOME:*** Dietary consumption ***MEASURES:*** 1. Interviews with participants (demographics; participation in assistance programs; pregnancy outcomes; height, weight, & basal metabolic rate; food security status; 24-hour dietary recall for F&V intake) ***DATA COLLECTION:*** Following a 2-month monitoring to obtain baseline F&V intake, the intervention was administered for 6 months and follow-up was conducted 6 months post-intervention. All participants were interviewed by trained WIC nutritionists in English or Spanish, with interviews at baseline, 2 months after baseline (beginning of intervention), at the end of intervention, and 6 months post-intervention. The 24 hour dietary recall was conducted using the multiple pass method. Two additional interviews (2 months apart) were conducted with intervention participants to obtain information on the F&V purchased with the vouchers. Voucher redemption data were collected by the research team from supermarket scanned data and tallying of vouchers by farmers' market manager, turned in to city government. ***LIMITATIONS:*** Sample not representative of WIC population at state or national levels; environment had wide range of F&V year-round (other settings would need canned or frozen alternatives); overall drop-out rate of 25% with primary expressed reason being relocation; demographics differed slightly between those completing the study & those lost to follow-up; those lost to follow-up lived in US 2.4 more years, had 0.3 fewer family members, had 1.2 more years of education, had a higher proportion of African Americans, and had higher proportion of English-speaking participants	Mothers 89.1% Hispanic, 5.9% African American, 2.8% non-Hispanic White, 1.9% Asian American, and 0.2% American Indian, 100% lower-income (sample) ***ELIGIBILITY:*** Three WIC sites chosen based on similarities in caseload, distribution of ethnic backgrounds of participants, having at least one supermarket and one farmers' market within walking distance (.5 mile). Female participants had to have recently delivered and recertified for WIC participation as a postpartum woman, speak English or Spanish, and be ≥ 18 years old. ***EXPOSURE/ PARTICIPATION:*** Not reported	***LEAD AGENCY:*** Research team and WIC clinics ***THEORY/FRAMEWORK:*** Not reported ***EVIDENCE-BASED:*** Author referenced previous studies that found high levels of coupon use among older adults and WIC participants who received coupons for use at farmers' markets. ***REPLICATION/ ADAPTATION:*** Not reported ***ADOPTION:*** Not reported ***IMPLEMENTATION:*** Participants at intervention sites were issued $10 in vouchers/ week, in $2 units for the farmers' market (Site 1) and in $1 units for the supermarket (Site 2) to buy produce. Control participants received $13/month in vouchers for diapers. Researchers provided vouchers for the participants. The farmers' market and supermarket were responsible for returning vouchers to the city government's accounting department. ***FORMATIVE EVALUATION:*** Not reported ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** 1. $10/week vouchers for produce (intervention) 2. $13/month vouchers for diapers (control) ***FUNDING:*** CA Cancer Research Program, CA Dept of Health Services; USDA through the UC-Davis; NIH through UCLA Cancer Education and Career Development Program in the Division of Cancer Prevention & Control Research; UCLA/Jonsson Comprehensive Cancer Center; UCLA Clinical Nutrition Research Unit; American Society of Nutrition Sciences ***STRATEGIES:*** Not reported	***NUTRITION:*** 1. F&V intake increased at farmers' market site (from 5.4 servings to 7.8 servings) and supermarket site (from 6.9 servings to 7.8 servings) over the course of the intervention, but decreased at the control site from 5.0 to 4.8 servings. The difference in F&V intake between each of the intervention sites and the control site was statistically significant (F=9.75, p<0.001). 2. Six months post-intervention, the increase in F&V intake at intervention sites was sustained. Participants reported eating an average of 7.5 servings (farmers' market site) and 7.4 servings (supermarket site) while those at the control site reported an average of 4.9 servings. The difference between each of the intervention sites and the control site was statistically significant (F=6.66, p=0.001). 3. There was no significant difference in consumption of fruit alone between the intervention sites and the control site at baseline (p=0.12) or at the end of the intervention (p=0.39) and 6-month follow-up. 4. Post-intervention, participants at intervention sites reported eating more servings of vegetables than the control site, statistically significant (F=11.0, p<0.001) 5. Six months post-intervention, both of the intervention sites sustained their higher average intake of servings of vegetables compared to the control site, however, only the supermarket site was significant (F=0.59, p=0.01) 6. Higher reported intake of F&V 6 months post-intervention was associated with higher reported F&V intake at baseline, preference for speaking Spanish, and being in one of the intervention groups. This model explained 14% of the variance in the study (p<0.001). ***USE OF RESOURCES:*** 7. Voucher redemption rates were 90.7% for the farmers market and 87.5% for the supermarket.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Anderson, Bybee (2001) Michigan	Provision of $20 FRESH (Farm Resources Encouraging and Supporting Health) coupons to Women, Infants, and Children (WIC) program participants which could be redeemed at a farmers' market ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* Not reported *Complex:* 1. Twenty-minute education session on health, buying power, seasonality, storage, and preparation of fruits and vegetables as an interactive lecture with follow-up questions in a noncompetitive game show format.	***DESIGN:*** Non-randomized trial ***DURATION:*** < 6 months ***SAMPLE SIZE:*** 455 women participating in WIC or Commodity Supplemental Food Program (CSFP). 