INTERVENTION TABLE 4

Food Pricing

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
United States						
Harnack, French (2008) Minnesota	Elimination of value size pricing (per unit cost decreases as portion size increases) and use of standardized prices (price per ounce standardized across portions size options) ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* 1. Menu labels added (calorie information) and removed (value pricing) at McDonald's *Complex:* Not reported	***DESIGN:*** Randomized trial ***DURATION:*** 7 months ***SAMPLE SIZE:*** 594 adults and adolescents ***PRIMARY OUTCOME:*** Nutrition (calories) ***MEASURES:*** 1. McDonald's food composition table in combination with the gram weight information (nutrient composition using the for the amount of kcal, total fat, total carbohydrate, total protein, saturated fat, dietary fiber, vitamin C and calcium) 2. Survey (fast food frequency, opinions about fast food and food shopping and preparation practices). 3. Interviews (nutrition knowledge and beliefs and self-reported height and weight). ***DATA COLLECTION:*** Four paper menus were developed by the research team (format of McDonald's menu boards, October 2005). Participants were blinded to the meal source (descriptions modified): 1. Calorie menu: calories for each menu item; 2. Price menu: modified so that the value size pricing structure (by portion size) was eliminated; prices listed were calculated so that the price per ounce was standardized across options; 3. Calorie plus pricing: calories listed with price modifications; 4. Control menu: no calories and usual McDonald's pricing. Data were collected while waiting for food to be ordered. ***LIMITATIONS:*** One-time exposure to conditions, while repeated exposure to calories and standardized pricing may be required; study did not take place in a restaurant; incentive may have undermined price sensitivity	Adults, 16-18 year olds ~25% racial/ ethnic populations (evaluation sample) ***ELIGIBILITY:*** Participants were eligible if they were >16 years old, ate at fast food restaurants > 1 time/week, were able to speak and read English, were willing to participate in a two hour study session requiring purchase of a fast food restaurant meal for dinner and had a complete survey and interview. Eleven people were excluded since they knew menus might be modified and they would not have to pay for the food ordered. ***EXPOSURE/ PARTICIPATION:*** Not reported	***LEAD AGENCY:*** Research team ***THEORY/ FRAMEWORK:*** Not reported ***ADOPTION:*** Not reported ***EVIDENCE-BASED:*** Not reported ***REPLICATION/ ADAPTATION:*** Not reported ***IMPLEMENTATION:*** Adolescents and adults were asked to purchase and consume a fast food restaurant meal from one of four randomly assigned menus. Menus varied as to whether calorie information was provided and value size pricing was used. Intervention took place in study sites (conference rooms and church), not in actual restaurants. Food was ordered and delivered to participants at study site. ***FORMATIVE EVALUATION:*** Not reported ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** 1. Incentives ($25 gift card) 2. Ads 3. Personnel to distribute menus and pick up food 4. Funds for the meals ordered 5. Car to pick up the meals 6. Menus 7. Conference room and basement in church ***FUNDING:*** National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) ***STRATEGIES:*** Not applicable – efficacy trial	***NUTRITION:*** 1. No significant differences (p=0.25) were found in the average number of calories consumed by those in the calorie, price, calorie plus price, and control menu conditions (n=805, 813, 761 and 739 respectively). Selection and consumption of major food categories and portion sizes did not differ by condition. 2. Average energy intake was higher among males in the calorie, price and calorie plus price conditions compared to controls (p=0.01). 3. Among those who reported that nutrition was important when buying food from a fast food restaurant, average energy intake was significantly lower among those who received the control and calorie plus price menus relative to those that reported nutrition was not important (p<0.01). 4. Among those who reported price was not important when buying food from a fast food restaurant, average energy intake was lowest among those in the control condition (598 kcal) and highest among those in the calorie plus price condition (948 kcal, p=0.01). 5. Multivariate regression indicated that average energy intake was comparable between those who reported noticing the calorie information and those who did not (690 kcal versus 671 kcal; p=0.65).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Horgen, Brownell (2002) Location not reported	Prices of healthy food lowered by 20%-30% in restaurants ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* 1. Point of purchase messages identifying healthy food choices in restaurants *Complex:* Not reported	***DESIGN:*** Quasi-experimental, time series study ***DURATION:*** 14 weeks ***SAMPLE SIZE:*** Not reported ***PRIMARY OUTCOME:*** Food purchases ***MEASURES:*** 1. Sales records ***DATA COLLECTION:*** *Sales collected and monitored in three phases:* Period 1: Initial baseline Period 2: Price reduction (3 wks) Period 3: Interim baseline Period 4: Point of purchase messages Period 5: Point of purchase messages + price reduction Period 6: Final baseline ***LIMITATIONS:*** Unable to track overall caloric and fat consumption (e.g., patrons may have compensated for healthier choices with less healthier choices later); increased sales of target items may have decreased sales of other, less healthy foods or patrons simply purchased more; study design precluded counterbalancing for intervention order effects (health information was expected to have a more lasting impact than price decreases)	Urban (~250,000 people in the city) Caucasian Upper-middle-class ***ELIGIBILITY:*** Not reported ***EXPOSURE/ PARTICIPATION:*** Approx. 225-275 customers patronized the restaurant daily. The restaurant served a varying clientele but did have a substantial base of regular (i.e., weekly) customers.	***LEAD AGENCY:*** Restaurant and the research team ***THEORY/ FRAMEWORK:*** Point of purchase messages guided by Health Belief Model and Matching Model, where choice = ratio of consumption values times inverse of delay ratio; interval between food choice and eating is short; satisfaction prevails over distal goal of good health. ***ADOPTION:*** Not reported ***EVIDENCE-BASED:*** Previous studies have shown that price changes can affect purchase of healthy foods. ***REPLICATION/ ADAPTATION:*** Not reported ***IMPLEMENTATION:*** Research team developed point of purchase messages and trained restaurant staff. Restaurant staff reduced prices for target items and monitored sales. ***FORMATIVE EVALUATION:*** Not reported ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** 1. Point of purchase messages and related materials 2. Funds to compensate restaurant for the price reductions 3. Personnel to train restaurant staff ***FUNDING:*** Not reported ***STRATEGIES:*** Not reported	***FOOD PURCHASES:*** 1. For target items, the effect size of period on sales was 0.39, indicating that variability in sales attributable to period was 39%. For control items, 6% of the variability in sales was attributable to period [the sales by period interaction was significant ($F(5,796) = 10.69$, $p<0.001$]. 2. Sales of target items varied based on intervention period ($F(5, 398) = 22.98$, $p<0.001$). Sales increased during intervention periods and decreased during baseline periods. 3. The price decrease intervention significantly increased sales for each target food item above the initial baseline: chicken sandwich [from mean= 1.81 (SD=1.36) to 12.90 (SD=5.71), $p<0.0001$], chicken salad [from mean= 2.71 (SD=2.17) to 6.24 (SD=2.43), $p<0.0001$], soup cup (from mean= 6.71 (SD=3.20) to 15.24 (SD=5.23), $p<0.0001$) and soup bowl (from mean= 3.24 (SD=1.95) to 8.33 (SD=4.15), $p<0.0001$). 4. Average sales of all food items during period 3 were lower than those during period 2; differences were significant for the chicken salad and chicken sandwich, $p<0.0001$. 5. Mean sales of all items rose during period 4 from period 3 levels, but none of the increases were significant. However, the increases in sales of the target chicken sandwich ($p<0.05$), soup cup ($p<0.01$) and soup bowl ($p<0.01$) were significantly higher than period 1 sales. 6. During period 5, sales of the chicken sandwich and chicken salad were significantly higher than period 1 ($p<0.0001$ and $p<0.05$, respectively) and period 3 ($p<0.0001$ for both), but not period 4. Soup cup and soup bowl sales were significantly higher than period 1 sales ($p<0.0001$) but not period 3 or 4. 7. Average sales of all items decreased in period 6, and were not significantly different than sales during period 1 (except for soup cup sales, $p<0.05$). 8. Sales of target items during period 2 were significantly higher than those during period 4 for the chicken sandwich ($p<0.001$) and the chicken salad ($p<0.05$). For all foods, sales were higher during the price reduction than the point of purchase message period. 9. Sales during period 4 were consistently the lowest of sales during any intervention period.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
French, Jeffery (2001) Minnesota	Pricing strategies examined on low fat snacks from 55 vending machines in high schools and worksites. Four levels of pricing utilized: 1. Equal price 2. 10% price reduction 3. 25% price reduction 4. 50% price reduction ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* Three levels of promotional signage examined: 1. No signs 2. Signs labeling low-fat snacks 3. Signs labeling low-fat snacks combined with signs placed on vending machines encouraging a low-fat snack choice. *Complex:* Not reported	***DESIGN:*** Time Series study ***DURATION:*** 12 months ***SAMPLE SIZE:*** The sample consisted of 55 vending machines placed in 12 secondary schools and 12 worksites. Each study site had 1 to 5 vending machines. ***PRIMARY OUTCOME:*** Vending machine sales ***MEASURES:*** 1. Sales data ***DATA COLLECTION:*** Sales data were recorded continuously throughout the intervention. Manual inventory counts were performed by vending route drivers each time the machine was serviced. The sales data were entered into a database at the vending company's central office. The dependent variable was average sales per site per experimental period (averaged across all machines at a given site). These data were considered in 3 ways: (1) proportion of low-fat snack items, (2) absolute number of low-fat snack items, and (3) net profits (food sales minus whole-sale cost to the vendor). Total product volume was also examined to determine whether the intervention affected overall sales volume. ***LIMITATIONS:*** Data was missing from 2 site-treatment condition combinations (out of 288), this problem was addressed via regression imputation; the problem of empty slots (time delay between a slot's emptying and a driver's refilling the machine) may have limited the size of the observed effects on sales; relatively short time period for each treatment condition	Adults 14-18 year olds ***ELIGIBILITY:*** Convenience sample of sites selected for demographic and geographic diversity. ***EXPOSURE/ PARTICIPATION:*** Anyone using vending machines was potentially exposed to the intervention.	***LEAD AGENCY:*** The research team from the University of Minnesota, Minneapolis. ***THEORY/FRAMEWORK:*** Not reported ***EVIDENCE-BASED:*** Yes, Other studies have shown that vending machines are a good source for nutrition interventions for pricing and promotion strategies. ***REPLICATION/ ADAPTATION:*** Not reported ***ADOPTION:*** Not reported ***IMPLEMENTATION:*** The research team planned the intervention and worked with vending route drivers to set up the vending machines at the beginning of each treatment period. Each treatment condition was implemented at each of the sites in a randomly assigned sequence. Vending route drivers and supervisors were trained by study staff on the study protocol 2 weeks before the intervention and at the midpoint of the study. ***FORMATIVE EVALUATION:*** Not reported ***PROCESS EVALUATION:*** Study staff conducted weekly site visits to each school and worksite to provide information about the fidelity of implementation.	***RESOURCES:*** 1. Vending machines 2. Promotional signage 3. Vending route drivers 4. Low-fat snacks ***FUNDING:*** The study was funded by the National Institutes of Health. ***STRATEGIES:*** Not reported	***FOOD SALES:*** 1. Price reduction was significantly associated with percentage of low-fat snack sales ($F=156.89$, $p<0.001$). Price reductions of 50%, 25%, and 10% were associated with increases in low-fat snack sales of 93%, 39%, and 9%, respectively. 2. The total number of low-fat snack sales was significantly different by each price reduction condition ($F=96.98$, $p<0.001$), but the low-fat snack sales in the 10% price reduction did not differ significantly from the equal price condition. 3. Price reductions of 25% and 50% were associated with significant increases in the absolute number of low-fat snacks sold relative to the equal price and 10% price reduction conditions ($p<0.05$). 4. The total number of low-fat snacks sold differed significantly between the 25% and 50% price reduction conditions (post hoc comparisons ($p<0.05$). 5. There was a significant interaction between setting (school or worksite) and price reduction ($F=13.9$, $p<0.0001$). The size of the increase in the number of low-fat snack sales in the 50% price reduction condition was slightly larger at schools than worksites. 6. Promotion of low-fat snacks was significantly and independently associated with greater low-fat snack sales ($F=3.48$, $p<0.04$). 7. The percentages of low-fat snack sold in the no-label, label-only, and label-plus-sign conditions were 14.3, 14.5, and 15.4, respectively. Only the label-plus-sign condition differed significantly from the no-label condition. Total number of low-fat snack sales did not differ significantly by promotion condition, but the label-plus-sign condition differed significantly from the no-label condition ($p<0.05$).