358 were exposed (121 coupons only, 123 education only, 114 coupons and education) and 97 were unexposed. ***PRIMARY OUTCOME:*** Dietary consumption ***MEASURES:*** 1. Pre-test and post-test questionnaires (fruit and vegetable (F&V) consumption, attitudes and beliefs about F&V, farmers' market use, recognition of the phrase "5 A Day for Better Health") 2. Coupon redemption data from WIC offices. ***DATA COLLECTION:*** The research team administered pre-test and post-test questionnaires to participants before the intervention (June-July) and 2 months after the intervention (Aug-Sept). The recruitment and data collection were coordinated with subjects' usual WIC and CSFP clinic appointments. The research team employed reminder postcards, telephone calls, and incentive payments. ***LIMITATIONS:*** Non-randomization of participants; attitude questions were not pre-tested; WIC participants may have underreported F&V intake for a variety of program-related reasons; variation in the pattern of incentives may have had some effect on group comparisons; the coupons-only group was recruited from a different clinic (CSFP) than the other groups (all WIC) and differences existed between the groups; there were significant differences between those recruited and those who completed all measures.	Females Parents 100% lower-income (at or below 185% of poverty) 43% African-American, 49% White, 7% Other (sample) ***ELIGIBILITY:*** Participants had to be pregnant, lactating, or caring for young children and eligible for Project FRESH due to nutritional risk. Participants were all participating in either WIC or CSFP programs. Those who did not complete pretest (n=105) and posttest (n=107) or had extreme or unbelievable scores (n=2) were excluded. ***EXPOSURE/ PARTICIPATION:*** Not reported	***LEAD AGENCY:*** The research team and WIC and CSFP clinics ***THEORY/FRAMEWORK:*** Stages of change (Transtheoretical Model) ***ADOPTION:*** Not reported ***EVIDENCE-BASED:*** Not reported ***REPLICATION/ ADAPTATION:*** Not reported ***IMPLEMENTATION:*** Participants were assigned to 1 of 4 groups: 1) coupons and education, 2) coupons only (recruited from CSFP program only due to USDA-mandated education component for WIC participants), 3) education only, and 4) no intervention. The researchers provided the coupons and delivered the education components. The education session was immediately after pre-test (groups 1 and 3). ***FORMATIVE EVALUATION:*** Questionnaire content and layout was explored in focus groups and a revised version was pilot-tested through intercept interviews. Focus groups helped develop concepts for educational components. ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** 1. Project FRESH coupons ($20) 2. Resources for education component ***FUNDING:*** Centers for Disease Control and Prevention and the National Cancer Institute ***STRATEGIES:*** Not reported	***NUTRITION:*** 1. There was a significant positive change in F&V consumption for the coupon component (ß=0.33, p<0.01). 2. Although the education component had no significant direct effect on consumption behavior change, it was indirectly associated through the strong relationship between attitude and consumption behavior (ß =0.80, p<0.001). The magnitude of the indirect impact was ß =0.14. 3. When indicators of attitude and consumption were examined together, significant positive effects for education and coupons were found (education: F=3.551, effect size=.07, p<0.001; coupons: F=2.976, effect size=.06, p<0.001). ***USE OF RESOURCES:*** 4. 87% of posttest completers had redeemed at least some of their coupons, 58% had redeemed them all, and 8% had redeemed less than half. 5. Participants in the 2 groups that received coupons were more likely to report visiting the farmers' market during the preceding 2 months (OR=69.91, p<0.001)

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Gibson (2003) United States	Food Stamp Program (FSP) participation ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* Not reported *Complex:* Not reported	***DESIGN:*** Retrospective cohort study ***DURATION:*** > 24 months ***SAMPLE SIZE:*** 6,731 men and women aged 20-40 years ***PRIMARY OUTCOME:*** Overweight/obesity ***MEASURES:*** 1. National Longitudinal Survey of Youth 1979 (NLSY79) (subjects then ages 14-22), the 1985-1996 waves (self-reported height, weight, Food Stamp Program [FSP] participation, total family income, parent education, education, family size, marital status, race, age, region, occupation, pregnancy status, and time trends) 2. Food Stamp Program measures included current participation (in previous calendar year), total household benefits in previous year (continuous variable), long-term participation (# years out of previous 5 years). 3. Income-to-needs ratio (family income/poverty threshold) ***DATA COLLECTION:*** Researchers used existing data with multiple observations per individual. Self-reported height information from the 1985 wave was combined with self-reported weight from 1985, 1986, 1988-90, 1992-94, and 1996 waves to calculate a respondent's BMI in each of these survey years. The researchers conducted data analyses. ***LIMITATIONS:*** Estimates may be biased as a result of reverse causality from obesity to FSP participation or selection bias; data did not allow consideration of depression; study could be biased by unmeasured intermediate variables influencing an individual's FSP participation; food insecurity could be an important factor and data did not allow its inclusion, potentially overstating relationship between FSP participation and obesity; many respondents were missing data on some or all of the long-term variables because data were inconsistent across survey years	Adults Lower-Income (sample) Black, Hispanic, and economically disadvantaged individuals were over sampled. ***ELIGIBILITY:*** Initial eligibility for NLSY79 not reported. For evaluation, observations on respondents were included every survey year in which the respondent was ≥ 20 years, had a total family income-to-needs ratio <2, was independent, and information was available on the respondents' current weight, height, and FSP participation status. ***EXPOSURE/ PARTICIPATION:*** Not reported	***LEAD AGENCY:*** Research team from City University of New York ***THEORY/FRAMEWORK:*** Conceptual model of obesity developed by the authors that assumes a person's obesity status at a point in time is a consequence of the person's current and past demographic, socioeconomic and environment characteristics rather than just current characteristics. ***EVIDENCE-BASED:*** Not reported ***REPLICATION/ ADAPTATION:*** Not reported ***ADOPTION:*** Not reported ***IMPLEMENTATION:*** Not reported ***FORMATIVE EVALUATION:*** Not reported ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** Not reported ***FUNDING:*** The Joint Center for Poverty Research / USDA Food Assistance Research Development Grants Program (evaluation) ***STRATEGIES:*** Not reported	***OVERWEIGHT/OBESITY:*** 1. In bivariate analysis, current FSP participation was significantly related to obesity status among women (χ^2=172.1, p=0.0001) and among men (χ^2=33.5, p=0.0001) – no other results for men reported. 