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Sturm, Datar (2005); Sturm, Datar (2008) United States	Food pricing in grocery stores, convenience stores, full-service restaurants and fast-food restaurants over a five-year period ***OTHER INTERVENTION COMPONENT:*** *Multi-component:* 1. Food store and restaurant density *Complex:* Not reported	***DESIGN:*** Retrospective cross-sectional study (no intervention – used Early Childhood Longitudinal Study, Kindergarten Class [ECLS-K] data from different points in time and compared to food pricing) ***DURATION:*** > 24 months ***SAMPLE SIZE:*** The sample consisted of 6,918 children from the Early Childhood Longitudinal Study, Kindergarten Class (ECLS-K); attended schools in 724 different zip codes, located in 59 metropolitan areas and 37 states ***PRIMARY OUTCOME:*** Overweight/obesity (body mass index) ***MEASURES:*** 1. BMI (child's height/weight) 2. Interviews (parental characteristics, sociodemographics [SES], lifestyles) 3. U.S. Census Bureau's 1999 Zip Code Business Patterns (classify food outlets and per capita # of grocery stores, convenience stores, full-service restaurants, fast-food restaurants, and ratio of grocery stores to convenience stores and of full-service restaurants to fast-food restaurants in the resident's zip code) 4. American Chamber of Commerce Researchers Association (ACCRA) food price data (food price indices for meat, fruit & vegetables, dairy, and fast-food). ***DATA COLLECTION:*** Data were collected through interviews by the ECLS-K team on children over a 5yr time period, beginning in Kindergarten through 5th grade. The ECLS-K team measured students' height/ weight and collected data on parental background characteristics, SES, and lifestyles. Census Bureau data on food outlets merged with individual level data on home and school zip codes. ACCRA food price data were merged with individual level data from the ECLS-K by Metropolitan Statistical Area (MSA). ***LIMITATIONS:*** Sample size was not sufficient for detailed stratified analyses by population subgroups; the authors did not observe actual consumption of fruits and vegetables (F&V); food prices might reflect cultural differences in consumption (i.e. demand) rather than supply alone; many limitations of ACCRA data could have biased results: no data available for neighborhood definitions within a city, possible sampling errors along with non-coverage of certain areas, different areas covered in different time-periods and authors couldn't exploit price variation over time	5-10 year olds Nationally representative sample 59.3% White, 12.8% Black, 18.4% Hispanic, 5.8% Asian, 3.7% other (sample) ***ELIGIBILITY:*** Kindergarten -5th grade children with BMI data; the largest and smallest changes (1%) in BMI over time were omitted ***EXPOSURE/ PARTICIPATION:*** Not reported	***LEAD AGENCY:*** Research Team ***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 reported ***FUNDING:*** United States Department of Agriculture Economic Research Service grant and Robert Wood Johnson Foundation Healthy Eating Research ***STRATEGIES:*** Not reported	***OVERWEIGHT/OBESITY:*** 1. Increasing F&V prices by 1 standard deviation would significantly raise BMI by 0.11 BMI units (95% CI: 0.05 - 0.18, p<.001) by 3rd grade. About half of the effect occurred in the first year between kindergarten and 1st grade (0.054 units; 95% CI 0.01 - 0.10, p=.016). 2. Increasing meat prices would lower BMI over 3 years, but this was not statistically significant (-0.025 units, p=0.414). 3. No robust effects were found between differential changes in BMI and any of the following: per capita measures of food outlets, relative shares of fast-food restaurants compared with full-service restaurants, or convenience stores compared with grocery stores. 4. At the lower end of the price distribution, children living in a city with low F&V prices would gain 0.28 BMI units less than the average, while at the upper end of the price distribution, children living in a city with high prices would gain 0.21 units more than the average (the average is already 0.55 units higher than should have been according to growth charts). 5. Point estimates suggest that the protective effect (i.e., lower weight gain) of lower vegetable and fruit prices is 1.5 times larger for children in poverty than for other children (not statistically significant, given sample size). *5 year update (4,557 of 6,918 children):* Increasing F&V prices by 1 standard deviation would significantly raise BMI by 0.20 BMI units by 5th grade (up from 0.11 BMI units by 3rd grade) (p<0.001).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Powell, Chriqui (2009) United States	State-level grocery store and vending machine soda tax rates ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* Not reported *Complex:* Not reported	***DESIGN:*** Retrospective cross-sectional study ***DURATION:*** Not applicable ***SAMPLE SIZE:*** 153,673 8th, 10th, and 12th grade students from 420 schools, from the Monitoring the Future Survey (MTF) from 1997-2006 (nationally representative sample) ***PRIMARY OUTCOME:*** Overweight/obesity (body mass index) ***MEASURES:*** 1. State statutory and administrative law on sales tax rates for soda from grocery stores and vending machines(primary legal research, verified by states) 2. Surveys from MTF study (height, weight; controlled for SES factors [gender, grade, age, race/ethnicity, highest level of schooling completed by father and mother, a rural/urban area neighborhood designation, total student income, weekly hours of work by the student, and whether mother worked full or part time]). 3. Dun and Bradstreet business lists from 1997-2006 (food store and restaurant outlet density) ***DATA COLLECTION:*** Data on state-level sales tax rates for soda purchased through grocery stores and vending machines (1997-2006) was collected by the MayaTech Corporation (for the Robert Wood Johnson Foundation). Data on the general state sales tax rates for food were obtained from the Federation of Tax Administrators. Researchers assessed whether or not the sales tax rate was disfavored by using a dichotomous indicator for disfavored status and a continuous measure of the amount of the disfavored tax (the soda tax rate minus the general food tax rate). Information on food store and restaurant outlets was pulled by zip code for 1997- 2006, and data were linked to the individual-level data by year and by the students' school zip code. Information was included on the total number of grocery food stores classified into 4 subcategories (chain supermarkets, non-chain supermarkets, convenience stores, and grocery stores). ***LIMITATIONS:*** Study design limits claims of causality; height and weight measures were self-reported; MTF survey data do not include information on household income; control variables, such as parental education, may not capture variation in income; limited ability to assess tax sensitivity based on differences in income	11-19 year olds 69.94% White, 10.26% African American, 10.10% Hispanic, 9.69% Other race, 48.06% male (sample) ***ELIGIBILITY:*** Students who reported height and weight and had non-missing information on the covariates used from the MTF study were included. ***EXPOSURE/ PARTICIPATION:*** Anyone purchasing soda from grocery stores and vending machines potentially exposed to sales tax rates.	***LEAD AGENCY:*** Research team ***THEORY/FRAMEWORK:*** Not reported ***ADOPTION:*** Not applicable ***EVIDENCE-BASED:*** Not reported ***REPLICATION/ ADAPTATION:*** Not applicable ***IMPLEMENTATION:*** Not applicable ***FORMATIVE EVALUATION:*** Not reported ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** Not reported ***FUNDING:*** National Institute on Drug Abuse (MTF survey), the Robert Wood Johnson Foundation support from University of Illinois, University of Michigan, and the MayaTech Corporation ***STRATEGIES:*** Not reported	***OVERWEIGHT/OBESITY:*** 1. When all control variables are included, results show no statistically significant association between any of the state-level grocery store or vending machine tax measures and adolescent BMI. 2. When results are reported by subpopulation (defined by weight status, grade, gender, and parents' educational levels), a one percentage point increase in the vending machine tax rate was associated with a 0.006 reduction in BMI among adolescents at risk of overweight (p=0.10).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Ard, Fitzpatrick (2007) Alabama	Fruit and vegetable (F&V) cost influence on fruit and vegetable availability in homes of school children ***OTHER INTERVENTION COMPONENTS:*** *Multi-component* Not reported *Complex* Not reported	***DESIGN:*** Cross-sectional study ***DURATION:*** Not applicable ***SAMPLE SIZE:*** 1355 fourth grade students from 33 elementary schools and 3 districts participating in the Hi5+ intervention in Birmingham, AL ***PRIMARY OUTCOME:*** Overweight/obesity and access to healthy foods ***MEASURES:*** 1. Fruit and Vegetable Availability Survey (availability of three 100% fruit juice items, 13 fruits, and 18 vegetables in the home in any form during previous 2 weeks). This instrument has been used in several assessments of fruit and vegetable availability. 2. Average cost per serving of fruits and vegetables (USDA cost data) 3. Body mass index (height and weight) 4. Household income ***DATA COLLECTION:*** Outcomes were assessed at baseline (spring) and after 1 and 2 years follow-up. Data from baseline assessment were used for this analysis. Parents and legal guardians who were the primary household shoppers completed the fruit and vegetable survey. Three items—other beans, other fruit juice, and fruit cocktail were excluded from analysis. Measured height and weight were obtained for children and self-reported height and weight were obtained for parent. BMI was calculated as kg/m^2. ***LIMITATIONS:*** Self reported data on surveys	5-10 year olds The sample was 31.8% African American and 68.2% white. The Hi5+ intervention sample was reflective of the racial/ethnic composition and income distribution of the Birmingham metropolitan statistical area. ***ELIGIBILITY:*** Parents had to provide informed consent. ***EXPOSURE/ PARTICIPATION:*** Not reported	***LEAD AGENCY:*** Research team from the University of Alabama, Birmingham ***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:*** JP Morgan & Co, the Robert Wood Johnson Foundation, and the Clinical Nutrition Research Center, University of Alabama-Birmingham ***STRATEGIES:*** Not applicable	***OVERWEIGHT/OBESITY:*** 1. BMI of the child or parent was not a significant predictor of fruit and vegetable availability in the home. ***ACCESSIBILITY OF HEALTHY FOODS:*** 2. Increasing the cost per serving of an item significantly decreased the odds of having the item available in the home by 23% ($p<0.001$) for each $0.10-unit increase in cost. 3. With squash and oranges removed (the highest priced items), the odds of having remaining fruit and vegetable items available decreased by 30% ($p<0.001$) as cost increased. 4. Relative to the lowest priced items, when a fruit or vegetable item cost $0.30 or more per serving, the odds of having that item available in the home decreased by one-third ($p<0.001$). 5. Higher proportions of Whites reported having items such as carrots, applesauce, bananas and raisins. 6. Higher proportions of African Americans reported having items such as greens, sweet potatoes and okra.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Beydoun, Powell (2008) United States	Association of fast foods (FFs) and fruits and vegetables (F&V) prices on intake by income level ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* Not reported *Complex:* Not reported	***DESIGN:*** Cross-sectional study ***DURATION:*** Not reported ***SAMPLE SIZE:*** 7331 adults (3721 men and 3610 women) aged >20 years from the United States Department of Agriculture (USDA) Continuing Survey of Food Intakes by Individuals (CSFII) 1994-96 data ***PRIMARY OUTCOME:*** Dietary consumption, overweight/obesity (body mass index) ***MEASURES:*** 1. Two 24-hour dietary recalls 2. Diet Quality Indices - USDA's Healthy Eating Index (HEI) and the Alternate Mediterranean Diet Score (aMED) 3. Fast food consumption indices (FFCI) - FFCI count index (sum of all food items reported to be consumed at a fast food restaurant including beverages) and the FFCI binary index of consuming (=1) vs. not consuming (=0) 4. BMI (height, weight) 5. American Chamber of Commerce Researchers Association (ACCRA) Cost of Living Index reports (food price data) 6. Fruit and vegetable price index ([FVPI] prices of potatoes, bananas, lettuce, sweet peas, tomatoes, peaches and frozen corn) 7. Fast food price index ([FFPI] on hamburger, pizza, fried chicken) 8. Poverty income ratio (PIR) as a percentage of the poverty line ***DATA COLLECTION:*** Foods described in the dietary recalls were grouped into broader categories with average dietary intakes considered. The two dietary quality indices were applied to assess overall quality of diet. The FFCI count index and FFCI binary index were computed based on average intake of foods. Price data were matched to the CSFII sample. Analyses were conducted to test the effects of the price indices (FFPI and FVPI) on the continuous outcomes (dietary intakes and quality and BMI). PIR and other covariates (e.g., age, gender) were controlled for during analyses. ***LIMITATIONS:*** Limited ability to ascertain causal effects; food prices indices based on city-level prices; FVPI limited to a small number of items and may not be representative of commonly consumed F&V; residual confounding by concentration of fast food restaurants; lack of access of lower-income groups to alternatives may explain inconsistent findings regarding price effects	Adults 26% racial/ethnic populations, 22.04% lower income, 51% female, 36% living in the South, 47% living in suburban areas (sample) CSFII 1994-96 is considered nationally representative ***ELIGIBILITY:*** Non-institutionalized persons aged 0-90 years residing in the U.S. were eligible for the CSFII. Those over the age of 65 were excluded (n= 2127), to ensure relatively healthy individuals who had no special dietary needs. Those who had completed only one 24-h dietary recall (n=414) were also excluded. ***EXPOSURE/ PARTICIPATION:*** Not reported	***LEAD AGENCY:*** Research team from Johns Hopkins School of Public Health and the Institute for Health Research and Policy at the University of Illinois-Chicago ***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 Research Initiative of the USDA Cooperative State Research Education and Extension Service ***STRATEGIES:*** Not applicable	***OVERWEIGHT/OBESITY:*** 1. A $1 increase in FVPI was associated with a significant reduction in BMI (ß=-3.9, p<0.05). 2. FVPI was associated with a marked reduction in the proportion of obese, particularly among the near poor (OR: 0.82; 95% CI: 0.67-0.99). 3. PIR was a significant effect modifier in the relationship between FVPI and obesity (p<0.10). ***NUTRITION:*** 4. For the total population, increasing FFPI by $1 was associated with a drop in percent saturated fat from total energy intake by 1.1 percentage points, an increase in fiber intake by 2.8 g/day (highest in the middle income category), and an increase in aMED score by 0.49 points (out of 10) (p<0.05). 5. For the total population, every $1 increase in FVPI was associated with 1777 mg lower sodium consumption, 141 mg lower cholesterol intake, and 10.8 points more on the HEI overall diet quality index. 6. FFPI had a small significant association with fast food consumption (OR: 0.89; 95% CI: 0.78-1.02). 7. FVPI was positively associated with an improved aMED score among the poor income category (OR: 2.22; 95% CI: 1.22-4.03).

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Powell, Auld (2006) United States	Fruit and vegetable and fast-food costs ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* 1. Neighborhood restaurant density *Complex:* Not reported	***DESIGN:*** Cross-sectional study ***DURATION:*** Not reported ***SAMPLE SIZE:*** Repeated cross sections from the Monitoring the Future Survey (MTF) conducted 1997-2003 yielded 72,854 observations from 8th & 10th grade students; 47,675 observations included food consumption data ***PRIMARY OUTCOME:*** Dietary consumption, overweight/obesity (body mass index) and probability of overweight ***MEASURES:*** 1. Height and weight (CDC growth chart for BMI) 2. Monitoring the Future (MTF) survey (demographics, food consumption, physical activity, F&V consumption, height and weight, geographic identifiers at zip code level for school) 3. Dun and Bradstreet density measures (restaurants, fast food outlets) 4. American Chamber of Commerce Researchers Association (ACCRA) Cost of Living reports (price data for F&V and fast food). ***DATA COLLECTION:*** The MTF survey consisted of 4 different forms administered to students in ordered sequence in classrooms. The research team in the current study, using Dun & Bradstreet software, pulled information on number of restaurant outlets by zip code for 1997-2003 at the 4-digit SIC code level and for fast food restaurant outlets at the 6-digit SIC code level. The outlet density data was linked to the individual-level data by student's school's zip code. Price data were drawn from quarters 1 and 2 of the ACCRA Cost of Living Index, and 2 price indices were created (F& V price index and fast food price index) which were deflated by the Bureau of Labor Statistics Consumer Price Index. The research team then conducted all data analyses. ***LIMITATIONS:*** Height and weight were self-reported; children may live in a different zip code from their school & school zip codes were used to link to food outlet density; control variables may not capture variation in income and therefore results may be subject to omitted variables bias; the researchers identified the effects of prices and densities using variation across geographic regions within years such that unobserved determinants of weight outcomes and eating habits across regions may bias the results	12-17 year olds (nationally representative) ***ELIGIBILITY:*** 8th or 10th grade students randomly selected at one of approx. 280 schools selected through MTF sampling procedures. ***EXPOSURE/ PARTICIPATION:*** Not reported	***LEAD AGENCY:*** Research team (University of Illinois-Chicago and University of Michigan) ***THEORY/ FRAMEWORK:*** The rational choice framework (individuals choose food intake and physical activity to achieve ends) ***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:*** National Institute on Drug Abuse (MTF survey) and the Robert Wood Johnson Foundation (evaluation) ***STRATEGIES:*** Not applicable	***OVERWEIGHT/OBESITY:*** 1. When year effects are not considered, fast food and F&V prices both statistically significantly impact BMI (p=0.01). BMI is lower when fast food prices are higher and when F&V prices are lower. 2. When year effects are included, the magnitude of the F&V price effect on BMI drops by more than half and loses statistical significance. The estimated effect on BMI of a $1 change in the price of a fast food meal falls by almost half to 0.31 m/kg^2, but remains statistically significant (P=0.05). 3. BMI is higher when there are fewer full service restaurants, more fast food restaurants, or higher F & V prices, but none of the results are statistically significant. 4. Controlling for year effects, a $1 increase in fast food reduces prevalence of overweight by 2.2 percentage points (p=0.05). 5. A 10% increase in the price of a fast food meal leads to a 0.4% decrease in BMI and a 5.9% decrease in prevalence of overweight. ***NUTRITION:*** 6. A $1 increase in the price of fast food is statistically significantly associated with a reduction in frequent consumption of F&V, by 7.3 percentage points when year effects are not included (p=0.01) and by 6.7 % points when year effects are included (p=0.01). 7. A $1 increase in the price of F&V is estimated to decrease F & V consumption by 6.3 percentage points (z=2.05, P=0.05), but loses some statistical significance when year effects are included (z=1.79, P=0.10). 8. Increased availability of full service restaurants has a statistically signification relationship with frequent F&V consumption. Ten more full service restaurants per capita in the region were associated with a 1.9 percentage point increase in the probability of frequent consumption (p=0.01). (Note: Year effects refer to trend up for BMI and trend down for fast food prices over 6 years MTF data were collected.)