2. After including individual fixed effects (e.g., age, race/ethnicity, marital status, family size), the coefficients on many of the variables declined in magnitude and significance indicating that models of obesity without them were subject to omitted variable bias. 3. In ordinary least squares models after adjusting for individual fixed effects, current and long-term FSP participation were significantly related to the obesity of low income women (p<0.05 for both), but not of low income men. 4. A woman who was not a current or former FSP participant whose other characteristics were equal to the sample averages had a predicted probability of obesity of 21.9%. All other variables constant, current participation in the FSP increased the predicted probability of current obesity by 2.0 percentage points or by 9.1%. Participation in the FSP in all of the 5 previous years increased the predicted probability of current obesity by 4.50 percentage points or by 20.5%.

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Dundas, Cook (2004) Idaho	Participation in the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) ***OTHER INTERVENTION COMPONENTS:*** *Multi-component* Not reported *Complex* Not reported	***DESIGN:*** Before and after study ***DURATION:*** 6 months ***SAMPLE SIZE:*** 91 children from 7 health clinics in southeastern Idaho ***PRIMARY OUTCOME:*** Eating behaviors ***MEASURES:*** 1. WIC Charts (demographic information [child's age in months, gender, race, household size and household income, maternal education level] and nutritional information [child's hemoglobin level, height, and weight, weight for height percentile, 24-hour dietary recall]) 2. Healthy Eating Index [HEI] (nutritious eating patterns) The HEI was validated for the US population (ages 2 and older) by using dietary data from the 1989-1990 CSFII. ***DATA COLLECTION:*** Demographic and nutritional information was recorded from the initial and 6-month certification in the child's WIC chart. Initial and 6-month follow-up eating behaviors were determined using the HEI developed by the US Department of Agriculture (USDA) Center for Nutrition Policy and Promotion. The HEI score assesses the overall quality of the American diet on the basis of USDA's Food Guide Pyramid and the Dietary Guidelines for Americans, composed of a sum total of 10 dietary components and a maximum score of 100 points. The specific items determined from each dietary history were the total HEI score and the 10 components of the score that includes grains, vegetables, fruits, milk, meat, total fat, saturated fat, cholesterol, sodium, and variety. Other dietary information determined were the amount of protein, carbohydrate, vitamin A, vitamin C, folate, vitamin B6, calcium, iron, and zinc consumed by children. ***LIMITATIONS:*** Results may not be generalizable to the overall WIC population; program impact may be different than other programs due to variances in ethnic, cultural, and educational backgrounds; dietary data were not verified by other dietary intake measures; impossible to follow-up on children to determine if positive changes in food consumption continued over time	Lower-income 3-4 year olds 52% (n=47) female, 79% (n=71) white and 20% (n=18) Latino ***ELIGIBILITY:*** Children meeting the following criteria were eligible: family had not participated in a WIC program for the previous 2 years, child was ≥ 24 months old at initial certification, child had a second certification within 7 months of initial certification, dietary histories declared a typical intake by parent or guardian, the child received the regular WIC child food package. ***EXPOSURE/ PARTICIPATION:*** Not reported	***LEAD AGENCY:*** Research team ***THEORY/ FRAMEWORK:*** Not reported ***EVIDENCE-BASED:*** Not reported ***REPLICATION/ ADAPTATION:*** Not reported ***ADOPTION:*** Not reported ***IMPLEMENTATION:*** The government funds and administers the WIC program which is operated by clinics. ***FORMATIVE EVALUATION:*** Not reported ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** Not reported ***FUNDING:*** Not reported ***STRATEGIES:*** Not reported	***NUTRITION:*** 1. The proportion of diets classified as good diets (HEI score > 80) at 6-month certification increased from 26% to 43%. Diets classified as needing improvement (HEI score 51-80) decreased from 71% to 56% at 6-month certification. 2. There was a significant difference between initial and 6 month follow-up mean scores for the HEI and the Pyramid. The mean HEI score increased 3.3 points (from 73.3 ± 9.9 to 76.6 ± 10.4 [95%CI -6.1, -0.6], p=0.01) and the Pyramid mean score (sum of 5 components) increased 3.9 points (from 32.9 ± 6.8 to 36.8 ± 6.4 [95%CI -5.7, -2.1], p<0.001). 3. Significant differences between initial and 6 month follow-up measures in the 5 Pyramid components were found for: vegetable (from 3.7 ± 3.2 to 4.8 ± 2.9 [95%CI -1.9, -0.3], p<0.01), fruit (from 7.5 ± 3.4 to 8.5 ± 2.9 [95%CI -1.8, -0.2] p=0.01) and meat (from 6.0 ± 3.2 to 7.3 ± 2.9 [95%CI -2.2, -0.5] p<0.01) intake. 4. There was a significant 13% increase in the fruit component HEI mean score after 6 months (p=0.01, no other results). 5. There was a 34% increase in the mean intake of fruit servings at the 6-month evaluation (no results). 6. There was a significant 30% increase in the vegetable component HEI mean score after 6 months (p=0.0001, no other results). 7. Six percent of children met the recommended servings for vegetable before the WIC program and 7% met the recommendation after 6 months. 8. The number of children meeting the recommended meat servings increased from 22.2% to 35.6% (p<0.01, no other results). 9. There was not a significant increase in the HEI grain and milk components or in the level of total fat, saturated fat, and cholesterol.