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Powell, Bao (2009) United States	Food pricing of energy-dense foods and healthy foods ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* 1. Neighborhood food store density *Complex* Not reported	***DESIGN:*** Cross-sectional study ***DURATION:*** Not reported ***SAMPLE SIZE:*** 3797 children (aged 6-17 years) from 3 waves of the National Longitudinal Survey of Youth 1979 (NLSY79) data ***PRIMARY OUTCOME:*** Overweight/obesity (body mass index) ***MEASURES:*** 1. NLSY79 data (individual-level data) 2. American Chamber of Commerce Researchers Association (ACCRA) Cost of Living Index reports (food price data) 3. Dun and Bradstreet business lists through Marketplace software (food store and restaurant outlets) 4. Census 2000 county-level population estimates ***DATA COLLECTION:*** The Robert Wood Johnson Foundation Bridging the Gap/ImpacTeen study provided the price and outlet density data available. Price data from ACCRA reports were matched to the NLSY79 sample based on the closest city match available in the ACCRA using the NLSY79 geocode county indicators. Based on the items in the ACCRA, the researchers created two indices, a fruit and vegetable price index and a fast food price index. Outlet density was matched by year at the county-level to the NLSY79 and computed as the number of available outlets per 10,000 capita using Census 2000 county-level population estimates. The researchers examined a continuous BMI outcome measure of weight using a random effects model and estimated separate models by children's socioeconomic status (SES) according to family income and mother's education level. ***LIMITATIONS:*** ACCRA price data collected in a limited number of cities and metropolitan statistical areas and they do not provide price data at lower geographic units; price data collection based on establishment samples that reflect a mid-management standard of living; ACCRA does not always continuously sample the same cities so data are not fully comparable over time; a small number of food items are surveyed across food groups; given that the price data are only available for a limited number of geographic areas, the researchers limited their sample to observations with an exact county-level match or a match with the closest ACCRA city in a contiguous, limiting generalizability	6-17 year olds 21% racial/ ethnic populations (sample) ***ELIGIBILITY:*** Children must live in the same household as their mothers and be linked by their mother's identifiers to the NLSY79 adult data. Girls who reported that they were pregnant at the time of the interviews were excluded from the sample. ***EXPOSURE/ PARTICIPATION:*** Not reported	***LEAD AGENCY:*** Researchers from the Institute for Health Research and Policy, University of Illinois-Chicago and the Global Health Economics and Outcomes Research, Abbot Laboratories. ***THEORY/ FRAMEWORK:*** Economic theory ***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 Research Initiative of the U.S. Department of Agriculture Cooperative State Research Education and Extension Service. ***STRATEGIES:*** Not applicable	***OVERWEIGHT/OBESITY:*** 1. A $1 increase in the price of fruits and vegetables raises BMI by 2.0 units. Increasing the price of fruit and vegetables by 1 standard deviation increases BMI by 2.0 units (p=0.01). 2. A 10% increase in the price of fruits and vegetables was associated with a 0.7% increase in child BMI (p=0.01). 3. Fast food prices were not found to be statistically significant in the full sample but were weakly negatively associated with BMI among adolescents with an estimated price elasticity of 0.12. 4. The associations of fruit and vegetable and fast food prices with BMI were significantly stronger both economically and statistically among low-versus high-socioeconomic status children. 5. For the full sample, the BMI fruit and vegetable price elasticity is 0.07(p=0.01) and the fast food price elasticity of BMI is -0.07 (not significant). 6. Increased supermarket availability is statistically significantly associated with lower BMI (-0.1928, SD=0.0772, p<0.05). 7. Food outlets, considered as a whole, were not found to have a strong statistical significant association with children's BMI when defined either on a per capita or per land area basis.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Hannan, French (2002) Location not reported	School policy to raise the price of three popular high-fat food items by ~10% and lower the price of four lower fat items by ~25% for one school year. ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* 1. Policy to target high fat foods in schools *Complex:* Not reported	***DESIGN:*** Non-comparative study ***DURATION:*** 9 months ***SAMPLE SIZE:*** 1,990 high school students from one high school ***PRIMARY OUTCOME:*** Food sales ***MEASURES:*** 1. Sales data from targeted items (high fat: French fries, cookies, cheese sauce; lower fat: fresh fruit, low-fat cookies, low-fat cereal bars, low-fat chips) ***DATA COLLECTION:*** The cafeteria personnel were responsible for tracking the sale of the targeted foods (low fat versus high fat). Food service staff received instructions from the cook manager about accurate keying of the targeted high and low fat items. ***LIMITATIONS:*** Lack of baseline sales data under usual prices; limited number of foods included in the pricing intervention; use of a single high school setting; use of a cashless payment system that may have decreased students' reactivity to the price changes	14-18 year olds 13% racial/ ethnic populations 8% lower income ***ELIGIBILITY:*** Not reported	***LEAD AGENCY:*** Research team ***THEORY/FRAMEWORK:*** Not reported ***EVIDENCE-BASED:*** Builds off of the success of previous studies that have increased purchases of healthy foods by lowering prices. This study examines the ability to make pricing strategies more sustainable by offsetting the lower costs of healthy foods with higher costs of unhealthy food. ***REPLICATION/ ADAPTATION:*** Not reported ***ADOPTION:*** Not reported ***IMPLEMENTATION:*** The research team designed the pricing intervention and the school cafeteria implemented it. ***FORMATIVE EVALUATION:*** Not reported ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** Not applicable ***FUNDING:*** National Institutes of Health and the Centers for Disease Control and Prevention ***STRATEGIES:*** Not applicable	***FOOD SALES:*** 1. The low fat food sales averaged 13.1% of sales for the targeted foods, ranging between 10% and 16% with no consistent trend or pattern. 2. For individual foods, sales of fresh fruit tended to increase throughout the study period, sales of low-fat cookies and low-fat chips initially increased but then decreased and sales of the low-fat cereal bars remained stable. 3. High-fat foods showed a slow decline in sales. ***MODELING RESULTS:*** 4. Total revenue for the seven targeted foods is expected to average 6.2% lower if the price elasticity for targeted high-fat foods equals -1.5, and 4.6% higher if the price elasticity for these high-fat foods equals -0.5. 5. Based on the model used in the study, at a price elasticity of -1.0, the revenues are expected to be down 0.8%. 6. According to the sensitivity analysis, the worst scenario is for an expected 7.1% loss of revenue under the model when price elasticity for low-fat foods is -1.0 and the price elasticity for high-fat foods is -1.5. 7. With the actual pricing strategy and the simple econometric model used, the average price elasticity for high-fat foods that would make the intervention revenue-neutral is -0.93.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Epstein, Dearing (2007) New York	Laboratory food-purchasing experiment to assess influence of price changes of low-energy-density (LED) and high-energy-density (HED) foods on mother's food purchases ***OTHER INTERVENTION COMPONENTS:*** *Multi-component* Not reported *Complex* Not reported	***DESIGN:*** Non-comparative study ***DURATION:*** < 6 months ***SAMPLE SIZE:*** 47 mothers between ages of 25 and 50 years old ***PRIMARY OUTCOME:*** Hypothetical purchase of high-energy dense (HED) or low-energy dense (LED) foods ***MEASURES:*** 1. Body mass index ([BMI] height, weight) 2. Food liking test (7-point Likert scale) 3. Same day dietary recall interview 4. Hunger (5-point Likert scale) 5. Demographics using the Hollingshead demographics questionnaire (socioeconomic status on the basis of educational level, occupation, and race; weekly amount spent on groceries; number of persons in the family; hunger; age; minority status) ***DATA COLLECTION:*** Sixty foods were divided into six food groups (fruit, vegetables, dairy, protein, grains, and other, which were desserts). Five foods in each group were classified as LED (<2.0kcal/g) or HED (≥ 2.0 kcal/g). Reference price for each food was determined by averaged cost of two local markets. After the grocery store experiment participants had their height and weight measured. Participants were considered obese if they had a BMI ≥ 30. Participants were interviewed by the experimenter to ensure that they had not eaten in the 3 hours before the appointment. ***LIMITATIONS:*** The laboratory study may not be a good representation of individual's purchasing behaviors; no penalty for too much money spent	Mothers The sample was 72.3% white, 21.3% minority (Hispanic and African American), and 6.4% other race or multi-race; 19.2% of the sample had family incomes below $29,999, and 23.4% had family incomes greater than $70,000; 53.2% had a high school, vocational school, or associates degree, whereas 46.8% had a college or graduate degree. ***ELIGIBILITY:*** Participants had to be responsible for the primary grocery shopping for the family, have at least one child aged 2-15 residing in the household, and provide written consent. ***EXPOSURE/ PARTICIPATION:*** Not reported	***LEAD AGENCY:*** Research team from the University of New York at Buffalo ***THEORY/ FRAMEWORK:*** Not reported ***EVIDENCE-BASED:*** Not reported ***REPLICATION/ ADAPTATION:*** Not reported ***ADOPTION:*** Not reported ***IMPLEMENTATION:*** The researchers set up the experimental store and gave mothers a certain allowance in two different trials ($15 and $30) to purchase foods for their families, represented as pictures on cards. ***FORMATIVE EVALUATION:*** Not reported ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** 1. Incentives ($25 gift certificate to local supermarket) 2. Picture cards 3. Space 4. Personnel ***FUNDING:*** The National Institute of Child Health and Human Development ***STRATEGIES:*** Not reported	***OVERWEIGHT/OBESITY:*** 1. Maternal BMI interacted with price to influence purchases of HED foods when the price of HED foods increased (p=0.016) and interacted with price to influence purchases of LED foods when the price of HED foods increased (p=0.008). 2. The own-price elasticity of HED foods for the non-obese and obese mothers was -1.051 (p<0.001) and -0.767 (p<0.001), respectively, with the non-obese mothers being more sensitive to increases in the price of HED foods than were the obese mothers. 3. Non-obese mothers were more likely than obese mothers to substitute LED foods for HED foods when the price of HED foods increased. 4. Own-price elasticity for HED foods differed on the basis of BMI as evidenced by the significant interaction between the price of HED foods and BMI (coefficient=0.023, p=0.016). 5. Cross-price elasticity for LED foods was also related to BMI, as evidenced by the significant interaction between the price of HED foods and BMI (coefficient=-0.017, p=0.008). ***OTHER RESULTS:*** 6. A cross price elasticity of 0.622 means that when HED prices are increased by 10%, the demand for LED foods increases by 6.22%. When the price of HED foods increased, there was an increase in purchases of LED foods. Mothers in the $30 per family member condition purchased 4028.0 kcal of LED foods when the price of HED foods was 75% of the reference price, and 4350.3 kcal of LED foods when the price of HED foods was 125% of the reference price. 7. Because the cost per 100 kcal is less for HED foods than for LED foods, mothers purchased more energy from the HED foods than from the LED foods at each price comparison. For example, according to the average energy for foods purchased in the LED and HED food groups, mothers in the $30 per family member condition purchased 8309.9 kcal of HED foods but only 5116.7 kcal of LED foods when the price of these foods was reduced to 75% of the reference price, and 4701.1 kcal of HED foods compared with 3222.6 kcal of LED foods when the price of these foods was 125% of the reference price. 8. Hunger was a significant predictor of purchases of both LED (coefficient=-0.041, p=0.008) and HED (coefficient=0.060, p=0.005) foods. Hungrier mothers purchased more HED and less LED foods. (Note: High-energy dense foods = HED and Low-energy dense foods = LED; Own-price elasticity is the percentage change in quantity demanded in response to a one percent change in price. Cross price elasticity is the percentage change in demand for HED foods that occurs in response to a percentage change in price of LED foods or vice versa.)