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Ver Ploeg, Mancino (2008) United States	Food Stamp Program (FSP) or Special Supplemental Nutrition Program for Women, Infants and Children (WIC) participation ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* Not reported *Complex:* Not reported	***DESIGN:*** Retrospective cross-sectional study ***DURATION:*** Not reported ***SAMPLE SIZE:*** 21,056 total children from 3 waves of the National Health and Nutrition Examination Survey (NHANES) conducted by the Centers for Disease Control and Prevention (CDC) in 1976-1980, 1988-1994, and 1999-2002. ***PRIMARY OUTCOME:*** Overweight/obesity ***MEASURES:*** 1. NHANES survey (weight, height, FSP participation, WIC participation, demographics) 2. Poverty Income Ratio (PIR) (household income) ***DATA COLLECTION:*** To examine trends over time, existing data were analyzed. During each survey wave, children aged ≥ 2 years were measured for height and weight using standardized protocols and these data were used to classify children as underweight (body mass index [BMI] < 5th percentile), normal weight (BMI at 5th-85th percentile), at-risk for overweight (BMI≥85th percentile and overweight (BMI ≥ 95th percentile). FSP participation (children aged 5-19) was measured as current receipt of food stamps by the child as reported by an adult member of the family. Individual measures of participation were used for 1976-80 and 1988-94 but for 1999-2002, responses to a household level question concerning whether anyone in the household received food stamps in the last 12 months was used as a proxy for the child's FSP participation status. For WIC, researchers determined whether the individual child (aged 2-4) was receiving WIC benefits at the time of the survey. The researchers in the current study conducted all data analyses. ***LIMITATIONS:*** Cannot ascribe causation between program participation and weight status; cannot account for any selection bias due to unobservable systematic differences between FSP participants and non-participants; food assistance programs and regulatory standards have changed over time, affecting who participates; composition of subgroups of children in the participant, eligible non-participant, and higher income groups may have changed over time as demographic, economic, and other policy conditions changed; use of the household level of FSP participation could result in erroneous classifications	Lower-income 2-19 year olds NHANES sampling method designed to be representative of civilian, non-institutionalized population ***ELIGIBILITY:*** CDC eligibility requirements not reported. For analysis, underweight children were excluded from the study ***EXPOSURE/ PARTICIPATION:*** Not reported	***LEAD AGENCY:*** Research team ***THEORY/ FRAMEWORK:*** Not reported ***EVIDENCE-BASED:*** Not reported ***REPLICATION/ ADAPTATION:*** Not reported ***ADOPTION:*** Not reported ***IMPLEMENTATION:*** Not reported ***FORMATIVE EVALUATION:*** Not reported ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** Not reported ***FUNDING:*** Federal funds through the Centers for Disease Control and Prevention (original NHANES survey) and United States Department of Agriculture (current analysis) ***STRATEGIES:*** Not reported	***OVERWEIGHT/OBESITY:*** *School aged children (aged ≥ 5 years):* 1. Results show an inconsistent association between FSP participation and weight for school-aged children. 2. For boys, few differences were found between FSP participants and eligible non-participants throughout the 3 waves of data. 3. Trend analysis for non-Hispanic Black boys showed a slight reversal in the trend of FSP participants to have lower BMI and lower probabilities of at-risk of overweight and overweight than some non-participants. In 1999-2002, non-Hispanic Black boy participants were more likely to be at risk of overweight relative to eligible non-participants, although statistically significant only at the 10% level. 4. No consistent relationship between FSP participation and weight for girls was found. 5. When comparing girls who receive FSP benefits with higher income non-participants, the authors found that the association varied over time and across race and ethnicity groups. For non-Hispanic white and Mexican-American girls, FSP participants were heavier than higher income girls in the earlier waves, but in 1999-2002, none of these differences were statistically significant. *Young children (aged 2-4 years):* 6. Young children participating in WIC had similar BMI and similar probabilities of being at risk of overweight as eligible non participants. This was true for both boys and girls and for both time periods for which data were available (1988-1994, 1999-2002).