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Epstein, Handley (2006) New York	Laboratory experiment to assess influence of price on purchase of healthy and unhealthy foods ***OTHER INTERVENTION COMPONENTS:*** *Multi-component* Not reported *Complex* Not reported	***DESIGN:*** Non-comparative study ***DURATION:*** < 6 months ***SAMPLE SIZE:*** 52 children aged 10-14 years (32 in experiment 1, 20 in experiment 2) ***PRIMARY OUTCOME:*** Hypothetical food purchasing behavior ***MEASURES:*** 1. Parental questionnaire (demographic and socioeconomic status) 2. Hunger scales (5-point Likert scale) 3. Likeness scales and purchasing preferences (9-point Likert scale; how much child liked foods tasted) 4. Body mass index ([BMI] height, weight) ***DATA COLLECTION:*** Children listed the foods that they had eaten that day and were presented with 12 different foods to taste. If all foods were eaten, the energy consumed approximated 146 calories. The child rated how much they liked each food (1=do not like, 9=like very much) and indicated their favorite snack and vegetable or fruit. Eight of the participants were asked to repeat the experiment after 12 months to assess the reliability of the results. In Experiment 2, children were presented with eight foods classified as more or less healthy. Consuming all foods during the taste test would amount to an intake of approximately 177 kcal. Six of the 20 children were retested after 4 months to establish the repeatability of the findings. ***LIMITATIONS:*** Parent Questionnaires were based on self-reported measures	10-14 year olds ***EXPERIMENT 1:*** 20% African American and 65% Caucasian; 15% of the children were of other races or mixed race ***EXPERIMENT 2:*** 75% Caucasian, 10% African American, and 15% were of other races or mixed race. ***ELIGIBILITY:*** Participants had to have at least moderate liking for one snack food, one fruit or vegetable, one sedentary activity, and one physical activity; have no current psychopathology or developmental disability; and have no medical condition that would prevent the child from engaging in usual physical activities. Parental written assent and participant assent were required. ***EXPOSURE/ PARTICIPATION:*** Not reported	***LEAD AGENCY:*** Research team from the University of New York at Buffalo ***THEORY/ FRAMEWORK:*** Not reported ***EVIDENCE-BASED:*** Not reported ***REPLICATION/ ADAPTATION:*** Not reported ***ADOPTION:*** Not reported ***IMPLEMENTATION:*** Children were given plastic tokens to purchase favorite foods. At each trial the prices varied. In Experiment 1, they were given $5 in tokens. In Experiment 2, they were given $1, $3, and $5 in different trials to compare which foods they would buy when prices changed. ***FORMATIVE EVALUATION:*** Not reported ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** 1. Incentives ($20 and $15) 2. Food items (for choice test) 3. Red plastic tokens 4. Plates 5. Imitation US coins 6. Personnel ***FUNDING:*** National Institute of Child Health and Human Development and the National Heart, Lung, and Blood Institute ***STRATEGIES:*** Not reported	***FOOD PURCHASING:*** 1. The estimates for same-price elasticity for healthy and unhealthy foods were significant and strong (-1.010 and -0.921, respectively). The estimates for cross-price elasticity were also negative and significant (-0.262 and -0.143 for healthy and unhealthy foods, respectively), but lower than the estimates for same-price elasticity. 2 Estimates for the same-price elasticity (-1.651, Prep=0.999, d=4.42, p<0.001) and cross-price elasticity (0.974, Prep=0.997, d=2.61, p<0.001) were significant for purchases of healthy foods. 3. Income interacted with the price of unhealthy foods to influence purchase of healthy foods (estimate=-0.300, Prep=0.998, d=0.80, p<0.001). Same-price elasticity (estimate=-2.109, Prep=0.999, d=6.01, p<0.001) and cross-price elasticity (estimate=0.491, Prep=0.923, d=1.398, p=0.23) were observed for purchases of unhealthy foods. 4. Income interacted with the price of healthy foods (estimate=-0.133, Prep=0.898, d=0.39, p=0.036) and the price of unhealthy foods (estimate=0.136, Prep=0.892, d=0.38, p=0.40) to influence purchase of unhealthy foods. (Note: Elasticity refers to the ratio of the percentage change in one variable to the percentage change in another variable. Cross price elasticity is the percentage change in demand for one variable that occurs in response to a percentage change in price of another variable.)

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
International						
Haerens, Deforche (2006); Haerens, De Bourdeauduij (2007); Haerens, De Bourdeauduij (2007); Haerens, Cerin (2007); Haerens, Cerin (2008); Haerens, Deforche (2006) Belgium	School policy to increase healthy food choices by: 1. Selling fruit at school for a very low price or for free at least once a week 2. Pricing water lower than soft drinks 3. Offering fruit for dessert during lunch ***OTHER INTERVENTION COMPONENTS:*** *Multi-Component:* 1. Physical activity (PA) component to increase levels of moderate to vigorous physical activity (MVPA) to at least 60 min/day. Activities included PA during breaks using varied content to reach all students, provision of extra sports materials, encouragement of active transportation to school, and a computer-tailored PA classroom lesson. 2. Access to free water through drinking fountains *Complex:* 1. Computer-tailored classroom lesson on fat and fruit intake 2. Parent component including interactive meeting on healthy living, newsletters/ school paper 3 times/yr and adult computer-tailored intervention for fat intake and PA	***DESIGN:*** Group randomized trial ***DURATION:*** 2 school years ***SAMPLE SIZE:*** 2434 7th and 8th grade students in 15 schools (5 schools= parent component; 5 schools= no parent component; 5 schools= no intervention); 2287 students included in 2 year sample ***PRIMARY OUTCOME:*** Overweight/obesity (body mass index) ***MEASURES:*** 1. BMI- Height and weight 2. Flemish PA questionnaire (FPAQ). 3. Accelerometers (N= 258) 4. PA diary (activities done without accelerometer) 5. Self administered questionnaire (fat intake) 6. Food frequency questionnaires (fruit, water, soft drink intake) 7. Implementation questionnaire (implementation of the intervention activities) ***DATA COLLECTION:*** Students completed the questionnaires once a year. BMI was measured at baseline, 1 year, and 2 years. A subsample of students wore the accelerometer for four weekdays and two weekend days. Students recorded their activities in the diary. One workgroup member from each intervention school completed the implementation questionnaire at the end of the 2 year intervention. ***LIMITATIONS:*** Self-reported data; high attrition rate (25%); risk for clustering of outcome variables within schools due to randomization at the school level; schools not matched on key characteristics resulting in a gender disparity across conditions; accelerometers only used in a subsample of 7th graders; not possible to determine which component of the intervention had significant effects	11-18 year olds 68% lower income (evaluation sample) ***ELIGIBILITY:*** Not reported ***EXPOSURE/ PARTICIPATION:*** All children in the 10 intervention schools were exposed to the healthy eating and physical activity policies; all children in the 5 intervention with parent schools were exposed to the parent component.	***LEAD AGENCY:*** Research team ***THEORY/FRAMEWORK:*** Not Reported ***EVIDENCE-BASED:*** The study builds off previous successful interventions that targeted the environment and computer-tailored physical activity interventions. The current study combines these two approaches. ***REPLICATION/ ADAPTATION:*** Not reported ***ADOPTION:*** Not reported ***IMPLEMENTATION:*** The research team developed the intervention (including the intervention manual). In year one the research team led a work group composed of school staff that help to guide the intervention delivery. The school staff made changes to the food environment, physical activity environment, and led the parent component. ***FORMATIVE EVALUATION:*** Not reported ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** 1. Computers 2. CD-ROM for the adult computer intervention 3. Sports materials (jump ropes, balls etc.). 4. Funds for subsidizing fruit and water 5. Materials for meetings with parents 6. Newsletters for parents ***FUNDING:*** Federal Flemish government funds ***STRATEGIES:*** Not Reported	***OVERWEIGHT/OBESITY:*** *After Two Years* 1. For all analyses, variance at the school level was not significant (all z< 1.59). 