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Hofferth, Curtin (2005) United States	Participation in the Food Stamp Program (FSP), the National School Lunch Program (NSLP), and the School Breakfast Program (SBP) ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* Not reported *Complex:* Not reported	***DESIGN:*** Cross-sectional study ***DURATION:*** Not reported ***SAMPLE SIZE:*** 1,268 children (ages 6-12) from the 1997 Child Development Supplement to the Panel Study of Income Dynamics (PSID-CDS) ***PRIMARY OUTCOME:*** Child overweight/obesity (body mass index [BMI]) ***MEASURES:*** 1. Secondary data from 1997 PSID-CDS generated from interviews of household members: a. BMI calculation from measured height, parent-reported weight; b. Demographic variables (race, age/education of head of household, age /sex of child, parents' employment, family size and structure, household income, estimates of spending on food used at home and eating out) c. Income categories (current study created), poor (<100% poverty level), near poor (100-130%), working class (130-185%), moderate (185-300%), high (>300%) d. Food program participation (amount of food stamps received monthly and # of months received, whether child ate school lunch / participated in SBP) 2. National Health and Nutrition Examination Surveys (NHANES) data for comparison (height, weight, income) ***DATA COLLECTION:*** To determine if low family income is associated with overweight in children and to what extent food programs contribute to overweight, the research team conducted secondary data analysis with PSID-CDS data. The University of Michigan conducted PSID-CDS household surveys, including direct questions about where children usually ate. Primary caregivers provided child's weight and interviewers measured child's height, allowing BMI computation, using CDC growth charts. The research team compared NHANES data, conducted by the National Center for Health Statistics, in part, because investigators measured weight in that study. The research team in the current study conducted data analyses. ***LIMITATIONS:*** Results do not take into account recent efforts by the USDA and states to improve the nutritional content of school meals; if unobserved factors leading children to participate in school food programs are also linked to being overweight, the estimates of their effects will be biased; caution is recommended in interpreting findings because, if children with a tendency to be overweight are the ones who choose to eat a school lunch, a school lunch too high in fat /cholesterol could reinforce previous tendencies toward overweight	Lower income 6-12 year olds PSID-CDS survey has been found to be representative of U.S. individuals and their families in 1997 ***ELIGIBILITY:*** Eligibility for PSID-CDS not fully reported; up to 2 randomly selected children of PSID participants included in CDS component. For this evaluation, children were excluded if they had missing survey data (weight status; parents' education; FSP, NSLP, or SBP participation; family income) ***EXPOSURE/ PARTICIPATION:*** Not reported	***LEAD AGENCY:*** Research team (from University of Maryland) ***THEORY/ FRAMEWORK***: Not reported ***EVIDENCE-BASED:*** Not reported ***REPLICATION/ ADAPTATION:*** Not applicable ***ADOPTION:*** Not applicable ***IMPLEMENTATION:*** Not applicable ***FORMATIVE EVALUATION:*** Not reported ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** Not applicable ***FUNDING:*** The National Institute of Child Health and Human Development provided funding for the PSID-CDS and the current evaluation. The evaluation was also supported by the Economic Research Service, Food Assistance and Nutrition Research Program, USDA. ***STRATEGIES:*** Not applicable	***OVERWEIGHT/OBESITY:*** *Bivariate analysis:* 1. Neither the dollar amount of food expenditures nor the amount of FSP income is linked to child overweight or BMI. Dollars spent eating out are linked to the child's BMI at the p≤0.10 level. 2. In all income groups except the near-poor, children who eat a school lunch are more likely to be overweight and their BMIs are higher than those who do not. Except for the near-poor and working class, the same holds true for those who eat a breakfast. *Multivariate analysis:* 3. Income is linked significantly and non-linearly to overweight and BMI. The coefficients were negative for children in poor families (significant, p<0.05 or p<0.10, in 5 of the 6 models) compared with those in moderate-income families. 4. Eating a school lunch is associated with a higher probability of being overweight (p<0.10) and a significantly higher BMI (p<0.05). 5. Eating breakfast as well as lunch does not increase probability of overweight or increase BMI over that for children eating lunch only. 6. Analysis of the interaction between school lunch and family income showed no significant effect of eating either school lunch or school breakfast on overweight and BMI.

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Siega-Riz, Kranz (2004) United States	Participation in the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) ***OTHER INTERVENTION COMPONENTS:*** *Multi-component* Not reported *Complex* Not reported	***DESIGN:*** Cross-sectional study ***DURATION:*** Not applicable ***SAMPLE SIZE:*** 2,461 children (aged 2-5) from the 1994-1996 and 1998 US Department of Agriculture (USDA) Continuing Survey of Food Intakes by Individuals (CSFII) surveys ***PRIMARY OUTCOME:*** Eating behavior ***MEASURES:*** 1. Data from the 1994-1996 and 1998 USDA CSFII surveys (24-hour recall methods, sociodemographic information [age, sex, race, education, employment status, child receiving a meal at school or daycare, multivitamin use, vegetarianism, whether the child is on any diet, average daily hours spent watching TV or video, household size, urbanicity, food stamp participation, total household income], child participation in WIC, participation in WIC of anyone in household) ***DATA COLLECTION:*** In the USDA CSFII survey, 2 days of dietary data were collected using the 24-hour recall methods. Adults reported the diets of children < 6 years of age. The 1st recall was collected during a household interview; the 2nd recall was collected 3 -10 days after the first. For each food consumed, the respondent was asked if the eating occasion was a meal or a snack. An added sugar category was developed to capture all caloric carbohydrate sweeteners, excluding all naturally occurring sugars. Current participation in WIC of the child and anyone in the household was recorded at the time of the household interview. Only information on participation of the child was used. Only children with a family income of less than 185% of the poverty level (n=2,461) were included which was further stratified by income to reflect the different cut points used for participation in the food stamp and WIC programs (<130%, n=1,772, and 130% to 185% of poverty, n=689). ***LIMITATIONS:*** Some data was lost (n=22); only two 24-hour recalls were collected by proxy; USDA data set lacks data on medical eligibility for WIC aside (bias toward null); lacked information on duration of child participation to examine if those with the longest duration of participation benefited most; unable to control for biases associated with self-selection	Lower-income 2-5 year olds 100% lower-income children with family income < 130% of poverty were 36% white, 31% black, 27% Hispanic, and 6% other ethnicity. Children with family incomes between 130% and 185% of poverty were 57% white, 19% black, 19% Hispanic, and 5% other ethnicity. The USDA CSFII survey was designed to be nationally representative. ***ELIGIBILITY:*** Only children 2-5 years of age, not in school, who had dietary intake and household level data and participated in the WIC program (n=2,461) were included. ***EXPOSURE/ PARTICIPATION:*** Not reported	***LEAD AGENCY:*** Researchers from the Departments of Nutrition, Maternal and Child Health, and Economics, University of North Carolina and the Carolina Population Center, Chapel Hill, North Carolina; the Department of Nutritional Sciences, Pennsylvania State University, Pennsylvania ***THEORY/ FRAMEWORK:*** Not reported ***EVIDENCE-BASED:*** Not reported ***REPLICATION/ ADAPTATION:*** Not applicable ***ADOPTION:*** Not applicable ***IMPLEMENTATION:*** Not applicable ***FORMATIVE EVALUATION:*** Not reported ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** Not applicable ***FUNDING:*** Not reported ***STRATEGIES:*** Not applicable	***NUTRITION:*** 1. Among WIC participants, the prevalence of snacking was significantly lower (68%) compared with non-participants (72%) (χ^2=5.9, p=0.01) 2. For those <130% of poverty, WIC had a beneficial effect on the intake of fat (β=-0.96; p=0.02), carbohydrates (β=1.16; p=0.03), added sugar (β=-1.44; p=0.007), and fruit intake (β=0.54; p=0.05) from the total diet. 3. For nutrient intake attributable to snacking, WIC had a beneficial effect on added sugar intake (β=-4.24; p=0.003) and a suggestive beneficial effect on iron (β=0.58; p=0.05) and fruit and vegetable intake (β=0.33; p=0.06). 4. For those with higher incomes (130%-185% of poverty), the beneficial effects of WIC participation was limited to added sugar (β=-3.23; p=0.0001), iron density (β=1.06; p=0.002), fruit intake (β=0.4; p=0.02), and fruit and vegetable intake (β=0.64, p=0.01) for the total diet. 5. A similar significant effect of decreased added sugar intake from snacks (β=-5.97; p=0.01) was seen in this income group as in the lower income group.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Webb, Schiff (2008) Massachusetts	Participation in Food Stamp Program (FSP) and other federal nutrition programs ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* Not reported *Complex:* Not reported	***DESIGN:*** Cross-sectional study ***DURATION:*** Not reported ***SAMPLE SIZE:*** 435 adult respondents ***PRIMARY OUTCOME:*** Overweight/obesity (body mass index [BMI] ***MEASURES:*** Telephone surveys (household income, demographics, participation in government nutrition programs [FSP, WIC, free/reduced price school meals], use of food from charities, use of supermarkets and other store types, self-reported height and weight, health coverage, self-perceived health). Survey included 18-item and 10-item subset United States Department of Agriculture Household Food Security Module (HFSM). ***DATA COLLECTION:*** Using list-assisted random digit dialing generated phone numbers, lead agencies interviewed participants between September and December 2005. All interviews were done in English. For households with children, the full 18-item HFSM scale was used and for those without children, only the adult-specific 10-item subset was used. Participants were classified as "food secure" or "food insecure" (households that cannot buy enough