2. For girls there was a significantly lower increase in BMI (from 20.23 ± 3.95 to 21.34 ± 3.83) in the intervention with parent group compared to control (from 19.12 ± 3.50 to 20.78 ± 3.66), F=12.52, p<0.05. 3. For girls there was a significantly lower increase in BMI z score (from 0.24 ± 1.11 to 0.24 ± 1.06) in the intervention with parent group, compared to control (from -0.03 ± 1.05 to 0.14 ± 1.00), F=8.61, p<0.05. 4. In addition, there was a significantly lower increase in BMI z score (from 0.24 ± 1.11 to 0.24 ± 1.06) in the intervention with parent group, compared to intervention no parent group (from 0.28 ± 0.97 to 0.35 ± 0.96), F= 2.68, p=0.05. 5. In boys, no significant positive intervention effects were found. 6. BMI z-score increased significantly more in schools with low levels of implementation, when compared with schools with medium (F=5.03, p<0.05) and high (F=2.80, p<0.05) levels of implementation. After 2 years of the intervention, BMI z-score increased with 0.12 units in the schools with low levels of implementation and with 0.06 and 0.09 units, respectively, in schools with medium and high levels of implementation. ***NUTRITION:*** *After One Year* 7. The intervention was not effective in increasing self reported fruit intake and water consumption or decreasing soft drink consumption. 8. Fat intake decreased significantly more in girls in the intervention with parent group, compared to the intervention no parent group (F=6.1, p<0.05) and control group (F=17.3, p<0.001). 9. Percentage of energy from fat also decreased significantly more in girls in the intervention with parent group, compared to the intervention no parent group (F=3.9, p<0.05) and control group (F=16.7, p<0.001). 10. No significant effect for fat intake or percentage of energy from fat among boys. *After Two Years* 11. In year 2 for girls, decreases in fat intake were higher in the intervention groups (-20g/day) when compared to control group (-10g/day), F=5.8, p<0.05. Percentage of energy from fat decreased by 9% in the intervention group and 5% in the control group (F=13.3, p<0.001). *(continued next page)*

(Continued from previous study)						
						PHYSICAL ACTIVITY: *After One Year* 12. Based on the physical activity questionnaire, the intervention with parent group increased their total physical activity by 9.0 min day-1 (95% CI: 2.9, 15.2; p=0.004) more than did the control group. 13. Based on the physical activity questionnaire, school related PA increased significantly in the two intervention groups (+6.4 min/day, d=0.40 with parent support group; +4.5 min/day, d=0.29 without parent support group) compared to controls (no change), p<0.05 for both. 14. Based on the physical activity questionnaire, girls leisure time active transportation remained stable in the no parent intervention group, while it decreased on average 4 minutes daily in the control group (F=12.1, p<0.001, d=0.28). In boys, there were no significant differences. 15. Based on the physical activity questionnaire, significant differences were also found between the intervention with parent group and the control group on changes in active transportation to/from school (2.1 min day-1, 95% CI: 0.6, 3.6; p=0.006) and changes in school-related sporting activities (2.1 min day-1, 95% CI: 0.5, 3.7; p=0.012). No significant differences were found between the control group and intervention with no parent group. 16. Based on accelerometry data, MVPA increased an average of 4 min. daily in the intervention with parent group, and decreased 7 min. daily in the control group (F=5.1, p≤ 0.05; d=0.46). 17. Based on accelerometer data, PA of light intensity decreased an average of 21 min daily in the intervention with parent group and decreased by 57 min on average daily in the control group (F=5.1, p≤ 0.05; d=0.54). *After Two Years* 18. In boys, school-related physical activity increased significantly more in the intervention groups (from 18.3 ± 18.7 to 25.2 ± 21.4) compared with the control group (from 22.6 ± 14.8 to 23.8 ± 16.5), F=3.4, p<0.05. 19. For boys, accelerometer data revealed a trend for significant lower decreases in physical activity of light intensity in the intervention groups (-6 min/day) compared with the control group (-39 min/day), F=8.6, p<0.001. 20. Based on accelerometer data for boys, MVPA remained stable in the intervention group, but significantly decreased (-18 min/day) in the control group (F=3.5, p<0.08). 21. In girls, time spent in physical activity of light intensity decreased significantly less in the intervention groups (-2 min/day) compared with the control group (-20 min/day), F=4.6, p<0.05.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Pearson, Russell (2005) United Kingdom	Fruit and vegetable (F&V) pricing ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* 1. Distance from residence to nearest supermarket *Complex:* 1. Area socioeconomic deprivation	***DESIGN:*** Cross-sectional study ***DURATION:*** Not reported ***SAMPLE SIZE:*** 426 household respondents from 4 electoral wards (2 rural, 2 urban) in South Yorkshire provided complete information ***PRIMARY OUTCOME:*** Dietary consumption ***MEASURES:*** 1. 24 hour food recall questionnaire (fruit and vegetable (F&V) intake) 2. Demographics questionnaire (grocery store use, car ownership, mobility) 3. Small area deprivation score (localized measure of socioeconomic deprivation) 4. Shopping basket survey (price and availability of four staple vegetables [carrots, onions, cauliflower, potatoes], two salad ingredients [lettuce, tomatoes], and three common fruits [apples, bananas, oranges], price per unit weight index employed for comparisons). ***DATA COLLECTION:*** Researchers mailed questionnaires to 1,000 randomly selected addresses in 4 electoral wards. Respondents recorded the number of portions/servings of F&V eaten per day with guidelines furnished by the researchers and also provided household demographic information. The researchers used respondents' postal codes to match a small area deprivation score for each address and to derive road travel distance from each home to the nearest supermarket. Grocery stores allowed the researchers to conduct shopping basket surveys to ascertain local prices. Researchers recorded the price of the lowest cost variety where multiple choices were available. A price per unit weight index was used in order to make price comparisons. All supermarkets were visited over a 14-day period. The researchers conducted data analyses. ***LIMITATIONS:*** 24-hour recall questionnaire was self reported; the sample is limited to those drawn from 4 of 22 wards, limiting generalizability; logistics of conducting the shopping basket survey constrained the extent of the geographical coverage; regression models used data from closest supermarket, but a majority of respondents reported using more than one supermarket	Adults ***ELIGIBILITY:*** Four wards were selected to reflect diversity in grocery shopping facilities, material deprivation and level of urbanization. For the 1,000 addresses randomly selected from those wards to participate, the household member largely responsible for grocery shopping was asked to complete the questionnaire. Individuals with incomplete information were excluded from the analysis ***EXPOSURE/ PARTICIPATION:*** Not reported	***LEAD AGENCY:*** The research team from the School of Health and Related Research at University of Scheffield ***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:*** Barnsley Metropolitan Borough Council ***STRATEGIES:*** Not applicable	***NUTRITION:*** 1. Deprivation, supermarket fruit and vegetable price, distance to nearest supermarket and potential difficulties with grocery shopping were not significantly associated with either fruit or vegetable consumption. 2. Male grocery shoppers ate less fruit, approximately one third of a portion per day, than female grocery shoppers (β=-0.30; 95% CI: -0.57, -0.02; p=0.04). 3. Consumption of vegetables increased slightly with age, by one-tenth of a serving per day per 15 year age increment (β=0.12; 95% CI: 0.00, 0.23; p=0.05). 4. There was a similar trend of an increase in fruit consumption with age, but the effect was not statistically significant (β=0.13 servings/day/15 year age increment; 95% CI: -0.01, 0.27; p=0.07).

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