food to meet basic food needs). Some of these were further categorized as "food insecure with hunger" if they experienced prolonged periods without adequate food or more severe instances of hunger. Researchers conducted data analyses. ***LIMITATIONS:*** Study design cannot address causality; populations at high risk may not have been surveyed including homeless, those without land-line phones, and households without an English speaker; response rate was low (21.6%) limiting generalizability; self reported BMI may have been underestimated, biasing estimates toward the null; information on food expenditures and nutrition education exposure was not available	Adults Lower-Income Hispanic 17.6%, African American 20.2%, White 60.2%, Other 2% (sample) ***ELIGIBILITY:*** Households had to be located in one of the 216 Qualified Census Tracts (at least 50% of households have income <60% of area mean) in Massachusetts. Only adults aged 18 and over were interviewed. Households with children were oversampled. ***EXPOSURE/ PARTICIPATION:*** Not reported	***LEAD AGENCY:*** Project Bread and RTI International ***THEORY/ FRAMEWORK:*** Not reported ***EVIDENCE-BASED:*** Not reported ***REPLICATION/ ADAPTATION:*** Not applicable ***ADOPTION:*** Not applicable ***IMPLEMENTATION:*** Not applicable ***FORMATIVE EVALUATION:*** Not Reported ***PROCESS EVALUATION:*** Not Reported	***RESOURCES:*** Not applicable ***FUNDING:*** National Institutes of Health and the Massachusetts MSG /Nucleotides Class Action Settlement ***STRATEGIES:*** Not applicable	***OVERWEIGHT/OBESITY:*** 1. Respondents classified as food-insecure or food-insecure with hunger had significantly higher BMI (kg/m^2) than those classified as food-secure (mean=25.9; SE=0.5; p<0.01). 2. Respondents whose food supplies did not last, who were unable to afford balanced meals, cut meal sizes, and ate less than their perceived need had significantly higher BMI than those who reported never having those experiences (p<0.01, p<0.01, p=0.02, p<0.01, respectively). 3. BMI was significantly higher in those who reported their households ever participating in the FSP (mean=27.9; SE=0.8; p<0.01). 4. For current FSP participants, BMI was significantly lower in respondents whose households had participated in the program for ≥6 months compared with those whose households had participated for <6 months (mean=26.9; SE=1.2; p<0.01), and this difference remained statistically significant after adjustment for food insecurity. 5. Those who reported household participation in the FSP, WIC, and/or free/reduced price school meals during the 12 months prior had significantly higher BMI than those who reported no federal nutrition assistance (mean=28.4; SE=0.9; p<0.01), and this difference remained statistically significant after adjustment for sociodemographic factors. 6. BMI was significantly higher among those who obtained food from charitable sources (mean=28.5; SE=1.1), those who reported shopping at convenience stores (mean=27.2; SE=0.6), and those who consumed fast foods in the month prior to the survey (mean=27.2; SE=0.6) versus those who did not (p<0.01, p=0.04, P<0.01, respectively). Eating fast food remained significantly associated with higher BMI after adjustment for sociodemographic characteristics and food insecurity.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Kropf, Holben (2007) Ohio	Special Supplemental Nutrition Program for Women, Infants and Children (WIC) Farmers' Market Nutrition Program (WIC/FMNP) participation ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* Not reported *Complex:* Not reported	***DESIGN:*** Cross-sectional study ***DURATION:*** Not reported ***SAMPLE SIZE:*** 235 female heads of household or women receiving WIC benefits only (n=170) or WIC and Farmers' Market Nutrition Program (FMNP) benefits (n=65) in Athens County, OH ***PRIMARY OUTCOME:*** Dietary consumption ***MEASURES:*** 1. Participant surveys (demographics, household food security status, nutrition behaviors) included previously validated measures; (a) 18-item US Household Food Security Survey Module, (b) 13-item Tool to Assess Psychosocial Indicators of Fruit & Vegetable (FV) Intake in Low-Income Communities); (c) 7-item Food Behavior Checklist for a Limited Resource Audience; (d) 1-item perceived health question; (e) 7-item measure of social capital 2. Survey version for participants in Farmers' Market Nutrition Program included participation, satisfaction, and behavior questions. ***DATA COLLECTION:*** To identify differences between women from households participating in WIC only, and those participating in WIC/Farmers' Market Nutrition Program, two survey versions, one designed for participants in each program, were mailed to all participating female heads of household in the County. A letter describing the study and a postage-paid return envelope was included with the surveys. Surveys were labeled and mailed by WIC staff only, to insure client confidentiality. No follow-up phone calls or reminder postcards were sent. The researchers conducted data analysis. ***LIMITATIONS:*** Study design limits claims of causality; difficult to estimate influence of program because of self selection into FMNP – participants may have already had higher consumption of FV and/or interest in nutrition; FMNP participants reported higher levels of education (95.2% FMNP vs. 84% WIC having high school diploma/ equivalent, p=0.027); return rate for the survey was 22%; some members of the sample may have had lower rates of literacy than US average posing a limitation due to the self-administered nature of the survey	Adults Female Rural 100% lower-income (sample) Non-Hispanic White 93%, African Americans 3.9%, Asian 1.2%, and Hispanic 0.09% (general County population) ***ELIGIBILITY:*** All households in Athens County receiving WIC or WIC/FMNP benefits. Those who returned the survey were included in the study. ***EXPOSURE/ PARTICIPATION:*** At the time of the survey, 23% of WIC households had chosen to participate in the Farmers' Market Nutrition Program	***LEAD AGENCY:*** Researchers from Ohio University and Athens County WIC staff ***THEORY/ FRAMEWORK:*** Not reported ***EVIDENCE-BASED:*** Not reported ***ADOPTION:*** Not applicable ***REPLICATION/ ADAPTATION:*** Not applicable ***IMPLEMENTATION:*** Not applicable ***FORMATIVE EVALUATION:*** Not reported ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** Not applicable ***FUNDING:*** School of Human and Consumer Sciences at Ohio University. in Athens, OH; Graduate Student Senate at Ohio University, and the Ohio University Research Council ***STRATEGIES:*** Not applicable	***NUTRITION:*** 1. Daily vegetable servings for women from the FMNP group (2.23±1.18) was significantly greater than for the WIC only group (1.91±0.98), p=0.040. 2. Daily fruit intake did not differ between groups (1.69±0.97 servings for FMNP vs. 1.64±1.21 for WIC, p=0.769). 3. No other variations in behaviors related to FV intake (FV variety, eating FV as snacks) were significantly different between groups (p>0.05). 4. For the entire sample, food insecurity was negatively associated with perceived diet quality (r=-0.248, p<0.001). ***OTHER:*** 5. Food security status of participant households did not differ significantly between groups (χ^2= 2.117, p=0.548). 6. Women from the FMNP group showed higher scores in perceived benefit of fruit and vegetable intake (χ^2 = 4.574, p=0.032), perceived diet quality (χ^2 = 7.219, p=0.027), and stages of change continuums for both fruit intake and vegetable intake (χ^2 = 12.171, p=0.007 and χ^2 = 10.238, p=0.017 respectively).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Gibson (2004) United States	Long-term Food Stamp Program (FSP) participation ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* Not reported *Complex:* Not reported	***DESIGN:*** Non-comparative study ***DURATION:*** > 24 months ***SAMPLE SIZE:*** 7,843 The final sample contained 12,801 observations on 3,831 girls from 2,656 families and 13,303 observations on 4,012 boys and from 2,707 families who participated in the National Longitudinal Survey of Youth (NLSY79) ***PRIMARY OUTCOME:*** Overweight/obesity ***MEASURES:*** 1. NLSY79 data: a) child body mass index [BMI]; b) long-term family resources or total family income; c) FSP eligibility income; d) demographic information ***DATA COLLECTION:*** An observation on a child was included in the sample every survey year in which the child was between the ages of 5 and 18 years and for which there was information on the child's current weight, height, FSP participation status, and family income. Overweight classified if BMI ≥ the 95th percentile from the Center for Disease Control 2000 BMI percentiles. At risk for overweight was BMI ≥ the 85th percentile and < the 95th percentile. The sample used in this analysis included observations on children from the 1986 through the 2000 waves of the survey, although data from earlier years of the NLSY79 were used to create the variables that measured long-term family resources. ***LIMITATIONS:*** Selection, participation, omitted variable bias; confounding variables due to food security; self-reported, mother-reported data; shrunken sample size	100% Lower income 5-18 year olds ***ELIGIBILITY:*** Not reported ***EXPOSURE/ PARTICIPATION:*** Not reported	***LEAD AGENCY:*** Researcher team from the Baruch College, New York ***THEORY/ FRAMEWORK:*** Researchers developed a conceptual framework for the relation between current child weight and current and past child, family, and environmental characteristics. ***EVIDENCE-BASED:*** Conceptual framework is based on previous research ***REPLICATION/ ADAPTATION:*** Not reported ***ADOPTION:*** Not reported ***IMPLEMENTATION:*** Not reported ***FORMATIVE EVALUATION:*** Not reported ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** Not reported ***FUNDING:*** Supported by a grant from the Professional Staff Congress-City University of New York (PSC-CUNY) Research Awards Program. ***STRATEGIES:*** Not reported	***OVERWEIGHT/OBESITY:*** 1. In Ordinary Least Squares models, long-term FSP participation was positively and significantly related to overweight in young girls (p=0.048) with child fixed effects, and negatively and significantly related to overweight in young boys (p=0.100). 2. The prevalence of overweight by FSP participation was significantly different for girl-year observations (Pearson χ^2=15.65; p<0.01) but not boy-year observations (Pearson χ^2=0.42; p=0.52). 3. Compared to children whose families did not participate in FSP the previous 5 years, FSP participation during all of the previous 5 years was associated with a 42.8 % increase for young girls and a 28.8% decrease for young boys in the predicted probability of overweight. 4. In the models for family fixed effects and child fixed effects, long-term FSP participation was positively and significantly related to overweight in the younger sample of girls (5-11yrs) but was not significant for other age ranges (family fixed: coefficient=0.088, SE=0.036, p<0.05; child fixed: coefficient=0.062, SE=0.031, p<0.05). 5. In the models for family fixed and child fixed effects, long-term FSP participation was negatively and significantly related to overweight in younger boys (family fixed: coefficient=-0.061, SE=0.035, p<0.10; child fixed: coefficient=-0.053, SE; 0.032, p<0.10). 6. Without fixed effects, long-term FSP participation was not significantly related to overweight in boys. 7. Without fixed effects, long-term FSP participation was positively and significantly related to overweight in girls in the full sample of 5-18 years (coefficient=0.032, SE=0.016, p<0.05) and the older sample of 12-18 years (coefficient=0.061, SE=0.025, p<0.05).

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